



AMERICAN UNIVERSITY OF BEIRUT

INTEGRATED COASTAL MANAGEMENT FOR  
SUSTAINABLE DEVELOPMENT OF COASTAL CITIES:  
THE CASE OF EL-MINA, TRIPOLI

by  
GHADIR HASSAN GHAMRAWI

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for the degree of Master of Urban Design  
to the Department of Architecture and Design  
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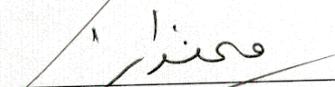
by  
GHADIR HASSAN GHAMRAWI

Approved by:



Dr. Yaser Abunnasr, Associate Professor  
Department of Landscape Design and Ecosystem Management

Advisor



Dr. Mona Fawaz, Professor  
Department of Architecture and Design

Member of Committee



Dr. Serge Yazigi, Assistant Professor  
Department of Architecture and Design

Member of Committee

Date of thesis/dissertation defense: April 25, 2019

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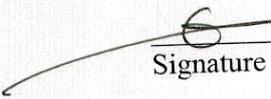
Student Name:            Ghamrawi            Ghadir            Hassan  
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# AN ABSTRACT OF THE THESIS OF

Ghadir Hassan Ghamrawi for Master of Urban Design

Major: Urban Design

Title: Integrated Coastal Management for Sustainable Development of Coastal Cities: The Case of el-Mina, Tripoli

Coastal cities are constantly exposed to environmental degradation and economic regression fueled by rapid and uncontrolled urban growth as well as continuous resource depletion (Krishnamurthy et al., 2018). This is the case of the City of Mina in Tripoli (Lebanon) where lack of awareness to preserve social, ecological and historical assets, coupled with the increasing development pressures, are threatening the socioeconomic status of the city residents, the quality of life and accessibility to the coast.

To address these challenges, a holistic coastal urban design and planning approach was developed to analyze the environmental, political, legal and socioeconomic context of the city. This approach aims to investigate the potential of balancing urban development with the protection and enhancement of cultural, ecological and environmental assets under an integrated coastal zone management approach (ICZM).

The analysis of Mina's different sectors adopted several tools that include direct field observation, interviews with stakeholders, analysis of available data, historical maps and previously proposed projects. The findings from the analysis were mapped and graphically represented allowing the recognition of character zones that become the design intervention units. Consequently, the thesis proposes an urban, city-scale intervention that (1) identifies 6 different character zones (the historical fishing port, Abdul Wahab island, the abandoned Port Said, Hammam el Makloub, the sand beach, and the new developable area) and proposes context-specific design interventions that capitalize on the main characteristics of each zone. Moreover, the intervention builds on (2) the institutional framework of ICZM as well as other studies previously conducted for the coast, and adopts (3) nature-based solutions with hybrid systems for providing better environmental design solutions for developing the coast. This enables the realization of an all-inclusive, well-connected shoreline with easy and free access towards the sea; a developed shoreline with an active local economy, and an improved urban environment.

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# CHAPTER I

## INTRODUCTION

### **A. Overview of Coastal Regions and Current Issues**

Waterfronts in cities constitute an essential spatial ecological edge, a valuable resource and a dynamic activator of the city's economy (Lindrgren, 2011). Nevertheless, city waterfronts and coastlines can be exposed sometimes to coast decay, environmental degradation and may suffer as well from declining economic activity (National research council U.S., 1980).

Mina- Tripoli coastal area has been suffering from various coastal problems along the years (Rajab, 2018; Harmandayan, 2018)<sup>1</sup> such as, illegal development threats on its shoreline near the maritime zone leading to severe environmental and ecological degradation (Shamaa, 2016). Moreover, the new southern development area in el-Mina is challenged by Mina municipality intentions of increasing the FAR (Saksouk, 2018). Since urban waterfronts represent a potential economic source; creative and pragmatic solutions are constantly sought by urban designers and planners in order to improve the global identity and economic situation of waterfront areas and their cities (Desfor, Gene and Jennefer Laidley, eds. 2011).

In an attempt to mitigate and resolve the present-day coastal challenges in Mina, this thesis investigates the different factors affecting the general situation of Mina and more specifically its coast. It aims to create a holistic understanding and analysis of the

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<sup>1</sup> These claims are based on in-depth interviews held with both Dr. Mosbah Rajab and Mr. Diran Harmandayan.

current coast's situation, potentials, and threats. As such, the thesis proposes and identifies an effective management framework which will help re-conceptualize and re-frame the role, function, land-use and identity of Mina.

In order to achieve a sustainable management of the coast, the thesis adapts the integrated coastal zone management (ICZM) approach to the context of Mina. This approach allows setting strategies, and guidelines to inform future designs for the coast of Mina. Simultaneously, it opens the door for rethinking the city's relationship with nature, heritage, culture and local economy (Sieber, 1991). Indeed, using ICZM, will protect the coast and provide recreational facilities while at the same time allowing new development projects to take place.

### **B. Problem Statement, Research Question & Hypothesis:**

The coast of Mina is suffering from dangerous urbanization pressures and privatization threats that are leading to environmental degradation and social disruption. The current development pressures enforced by Mina municipality are increasing the risk of Mina urban fabric transformation, densification and spatial degradation. This is threatening the quality of life in Mina as well as socio-economic status of the residents.

One of the reasons behind the deterioration of the public coast is the common belief among decision makers that property developers should be given incentives to establish private resorts along the coast. As such, decision makers are often found to issue exceptions and bend rules to provide developers with a basket of laws and exemptions that expand construction on coastal lands (Fawaz, 2017). Furthermore, most times, the Lebanese government is ignoring several international agreements that Lebanon has signed and that protect the public and ecological characteristics of the coast. In addition,

lack of collaboration between different governmental institutions remains as one of the essential causes for legal irregularities.

These public practices could be explained as a result of neo-liberal rationalism that reigns in the country. Indeed, urban privatization strategies became a neoliberal stance of an entrepreneurial city government eager to attract private investments at any cost (Fawaz, 2017). This is where, coastal investments become an economic opportunity to accumulate capital for a hand few of well-connected individuals who employ only a few hundred of people in menial jobs (Fawaz, 2017). Thus, and in an intention to suggest a solution for the protection of the future of our seashore, urban planning strategies and integrated coastal managements approaches should be developed and adopted (Taussik, 2007). The adoption of such strategic approaches is direly needed in order to protect public rights from private interests. However, the challenge remains in having such approaches adopted, given the fragmented Lebanese regime and the intertwined public\private interests (Alison Caffyn & Guy Jobbins, 2003).

My thesis explores different urban design guidelines, policy instruments, and strategic plans for the sustainable development of the coast. However, mitigating development pressures by applying sustainable development plans is not easy (Tosun, 1999). Therefore, I will investigate the procedures, policies instruments, and design guidelines and interventions that could help mitigate growth repercussions on coastal zones. I am keen on establishing a unique, effective, transparent, flexible and adaptable framework for long-term and short-term plans implementation.

Therefore, my thesis seeks to explore “*how to balance urban development in the coastal zone of Mina with protecting cultural, ecological and environmental assets under an integrated coastal zone management approach (ICZM)?*”

My hypothesis was that ICZM could provide a planning and implementation framework for the sustainable development of the coast of Mina in Tripoli. Adapting the ICZM approach to the context of Mina could also facilitate the establishment of urban design interventions and ease hurdles associated with conflictual interests.

My objective is to understand the existent current coastal assets of Mina and its potential for providing healthy lives for its residents. I aim to identify the multiple factors affecting the mechanisms that govern the performance of Mina. By doing so, I will unveil the relationships and networks that affect the decision-making process in Mina within the complex institutional and governmental structures. Furthermore, I will evaluate the present legislative decrees, environmental conditions, governmental and institutional power, in order to come up with an integrated holistic and flexible framework that defines long-term and short-term plans and goals (Pak and Farajzadeh, 2007). Finally, I will advocate for the involvement of local authorities and communities in this process.

### **C. Research Significance**

This thesis will help identify the main factors obstructing the realization of sustainable development plans in Mina by creating a framework that evaluates different proposed planning strategies and principles. This will help challenge the capability of different governmental bodies in preserving cultural, spatial and natural values while allowing for sustainable development and encouraging economic growth in the area.

Hence, the thesis will inform decision-makers to explore and issue well-planned interventions that encourage awareness and responsibility among different stakeholders. Moreover, it will help create a more flexible and transparent implementation systems of coastal plans.

#### **D. THESIS STRUCTURE**

This thesis starts by an introduction that overlays the research question, hypothesis, and research significance. It then moves in the second chapter to present an overview of the problems facing coastal cities world-wide and how sustainable coastal development is being adopted as an approach for improving decayed coastal areas. This section goes into details by looking at the literature on the various tools, principles and strategies for achieving a sustainable coastal development, where I explain how ICZM (Integrated coastal zone management) can be a strategic and effective approach towards sustainable coastal development. I finalize this chapter by developing a theoretical framework for implementing effective ICZM in coastal cities, particularly Mina.

In the third chapter, I present an in-depth description of the different spatial, socio-economic, and environmental components and characteristics of the coast of Mina. I define in this section how the deteriorated urban environment, lack of awareness, lack of municipal management, control and responsibility is leading to degrade the general condition of the coast of Mina and repel its visitor. I further explain how the existing development interests are threatening the coast's public aspect, environmental condition and ecological characteristic of the coast. I also carry an in-depth investigation of the existing laws, conventions, decrees, strategies and projects developed in correspondence with the coast of Mina and their different effects on it.

Following this, I analyze in the next chapter all of the above case profile and fieldwork, conducted interviews, case studies and existing projects and initiatives towards managing or improving the coast of Mina. I come up accordingly with main principles on the different aforementioned fields for the successful implementation of an ICZM and by that a sustainable coastal development in a context like Mina. I also develop a table that defines the main character zones with their vulnerabilities and distinctions.

Finally, I conclude with a design and planning theoretical framework that guides my design intervention on both the municipal and local contextual level for the sustainable development of the coast of Mina using an ICZM approach and resilient, flexible and natural approaches and tools.



## CHAPTER II:

### LITERATURE REVIEW

In the following chapter I explored and analyzed integrated coastal zone management, ICZM's different principles and tools in order to identify adequate strategies that can be applied in Mina in order to achieve sustainable development. Moreover, I looked at case studies where ICZM was implemented and classified them according to context and level of success. This helped me come up with well-defined guidelines for the implementation of ICZM and coast management and development in Mina.

#### **A. Sustainable Coastal Development**

Oceans, seas and coastal areas represent an important component of the Earth's ecosystem and are critical to sustainable development. They constitute an essential spatial ecological edge, a valuable resource and a dynamic rolling stone of city's economy (Lindrgren, 2011). They are also the primary regulator of the global climate, an important sink for greenhouse gases and a primary source of water and oxygen. However, cities' coastlines can be exposed to decay, environmental degradation and may suffer as well from declining economic activities (National research council U.S., 1980). Indeed, the fact that coasts represent a potential economic resource exposes these areas to high urbanization levels and extensive exploitation of marine resources (Krishnamurthy, R. R., et al., 2018). These practices lead to urban environmental degradation and high greenhouse gas emissions, which by its turn is leading to climate change and the vulnerability of coastal zones on different levels (Bart, 2010).

Accordingly, new concepts and approaches are developed for overcoming the timely and ongoing challenges that face coastal areas, such as sustainable coastal development and management, and coastal resiliency. These concepts could help overcome the environmental, socioeconomic, and political uncertainty and risks that are encountering cities (Miller, 2007).

UN agencies are one of the most important contributors in addressing and resolving these issues. In fact, the idea of sustainability was deeply elaborated in all of the Burtland report, the UN meeting in Stockholm (1972), and the Agenda 21 in Rio De Janero (1992), and was further developed to tackle ocean and sea issues. This was further expanded and explored in the Independent World Commission on the Oceans (IWCO) and in the 2030 Agenda (UN, 2015). All of the above international organizations included ocean health as an important sustainable component (Fig. 1 and 2).

Moreover, the UN global sustainable development principles lists ocean health and sustainable coastal development as a central component that is interconnected to different sustainable development goals of the 2030 Agenda (IASS, 2017).



Figure 1: ICSU, 2017

Source: IASS Policy Brief 1/2017\_9



Figure 2: Interlinkages between SDG 14 and other SDGs

Source: IASS Policy Brief 1/2017\_9

### ***1. Importance and main principles***

Sustainable coastal development is very important for sustainably developing coastal zones and improving their deteriorated conditions. This approach consists of preserving and enhancing existing marine ecosystems and managing them for maintaining the sustainability and ever existence of the coast. It consists as well on identifying natural hazards to reduce vulnerability, undergo regular assessments of the implementation process, lower possible risks by exceeding standards for construction, encourage appropriate development by using market incentives, tackle social and economic issues, balance the right of public to freely access the coast while protecting private property rights, protect the coast's water resources, and commit to stewardships that help sustaining coastal areas (Krishnamurthy, R. R., et al., 2018).

Sustainable coastal development helps achieve a balanced approach of economic, cultural, and environmental sectors due to its integrated approach that involves all sectors of the coast (Lan, 2008). This concept includes wide integrated processes of ecological research, evaluation of the marine performance, habitats and biodiversity, coastal studies, impact assessment of water quality from water diversion, researches on environment-development interactions and management concepts, and assessment of long-term sustainability of alternative developments, etc. This is usually done by drawing a holistic understanding of the different external forces that affect the coastal conditions and by defining new strategies for a landscape sustainable development (Cicin-Sain, 1993). It requires as well the development of new tools and methods to support and improve policy implementation including cost-effective management measures, improved spatial planning, etc. Nevertheless, efficient sustainable development of coastal zone management consists of utilizing diverse understanding of

different scientific, technical, social and economic coastal sustainability measures (Giordano, Laura, et al., 2013). In sum, sustainable development of coastal zones aims to promote successful adaptive management of the coastal ecosystems and environmental assets while providing a sound land-use.

## ***2. Sustainable management plans***

Sustainable coastal development plans implies environmental and ecological preservation and foster new orientation towards adopting a long-term planning and management timeframe (Marafa, 2016). They intend to promote better livability and an equitable distribution of resources and opportunities in coastal zones (Beatley, et al., 1994).

This approach relies on tools that deal with land-use planning, property takings, rolling easements and public trusts mechanisms to regulate coastal development and facilitate CCCA (Coastal Climate Change Adaptation) (Puthucherril, 2014). This makes it a catalytic tool for the successful implementation of ICZM (Puthucherril, 2014).

These plans consist as well on organizing the interaction between different coastal zones functions, uses and values; which by its turn help generating multiple economic goods and services (Turner et al., 1998). This allows the implementation of resilient design interventions that help overcoming and accommodating unpredictable outcomes for the preservation of coasts (Turner et al., 1998).

## ***3. Sustainable coastal development plans limitations***

Sustainable coastal development strategies need to be guaranteed that they function effectively; therefore, three sub-systems of the coastal zone should be evaluated

regularly and which includes: environment and resources, economic development, and society.

These assessments showed that coastal sustainable development is challenged by several limitations. For instance, although it is holistic since it comprises several existing sectors with diverse sustainable goals but sometimes these goals can be overwhelming for their excessiveness such as maintaining the ecological characteristics of the coast while promoting development. Also, sustainable coastal development plans and strategies require strong harmonization mechanisms to ensure the optimum integration of all of the composing activities, for the formulation of a holistic approach that covers different issues (M. Visbeck et al, 2013). Nevertheless, these integration, coordination and collaboration strategies should not only be restricted to the local level but should encompass international relations for guaranteeing the successful achievement of a coastal sustainable development. This requires a lot of efforts, especially in countries with low coordination skills (M. Visbeck et al, 2013). For instance, the lack of collaboration between various authorities and institutions contributes to the obstruction of the management of the implementation of sustainable plan processes (Shipman and Stojanovic, 2007). Also, the lack of funding due to short-term direct grants leads to the obstruction of the accomplishment of the proposed and started development plans. Moreover, the deficit in information based platforms and inventories conducts to the production of missing and un-exact data, which induce the generation of irrelevant results and assumptions (Shipman and Stojanovic, 2007; Ibrahim and Hegazy, 2015).

However, some planning approaches can be adopted for the successful implementation of the sustainable development of coasts as Integrated Coastal Zone Management

(ICZM). For instance, Integrated Coastal Zone Management (ICZM) help mitigating different challenges of reaching an integrated involvement of all sectors and by that achieving a holistic all covered sustainable development plan.

### **B. ICZM (Integrated Coastal Zone Management) Configuration**

ICZM planning approach helps manage the different sectors of the coast and achieve sustainable development. This approach is capable of developing sustainable, long-term plans for coasts in contexts where integrated and holistic planning and policy frameworks are absent (FAO, 1996) as it initiates an integrative collaboration between public and private sector (FAO, 1996).

Developing policies, regulations, planning tools and incentives enable the coordination and integration between different ideas, legacies and the full involvement of all the stakeholders. This helps in dealing with conflicts that might arise from diversity of interest in a certain context (FAO, 1996). Indeed, in order to maintain a healthy interchange of information and easy management in any devised plan for the coast and its management, ICZM initiatives require a wide, accessible and transparent platform of data (FAO, 1996).

Furthermore, the ICZM planning approach helps minimize costly delays in project implementation and make the most efficient use of infrastructure (FAO, 1996). This is because ICZM has the ability of coordinating the various coastal economic sectors in order to develop long-term efficient socio- economic management plans and outcomes (FAO, 1996). Consequently, according to FAO, ICZM can potentially enable the proliferation of strategies and actions that hold beneficial co-benefits and trade-offs on different levels for achieving a sustainable development of the coast.

### *1. Definition, Principles and Goals*

ICZM is an established planning process that opts for achieving coastal sustainable development (Tabet & Fanning, 2012). It represents a holistic approach towards integrative management of the coast. It aims to integrate all social, economic, spatial and environmental aspects of the coastal zones in order to avoid fragmentation and sectorial management (Khakzad, Pieters and Van Balen, 2015). ICZM is a multi-disciplinary adaptive management approach for a variety of scenarios of different activities and strategies that can be included for development and management of the coast (Alves, F. L., et al, 2013).

According to Shipman and Stojavonic (2007), ICZM can take two distinguished approaches. It can focus on technical management measures, or it can represent a more mature approach that takes into consideration intangible coastal assets (Shipman and Stojavonic, 2007). Generally, ICZM endorses long-term and short-term perspectives that advocate for adaptive, integrated and holistic planning and management of the coast (Shipman and Stojavonic, 2007). Moreover, ICZM embodies vertical linkages among power groups and authorities, while at the same time integrates horizontal linkages between diverse sectors (Tabet & Fanning, 2012).

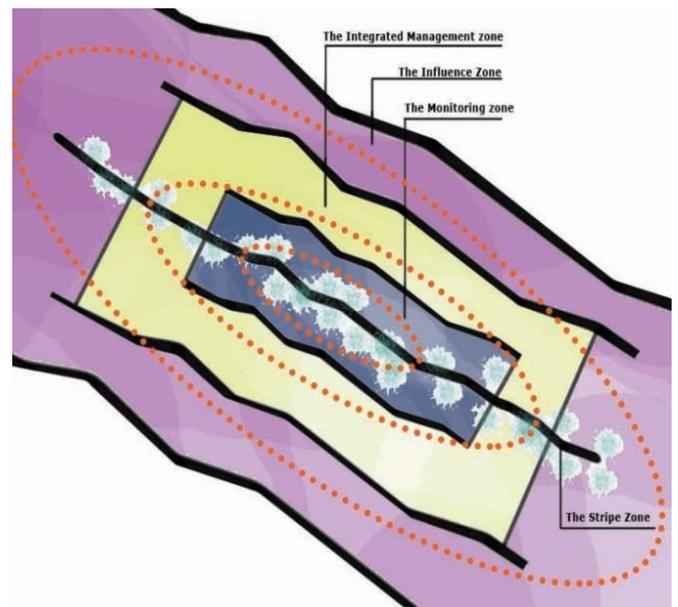
More importantly, ICZM is conceived for the purpose of responding to multiple coastal issues such as urban coastal rapid growth, marine resource exploitation, and coastal hazards and risks (Fabbri, 1998). It also works on illegal activities and behaviors on the coast, inadequate infrastructure, and economic and Tourism pressures (Pak and Farajzadeh, 2007; Tabet & Fanning, 2012). ICZM can be applied at different scales. It can be a part of local, regional, national or even international strategic plans (Fabbri, 1998). Despite the fact that an effective ICZM needs to encompass large scales

interventions, it should treat the coast as a large interconnected system of relations (Fabbri, 1998).

## 2. *Boundaries' identification*

Defining an ICZM's study boundaries are flexible and depend on the context of study and coastal related chosen criteria. For instance, the boundaries of a coastal area's intervention can be identified according to cultural, heritage led indicators and assets. These boundaries should encompass zones of cultural values and of interaction between land and sea with different intensities. Therefore various boundaries can be identified and they have direct or indirect effects on the coast (Khakzad, Pieters and Van Balen, 2015).

In general, an ICZM study area can include three to four zones: (1) The shore stripe zone includes natural processes and direct interactions between land and sea; (2) The integrated management zone includes areas where different policies have major role (3) The monitoring zone where physical, chemical, biological and economic indicators can be monitored (4) The influence zone expands beyond the



**Figure 3: Diagram showing different boundaries of important considered spaces and zones of intervention in an ICZM approach. Source: Author**

authority of the governmental agencies that are responsible for coastal affairs and it has direct and indirect effect on coastal zones (Pak and Farajzadeh, 2007) (Fig. 3).

### 3. ICZM planning process

ICZM plans' process can be structured into various stages that differ according to the adopted methodology.

#### a) Strategic large scale planning:

For instance, an ICZM strategic large scale plan can be comprised of the following three phases if an SSS methodology<sup>2</sup> is adopted (Fabbri, 1998):

- i. Screening phase: This phase addresses causes and effects of relationships of several activities. This leads to the development of a knowledge base platform of linkages and interactions among variables, helping in giving explanation to these causal relationships.
- ii. Scoping phase: where interactive models are established for the identification of existent stakeholders, problems, objectives and policies affecting the area of study. This phase encompasses reflection on the various stakeholders' needs and thus to the formulation of adequate ICZM's strategies.
- iii. Scanning phase: in this phase, proposed development strategies and indicators are evaluated and assessed.

#### b) Plan development:

On the other hand, ICZM can include the following phases (Pak and Farajzadeh, 2007):

- (1) Preliminary and start-up phase: this phase includes the study of pre-requisites,

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<sup>2</sup> SSS methodology: is an integrated approach for the sustainable development of coastal zones. It combines different policies, stakeholder analysis, spatial data modelling, multi-criteria and conflict analysis and graphical user interface together. This methodology is invented for the provision of best management strategies' evaluation. The SSS methodology's structure promotes transparency for the encouragement of discussion and awareness among decision-makers (Fabbri, 1998).

concepts and methods. It is also the phase where ICZM boundaries are identified and where GI database are established (2) Planning phase (3) Programming for implementation phase (4) Implementation phase, which includes by its role several strategic plans such as:

- i. Shoreline management plan or spatial marine plan (MSP or SMP): this phase deals with existing activities and resources, and studies vulnerable areas in order to minimize possible destructive effects on the human activities (Pak and Farajzadeh, 2007). An MSP endorses a multi-disciplinary adaptive approach of manipulation of the existing information. This helps in carrying out policy changes, new scenarios and new activities emergence in order to accommodate to new occurring circumstances (Alves, F. L., et al, 2013).
- ii. Environmental management plan (EMP): In this plan, environmental issues are identified & analyzed within existing mechanisms, processes and procedures currently used in environmental management. In result, effective coastal management and conservation are realized through the suggestion of adequate recommendations and action strategies (Pak and Farajzadeh, 2007).
- iii. Spatial plan for C.Z. (LUP or Land-use plan): This plan identifies development goals and objectives, and draws the future manner of the land in coastal zones. These goals are based on accurate evaluation of land capabilities and potentials (Pak and Farajzadeh, 2007).
- iv. Public participation plan (PPP): This plan defines all the tools for active involvement of all stakeholders, especially local communities. (Pak and Farajzadeh, 2007).

- v. Organizational structure plan: This plan determines institutional arrangements required for ICZM implementation. It consists on initiating a governmental organization that delineates inter-sectoral responsibilities and undergoes the generation processes of policy-making, planning, and activities' monitoring of different NGOs and private companies (Pak and Farajzadeh, 2007).
- vi. Monitoring and Evaluation plan: This plan is needed for evaluating the consequences of the policies approved and the actions taken in the framework. (Pak and Farajzadeh, 2007).

c) Monitoring

ICZM projects and implementation success is not possible without the development of an indicators' evaluation framework for the evolvement of ICZM plans (Tabet and Fanning, 2012). As an illustration, Olsen and Ehlers (2003) initiated an evaluation framework that prescribes the wanted outcomes, encourages partnerships and that determines the forces capable of driving change. While according to Billé (2007), an ICZM's evaluation framework should address the "dimension of integration" in the intention of determining where management is best integrated in practice. Such indicators help capturing components of good governance such as the ability to voice opinions, measuring efficiency, etc. (Tabet and Fanning, 2012).

### **C. ICZM approaches in international programs**

The concept of ICZM was recommended and encouraged in multiple international programs. In 1992, the United Nations conference on Environment & Development in Brazil issued the Agenda 21 which endorses a set of principles, actions and policies for sustainable development worldwide (Agenda 21, 1992). This program promoted the use

of ICZM as an approach to preserve coastal productive habitats and human settlements. This Agenda 21 defined the following ICZM principles: (1) Integrate all stakeholders in the decision-making; (2) Apply preventive approaches in project planning and implementation; (3) Include prior assessment and systematic observation of the impacts of major projects; (4) Promote the development and application of methods that mitigate problems such as pollution, marine erosion, loss of resources and habitat destruction; and (5) Provide the ease of circulation of data among all concerned individual, groups and organizations (Agenda 21, 1992).

Besides that, the Agenda 21 also defined strategies and tools (multiple policies and assessment) to implement an ICZM approach at different levels. It emphasizes on the importance of establishing an accessible platform for data and information. It accentuates as well on the importance of forging international and regional cooperation and coordination in order to support national efforts of coastal states to promote integrated management and sustainable development of coastal marine areas (Agenda 21, 1992).

According to Agenda 21, these aforementioned principles and roles of ICZM will help in realizing a sustainable development of the coast which in turn will allow the improvement of vulnerable coastal communities' lives (Agenda 21, 1992).

In 1996, the World Bank issued guidelines for Integrated Coastal Zone Management. These guidelines were presented since limited policies and plans cannot fit all situations and include all possibilities (World Bank, 1996). Therefore, the World Bank defined the main principles for the implementation of an ICZM and the guidelines for the development of ICZM programs.

The World Bank (1996) emphasized on the importance of developing ICZM structures that suits the designated nations. For World Bank, an ICZM approach help in defining a continuous process of administering the use, development and protection of coastal zones. It works on including multidisciplinary and holistic systems perspective, maintaining the protection of valuable ecosystems and development of coast-dependent economies. The World Bank also shed light on the importance of involving various stakeholders in decision-making accompanied with the establishment of an accessible platform for data input and output. All these ICZM principles help in moving beyond traditional approaches of managing the coast in sectors for treating it as a whole using an ecosystem approach and thus reduce the vulnerability of coastal communities (World Bank, 1996).

Finally, the ICZM approach was also adopted by European Commission in 2013 for establishing a framework for maritime spatial planning and integrated coastal management. This was with the intention to turn the European Union as a smart, sustainable and inclusive economy by 2020. Therefore, they defined the role of ICZM as a tool for the integrated management of all policy processes affecting the coastal zone. This helps by its turn in promoting sustainable growth of coastal areas, improve the coastal performance, and reduce conflicts between economic objectives and environmental legislation (European Commission, 2013).

In Conclusion, all international programs and legislations share common principles and guidelines from similar contextual case studies for the development and implementation of ICZM. These principles can be implemented in a context like Mina with slight modifications in order to provide its sustainable development.

#### **D. ICZM implementation tools**

In the following I will discuss the different tools used when applying an ICZM approach on any design and/or planning intervention. These tools propose solutions that balance between development and environment, and preserve natural resources among others.

##### ***1. Balance between development and environment***

One of the main objectives of coastal sustainable development and ICZM approaches is the achievement of a balance between economic development and preservation of environmental and cultural assets of the coast. The idea of balance between development and environment started in the 70s (especially in the US) with the proliferation of communal environmental awareness and the different serious environmental impacts of some economic activities (Norton, 2004). This concept consists on basing the economy on environmental principles and rules. For instance, the production of goods and services is highly linked to the cost of consumed natural resources and by that attached to environmental cost (Saloh, 2010). Also, environmental sustainability can actually lead to economic benefit, particularly since environmental friendly projects tend to offer lower returns than “less friendly” ones (Saloh, 2010). Nevertheless, investing in environmental industry or economy can generate thousands of new local jobs and revitalize economy instead of making it the other way round and think of economy first (Saloh, 2010).

For these reasons, World Bank has been working on giving assistance to member countries for attaining sustainability and environmental protection while ensuring development. This includes: helping countries in setting their priorities in defining their environmental policies (DESA, UN, 2008). Furthermore, UNCED's Agenda 21 has

elaborated an approach that consists on encouraging the integration of development and environment together for attaining a balance between environment and economy and achieving by that an ICZM of coastal areas (De, Janerio R., UN, 1992). This approach consists on the following:

- a- On the strategy level: Work on shifting economy towards environmental protection through building on existing consensus of the importance and strength of local economy, while also emphasizing on the necessity of involving community in the occurring economic processes (Norton, 2004). This helps in integrating all of economic and environmental activities together for balancing between economy and environment and achieving an ICZM.
- b- On the policy level: Integrate strategies that should respect the true value of environmental and natural resources for involving economic policy reform at both micro and macro levels; property rights enforcement; governmental policies and regulations to discourage environmentally destructive behaviors and encourage environmentally protective or enhancing activities (El-Ashry, 1993). This opts to ensure the protection, preservation and mutual perseverance of all existing social, environmental and economic components when planning and implementing ICZM approaches. Moreover, several regulations should be amended to ownership rights, in order to aware developers on the importance of protecting the environment while taking decisions, and perhaps acknowledge the benefit of successfully investing in environmental protection. This could be reinforced by eliminating subsidies on environmental consumption and rather enforcing taxes (Broadstock, 2016).
- c- On the plan and financial scheme: Local management plans require taking into consideration dealing with natural resources constraints, and addressing land-use related

impacts in accordance with coastal resources (Norton, 2004). This attempts achieving better economic sustainability for ICZM implementation by adopting new tools can be adopted such as: Crowd funding, venture capital, private equity, Green bonds and internet finance especially for supporting economic sustainability within organizations (Broadstock, 2016).

All of the above strategies aim to empower governments with tools that help them achieve a balance between all of the components of the coast especially the economic and environmental. This is in an intention to allow an easy and realistic implementation of an ICZM approach that consists on assuring the effective integration and interaction of all existing and sectors of the coast. Nevertheless, ICZM approaches should not only incorporate planning strategies for integrated balance plans, but it should include as well implementation and design strategies for ecological and social sustainable development of the coast, as nature based solutions (Banica et al, 2003).

## ***2. Nature Based Solutions (NBS) & re-naturing Cities***

Nature based solutions can be one of the essential and main implementation solutions of an ICZM approach for the sustainable coastal development. In fact, approaching NBS in urban planning and policy-making is a new world direction for addressing environmental urban issues, conserving biodiversity, improving human health and mitigating climate change (Raymond, Christopher M., et al, 2017 ; Cohen-Shacham et al., 2016). As defined by the IUCN, NBS are the actions that protect, sustainably manage, and restore natural or modified ecosystems (IUCN, 2015). They are natural solutions, highly connected with nature, and are supported by diverse natural processes for multiple social, economic and environmental benefits (Frantzeskaki, 2019).

NBS can present multiple economic and recreational benefits such as reviving and increasing tourism, improving the productivity of natural resources, and water quality. This concept was adopted and encouraged by the IUCN European Regional Office, by raising awareness on the benefits of these types of solutions, and supporting its practical implementation. This is in order to address in an effective and adaptive way all of the social challenges by improving people's quality of life, health and wealth, and the diverse biodiversity elements of the coastal zone (IUCN, 2015).

Moreover, NBS contribute to provide healthier environments and communities, improve social ties, and incorporate stronger economies. They are intended to work on achieving the society's development goals and improve people's quality of life by enabling the resilience of the existing coastal ecosystems and their capacity to renew themselves and provide diverse services. Also, NBS help preventing the ecosystems' degradation and the unsustainable exploitation and management of natural resources (EC, 2015). These solutions (of maintaining and restoring ecosystems) are being perceived nowadays as essentials for generating economic benefit from the investment in natural economy, and attractive strategies to improve cities' landscape and contribute to society health and well-being (EC, 2015).

Furthermore, for an efficient NBS implementation it is required to incorporate ecosystem strategies such as: Ecological restoration, Blue Green Infrastructure (BGI), IWRM (Integrated water resources management), PAM (Protected area management). However, Blue Green Hybrid Infrastructures such as "livable shorelines" are one of the best examples of NBS that focus on ecosystem restoration and climate change mitigation and adaptation.

a) Blue Green Infrastructure (BGI)

BGI is one of the best examples of nature based solutions for the successful implementation of an ICZM as it helps in maintaining a good balance between economic potential, benefits and expected values (Ghofrani, Sposito, and Faggian, 2017). It consists on connecting different natural elements and functions for addressing climate change issues such as floods and droughts. This by its turn, help providing socio-economic benefits in terms of co-benefits and enhanced urban livability (Gehrels, Hans, et al., 2016.). BGI approaches include using streets and infrastructure for addressing natural risks issues and for managing natural elements such as storm water runoff, sea level rise, flooded water, etc. This could be done by generating strategies, tools and ideas for retaining or detaining water or also control flooding events (ECN, 2016). Aside from that, BGI solutions embrace new visions for livability, engage key stakeholders to invest and be an important contributor in BGI solutions, identify renewal plans for promoting BGI, introduce new policies for integrated developments and propose local joint budgeting to overcome silos that inhibit BGI (Ramboll, 2017).

For instance, hybrid approaches represent an effective BGI solution for climate change mitigation and adaptation and coastal sustainable development (Deipetri and McPhearson, 2017).

b) Hybrid Approaches

Hybrid systems are nature based solutions that work on enhancing shoreline conditions and providing innovative benefits on different levels (NOAA, 2015). They consist on combining two or more solutions or functions in one structure for working with nature and improving various sectors and encouraging green based solutions (Deipetri and McPhearson, 2017). They are conceived to fulfill multi-functionality and sustainability

goals (Eggermont et al., 2015) which helps providing better cost-effective flood risk reduction alternatives for communities (Ariana E., Wowk, and Bamford, 2015).

They use both built and natural infrastructure, such as combining the restoration of existing habitat with engineering structures as openable flood gates or removable flood walls. Unlike pure natural approaches, hybrid approaches provide strong hybrid resiliency and climate change adaptation benefits such as providing protection from storm and erosion (Winterwerp, Han, et al, 2014). Also, long term cost-effectiveness is another benefit of hybrid solutions as most of the existing natural ecosystems can reduce their maintenance costs since they maintain themselves, and are able to recover after storm events. Also, natural habitats such as coral reefs, marshes and dunes can act as buffers for waves, storms and floods. Natural ecosystems can also deal and overcome sea level rise (Winterwerp, Han, et al, 2014). Therefore, hybrid approaches can contribute in applying nature based solutions for the sustainable development and integrated management of coasts as they provide flexible natural systems that adapt with natural hazards, such as livable shorelines.

#### c) Livable Shorelines

Livable shorelines are hybrid nature-based structures built on the edge of a shoreline using natural materials for environmentally-friendly, and cost-effective approaches to shoreline stabilization. These strategies came to replace “hardened” structures, such as riprap or sea walls that were used to stabilize shorelines (NOAA, 2015 ; Sweet, W., et al., 2018). This method has been adopted worldwide for mitigating sea level rise, as in California where livable shorelines consisted on integrating engineered structures into restored natural features for improving the shoreline condition and mitigating sea level rise (Judge et al., 2017). In fact, living shorelines are an innovative and

environmentally-friendly alternative that uses natural materials and native plants for the stabilization of shorelines (Lee, 2015).

The main purpose of a living shoreline is to solve natural problems like erosion, sediment contamination, improve water quality, or change physical forces and ecology over time instead of preventing change (Lee, 2015).

Adding to this, living shorelines provide various benefits for humans, plants, and animals. They provide as well water cleaning for improving habitat for animals, fish, and birds, while presenting enjoyable aesthetics for property owners (Pilkey, et al., 2012).

Living shorelines achieve the aforementioned goals by mimicking natural conditions and adapting to the natural conditions of the coast for attaining a sustainable management of the shoreline. This includes providing long-term protection with minimal energy consumption, restoring the vegetated shoreline habitats through strategic placement of plants, stone, sand fill and other structural or organic materials (Pilkey, et al., 2012). However, there are two types of natural shorelines: Traditional shorelines and Hybrid shorelines (NOAA, 12015).

Traditional living shorelines are generally used in natural coasts with minimal manmade interventions. They work on stabilizing the shorelines through the utilization of natural materials such as bio logs and native plants (NOAA, 2015).

Hybrid living shorelines are used for supporting traditional shorelines when they are exposed to winds and bigger waves. This type of natural shorelines incorporates rock and/or oyster shells with natural materials acting as breakwater to reduce waves and

provide extra support and stabilization (Delaware Living Shorelines Committee.) (OH Pilkney, N Longo, R Young, A Coburn, 2016; NOAA, 2015).

However, all of the abovementioned strategies, concepts and tools should work all together and complement each other's in order to help achieving equilibrium of systems for the sustainable development of coastal zones, and therefore overcoming different possible risks and changes for procuring coastal resiliency (Meerow S. et al, 2015).

### **E. ICZM Challenges**

Finally, ICZM confronts diverse challenges like: Lack of awareness among communities and stakeholders, Lack of experience of the involved planners and decision-makers (Ibrahim and Hegazy, 2015). In addition, the lack of collaboration between various authorities and institutions contributes to the obstruction of the management plan process implementation (Shipman and Stojanovic, 2007). Also, the lack of funding due to short-term direct grants leads to the obstruction of the accomplishment of the proposed and started development plans. Moreover, the deficit in information based platforms and inventories conducts to the production of missing and un-exact data, which induce the generation of irrelevant results and assumptions (Shipman and Stojanovic, 2007) (Ibrahim and Hegazy, 2015).

### **F. Coastal Resiliency**

According to Meerow S. 2015, p.39, "Urban resilience refers to the ability of an urban system-and all its constituent socio-ecological and socio-technical networks across temporal and spatial scales-to maintain or rapidly return to desired functions in the face of a disturbance, to adapt to change and to quickly transform systems that limit current or future adaptive capacity".

All of the above mentioned concepts for the sustainable development of the coast help in attaining resiliency through conceiving new natural solutions able to adapt, mitigate and interact with natural risks and restoring habitat. For instance, nature-based solutions are long-term solutions that help reducing the frequency of different types of hazards, by combining multiple functions and benefits, and offering synergies in reducing multiple risks. However, these diverse and ever-lasting benefits are necessary to ensure a serious involvement of politicians and private stakeholders in the implementation and funding of such solutions (EC, 2015).

### ***1. Method of implementation***

Coastal resiliency is achieved by incorporating various natural hybrid tools that opt to mitigate and encounter natural risks and hazards. Also, being focused on addressing social issues as displacement, gentrification, and trying to propose social, environmental and economic measure for their resolution, NBS constitute a strong tool for coastal resiliency (Kim, Min, et al., 2017). Nevertheless, NBS characteristic of developing supporting regulations for encouraging private developers to invest in public-private infrastructure, help increasing these solutions' characteristic of proliferating a resilient coast.

For instance, the famous resilient project of Manhattan after “Hurricane Sandy” proposed by ARCADIS, One Architecture, Starr Whitehouse, James Lima Planning + Development, Green Shield Ecology, AEA Consulting, Level Agency for Infrastructure, and Buro Happold has taken several approaches to become more resilient by adopting combined green and grey infrastructures within open spaces.

It divides the area into three main character zones and develops accordingly different integrated hybrid nature based solutions that holds environmental and socio-economic benefits. These three zones protect the area from storm surges and rising sea levels, while enhancing the socio-economic activities.

## ***2. Limitations***

The long-term characteristic of the resilient plans can hold wrong assumptions, and high degree of uncertainty which can have negative impacts in the future (Gunderson, 2000; Pizzo, 2015; Vale, 2014 ; Meerow S. et al, 2016).. In fact, the vagueness of the ICZM meaning due to its flexible characteristic of allowing the stakeholders to define resiliency according to their beliefs, may create difficulties in operating and developing specific indicators for the implementation (Gunderson, 2000; Pizzo, 2015; Vale, 2014 ; Meerow S. et al, 2016)

## **G. Case Studies on the different planning ICZM approaches**

The planning process differs from one area to the other depending on the political and authoritative system present. For example, in Halic in Turkey (Fig. 5) where there is a lack of private stakeholders' participation, a top-down approach was adopted in the waterfront redevelopment intervention strategy's formulation. This is due to the existent particularities of the institutional arrangements and urban politics at the district, city and national levels. Unfortunately, these development trials weren't really successful, not only because of the private sector's absence in the development process but because of residents' reluctance to the projects and the lack of inclusion of the local community (Bezmez, 2008).



**Figure 4: Halic's – Turkey, Source: [https://www.istanbulsightseeingtours.com/golden-horn-&-bosphorus\\_u\\_r\\_n\\_56.htm](https://www.istanbulsightseeingtours.com/golden-horn-&-bosphorus_u_r_n_56.htm)**

Another example reflecting the reasons for the difference in the ICZM framework according to the existing authorities can be seen in Morocco and Tunisia (Fig. 6). These states made efforts to include the private sector into the decision-making of the implementation of coastal development plans. The government authorities adopted an ICM approach in an intention to encourage a vertical and horizontal integration of state policies interventions (Alison Caffyn & Guy Jobbins, 2003). But the limitations of such an approach were expressed in the actual rigidity of the governmental system and its centrality where it becomes difficult for one authority to govern the complex dynamics of coastal zones and to convince other actors to trust its decisions since they are not based on rational reasons and because they do not relate at all to people's needs and opinions (Alison Caffyn & Guy Jobbins, 2003).

Although the states' efforts to involve the local community in the ICZM process, especially in Morocco, -through developing user groups, capacity buildings, training and development for women and environmental education for local people and schools- ; it couldn't succeed in applying a successful coastal management plan. This is due to the limitation of implementing the plan only on the environmental level and sustainable

tourism rather than including the broader social, economic or political aspects (Alison Caffyn & Guy Jobbins, 2003)

Consequently, there is a need in the centralized and rigid governmental system to encourage stakeholders to adopt more open integrated and inclusive processes, in line with the principles of ICZM and sustainable tourism development. This should come in accordance with a shift in the governance system approach to benefit local people and the environment (Alison Caffyn & Guy Jobbins, 2003).

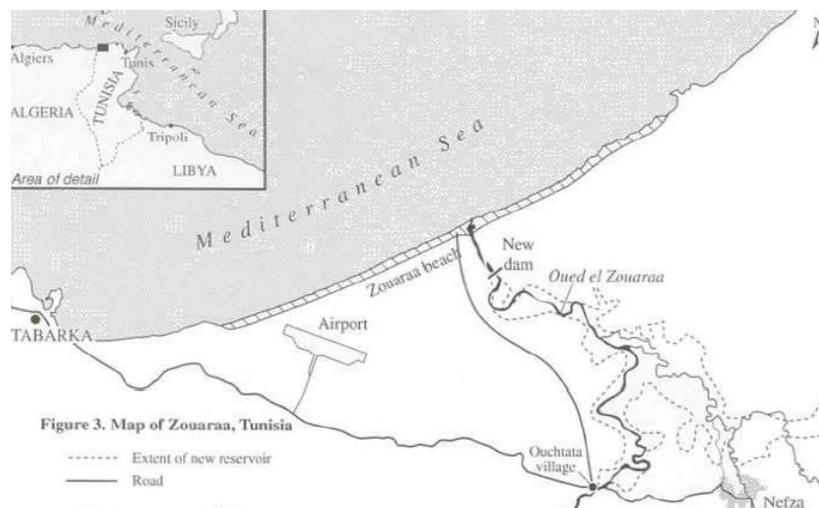


Figure 3. Map of Zouaraa, Tunisia

Figure 5: Tunisia map

Source: Alison Caffyn & Guy Jobbins, 2003

However, the ICZM model showed success in the case of Barcelona's coast (Fig. 7). This success contributed to the flourishing of what is called "the Barcelona Model". This came due to the good design and the quality of the public urban spaces and to the strategic instrument of urban regeneration (Monclus, 2003). In fact, the Barcelona model is successful because it included several aspects: (a) The identification of an autonomous sociopolitical structure community; (b) the establishment of a preliminary model; (c) The adoption of a Mediterranean style; and (d) preservation of the coastal

identity which establishes a clearer link between its culture and natural diversity (Martí, 2003).

Although the implementation of the sustainable development model for the Catalan coast challenged the economy's source (that was generated by the tourism industry), it succeeded to establish an environmental information system to better manage the implication of tourism and implement the National strategy of the Catalan coast (Sarda et al., 2004). Also the PPP (Public Private Partnership) between the port's authority and the city council's planning department for the redevelopment of the coast is one of the main assets that allowed the successful implementation of the development plan.

Adding to that, the combination of the use of the socio-economic and environmental indicators to assess pressures and impacts derived from human activities in the shoreline help assess the condition of the environment. The Catalan coastal development was successful since it was part of a national strategy for coastal development. The establishment of an accessible platform (digital inventory) and extensive data provision is one of the main assets of allowing collaboration between different stakeholders and thus contributing to comprehensive holistic sustainable development strategies (Sarda, Avila and Mora, 2005).

Although ICZM is a good strategy for the coast development of Mina,



**Figure 6: The Barcelona managed coast, Source: <https://www.alamy.com/aerial-view-of-barcelona-coastline-image60507850.html>**

it cannot be adopted alone in a context such as Mina with strong historical and traditional characters and where there is a lack of information and transparency and

poor collaboration between stakeholders. Thus, it becomes important to combine several tools and strategies in ICZM for implementing effective design interventions that lead to sustainable development of the coast. As such, in the following, I will explore three different case studies that mainly discuss the design aspect of the ICZM approach.

### ***1. The Orla project – Santa-Catharina, Rio de Janeiro***

The Orla project adopts a participatory approach that aims to derive new management methodologies and scenarios for the conservation and sustainable development of the coast, after it was threatened by disordered anthropogenic occupation and predatory exploitation of natural resources. The project represents a Network of strategies and principles that operates on different scales and levels. It focuses on the good organization of the coast, and protection of its cultural and environmental aspects, while promoting touristic economy and recreational functions. Moreover, it works on improving existing Flora and Fauna in the city by preserving and creating green and natural areas.

The Orla project is distinguished for adopting a methodology based on the physiographic characteristics, shoreline's vertical and horizontal occupation and population density, and based on a landscape and typologies diagnosis. Furthermore, the Orla project considers the potentials and the problems with their different associated impacts and activities as a main principle for the elaboration of an adequate management plan for the coast. It identifies as well different scenarios in order to propose a functional and efficient plan for each section of the coast. However, these scenarios do not propose an interconnected plan that relates and connects the different scenarios within each other to create a complete sustainable and resilient management

and development plan of the shoreline and its inner profile ( da Costa Cristiano, Samanta, et al., 2018). All this comes within a policy that improves the governance of marine aquaculture in Santa Catarina State. (Suplicy, Felipe M., et al, 2017)

The project promotes ecotourism with the definition of management measures that propose changes in some of the local paradigms, such as land occupation for occasional use and the regulation of vehicle circulation on the beach. Moreover, it ensures the protection of the Coastal Zone as national heritage, for the preservation of the biodiversity of the area and thus the creation of Protected Areas (PA).

The project includes the following:

- Incentives from the government for the use of wastelands as private parking lots, including the installation of an adapted footbridge, and other structures to support tourists, with an emphasis on the importance of installing access walkways.
- Implementation of a Dunes Management Plan along with marine parks, recreational areas, marine culture areas, based on the need of the local and tourist populations.
- Ensure peace of the existing fauna, Police supervision for safety and control, Installation of signs
- Create lifeguard stations that are adequate for the environment and can supply working conditions (toilets, water and electricity), and provide the effective management of the solid waste, along with the establishment of environmental education programs.
- Implement a sewage disposal system and a wastewater treatment plant, in order to preserve the health of people and the environment.

- Create an integrated system of supervision (data center) between the different parts responsible for the shoreline.

In Lebanon, to take on a coastal management plan, local authorities, municipalities and unions, should be acknowledged as important actors and be granted maximum support, strategically and financially to carry on studies, educate people, and encourage research in the fields of sustainability and environmental health and its application in our context. Unfortunately, the dysfunctional political system fails to come up with policies to support such plan. Thus, there is a need for a higher power or an active civil society to hold the people in control accountable for their practices. Nevertheless, Mina, in particular, has a lot of opportunities to take into account when applying such a plan, since it has a very important heritage and cultural layer and specific fauna and flora. Indeed, a holistic and multi-layered plan, backed by an organized civil society, could help achieve sustainable management of the coast.

## ***2. Barcelona Waterfront revitalization projects (Port Vell, Port Olympic and Forum 2004)***

The concept of Barcelona model represents a network of strategies and principles that operate on different scales and levels in order to generate a holistic and comprehensive coastal management plan. This plan focuses on the good organization of the coast, protection of its cultural and environmental aspects, while promoting for touristic economy and recreational functions (Acebillo, 2006).

Objectives: Forge a more socially just and equitable models, policies and interventions, to redefine the relationship between the city and its shoreline, and open Barcelona towards the sea. (Lamarca, 2018). It aims as well to emphasize on the city identity and

improve the quality of urban life. (Sijakovic, 2010) This is in order to convert the city into a more competitive and dynamic one, and to open up the existing tissue to new collective practices with the inaugural "new squares"

Implementation Tools: The Barcelona redevelopment plan consisted of relocating industries far from the sea to let the city regain access to the shoreline (with creating new beach areas), and to re-conceptualize the city as a decoupled city with various spatial specializations rather than a one organizational spatial unit consisting of city and port. (Hassan et al., 2015)

In this intention, mixed uses were allocated along the coastline with a redefinition of the urban nucleus. This was done through re-cycling abandoned structures, and integration of a wide variety of recreational and cultural activities, and metropolitan facilities (Congress, platforms protruding into the sea, beaches, zoo, and activation of the port Vell (a shopping center, an aquarium, an iMax theater and a series of public spaces encouraging 75% of tourists to visit the coast for good reasons. (Hassan et al., 2015) Furthermore, new building typologies were adopted in order to successfully combine hybrid programs on the same project, and improve Barcelona's urban environment.

Barcelona's redevelopment plan included the implementation of new connection strategies that aims to connect the area's communications infrastructure and civil axes with those of the rest of the coastal strip. This comprises the conversion of the large heavily trafficked routes into a promenade pathway (through hiding the highway) with well-connected pedestrian links from the old town towards the port, and enhanced public transportation network.

It included as well the creation of new connected public spaces with panoramic views such as: establishment of a pedestrian bridge from the activated port (Hassan et al., 2015), which will play a very basic role to span across the harbor and connect the land with the pier.

From an ICZM point of view, Barcelona's redevelopment plan endorsed coastal environment protection strategies and urban sustainability, with integration of socio-economic revitalization approaches, such as: turning the banks of the river into a linear park to restore the local environment of the river, and the renovation of existing water treatment plant to meet sustainability standards and produce energy (Sano et al., 2010).

It re-envisioned as well the economy and planning of Barcelona as a whole and its different character zones in specific in a direction towards a more flexible planning that incorporates various coastal aspects: fisheries, industries, tourism, recreation, culture, etc. By that, the city has successfully created an identity at the global scale (Sano et al., 2010) and benefitted greatly from the urban plan for the Forum of Cultures. Land values increased and city identity began to flourish in older developments such as the Poblenou (Sano et al., 2010)

New Laws were dismantled in order to control the crazy behavior of tourists (Acebillo, 2006). Also, new guidelines were defined in order to protect the shoreline as: a 100 meters set back from the upper limit of the MTPD, which can be extended to 200 m for specific cases, where housing is forbidden. An area of influence extends 500 m from the limit of the MTPD, where land-use must be adapted to ensure protection and access to the MTPD. A 6 m easement of passage is applied landwards of the limit of the MTPD. However, the combination of urban design together with large events became a

successful strategy for city marketing. (Desfor et al., 2010) In addition, the responsibility of the city for the zoning and policy changes will be continuously needed to implement the plan and any incentive programs for developing downtown.

Small focused and integrative projects (unlike holistic, large scale, top-down master plans) could provide better development opportunities for the city. As such, defining distinguished character zones will help in understanding and identifying the multiple regions constituting the coast with their different characters. This will be a way to approach the coast through small, focused and contextual interventions dedicated for special well-defined regions. By that, the proposed strategies will be tackling small regions, which will help achieve more successful results, in terms of suitability with the site and its different aspects.

The adoption of a national ICZM protocol will help in protecting the coast and achieve a sustainable development for its various aspects irrespectively of their characteristics. Therefore, the adoption of ICZM principles (of Lebanon) as a large umbrella for the erection of the general framework for the management of the coast of Mina is fundamental to protect and sustainably manage the coast of Mina.

### ***3. SUMMERSIDE - URBAN CORE PLAN (Towards a Downtown Plan for Summerside)***

The Summerside coastal redevelopment project is a plan that aims to encourage the growth of summerside city through attracting private sector investment and new employment opportunities to the downtown core. This was achieved through a process of community visioning for the waterfront. The aim of the summerside plan is to develop an economic strategy for the long-term management of the port and its land

holdings, allowing by that the accommodation for any future changes while preserving heritage. It intends to align the community and government partners in such a way as to build confidence and momentum for a shared future, and to leverage private investment with strategic public investment in order to ensure a fully public waterfront between the water and any private development. In addition, it fosters as well to ensure high quality public spaces, which are flexible, four season, and rich in amenities and diverse uses (work, shop, play in the same place) (Le Blanc, 2016).

The methodology adopted for the achievement of these goals are the development of incentives to attract private developers to invest in the region, along with encouraging community participation , and the formulation of new management policies.

The summerside projects consist of encouraging new breed of residential opportunities, achieved with land assembly. Adding to that, the establishment of university campuses as a connected part of the urban fabric bringing youth, vitality, new ideas, commerce, and the need for new services like housing, bars, restaurants, coffee shops, recreational needs, etc. into the downtown mix. This would help in activating the land-use of the waterfront ground floors through introducing retail, recreational, entertainment and artistic activities, and allocating commercial uses for docks and wharves.

On the other hand, summer side project considered the existing history of the waterfront as the core of the design, fortified with proposed confederation trails, and tax incentive provided to heritage property owners. This is along a vision that prioritizes water related uses (Marina's and harbor tours), preserves natural shorelines, wetlands, or beaches, and includes a wide variety of scales, active/passive uses, themed and non-themed environments. Adding to that, summerside development plan fosters for a connected

green network that serves the control density and population in the city.

All this is proposed to be done through community participation, PPP Public Private Partnerships, while keeping the waterfront held and developed in public ownership.

The ICZM approach adopted in the summerside project consists on managing both industrial and marine operations as well as mixed use development. It is structured to deliver long-term strategies to economize in the infrastructure and encourages economic and environmental sustainability through developing a green and clean downtown. (Le Blanc, 2016)

To achieve this, the summerside project develops strategies that encourage developers (as land assembly) to invest in socio-economic activities that enhance the quality of living in the region. It fosters as well to balance design for tourism with design for locals. This includes the enhancement of waterfront facilities for touristic purposes (incentives for commercial activities), along with a strong connection of the waterfront with the downtown to benefit from tourists' flow. In addition, new flexible, adaptable and greener design of pedestrian and road network, parking and public transportation is endorsed in this plan to accommodate various uses for the streets and avoid vehicular traffic.

Also, Summerside plan proposes a form based code contribute to control the 3 dimensional volumes of a building and attempt to provide direction to ensure high quality architectural design controls. (Le Blanc, 2016) It specifies the built environment conditions: medium building heights and population density, Increase green and open public spaces, encourage economic environmental sustainability, and give incentives for sustainable development.

On the other hand, the project opts to preserve and enhance sustainable energy, as concentrating density in smaller urban areas in order to reduce the cost of maintaining public infrastructure. It creates as well a waterfront boardwalk in order to increase the value of the landside parcels (and eventually have greater development potential).

This project aims to revive the area and attract investments for a better coastal performance and space. This was supposed to be achieved through revalorizing the industrial character of the area as heritage, creating an active and interactive ground floor that provide a diverse marine and coastal services, re-integrating new units into the site, and through enhancing pedestrian and transportation networks, and connectivity with various marine services. Also, incorporating organized civil society in the decision making is one of the main principles adopted by summerside urban core plan, along with key planning policies and incentives (as land assemblies, tax reduction) for better local economy, touristic encouragement, and development investment. In the case of Mina, it is important to recognize and revalorize the existing old industries and economy related to marine and coastal contexts, encourage developers to invest in diverse waterfront economies.

## **H. Framework**

The presented information above and the analyzed case studies provide evident data that underscores the importance of ICZM as an approach for achieving sustainable development of the coast through allowing a cross-sectional integration of different sectors with both horizontal and vertical coordination. This will help introduce new responsive and flexible management plans which encourage diversity, effective governance, optimum balance of opinions, and cater for different development and cultural and environmental interests.

ICZM approach will require both planning and design tools in order to guarantee its successful implementation. On the planning level, land use management, participatory approaches and round tables, transparent and accessible data platforms, and awareness and incentivizing programs are all preliminary assets and tools for the effective application of ICZM. On the other hand, environmentally-led design intervention tools are key for the implementation of sustainable design proposals of an ICZM of the coast. For instance, “Nature based solutions” as “hybrid solutions, blue green infrastructure, and livable shorelines” are intervention methods for the restoration and revitalization of the coast. These tools allow shorelines to adapt to different future natural and man-made risks while improving their environmental conditions and reinforcing their connections with the city (Fig. 8).

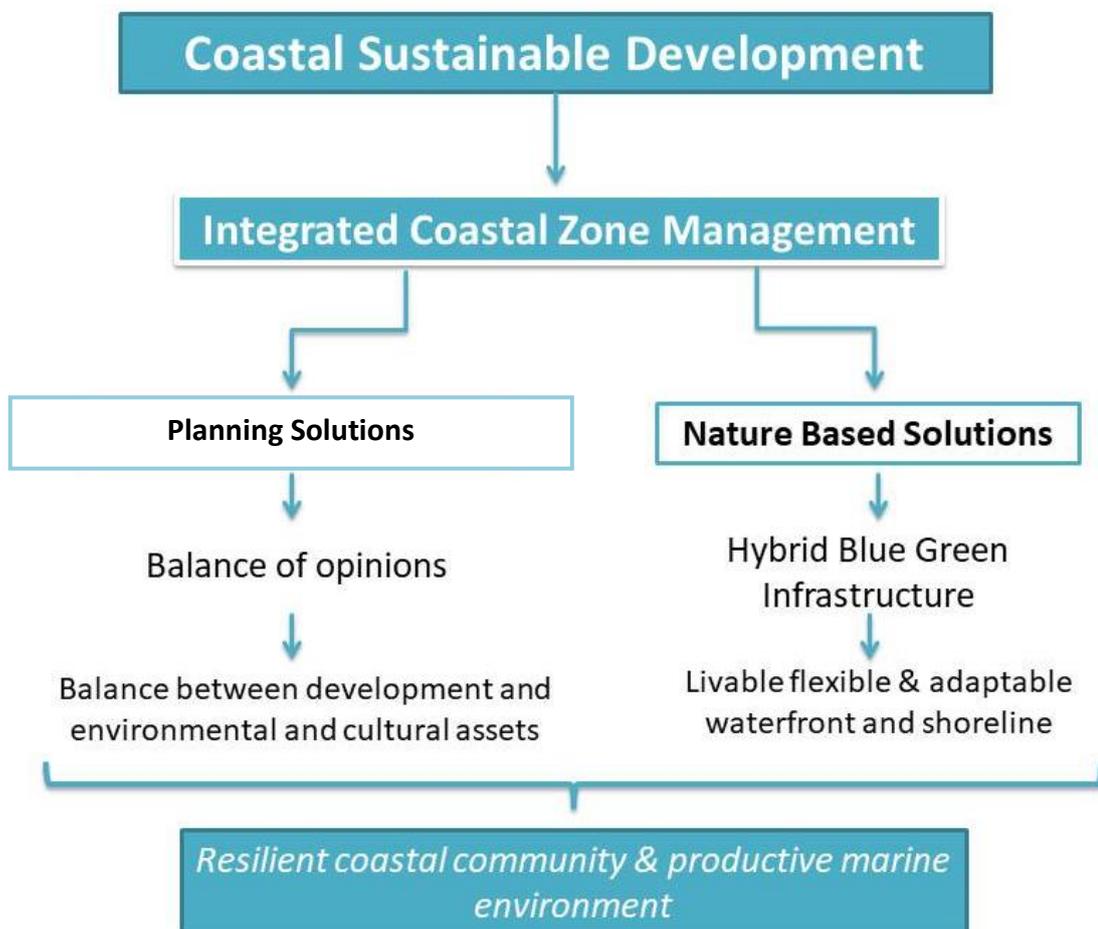


Figure 7: Theoretical Framework, Source: Author

Such a design and planning framework intends to attain a resilient waterfront and coastal community incorporating both ecological functions and recreational needs of the city for the achievement of a sustainable development of the coast. However, all of the above mentioned concepts, tools, and methods should be combined and integrated all together under the aim of introducing new innovative sustainable and effective climate change adaptation and mitigation measures and tools; while achieving a balance between development and environment. This is in an intention to procure an integrated coastal zone management for sustainably developing coastal areas and re-enforcing their resiliency in front of climate risks. This model structure could therefore constitute an efficient framework for achieving the resiliency of coastal communities with productive marine environment and thus attaining a sustainable development of coastal zones (Fig. 8).



## CHAPTER III:

### METHODOLOGY

This thesis aims to elaborate planning and design guidelines for the protection of the coast of Mina from development pressures and social, economic and environmental repercussions. In that aim, I developed:

#### A. A theoretical framework for Mina coastal preservation and protection

##### *1. Position the case study within relevant literature*

- a. Purpose: Define the ICZM's principles to adopt for achieving a coastal sustainable development for Mina.
- b. Data: To understand the framework that should be adopted in the urban design proposal to protect and enhance the coastal conditions of Mina, different literature reviews on ICZM and sustainable coastal development were reviewed and assessed according to scale, context and approach.

**Table 1: Type of Data for positioning the case study within relevant literature**      **Source: Author**

<b>Type of Data</b>	<b>Source</b>
Literature review on theoretical and practical ICZM, which include similar contexts and political regimes.	Peer reviewed articles – Books (Full bibliography listing is listed in the Bibliography chapter)
Literature review on Sustainable development in coastal zones as tool for ICZM implementation.	Peer review articles – Books

- c. Method of Analysis: Different references on ICZM and sustainable development were explored and compared to generate a list of principles that define the components, stages, methodology of implementation, terms of use, importance

and limits of ICZM and sustainable development and that can be adequate to be implemented in a context like the coast of Mina.

d. Type of output: A table including specific principles for both ICZM and sustainable development to be adopted in the context of Mina.

**2. *Explore the different approaches of planned or implemented case studies to protect the coast and to balance public rights while allowing development***

a. Purpose: Develop a vision and a flexible, strategic median approach for the balanced existence of both development and public access in Mina.

b. Data: Case studies that address the same issue, preferably similar context, were assessed to classify the different types of interventions and guidelines that could be followed to protect and manage the coast.

**Table 2: Type and source of data for exploring different approaches for developing and protecting the coast**

Source: Author

<b>Type of Data</b>	<b>Source</b>
International case studies on coastal management	Literature review and peer articles (Full bibliography listing is found in the bibliography section)
Case study with similar political-juridical structure	Literature review and peer articles
Mediterranean case studies	Literature review and peer articles

c. Method of analysis: In that attempt, I examined various case studies from the regional and similar international context to deduce specific guidelines categorized according to role: allow for development, protect the environmental assets of the coast, and protect public rights.

d. Type of output: A table classifying different case studies with their various and common types of vulnerabilities, urban design goals, principles, strategies and implementations proposals.

**3. Develop structured theoretical Framework**

- a. Purpose: Formulate a specific framework for the sustainable development of the coast through an ICZM approach
- b. Data: Analysis of the previous two sections

**Table 3: Type of data for developing a theoretical framework      Source: Author**

<b>Type of Data</b>	<b>Source</b>
Analyzed literature review and case studies	Previous sections

- c. Method of Analysis: Analyzed case studies were approached within an ICZM approach in order to come up with a theoretical framework that could be adopted in the coast of Mina.
- d. Type of output: A diagram and table showing the different components and principles of a recommended developed framework for sustainably developing the coast of Mina.

**B. A research of existing development pressures on the coast:**

An investigation of the different forms of development on the coast of Mina was undertaken, to understand the different stakeholders and involved groups in the development efforts, their prospective and methods to invest on public coastal lands.

**1. Understand the historical background of el-Mina coast and its cultural heritage**

- a. Purpose: Understand the history and cultural and heritage evolution of Mina city along different eras. Examine the different historical factors that affected the planning and development in Mina.

- b. Data: In an intention to determine the cultural and heritage importance of the coast of Mina, I collected and reviewed various articles, and books on the history of both Mina and Tripoli.

**Table 4: Type of data for understanding the historical background of Mina**

**Source: Author**

<b>Type of data</b>	<b>Source</b>
Reviewed articles and books	Omar Tadmuri National Master Plan- Diran Harmandayan
Heritage Listed buildings and sites	CDR- Municipality- Diran Harmandayan

- c. Method of Analysis: According to the examined gathered data, I identified the different tangible and intangible cultural heritage of the coast of Mina coast. I determined then the major phenomena that affect its current status.
- d. Type of output: A timeline showing the different important events that affected the spatial, socio-economic and environmental aspect of the coast of Mina. I identified as well a list of important traditional behaviors, sites and monuments, with their detailed characteristics, value and conditions on the coast of Mina to shed light on its richness and the importance to protect it for its residents.

## ***2. Patterns of urban change***

- a. Purpose: Depict the urban spatial transformation of Mina and define the impact of the development encroachment on its shoreline and adjacent urban fabric and general condition.
- b. Data: In the light of determining the different urban built patterns along the years, I collected all of the master plans for Mina from year 1912 (oldest available map) until 2018. This helped me understand the causal relationship of development performances and the built environment and urban patterns of the coast.

**Table 5: Type of data for mapping the urban change patterns**

**Source: Author**

<b>Type of Data</b>	<b>Source</b>
AutoCAD updated Map	Municipality of Tripoli
Aerial photos dating from 1990 till 2018	Google earth Lebanese Army forces
Historical maps from 1912 (on a scale of 10 to 20 years)	Municipality of Tripoli IFPO
Building heights and shades map	Fieldwork
Open Vs Built Map	AutoCAD map verified with Fieldwork
Public open spaces map	2002 AutoCAD Map verified through fieldwork
Green spaces	2002 AutoCAD Map verified through fieldwork
Ownership Map	Municipality
Dynamic Vs Static Map	Fieldwork
Linkage map (Road network)	2002 AutoCAD Map verified through fieldwork
Linkage Map (Transportation network)	Municipality – Fieldwork – Interviews

c. Method of Analysis: The different aerial and mass plans were collected and compared by highlighting the evolution of both the urban built (buildings and roads), open spaces and the coastal line of Mina. An analysis of the patterns changes was conducted to determine the different types, rate of change, causes and effects of the urban transformation.

d. Type of output: A series of retraced maps that show the evolution of the urban fabric and the evolution of the coastline along the years; and explaining the relationship between the development encroachment forms and the environmental and socio-economic status of the coast.

### **C. An Analysis of current conditions**

#### ***1. Depict the socio-economic distribution/structure of Mina and its coast***

- a. Purpose: Define Mina residents’ socio-economic status and their spatial distribution and investigate in the reasons and causal relationship for this socio-economic distribution.
- b. Data: All of the reports and articles on the socio-economic structure of Mina and on their spatial expansion in its regions were gathered and inspected to identify their causes, impact, different location and, adjacent relations and potential expansion.

**Table 6: Type of data for finding the socio-economic structure of Mina**

**Source: Author**

<b>Type of data</b>	<b>Source</b>
Technical reports on the socio-economic structure of Mina and Tripoli	Literature review – articles - books
Land use maps	Fieldwork
Demographics Diagrams	Municipality – UN-Habitat – Ministry of social affairs

- c. Method of Analysis: The gathered data was evaluated according to the date of the group proliferation, regions and limits of expansion, factors affecting the socio-economic condition of these regions and the resulting effects on the region and its surroundings.
- d. Type of output: Map showing the different socio-economic regions on the coast of Mina, accounted with diagrams highlighting their various impact, relationship with the development encroachment and the potential suggestions to enhance their status.

## ***2. Explore the environmental status of the coastline of Mina***

- a. Purpose: Analyze the environmental structure of the coast and characterize its different regions.

- b. Data: Technical reports on the different environmental status of the coast of Mina, the pollution types and intensity, and its vulnerability.

**Table 7: Type of data for understanding the environmental conditions and components of the coast of Mina, Source: Author**

<b>Type of data</b>	<b>Source</b>
Technical reports on the general environmental status of Mina	Ministry of environment – ALBA – Majal-Institute of Oceanography
Water pollution types and rates	Ministry of environment – Municipality – reviewed peer articles
Shoreline condition and pollution rates	Ministry of environment – Technical reports in Municipality and in peer articles review
Air Pollution	Ministry of environment – Technical reports in Municipality and in peer articles review
Land/ Soil pollution	Ministry of environment – Technical reports in Municipality and in peer articles review

- c. Method of Analysis: I examined the various collected data on the environmental status of the coast of Mina, shoreline and inner in a way to sort them into types, levels and vulnerability labels in order to come up with final determination of the vulnerable zones
- d. Type of output: A map showing the different sections of the coast with their environmental

### **3. Define different ecological characteristics of the shoreline of Mina**

- a. Purpose: Understand the ecological characteristics of the coast of Mina and identify determined zones with specific ecological aspects and characteristics.
- b. Data: articles on all of the soil type, land cover and biotic aspect of the shoreline of Mina.

**Table 8: Type of data for defining the ecological characteristic of the coast of Mina Source: Author**

<b>Type of Data</b>	<b>Source</b>
Technical reports	Municipality, Ministry of environment, Institute of Oceanography, peers review.
Ecological Maps	Abdallah el Hajj Thesis – Diran Harmandayan study report

- c. Method of Analysis: I defined character zones and critically assess and delineate the needs, level of vulnerability of the zone and impact factors based on related Fauna and Flora, ecological cycles and systems, the threat scale, the different ecological vulnerability levels and the various types and scales of intervention on different areas of the shoreline of Mina.
- d. Type of output: A map showing the different ecological character zones, with their related Fauna and flora. Also diagrams showing the cycle and the essential components and impactors of the ecosystem and the different recommendation that should be adopted to enhance the ecological condition of the coast of Mina.

**4. Existing development efforts on the coast of Mina**

- a. Purpose: Examine different proposed development projects on the coast of Mina and understand the developers’ goals and intentions towards and impacts on the coast.
- b. Data: To understand the development projects on the coast, newspaper articles on the different projects were collected from 2005 (start of grassroots activism) to 2018 to understand the developers’ intentions from the media which was compared and analyzed against the project documents, as such:

**Table 9: Type of data for revealing the existing possible developments on the coast of Mina Source: Author**

Type of data	Source
Newspaper articles	Al-Akhbar electronic newspaper
Master plans, reports and studies	Developers Municipality Activists

- c. Method of analysis: Newspaper articles were collected and analyzed by using the following criteria: claim of the developer; declared objective of the developer; declared advantages and disadvantages; and apparent impact on the coast. A meta-analysis of the project documents was also conducted to identify project aims, criteria, extent of developers, stakeholders, level and types of impact, level and type of illegality/legality and advantages of each development project proposal on the coast of Mina.
- d. Type of output: A comparative table of the different projects using criteria deduced from the data analysis with a final assessment of each project in regards to balance between development and ecological integrity of the coast.

**5. Existing Laws, decrees and building codes on the national, regional and local scale**

- a. Purpose: Analyze different old and existing local and national decrees on the development on the coast and understand their relationship with allowing illegal development to happen on the coast.
- b. Data: To understand the different features of the development decrees on the coast and their impact on the development direction, all of the coastal decrees on all levels from 1964 were collected and analyzed to identify the laws role in regulating legal/illegal development on the coast.

**Table 10: Type of data for acknowledging all of the existing laws, decrees and building codes Source: Author**

<b>Type of data</b>	<b>Source</b>
National and regional laws related to the coast	The Lebanese code - Majal (ALBA) - CDR - DGU
Local laws on coastal development	Municipality laws
Zoning Maps from 1964	Municipality Diran Harmandayan study on Tripoli

- c. Method of Analysis: To determine the laws and decrees shortfalls, and ability to allow for circumventing the laws, all of the existing laws since 1964, I reviewed and compared according to the issue their addressing, the level of strictness, the groups they give authority and to and the benefiting parties from these decrees.
- d. Type of output: A list highlighting the different irrelevant decrees, and the requirements to adjust them in order to obstruct illegal coastal developments and protect the public rights to the coast.

#### **D. Stakeholder Analysis**

An investigation of the different stakeholders' opinion, position, potential, power and role in the decision making of the evolution and development of Minawas conducted to identify the main players and their level of impact in the ICZM process of the sustainable development of the coast.

#### **1. The grassroots movement against development efforts on the coast of Mina**

- a. Purpose: Determine the position of the activists from the development efforts. Define the activists' goals, potentials and movements to obstruct previous and forthcoming development proposals.
- b. Data: Reports, documentaries and newspaper articles related to the development threats on the coast of Mina were collected to extract activists' position,

continuous movements, protests and efforts to obstruct development scenarios on the coast and the resulting confrontations.

**Table 11: Type of data for depicting all of the grassroots' movements**

**Source: Author**

<b>Type of data</b>	<b>Source</b>
Newspaper Articles	Al-Akhbar electronic newspaper The daily star
TV documentaries	MTV –LBCI documentaries on the different issues in Mina
Interviews with activists	Nariman Shamaa and Wael Debs

- c. Method of Analysis: I have undergone a comparison between the different activists’ movements and acts based on their different acts and reactions towards development projects, potential to impact on decision-making, awareness and will to change generated. This was done through conducted semi-structured interviews with involved stakeholders, and through reviewing their various perspectives reflected in newspapers and TV reports.
- d. Type of output: A summarizing table was deduced of all the grassroots positions, intentions, level of influence and the different types of possible pressures against their opposing position.

## ***2. Municipality proposals to existent development efforts on the coast of Mina***

- a. Purpose: Investigate in the various municipal actions concerning the coast and determine the goals and intentions of the municipality of Mina towards development encroachment.
- b. Data: In an intention to understand the officials’ role, stance and impact on the development performances on the coast, all of the done reports on the management of the coast of Mina were gathered and analyzed.

**Table 12: Type & source of data for analyzing existing municipal proposals for the development of the coast of Mina, Source: Author**

Type of Data	Source
Projects reports and Maps (PACEM & TEAM projects, Tripoli 2020, IMAC-ICZM)	Municipality Meeting with Professionals, Prof. Manal Nader, Serge Yazifi, Abdallah-Abdul Wahab.
The municipality stance and claims towards the aforementioned projects	Interview with municipal members (Mr. Wael Debs: Architect and previous municipal council member of Mina municipality, Dr. Khaled Tadmuri: Architect, restaurateur and current municipal council member of Tripoli's municipality). Newspaper and Magazine articles (if found)

- c. Method of Analysis: I reviewed and evaluated all of the proposed projects for the enhancement of the coast of Mina according to their goals, principles, level of interventions and the reasons for their non-fulfillment. These criteria was critically assessed to identify the projects' weaknesses and then compared with the municipality claims and reaction towards these projects to acknowledge the position of the municipality from the existing development pressures
- d. Type of output: Comparative table showing the different principles, advantages and disadvantages of the proposed projects for the municipality on the coast of Mina with final identification of their role in regards to environmental, social, economic and cultural enhancement of the coast.

### ***3. Residents awareness and potential to influence the development of the coast***

- a. Purpose: Explore the residents' involvement in the usage of the coast and their willingness and level of influence on the decision making of the development of the cost.

- b. Data: To reflect the residents’ voice, various opinions, awareness and level of impact on the coast development, all of the existing newspaper articles, study reports were reviewed and approached in comparison to the conducted semi-structured interviews with the residents of the coast of Mina.

**Table 13: Type and source of data for revealing people's awareness towards development efforts in Mina**  
Source: Author

Type of data	Source
Newspaper Articles and technical reports	Newspapers and study reports (see Bibliography)
TV documentaries and reports	MTV –LBCI documentaries on the different issues in Mina
Interviews with coast users	Visitors, shop owners, residents, street vendors.

- c. Method of Analysis: All of the interviews were compared with existing reports and articles claims and critically assessed and analyzed. This helped me to come up with an assumption on people’s position towards development pressures on the coast and their various impacts.
- d. Type of output: A table showing the different opinions, fields and levels of impact on the development of the coast.

#### ***4. Developers intentions and plans for the coast***

- a. Purpose: Understand and define the developers’ plans for the coast, and their different ways of achieving them.
- b. Data: Existing maps, published projects, and proposed development reports on the coast were investigated and reviewed and compared with all of the activists, municipality and residents definition of the developer’s intentions. In addition, semi-structured interviews were conducted with developers in order to formulate the developers’ intentions towards the coast.

**Table 14: The data type and source for depicting the developers' intentions for the coast of Mina**  
**Source: Author**

Type of data	Source
Newspaper Articles	Newspapers and study reports (see Bibliography)
Interviews with developers	Al-Fattal and TDH if possible

c. Method of Analysis: I reviewed and assessed all of the previous gathered reports and articles in the lights of the different other opinions and statement derived from the conducted interviews with all of the stakeholders.

d. Type of output: Table stating the different developers' interests on the coast, preferred areas, parties they aim to collaborate with and ways to implement them in order to

**E. Analysis of the case study of the coast of Mina through defining its different sections and characteristics:**

In an attempt to determine the causal relationship between development efforts proliferation and the current situation of Mina and its coast, all types of urban assets were inspected as follow:

**1. Define characteristic zones**

a. Purpose: Characterize the various zones of the coast according to specific criteria that helps making decision in the intervention process.

b. Data: All of the previous gathered urban components of the coast, tables, maps and diagrams of Mina.

c. Method of Analysis: All of the previous gathered urban components, tables, maps and diagrams of the coast of Mina were critically assessed and narrowed down to come up with a final assumption, differentiation and characterization of the different zones of the coast.

- d. Type of output: Conceptual map showing the characterized zones with an amended table or schematic on their different characteristics.

**2. Conclusion maps related to each variable (history, socio-economic, environmental, etc.)**

- a. Purpose: Deduce the main prominent and important components of the different assets of the coast.
- b. Data: All of the previous gathered urban components, tables, maps and diagrams of the coast of Mina.
- c. Method of Analysis: All of the previous gathered urban components of the coast of Mina, tables, maps and diagrams, were critically assessed to define final statements about the history, socio-economy and environment of the coast.
- d. Type of output: Maps and diagrams showing the different historical, socio-economic and environmental aspects and features of the coast.

**3. Analytical and defining maps of the constraints and opportunities of the coast**

- a. Purpose: Develop analytical and conclusion maps and diagrams showing the present strengths, opportunities, weaknesses and constraints of the coast.
- b. Data: All of the previous maps and diagrams showing the elements of the coast, combined with all tables showing the various reports and interviews statements of the different problems and potentials of the coast.
- c. Method of Analysis: I have critically assessed and narrowed down all of the previous gathered urban components, tables, maps and diagrams of the coast of Mina to come up with a final assumption, differentiation and characterization of the different zones of the coast.

- d. Type of output: maps, diagrams and tables showing the potential opportunities of the coast with its vulnerabilities and prominent constraints.

#### **4. Focus area study delimitation**

- a. Purpose: Define the prospected area of study and intervention.
- b. Data: All of the previous gathered analytical and characterization maps, diagrams and tables of the coast of Mina.
- c. Method of Analysis: All of the previous gathered developed analytical maps, tables, and diagrams, were critically assessed and examined in order to come up with an area of intervention based on its vulnerability to development and its importance to the urban life of the coast residents.
- d. Type of output: Map determining the extent of the study area with an identification of its different assets that makes it a focus zone.

### **F. Sustainable urban design and planning framework, guidelines and intervention for the protection of the coast of Mina**

#### **1. Propose a strategic ICZM for the coast of El-Mina**

- a. Purpose: Develop a specific ICZM framework for the coast of Mina.
- b. Data: All of the previous gathered urban components of the coast of Mina, tables, maps and diagrams.
- c. Method of Analysis: All of the previous gathered urban components of the coast of Mina, tables, maps and diagrams, were critically assessed and narrowed down to come up with a main problem
- d. Type of output: Comparative tables of different findings were established to generate a list of principles for ICZM and sustainable development in the specific context of the coast of Mina.

**2. *Develop an urban design proposal to demonstrate applicability of the approach***

- a. Purpose: Deduce planning and design recommendations and guidelines to maintain the identity of the coast of Mina, enhance its condition along years and protect it from encroachment developments.
- b. Data: All of the previous gathered urban components, tables, maps and diagrams of the coast of Mina.
- c. Method of Analysis: A detailed comparison and analytical review of the main factors impacting the problem of coastal social, economic and environmental decline, and the different hurdles in sustainably managing helped in deducing improving strategies for the coast.
- d. Type of output: Six different character zones, with attached equivalent recommendations and design proposals allowing integrated design and management to take place and improve the coast's status. Also, an evaluation framework was developed in order to follow up the applicability and success of the project and its management.



## CHAPTER IV:

### MINA CITY'S PROFILE

#### A. Mina context and location

Mina is part of Tripoli which is the second largest city in Lebanon after Beirut. It is located in the north governorate of Lebanon, on the eastern shores of the Mediterranean (Fig. 9). It is about 80 Kilometers North of Beirut (Harmandayan, 2006).

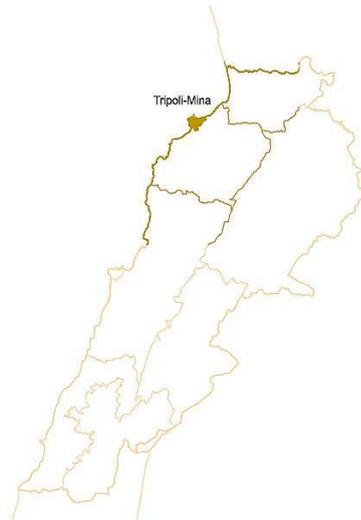


Figure 8: Tripoli- Mina location, Source: (UN-Habitat, 2016)

The Tripoli–Mina coastline extends over 13 km divided as: 7.5 km belonging to the municipality of Mina and 5 km owned by Tripoli municipality (Mina municipality, 2009).

Mina covers an area of 3.5 km<sup>2</sup>, incorporating a length of 7.5 km of coastline (Mina municipality, 2009). It is situated on the western edge of the municipal boundary of Tripoli, and is considered the commercial anchoring connection between Mediterranean countries and Tripoli (Harmandayan, 2002).

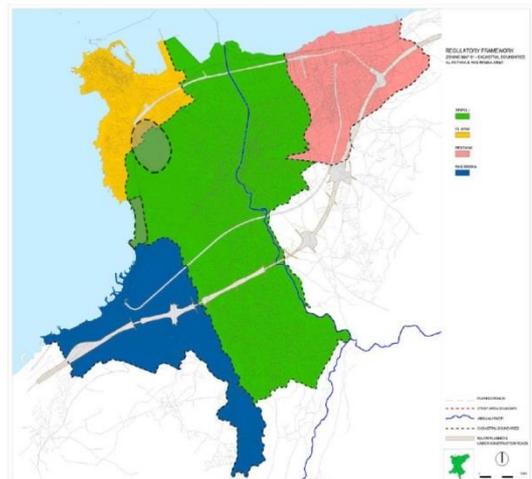


Figure 9: Mina municipal boundaries and limits, Source: (El-Hajji, 2013). Edited by Author

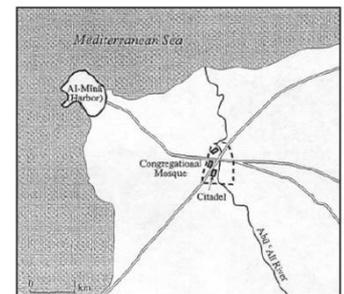
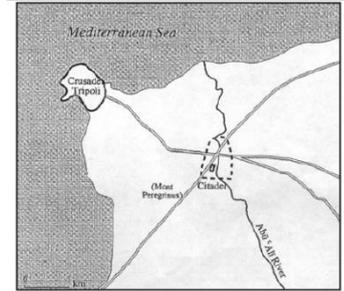
Mina shares several lots in common with Tripoli, such as the Tripoli international fair, where half of its land belongs to Tripoli municipality and the other half belongs to the municipality of Mina as shown in the Fig 10 (El-Hajj, 2013).

The same is applicable to Tripoli –Mina port. This latter’s ownership is divided between Tripoli and Mina municipality properties (El-Hajj, 2013).

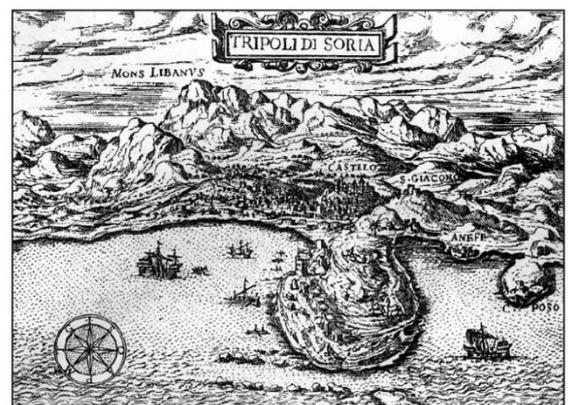
### B. History, role and evolution

Mina existed from the 8<sup>th</sup> century B.C. with the Phoenicians. In fact, the Phoenicians settled along the coast and established the city of “Tripoli” which represented at that time the center of the Phoenician confederation with Sidon, Tyre, and Arados (Arwad Syria) Island. This is where the name “Tripolis” came from and which means “Three cities”. In the 10<sup>th</sup> century, Mina-Tripoli became an independent province with Fatimi caliphite (UN-Habitat, 2016).

In 1259, the Mamelukes invaded the city and won over the crusaders after they conquered Tripoli-Mina (UN-Habitat, 2016). They relocated in 1289 the city of Tripoli away from the peripheries on the coast towards the inner lands near the citadel for protection and security reasons (Fig.11) (Fuess, 2009). This contributed to the loss of the Trans Mediterranean commercial characteristic of Tripoli.



**Figure 10: The relocation of Tripoli’s location in the Mamelukes era, Source: (Fuess, 2009) (Luz 2002 : 55).**



**Figure 11: Tripoli’s coast and port in 1586, Source: (Zuallart, 1595; Fuess, 2009)**

The city faced slight changes in the functions but without losing its complete importance (Fuess, 2009). This is how the differentiation between el-Mina and Tripoli started.

However, while four guard towers were being constructed on the coastal zone of Tripoli (Luz, 2002), “the port “or “al –mina” stayed at ruins as shown in Fig.12 (Zuallart, 1595; Fuess, 2009).

The city’s structure stayed this way until the 19<sup>th</sup> century where competition between Tripoli’s and Beirut’s port began (UN-Habitat, 2016). However, the city started exploring the cycle of urban growth where the historical core was expanding towards the peripheries and thus different master plans were proposed to guide urban growth and development (UN-Habitat, 2016).

### **C. Shoreline processes and evolution**

Mina city witnessed major evolution on different levels (Fig. 13). The main alteration was exacerbated with the shoreline boundary transformation as it has been converted from a purely natural shoreline to a man-made refined shore with an adjacent corniche. In addition, massive urban encroachment and metamorphosis took place in Mina, mainly towards the south accompanied with the fragmentation of the previously green areas and agricultural lands between the newly developed urban expansions. As such, the morphology of Mina has enormously changed and evolved towards an urbanized one, far from its very first existence as a city with a natural landform along the sea. The maps below show the different evolution of Mina and its coast along the years (Fig. 14 – 24). These maps highlight the extensive urban encroachment happening in Mina and its effect on the coastal landform and its relation with the city.

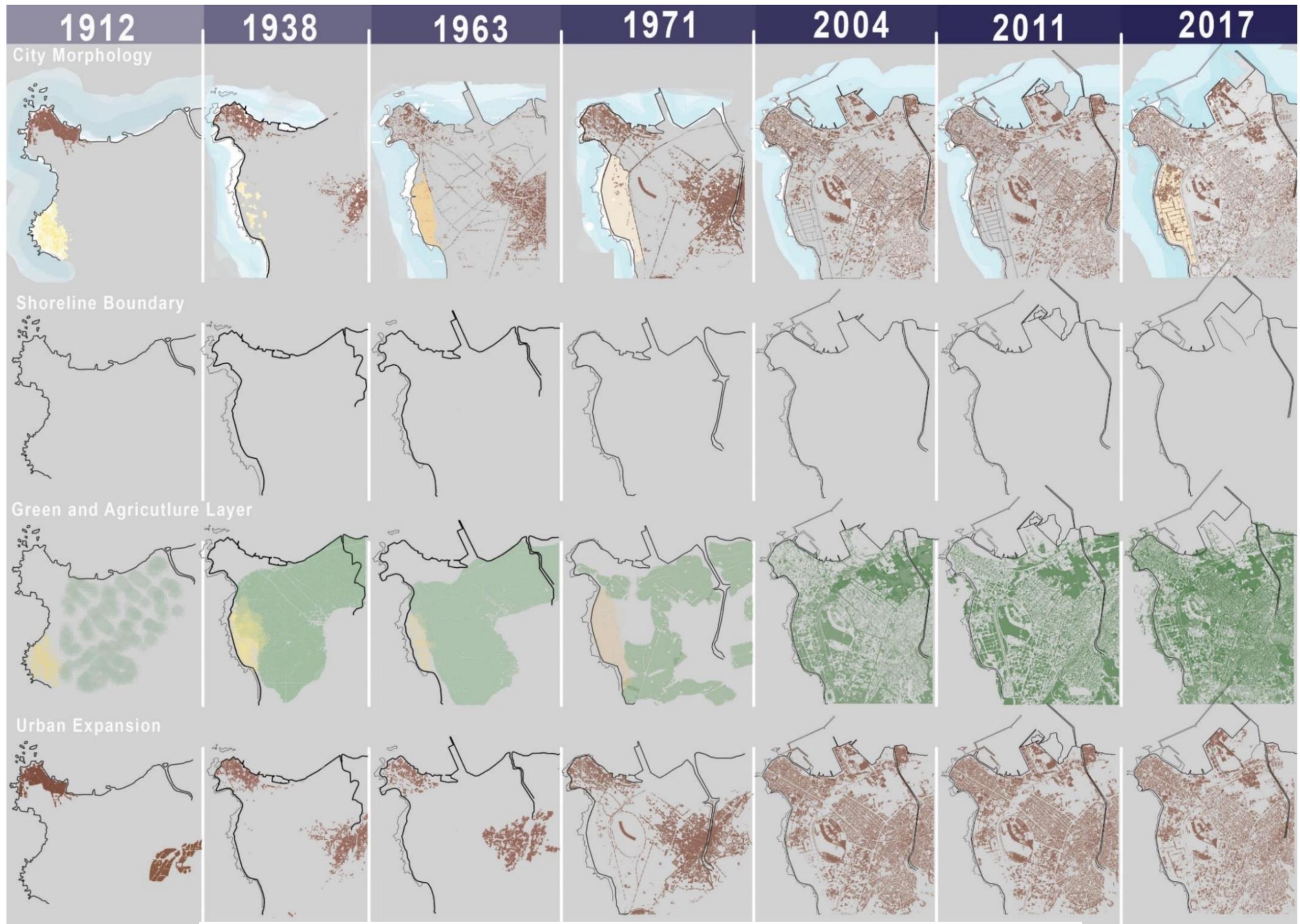


Figure 12: Evolution of the shoreline of Mina on different levels, Source: Author

# 1. Continuous evolution of Mina and its coast

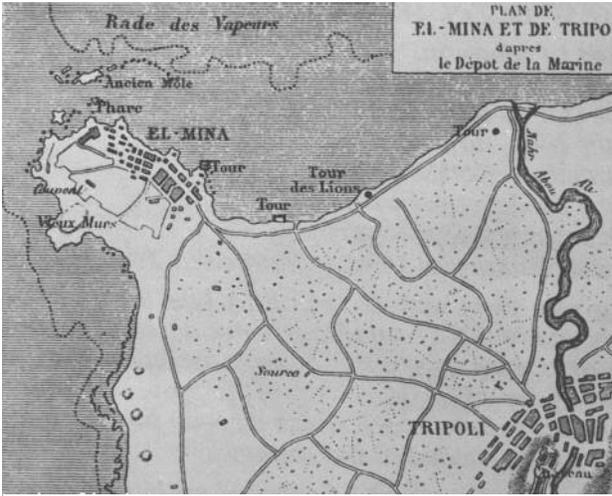


Figure 13: The map of Mina with its coast in 1900, Source: Tripoli-city.org

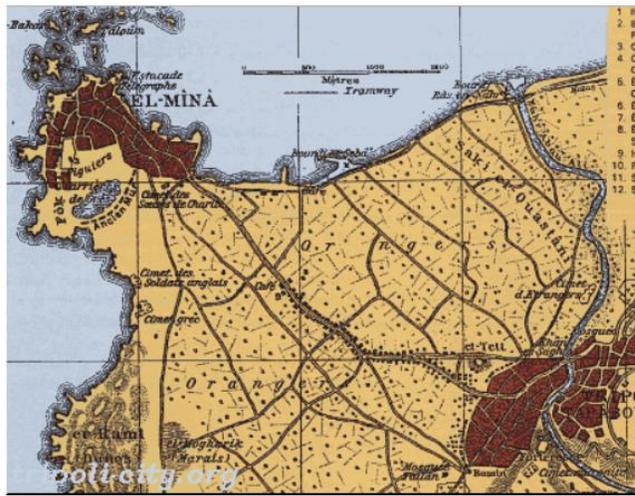


Figure 15: The map of Tripoli during the French mandate, Source: Tripoli-city.org

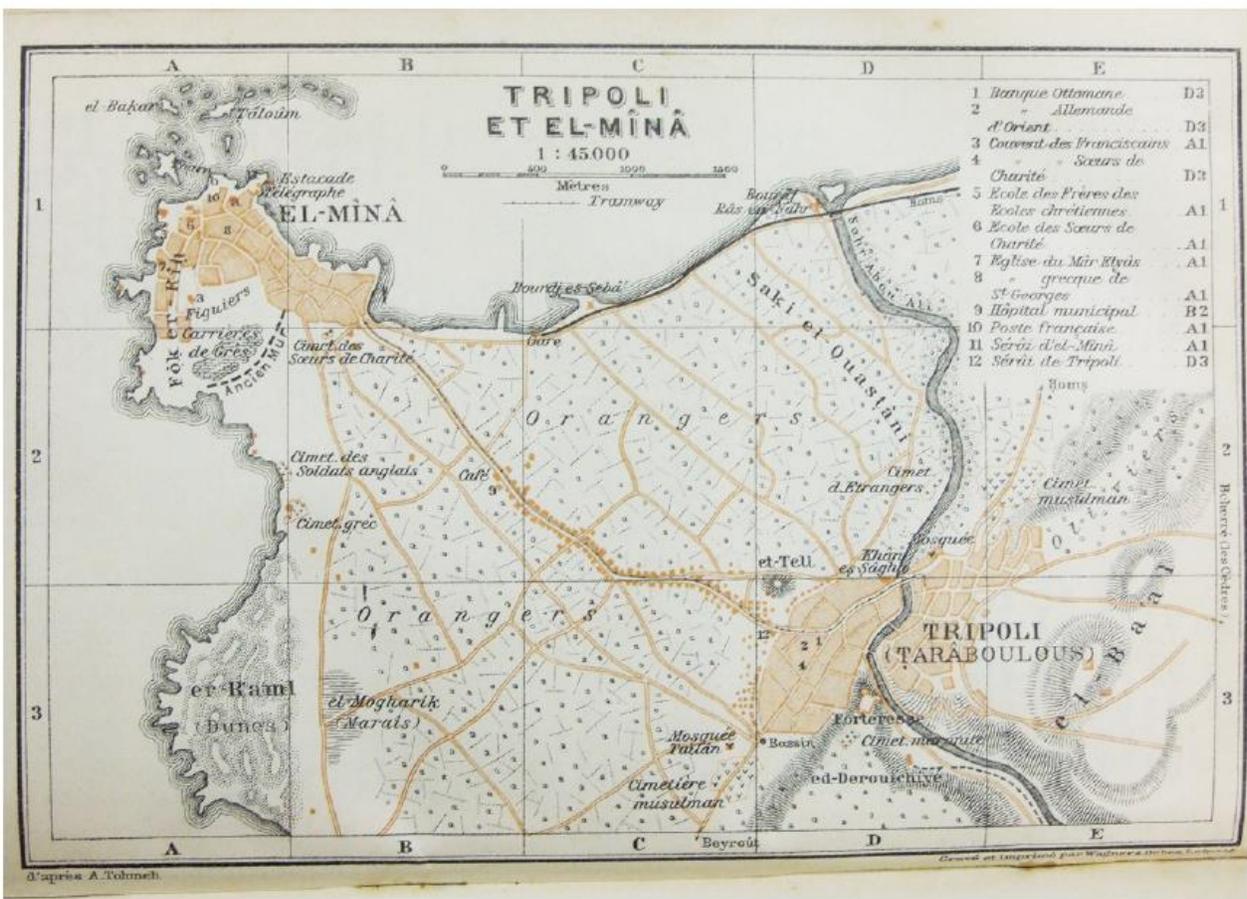
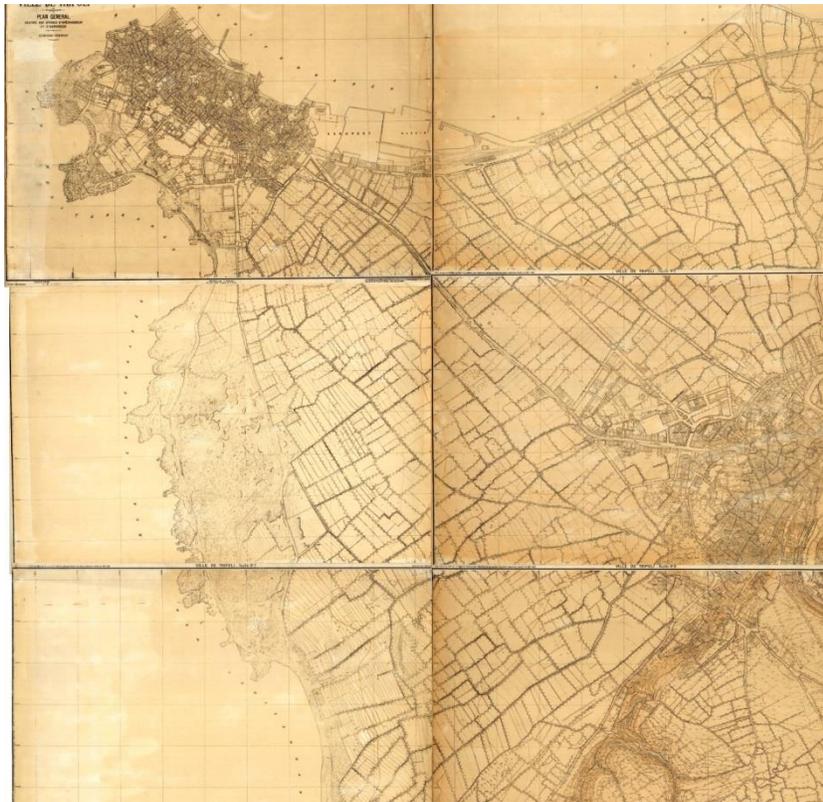
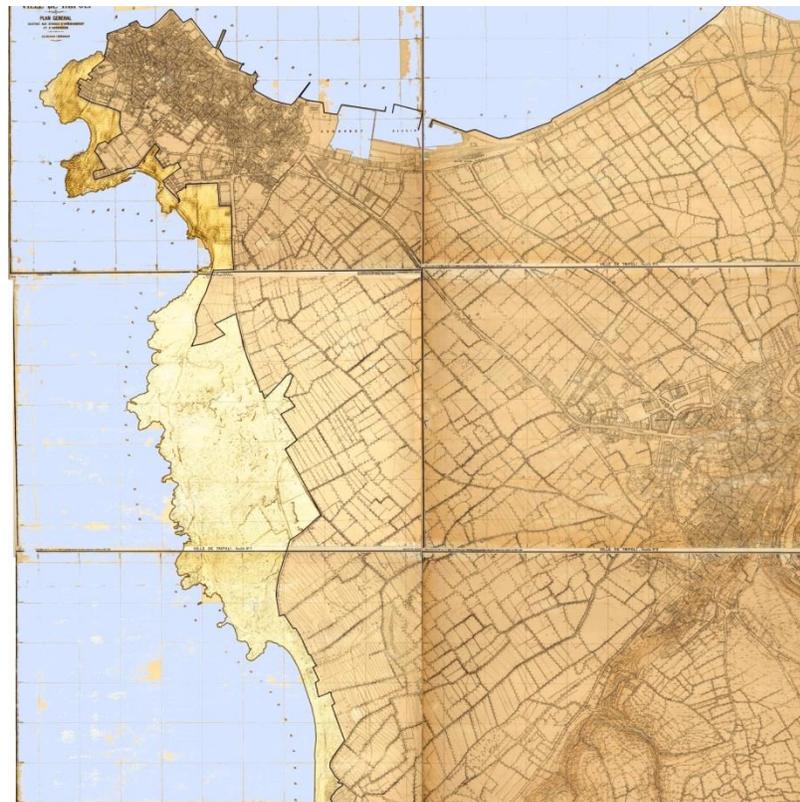


Figure 14: The map of el-Mina, Tripoli in 1912, Source: El-Hajj, 2013; Baedeker, 1912.



**Figure 16: The Map of Mina--Tripoli in 1930,**

**Source: The**



**Figure 17: The existing sand dunes during 1930s,**

**Source: Municipality**

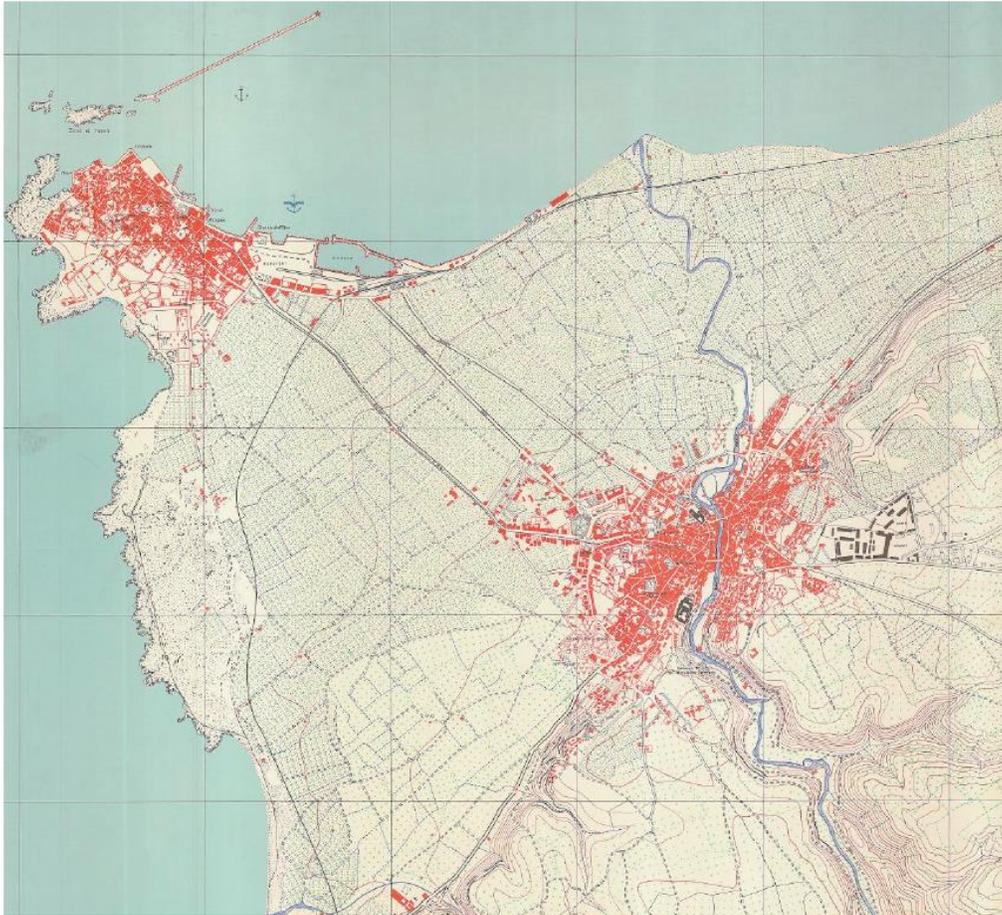


Figure 18: The Map of Mina-Tripoli in 1938,

Source: El-Hajj, 2013; IFPO

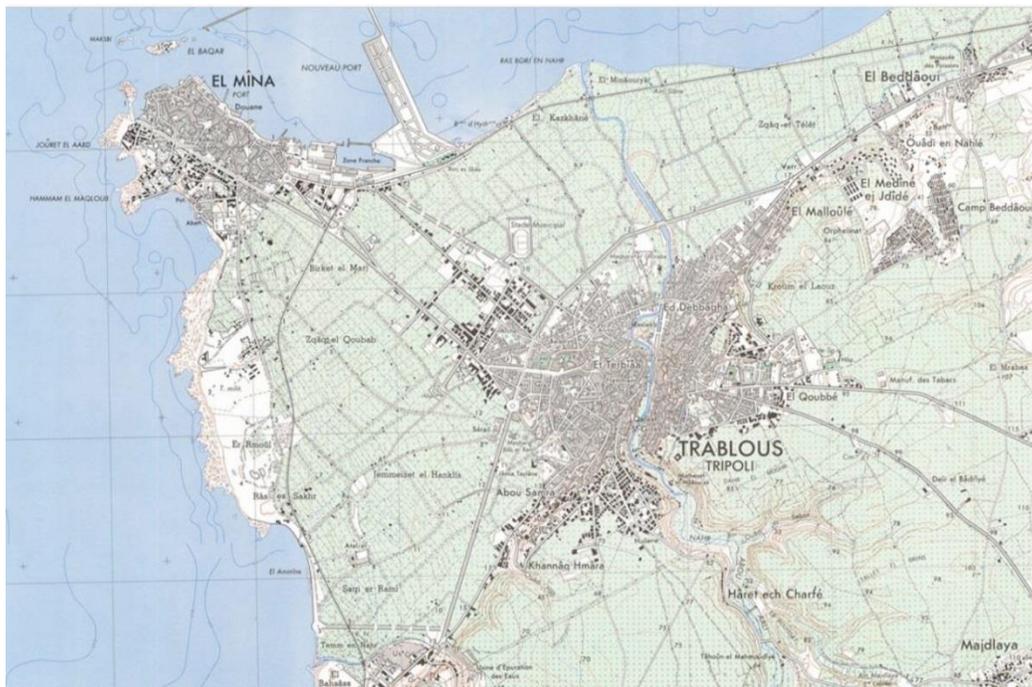


Figure 19: The map of Mina-Tripoli in 1963, Source: El-Hajj, 2013; IFPO

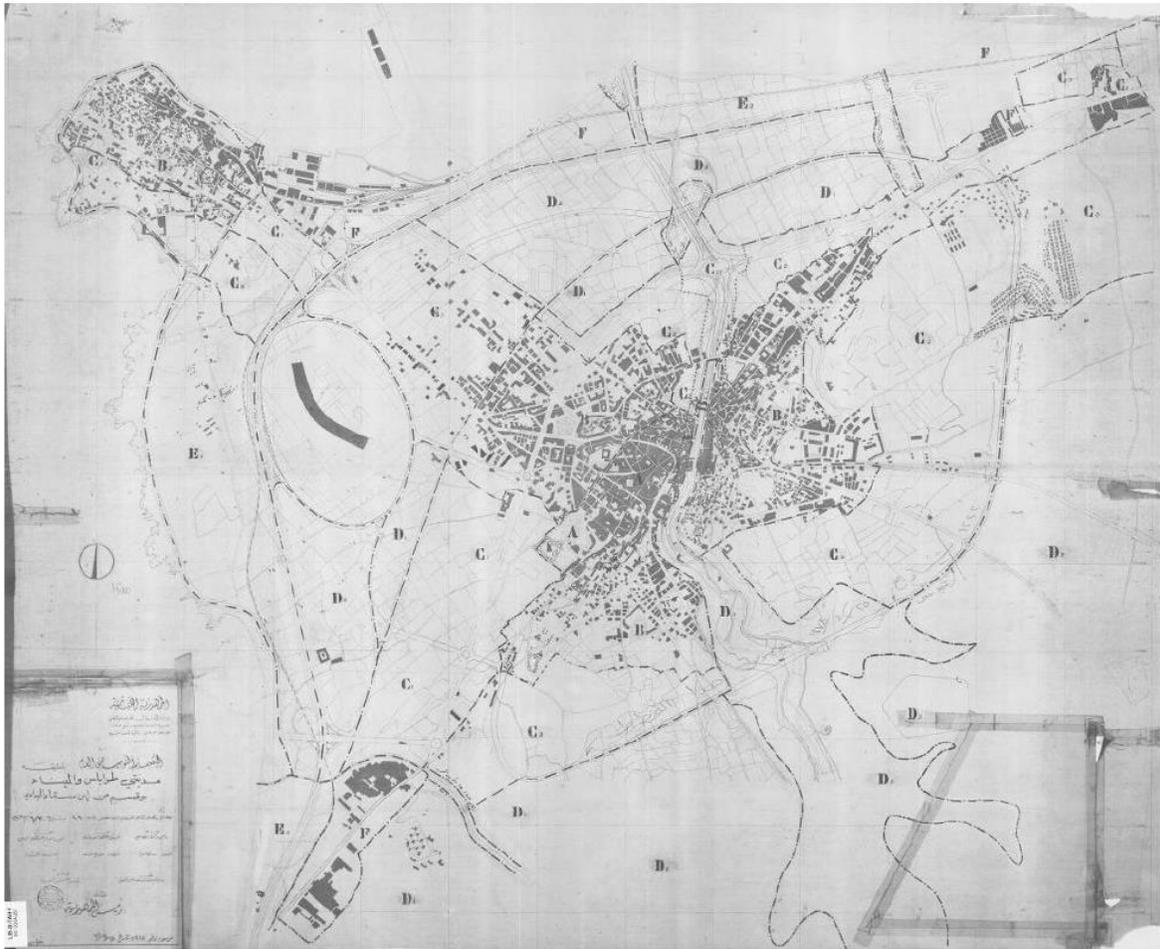


Figure 20: The map of Mina-Tripoli in 1971, Source: El-Hajj, 2013; IFPO

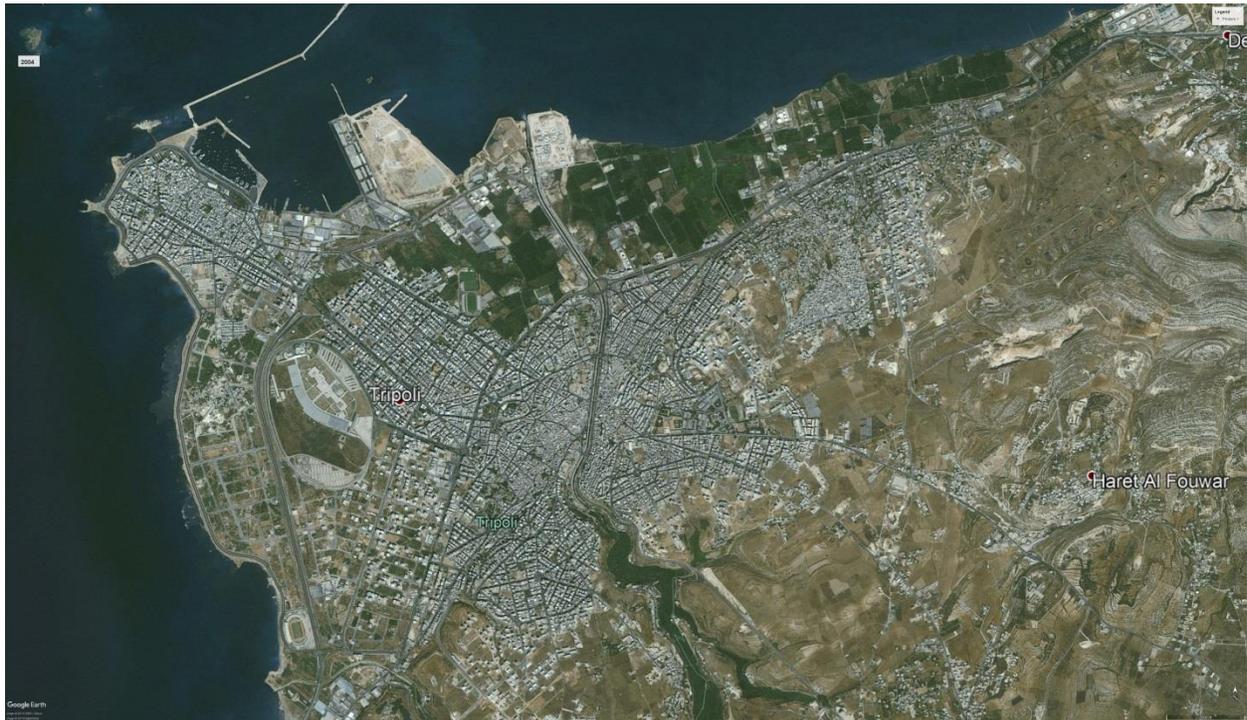


Figure 21: The aerial photo of Mina-Tripoli in 2004,

Source: Google Earth



**Figure 22: The aerial photo of Mina- Tripoli in 2011,**

**Source: Google Earth**



**Figure 23: The aerial photo of Mina-Tripoli in 2018,**

**Source: Google earth**

## **D. Zoning and Coastal Laws**

### ***1. The 2010 zoning and master plan of Mina***

Looking at zoning of the waterfront of Mina (Fig. 25), we can easily depict that the coastline falls under the (Public domain) area, and the supervision and management of the Ministry of Public Works. This is supposed to prohibit any constructions along the waterfront of Mina and maintain it as a public space that should be accessible for all. Although being a public domain provides a lot of protection guidelines and principles, several violations (as the construction of new structures on the public domain) were observed by privatizing the public domain (إسقاط) (decree number 1196). Furthermore, the fact that the zone M4 allows for higher FAR and building heights creates a vertical rupture in the urban fabric and cuts the relationship of the coast with the city (Fig.25).

Nevertheless, zones M2 and M4 along with M9 and M10 are a center of attraction for developers looking to maximize their profit by capitalizing on the strategic location of their properties and investing the maximum FAR and often ask for exceptions to further increase land value. This situation may lead to gentrification risks driven by developers' interest to make maximum profit of their allowed FAR.

Lately, the municipality of Mina has been organizing participatory workshops in order to change the zoning law for the M9 and M10 zones to increase their land and development value. The process is still in the studying phase and the final decision of the municipality is yet to be determined.

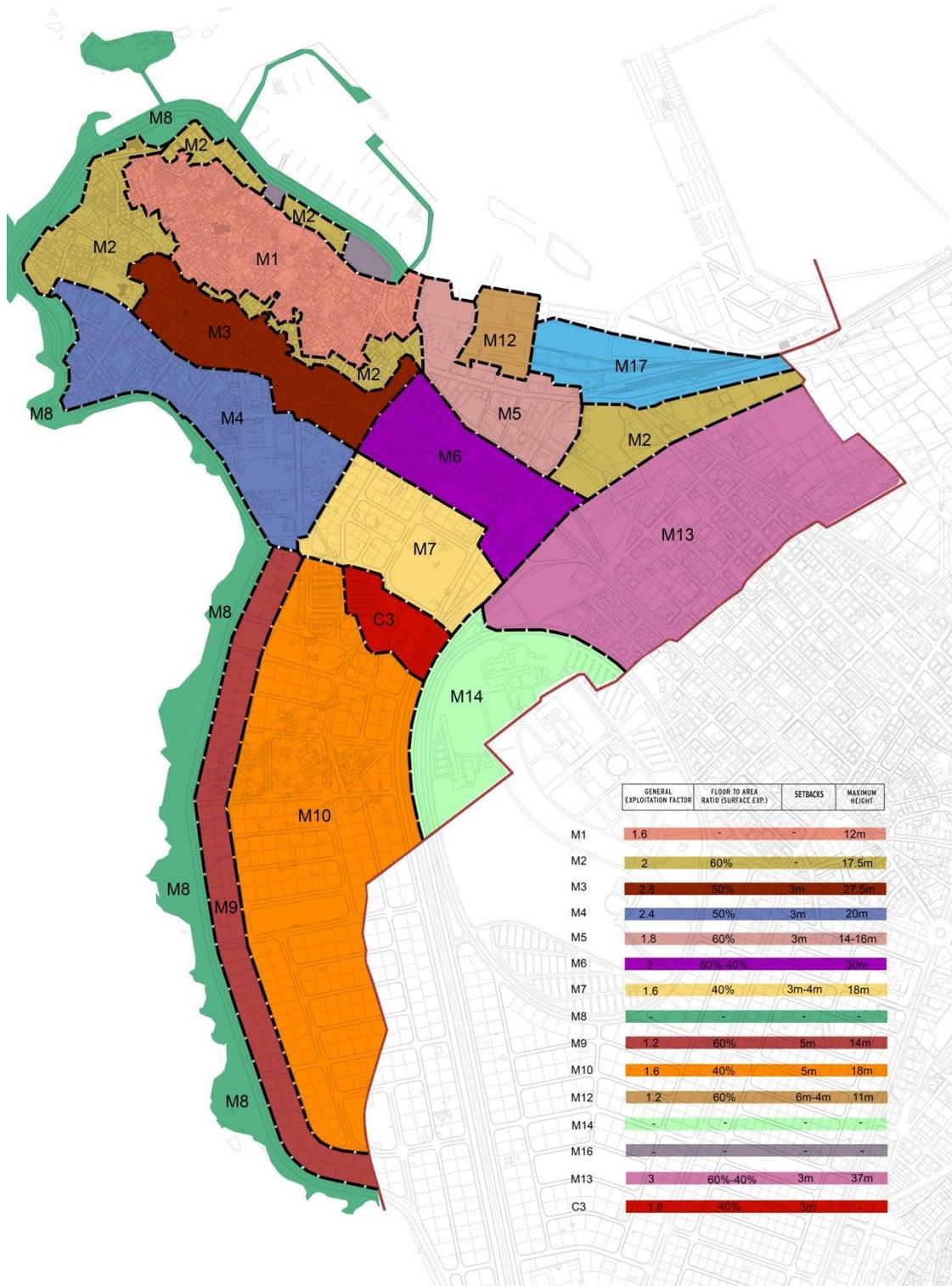


Figure 24: The zoning map of Mina- Tripoli last devised in 2010,

Source: Author

The table below showcases the different Master plans and documents proposed for Tripoli-Mina-Beddaoui municipalities:

Municipality	Law / Decision	Project / Study	Municipal Coverage	Status	Author / Initiator	Topic
1964		First Master Plan of Tripoli City	Tripoli	Technically live but outdated***	Henri Edde (head of Lebanon's Association of Engineers and Architects in 1961 )& Georges Doumani	City zoning and Land use
1982	Decree No. 5234 (Tripoli & Mina); Decree No. 23 (Beddaoui) *	Establishment of Al Fayhaa Union of Municipalities	Tripoli, Mina, Beddaoui	Live***;	Ministry of Interior and Municipalities	Unionisation of 3 municipalities of Tripoli, Beddaoui, Mina
Qalamoun added to the Union in 2014	Ministry of Interior and Municipalities	Unionisation of 3 municipalities of Tripoli, Beddaoui, Mina	Tripoli, Mina, Beddaoui	Not implemented **	JICA for Lebanese Council for Development and Reconstruction (CDR)	Transport Study for traffic reorganization
2001		Japanese International Consulting Agency (JICA)	Tripoli, Mina, Beddaoui	Not implemented **	JICA for Lebanese Council for Development and Reconstruction (CDR)	Transport Study for traffic reorganization
2001		Cultural Heritage and Urban Development Project (CHUD)	Tripoli, Mina, Beddaoui	Not yet completed**	Lebanese Government	Cultural Heritage and Urban Development
2002		First review of the 1964 Master Plan of Tripoli City	Tripoli, Mina, Beddaoui	Rejected by local authorities/ not implemented**	Lebanese Council for Development and Reconstruction (CDR)	Master Plan Review:
New zoning and land use		A Sustainable Development Strategy for the Al-Fayha'a Union of Municipalities, Tripoli, El-Mina and Beddaoui	Union of Municipalities: Tripoli, Mina, Beddaoui		Not implemented**	Sustainable development strategy
Master Plan updated and re-released		Ancient/ traditional buildings in Tripoli, Mina and Beddaoui.	Tripoli, Mina, Beddaoui	Completed Feb 2008	Completed in 2004; implemented in 2009**	Building and character area conservation/heritage
		Sustainable development program of the coastal zone	Coastline of the Union of Al Fayha'a municipalities	Not implemented	Urban community of Al-Fayhaa in collaboration with "Lavall Conseil" (Private Company) and European Union	Network of Mediterranean cities collaborating on environmental management & urban environmental conservation
2002		Study for developing a new master plan for the Union of Municipalities				
2005 Dec	Decreed	National Physical Master Plan for Lebanon [SDATL / NPMLT]	Tripoli, Mina, Beddaoui	Completed in 2004; implemented in 2009**	Lebanese Council for Development and Reconstruction (CDR)	National strategic spatial planning
2006		A Sustainable Development Strategy for the Al-Fayha'a Union of Municipalities, Tripoli, El-Mina and Beddaoui	Union of Municipalities: Tripoli, Mina, Beddaoui		Diran Harmadiyan	Sustainable development strategy
2008		Ancient/ traditional buildings in Tripoli, Mina and Beddaoui.				
	Tripoli, Mina, Beddaoui	Completed Feb 2008	Al Fayhaa Union of Municipalities Environmental Monitoring and Development Centre	Identification of building and character-area conservation/ heritage designations		
2009	Decreed	New master plan of Tripoli municipality		Implemented by decree 2009		
2010	The Strategic Plan« Tripoli 2020 » / "Plan of the MPs Office"	Based on a diagnosis of the economic situation in Tripoli and the need to create 30 000 jobs, the study which was funded by the MPs themselves and by Prime Minister Saad Al-Hariri, proposed 24 sub-initiatives for a vision of Tripoli. Initiatives were grouped into 6 categories: 1-Management and implementation of the programs, 2- Lobbying and infrastructure unit, 3-Projects 4-Funding & Finance 5-Employment and training 6-Young, Small & medium enterprises. Study proposed creation of a Tripoli Development Council.		Strategic plan project frozen following dissolution of partnership of initiating MPs.		
2010		Sustainable Development Program of the Coastal Zone	Coastline of the Union of Al Fayha'a municipalities	Not implemented	Urban community of Al-Fayhaa in collaboration with "Lavall Conseil" (Private Company) and European Union	Network of Mediterranean cities collaborating on environmental management & urban environmental conservation
2011		Al Fayhaa 2020 Sustainable Development Strategy 2020	Tripoli, Mina, Beddaoui, [Report later revised to include Qalamoun post-2014]	Completed in 2011; Revised in 2014 year to include Qalamoun	Al Fayhaa Union of Municipalities	Sustainable development of the Union
2011	Cultural Heritage and Urban Development Project (CHUD) Implementation Report	Tripoli, Mina, Beddaoui		Not yet completed**	Lebanese Government	Cultural Heritage and Urban Development Project
2014	Decree No. 150 (Qalamoun)	Addition of Qalamoun Municipality to Al Fayhaa Union of Municipalities		Live		Amendment to membership of Union of Municipalities of Al Fayhaa

Table 15: City Planning documents, Source: UN-Habitat, 2016

The first planning initiative in the cities of Tripoli and Mina took place in 5/5/1947, after the independence. At the time, the Swiss planner Ernest Egli<sup>3</sup> developed a new master plan that determined different extension zones of El-Mina and Tripoli (Harmandayan, 2000) (Fig.26). The proposed master plan particularly identified the regions of extension of El-Mina old core towards the south and the western agricultural lands along the coast. It also allocated an industrial zone that extends from the port towards Beddaoui along the waterfront of Tripoli's northern agricultural lands (Known as "SAKI"). In addition, Egli proposed a street renovation and rehabilitation plan for the inner old core of both Tripoli and Mina. It's important to note that

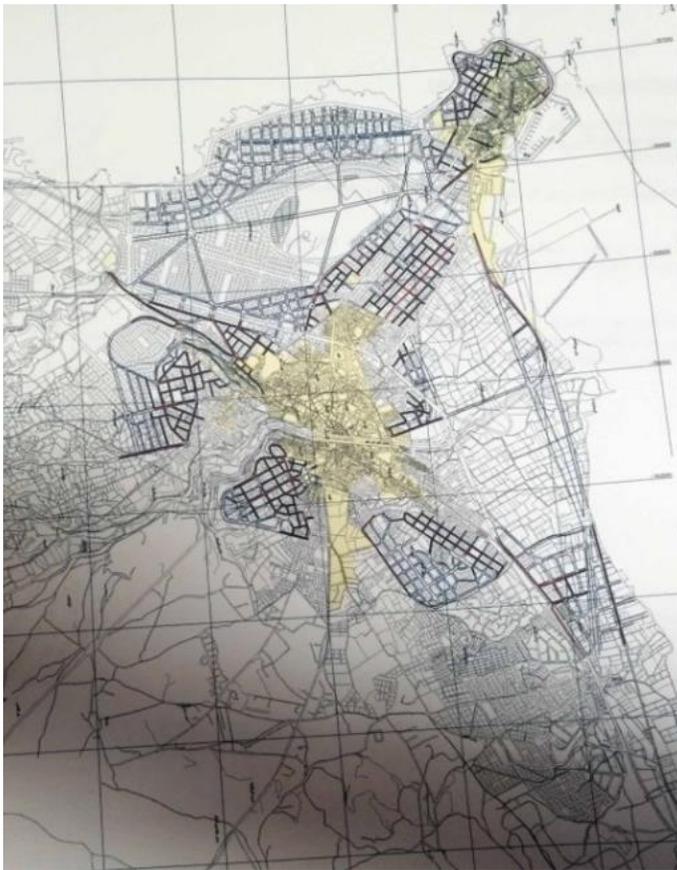


Figure 25: 1947 Tripoli and Mina Master Plan road network, Source: Harmandayan, 2000

**1.1.9: المخطط التنظيمي، مرسوم رقم 8938 سنة 1947**

تمت المحاولة الأولى لتنظيم مدينتي طرابلس والميناء بعد الاستقلال، وفق دراسة وضعها أيغلي (Eglic) وقد صدرت بالمرسوم 8938 تاريخ 1947/5/5، ألغت جميع التخطيطات السابقة الموضوعه ضمن نطاق بلدي طرابلس والأسكلة، وتم الأخذ بهذا المرسوم إلى حين إعادة تنظيم منطقة طرابلس سنة 1971.

حدد تنظيم سنة 1947 مناطق الامتداد لمدينتي طرابلس والميناء، كما حدد مواقع الخدمات ومناطق الحماية بالإضافة إلى شبكة الطرقات داخل المدينة ومناطق الامتداد (الخريطة رقم 01-9). بسبب عدم توفر الدراسة الكاملة تم الأخذ بالمعلومات المتوفرة عنها من الدراسات اللاحقة لتنظيم المنطقة.

حدد تنظيم 1947 مناطق الامتداد التالية:

- امتداد الميناء إلى جنوبي المدينة القديمة في رأس الميناء وإلى السقي الغربي على امتداد الشاطئ.
- امتداد طرابلس والميناء في منطقة بساتين طرابلس وبساتين الميناء بين المعرض (الحالي) وشارع المنتين. مع امتداد مثلث الشكل في السقي الشمالي والسقي الجنوبي بين المنطقة الوسطية وبولفار فواد شهاب (الحالي).
- امتداد طرابلس إلى الهضاب في زيتون طرابلس ضمن ثلاث مناطق منفصلة: أبو سمرا في الجنوب، امتداد القبة في الوسط، امتداد بين التبانة - القبة والبدوي في الشمال.
- امتداد البدوي إلى السهل بين المدينة القديمة وحدود منطقة طرابلس العقارية، غربي طريق طرابلس - اللانقية.

وحدد المناطق التالية:

- منطقة زراعية في مجمل السقي الشمالي.
- منطقة زراعية للحضيات في وادي نهر أبو علي.

- مناطق صناعية على الواجهة البحرية للسقي الشمالي امتدادا من المرفأ إلى حدود منطقة البدوي، بالإضافة إلى ثلاث مناطق صناعية على أطراف الامتداد المقترح في منطقة زيتون طرابلس؛ منطقة صناعية في موقع جامعة المنار ومنطقة الفرز والصم الحلال، منطقة صناعية بين محطة لمحطة القبة في الجزء الأوسطي لزابون طرابلس.

- منطقة عسكرية حول الكتلة العسكرية في منطقة القبة - زيتون طرابلس.
- منطقة مدارس في منطقة الغرياء.
- منطقة خدمات رياضية في موقع الملعب البلدي القائم في السقي الشمالي.
- مطار محطتها في مواقع المقترح القائمة.
- مسالخ في موقع المسالخ الحالي.
- فسحات خضراء وحدائق في مناطق الامتداد المقترح وفي المدينة بالإضافة إلى مناطق خضراء على سفوح وادي نهر أبو علي على حافة المنطقة الزراعية المقترحة، ومنطقة خضراء على المنحدرات في وادي هاب والمنحدرات إلى غرب حوضه جامعة المنار الحالية.

كما خطط لشبكة الطرقات في مناطق الامتداد المقترحة وتوسيعا لطرقات في مدينتي طرابلس والميناء بالإضافة إلى فسحات ومساحات في مناطق تقاطع هذه الطرقات.

وقد وضع هذا التخطيط الأطر الأساسية لعمارة المدينة وتنظيم الأراضي في جوارها بينما لم تنظم الاشكال المعمارية التي خصصت للنظام البناء المصمم في جميع الأراضي الشمالية الأثمة، مرسوم رقم 6171 بتاريخ 1940/8/30 - فكان الوجهة الأساسية لتحدد المدينة خاصة إلى جنوبي مدينة الميناء القديمة والواقعة الممراني بين الميناء وطرابلس والامتداد في ثلاث اتجاهات في منطقة زيتون طرابلس.

من الخدمات المقترحة تم الأخذ بموقع المسالخ والمنطقة العسكرية، التي حددت نهائيا بالمرسوم رقم 4174 بتاريخ 1981/7/14، والشعبت البلدي في السقي الغربي الذي أقيم سنة 1949، وتم تحديد نطاقها بالمرسوم رقم 8638 تاريخ 1955/3/14. بينما تم بوضع معظم المناطق المقترحة مما سبق ففقدت الفسحات الحرة في المجال المديني الحديث الكثيف في بساتين طرابلس بين مدينتي طرابلس والميناء. كما سبب في تحديق منطقة صناعية إلى جنوب المرفأ. بينما في الجزء من شاطئ السقي الشمالي إلى شمال جنوبي نهر أبو علي وإن أقيمت فيه بعض المصانع فوجهة الفرز أصبح بين تحديده كمساحة صناعية في نظام 1947 ونظم 1971 حيث سنفت منطقة سياحية والاقترحات اللاحقة التي أعادته كمساحة صناعية محددة.

كما ساعد نظام 1947 في المحافظة على معظم الأراضي الزراعية في السقي الشمالي، وادي نهر أبو علي وجزء من المنحدرات في وادي هاب وشمال منطقة جامعة المنار الحالية.

تم الأخذ بمعظم شبكات الطرقات في مناطق الامتداد في طرابلس والميناء، ما عدا السقي الغربي من بساتين طرابلس الذي وضعت له دراسة شاملة مع إعادة الضم والفرز.

Figure 26: 1947 Tripoli and Mina Master Plan decrees, Source: Harmandayan, 2000

<sup>3</sup> Ernst Arnold Egli (1893-1974) is a Swiss architect, urban planner and historian. He exercised his profession in Turkey, Vienna, Zurich and Lebanon. He was commissioned to become the Chef of Urban and Municipalities' services in the Ministry of the interior from 1947 until 1952 (Verdeil, 2016).

these interventions were criticized for contributing in heritage loss and for being difficult to implement, as they require heavy infrastructure work and large amount of funding (Harmandayan, 2000).

As a response to the critiques of the 1947 master plan, UNESCO proposed a revised study for Tripoli's old core in 1953. This plan was influenced by the General Directorate of Antiquities and Museums' interest in the old historical core of Tripoli. As such, the study listed 30 heritage sites and encouraged their restoration. In addition, new heavy infrastructural linkages were proposed to connect the old historical core with its surrounding. Nevertheless, the 1953 plan received similar criticisms to the 1947 plan (Harmandayan, 2000) (Fig. 27).

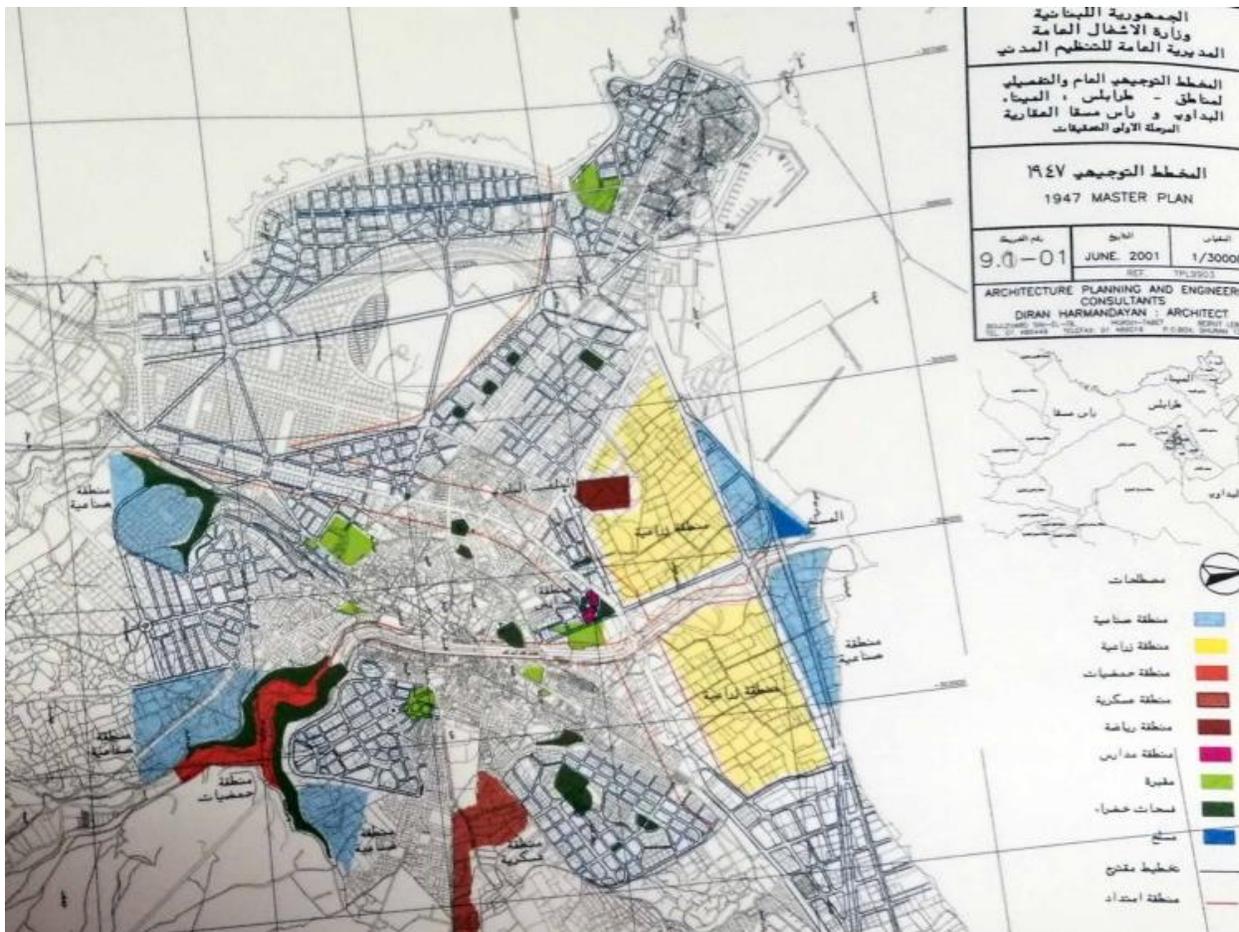


Figure 26.:1947 Tripoli and Mina Master Plan,

Source: Harmandayan, 2000

In 1964, the CDR commissioned Henri Edde<sup>4</sup> and George Doumani to develop a Master plan for Tripoli and Mina (UN-Habitat). The plan divided the area into five different districts: the historical core defined as zone A, the commercial mixed-use zone defined as zone B, the residential area defined as zone C and which can be expanded over the well-defined zone D, and finally zones E and F combined as one zone designated for tourism and industrial activities (Nahas, 2001). As for the coastal lands in El-Mina, five main zones were identified: the hotel zone in the southern lands (colored in pink in Fig28), the new city zone or zone V, which extends to the western peripheries of Tripoli along the shore (colored in green in Fig28), the city's expansion zone in agricultural lands or zone IV-B (marked in yellow in Fig28) which is positioned on the southern edges of the old historical core of el Mina, the city zone or zone II (colored in orange) and finally, the industrial zone (colored in light blue in Fig28). Nevertheless, an additional zone in the inner parts of Mina was designated for sports (Harmandayan, 2000).

It is important to note that the new coastal development zone (colored in green in Fig.28), is characterized by the lowest FAR for development in comparison with the surrounding coastal developed areas.

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<sup>4</sup> Henri Eddé: Lebanese architect and urban planner born in 1924. He undertook several urban planning projects in Lebanon during the “Chehab” era since 1959. He erected several Master plans for all of Tripoli, Beirut, and Baalbek. He was heavily involved in political relations which reinforced his engagement in planning initiatives (Verdeil, 2010).



The 1964 plan was intended to be implemented in 1971 after slight modifications (Nahas, 2001). This led to the development of a new master plan for Tripoli, el-Mina, Baddaoui and Ras Maska in 14/9/1971. The new master plan defined five main zones: the historical zone (in red in Fig. 292), the residential zones defined as: zones B and C (in pink, yellow and orange in Fig. 29), the extension zones or zone D (in green in Fig. 29), the touristic zone E (in light blue in Fig. 31). - The zones labelled as E endorse the western agricultural lands of el-Mina along the shoreline, and a resorts' region located in the northern agricultural lands of Tripoli. Therefore, a very specific decree was established for the construction and management of coastal regions. This

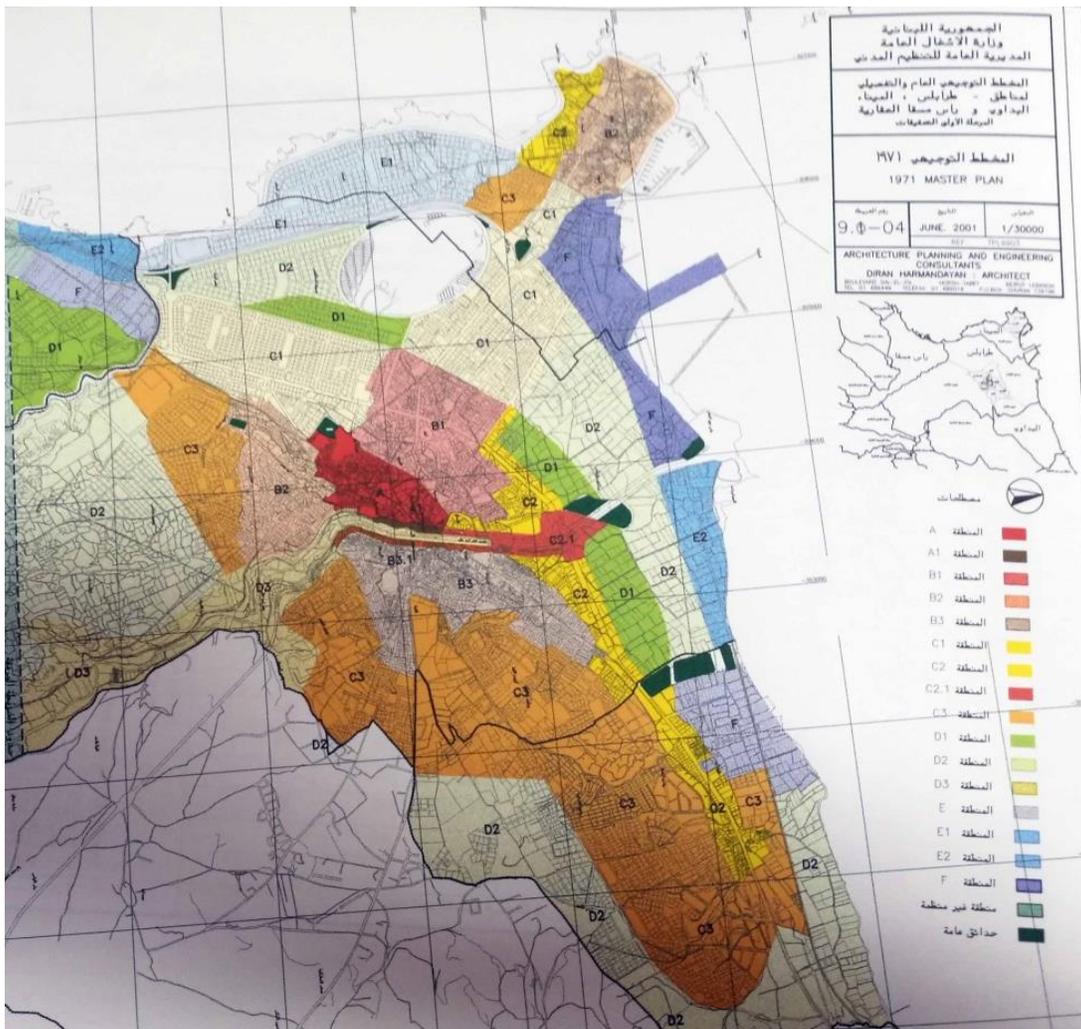


Figure 28: 1971 Tripoli and Mina Master Plan,

Source: Harmandayan, 2000

decree allocated the zone E1 (in light blue in Fig.29) for touristic activities, and defined as well a medium to high FAR for development in this zone. It also defined a region for resorts on public properties with very low FAR for development. Finally, an industrial zone was allocated on the western peripheries of the northern agricultural lands of Tripoli (in dark blue in Fig29) (Harmandayan, 2000).

The “Zone E” decree of the touristic areas specifies strict conditions for the construction on the coast. First, it imposes 10m setbacks from the public coastal properties. Additionally, it bans investments in classified institutions except the one mentioned in decree number 3-1 and 4-1. Moreover, it gives FAR exceptions only for the defined industrial area (Harmandayan, 2000). However, these decrees were modified and revised in the 1993 decree. The decree number 3-2 in the “Coastal Development Plan” section, which defines strategic general design plans for the northern coastal areas in Lebanon; was removed from the 1972 master plan legislations (as shown in Fig30) (Harmandayan, 2000). As a result, the planning of the coastal zones in Mina was greatly affected.

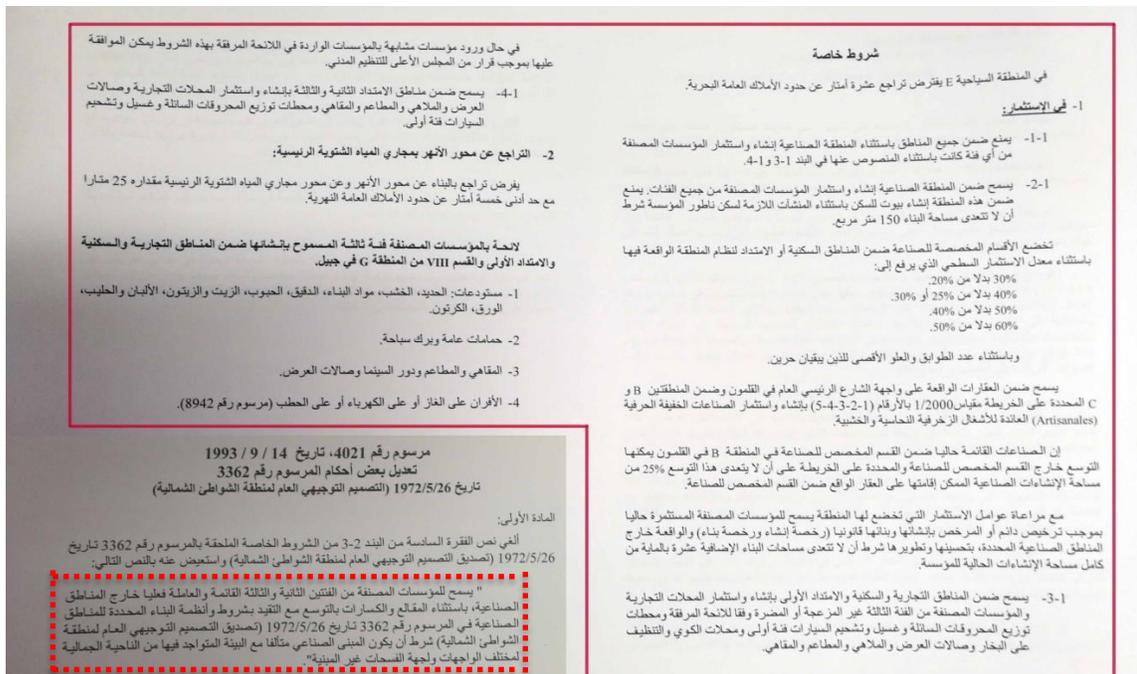
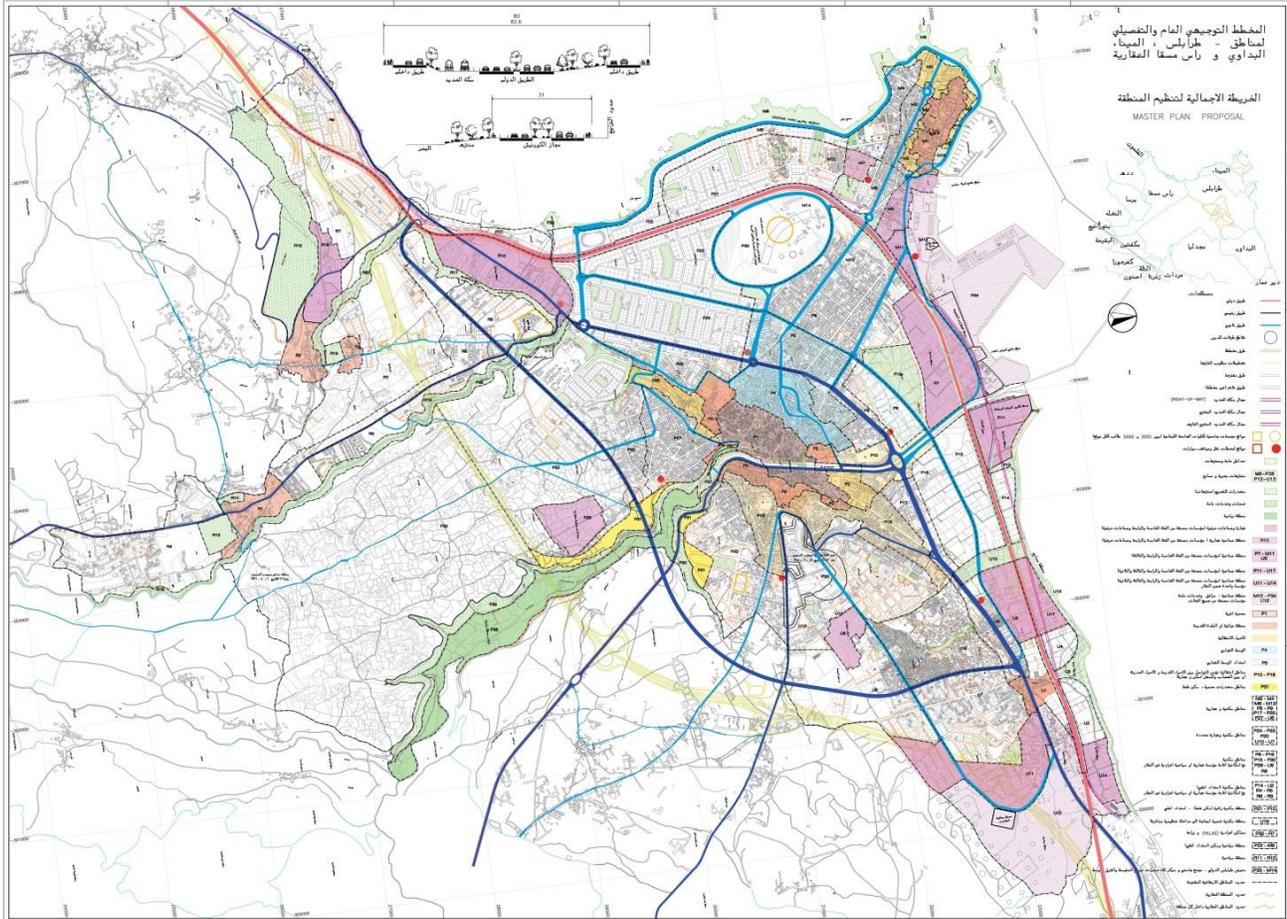


Figure 29: The 1971 decree for coastal areas, Source: Harmandayan, 2000

In 2002, Diran Harmandayan's office was commissioned to develop a holistic and general Master plan for the Al-Fayhaa union: Tripoli, Mina, Beddaoui and Ras Maska. In his study, Harmandayan defined the zone M8 of the coast as a maritime zone and designated it for the public services and uses as shown in Fig. 31 (Harmandayan, 2002).



**Figure 30: The 2002 general Master plan for Al-Fayhaa Union, Source: Harmandayan, 2002**

He also divided zone E proposed in the 1971 master plan into three main zones: zone M8 defined as a protected maritime zone where no construction is allowed, zone M10-P21 representing the waterfront of Mina and designated for luxurious residential functions with a horizontal extension and with low FAR, and zone M10- P22 designated for touristic and residential functions with also horizontal extension. The plan gave importance to public green

areas which are well defined in the proposed Master plan (Harmandayan, 2002). Thus, the 2002 master plan for el-Fayhaa union envisioned the new undeveloped agricultural areas of the el-Mina as luxurious residential and touristic areas but respects the waterfronts' elevation and their relationship with the inner cities of both el-Mina and Tripoli (Harmandayan, 2002).

Following that, the municipality of el-Mina was the only municipality of el-Fayhaa union that decided to adopt the Harmandayan Master

plan in 2006 (Kassir, 2018). However, the study of Harmandayan wasn't accepted or implemented as proposed by the latter (Harmandayan, 2018). Two obvious modifications were observed in the issued 2006 Master plan and decrees as seen in Fig. 33. As seen in Fig14. , the zone M10 in the Harmandayan Master plan was divided into two zones (M10 and C3). The C3 zone kept its high FAR without responding to the M10 conditions, and therefore was

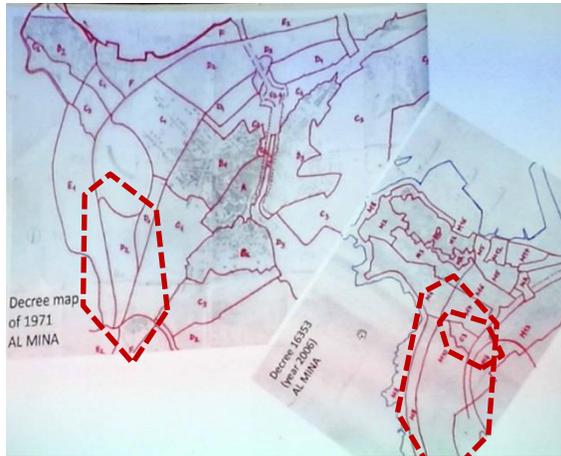


Figure 31: The 1971 and 2006 Master plans for El-Mina city, Source: 2018, استوديو أشغال عامة

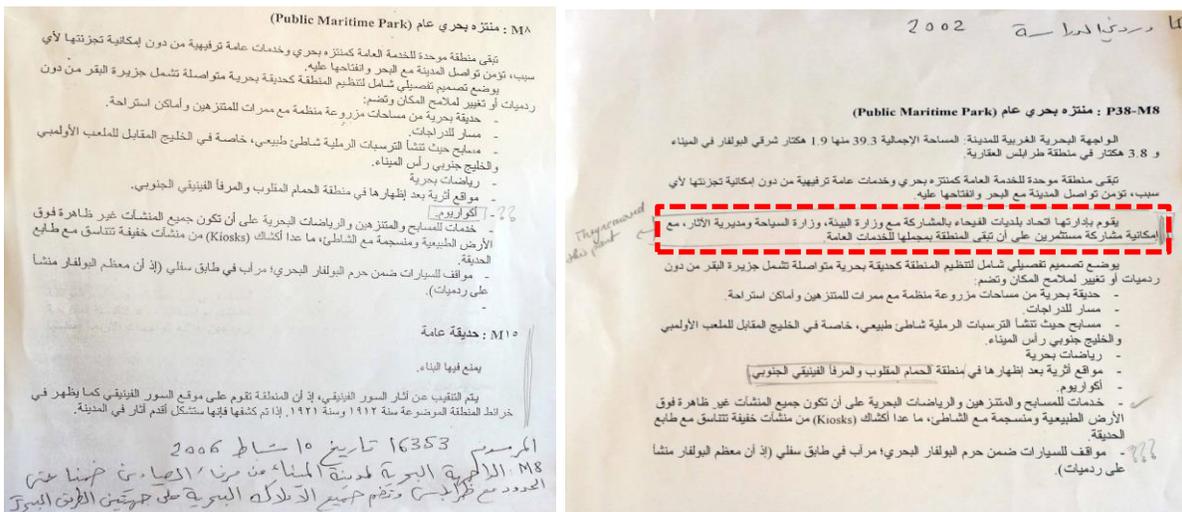


Figure 32: The decree erected by Diran in 2002 for the zone M8 and how it was modified by the municipality in Decree 16353 in 2006, Source: Harmandayan, 2018

distinguished from the M10 zone<sup>5</sup>. Moreover, the issued decree number 16353 for the maritime zone M8 removed the following proposed statement of Harmandayan's study which declares: "The maritime zone M8 is managed by the Fayhaa Union in collaboration with the Ministry of environment, tourism and the heritage directorate with possible coedination with investors, for keeping the area for PUBLIC SERVICES" (Harmandayan, 2002).

The municipality of el-Mina approved in 2006 a master plan accompanied that included a set of ambiguous planning laws and decrees which paced the way for modifications in their application. This would mainly benefit private developers who can manipulate the application of these decrees for profit. Several projects were proposed by private developers for individual profit and coastal investment with high economic revenue such as Al-Fattal residential tower on a sea reclaimed land and TDH project for touristic investment (both projects are explained later in page 172).

On the other hand, all proposed Master plans for el-Mina considered the coast as a separate entity from the city. Indeed, the clear separation of the different functions and zones of Mina, led to the proliferation of different zones each characterized by a distinct character, some are active and dynamic while others are dead and static.

These plans overlooked the environmental aspect and importance of the coastline of Mina and its adjacent zone, by favoring extensive development along the coast and neglecting the identification of protection zones. Furthermore, the aforementioned Master plans disregard the importance of defining the spatial characteristics of the coastal zones and their implication on its inhabitant livability and economic status.

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<sup>5</sup> Some of the claims of Mayssa Kassir were that the properties of zone C3 belongs to the old public works minister Mr. Mikati's developers.

In addition, the new municipal intentions to increase the FAR will cause spatial and economic change in the designated neighborhoods by defining zones that are mainly dedicated for high income people. They will also lead to urban spatial transformation repercussions, where streets' quality of life will deteriorate and impact negatively people's behavior and interaction with their built environment.

## **E. Urban Spatial Structure**

### ***1. Image of the city***

By applying the Kevin Lynch theory on the image of the city, I was able to develop a Lynchian Map of the coast of Mina as seen in Fig.34 that shows:

- 1- The main important nodes of Mina are mainly located inwards around the roundabouts as the Groupy, al Shiraa and al Mina roundabout.
- 2- Major landmarks that exist extensively along the coastline. Most of them are historical structures that date back to the Mameluke and Roman periods, and the different economic and natural hubs. Namely, Abdul-Wahab island, Hamam el Makloub, the fishing port.
- 3- The two main edges; the natural coastal edge of the shoreline that separate the city from the sea. Also the Tripoli-Beirut highway strongly cuts the city of Mina and its urban fabric from the rest of the city and mainly from Tripoli.
- 4- The three main neighborhoods of Mina; reflecting the different evolutions of the historical city of Mina: the old city, the new commercial one, and the new residential one.
- 5- The different paths highlighted in red link the different existing nodes, landmarks and neighborhoods of Mina. We can namely denote the Port-Said Boulevard linking Tripoli to the coast and to the different other neighborhoods of Mina.

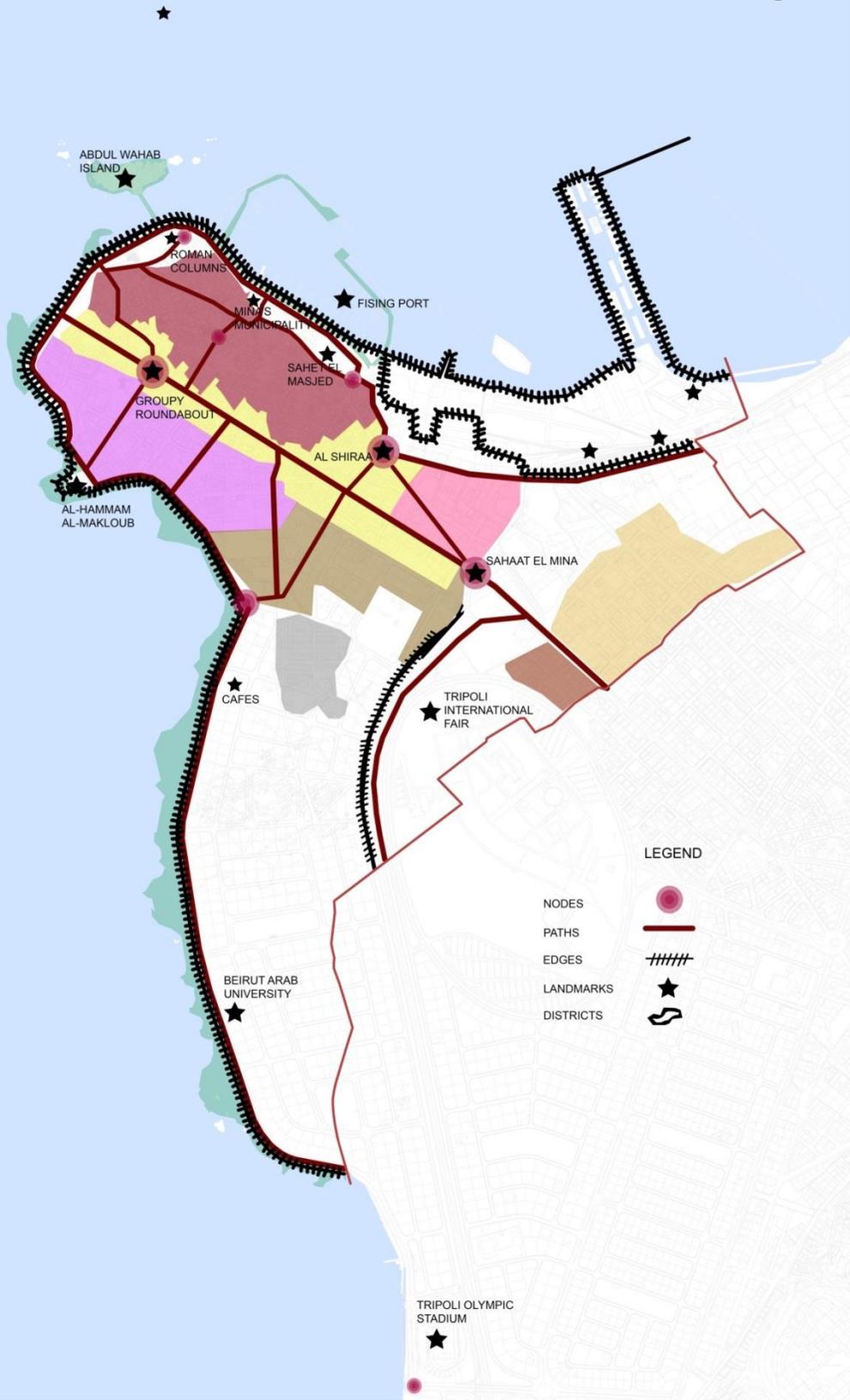


Figure 33: Lynchian map of Mina, Source: Author

## *2. Zoning and Heights*

Not only has the infrastructure discouraged the connection of the inner city with the coast, the existing urban fabric with its ad-hoc character have affected negatively the relationship of the city to the sea. The tall buildings elevated along the coastal waterfront of Mina exacerbate the disconnection of the inner city with the sea. This is due to the large spatial difference existing between the high buildings and the streets.

In fact, the waterfront of Mina embeds two regulatory zones with high FAR and respectively high heights (6 to 7 floors) and which are zone: M2 and M4. These heights are considerably high and do not match with the human scale and affect negatively the street life. (See Fig. 35 and 36)

Moreover, the coast of Mina has been losing its characteristic of sea meeting the city through the design of its front buildings. Currently, the shoreline is separated from the inner neighborhoods of Mina through the prolongation of the Istiklal highway and the construction of tall, anonymous buildings.

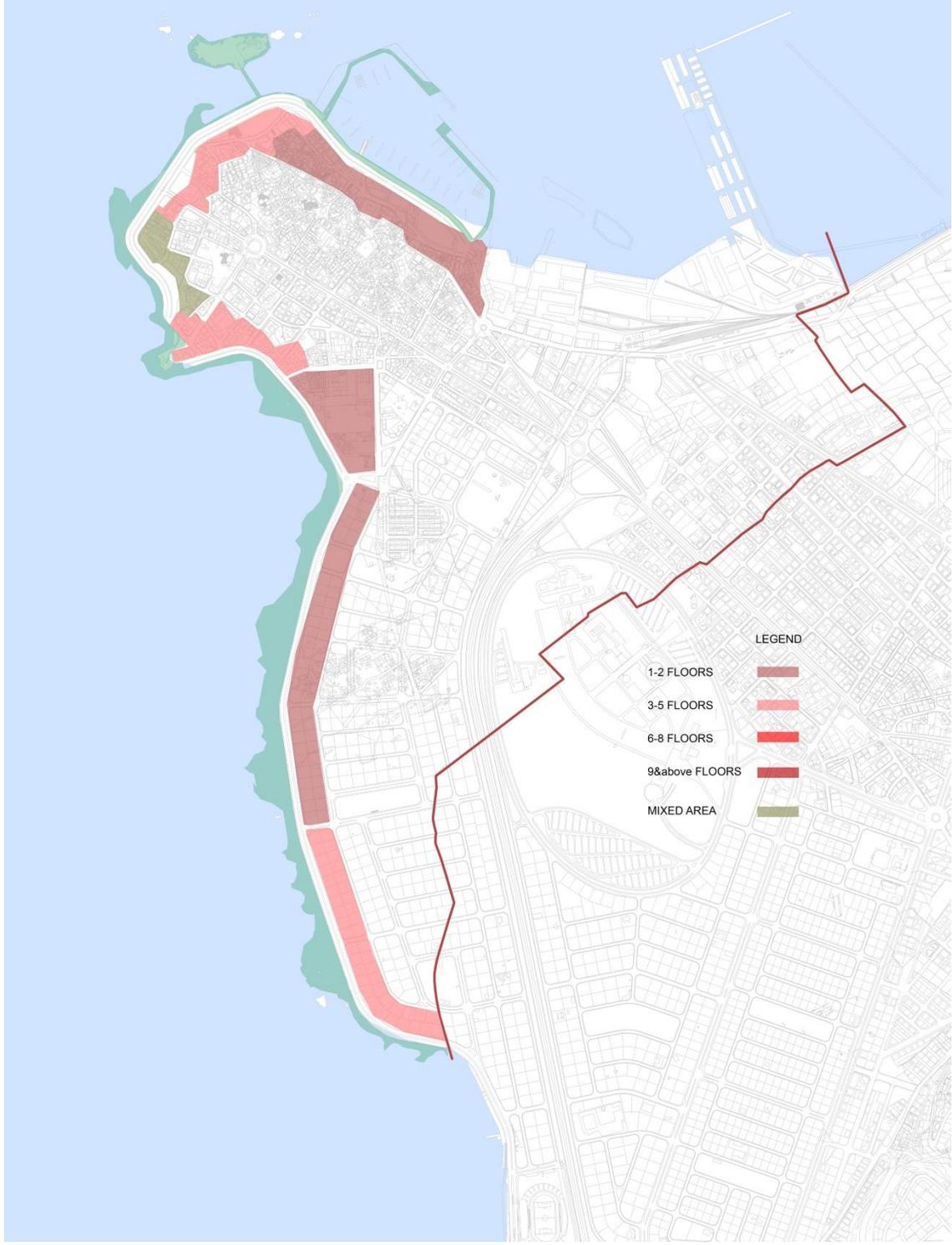


Figure 34: Map of the general heights plan along the coast of Mina, Source: Author

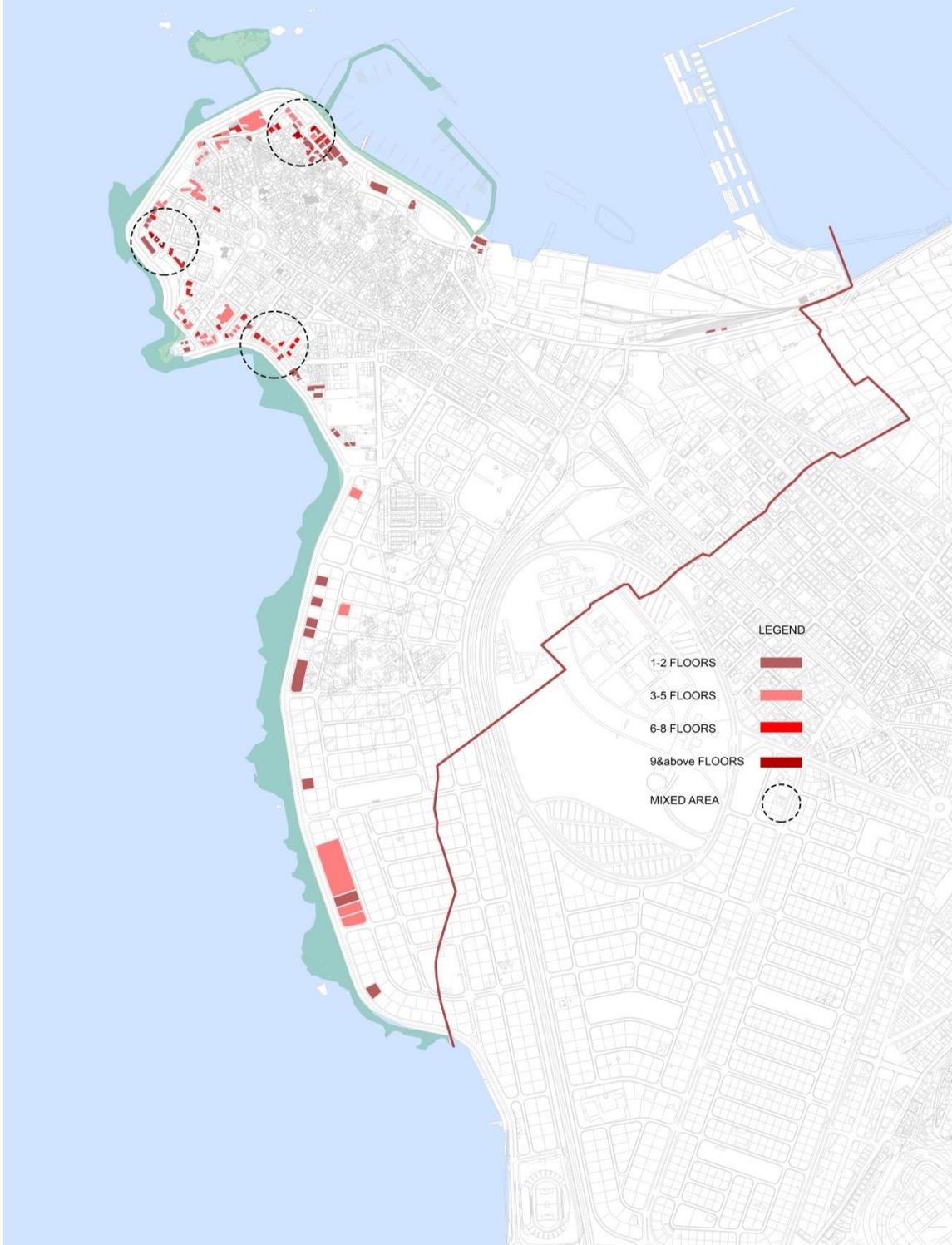


Figure 35: Map of the detailed heights plan along the coast of Mina, Source: Author

### *3. Land Use*

#### a. Ground Floor uses:

The city of Mina endorses a variety of uses on its ground floor, making from it a vibrant city that provides all needed services and facilities for its residents. The largest land-use category in Mina waterfront ground floors is the Cafes and Restaurants, which have found a strategic location along the coast and its front to benefit from the panoramic views of the sea (Fig.37). Fishing activities (such as fishing market, fishing port, boat maintenance, etc.) are the second major uses taking place on the ground floors of the waterfront buildings of Mina (Fig.37). The third and most important usage of the Mina waterfront ground floor region is the industries which occupies almost 25% of its municipal boundaries and endorses one of its most important economic hubs “the port” (Fig.37). Going inside the regions of Mina, commercial uses dominate the ground floors. They include residential services, furniture manufacturing and handicrafts. This takes place in the old city and in its southern expansion. However, the Bassatine region in the south of Mina accounts for large areas of vacant lots. Furthermore, some of the inner ground floor regions of Mina accounts for one large cultural-open space on its eastern side (Fig.37). Consequently, the Bassatine of Mina are under high development attraction which might result new highly developed area.

#### b. First Floor uses:

The upper floors of the urban fabric of Mina are residential apartments, which occupy almost 75 % of the developed areas. No other uses take place in the upper floors of the buildings (Fig. 38). Only the Tripoli international fair and Tripoli port encompasses other uses in their upper floors, such as hotels and restaurants, and industrial services (Fig. 38).

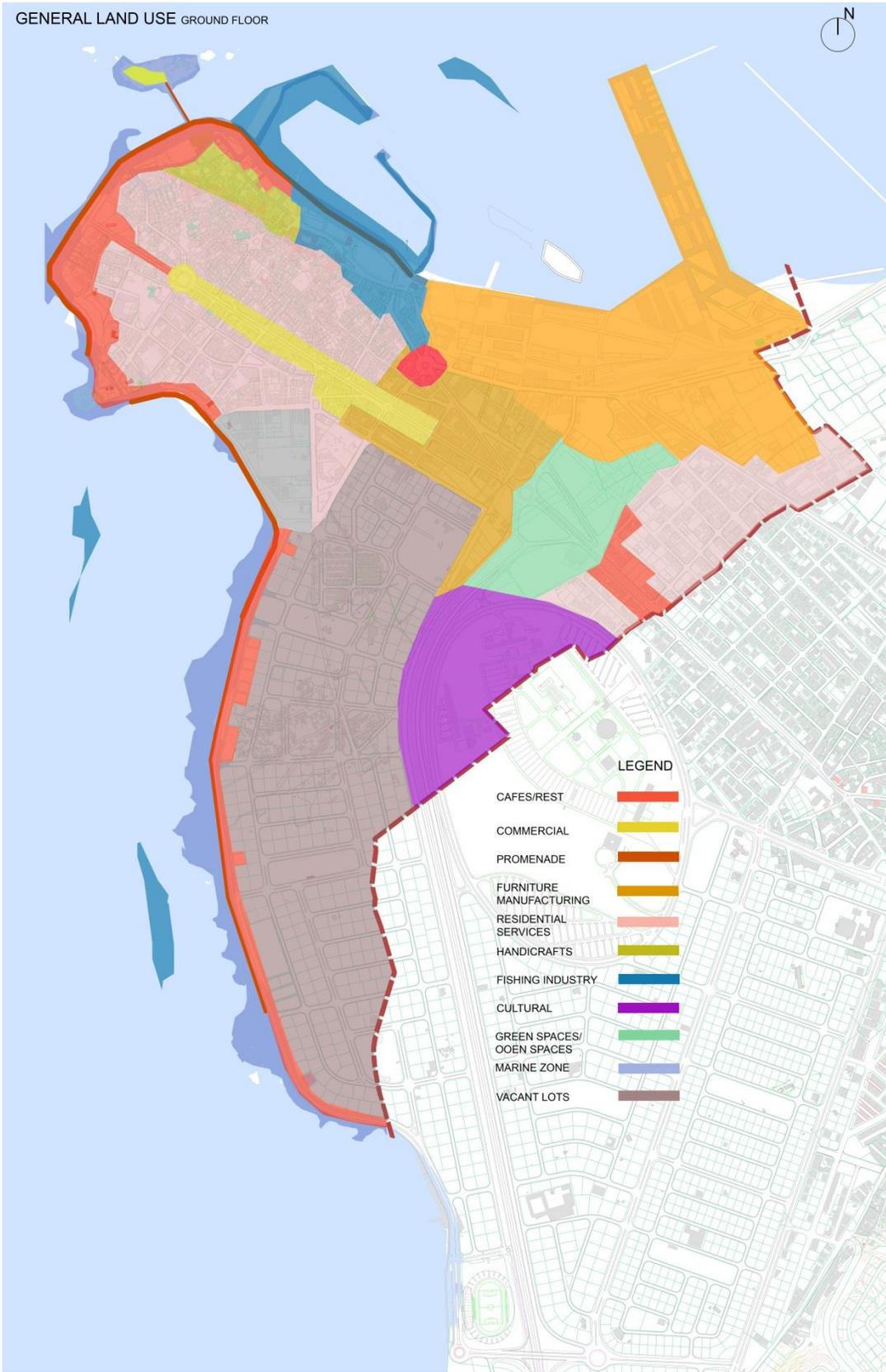


Figure 36: Map of the ground floor uses in Mina, Source: Author

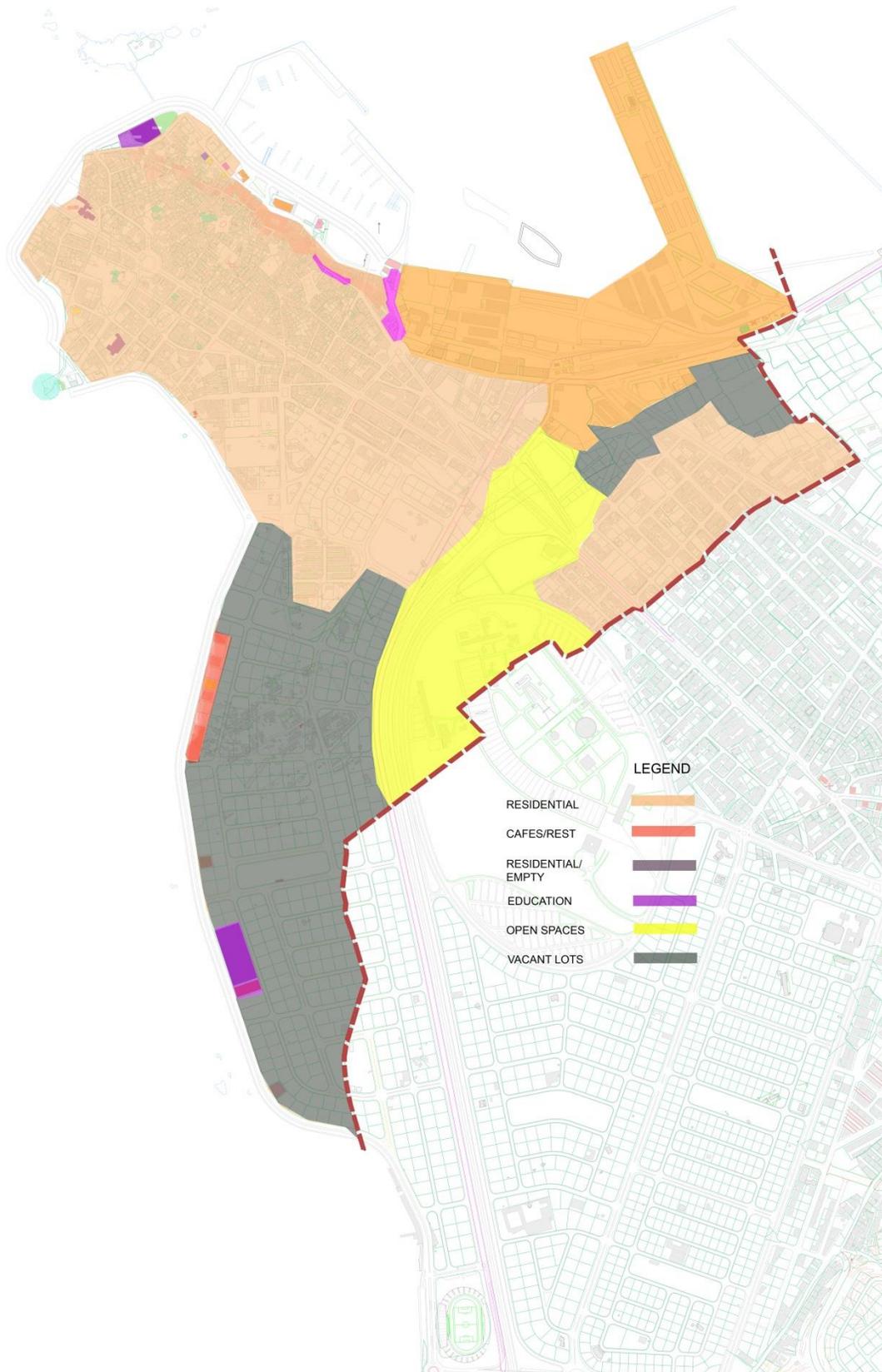


Figure 37: Map of the general land-use of the upper floors of Mina, Source: Author

#### ***4. Open Vs Built Ratio***

As shown in Fig. 39, the urban fabric of Mina is approximately constituted from 73% of open spaces. This ratio of open spaces is divided into 55% of undeveloped lots, 30% residual spaces (mainly blocks leftovers), 15% public spaces, and 10% public domain. Accordingly, only 15% of the open spaces represent efficient usable spaces. This explains the insufficient number of open spaces that serves the city. In addition, these open spaces are scattered all along the city which increases the inefficiency in their uses.

#### ***5. Green Open Spaces***

The green spaces are very limited in Mina. There are only 4 main public parks and some other small pocket green spaces across the city (Fig. 40). The other informal green spaces present in the region are the turf that covers Tripoli international fair land, the abandoned train station and the undeveloped lands in southern Mina (Fig. 40).

Therefore, the green spaces in Mina are minimal and scattered all along the city, which implicates a deteriorated urban environment, unable to accommodate the human needs and rights for green open spaces in their cities (Fig. 40).

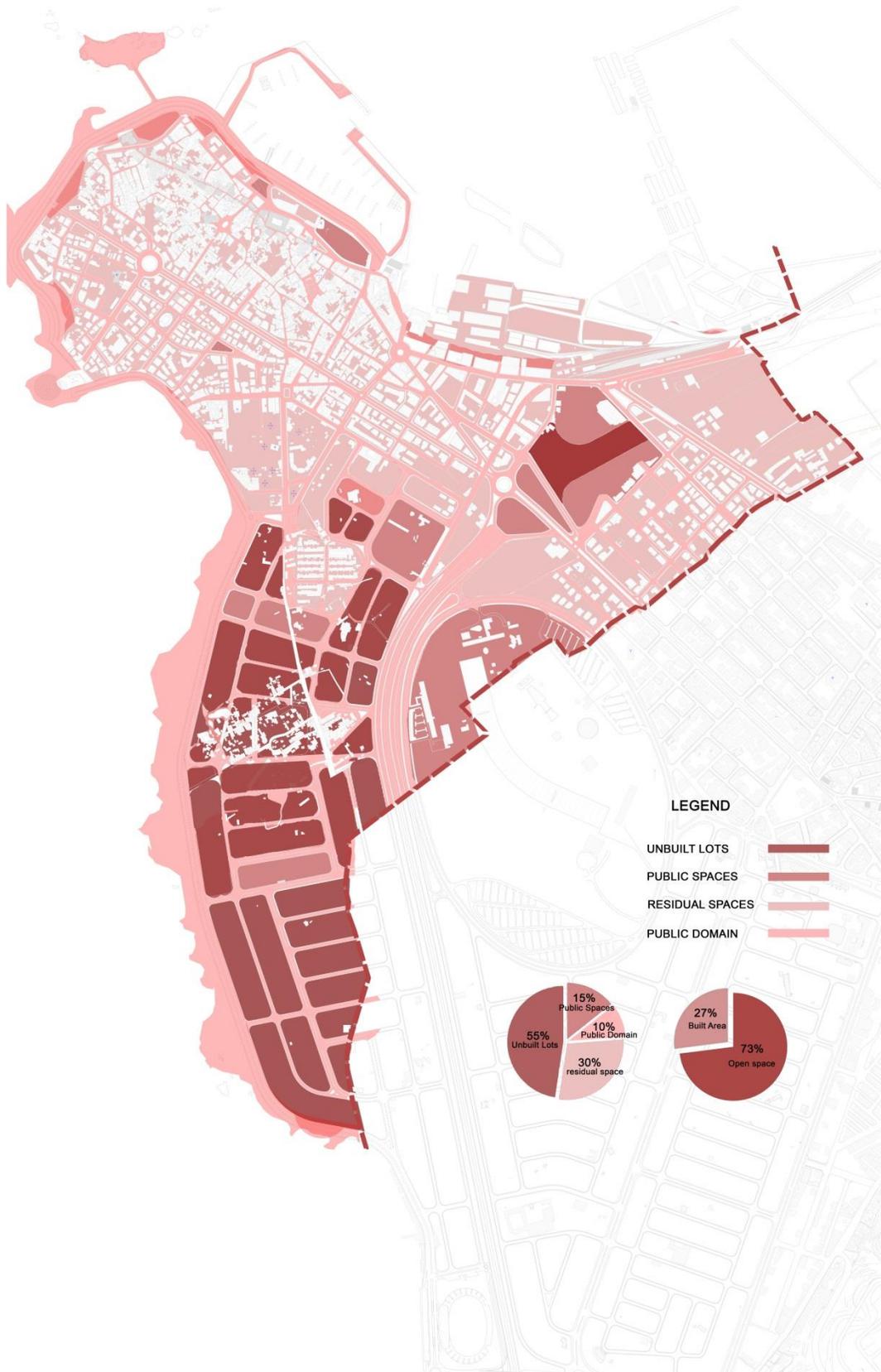


Figure 38: Map of the different types of open spaces in Mina, Source: Author



Figure 39: Map of the different green and open spaces in Mina, Source: Author

## 6. Access and connecting relations with the sea

### a. Road hierarchy, vehicular breaks and connection with the coast

The road network of Mina dictates the spatial characteristics of the streets, defines the spatial and social dynamics of the city, and allows the city's connection with the sea through both vehicular and pedestrian accesses (Fig. 41).

One of the main roads that link the city to the coast is the Boulevard of Port-Said which functioned in the 30s as a tramway line from Tripoli to the port (M. Gilseman, 1996). It is the major roadway that connects all of the old city of Tripoli and the different roads of Mina and Tripoli (intersecting with the boulevard) with the coast (as seen in sketch 1). However, this road divides spatially the old Mina core from its expansion to the south (Fig. 41).

Although Port-Said Boulevard is considered to be the main and initial connection to the coast, the coast users often try to find other ways to access the shoreline, mainly because this commercial spine is characterized by heavy traffic and lack of safety measures, obstructing the movement of both vehicles and pedestrians.

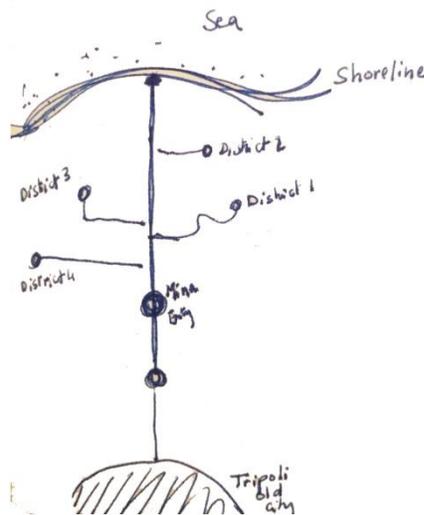
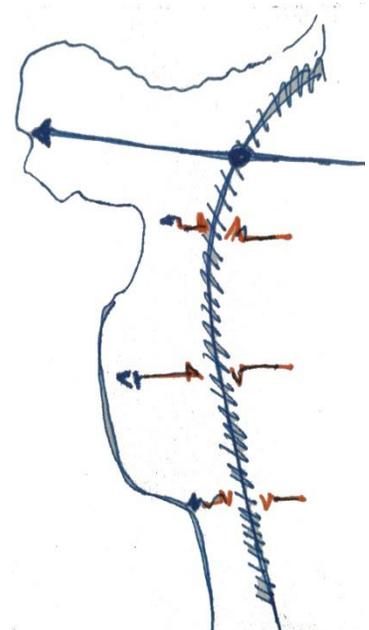


Figure 40: The concept of the road structure, Source: Author

The other important vehicular connection with the coast is the highway, Istiklal and Jamal Abdel Naser, that elongates along the coastline. It creates a physical rupture between the coastline and the inner city, typically because of the lack of safety for pedestrian to cross. My field observation revealed many cases where individuals struggled to find their way to cross the street towards the corniche. Furthermore, this highway encounters vehicular traffic at its entry points from the north and south, as well as at intersection points with inner streets. This acts as a major repellent factor to coast visitors coming from outside Mina.

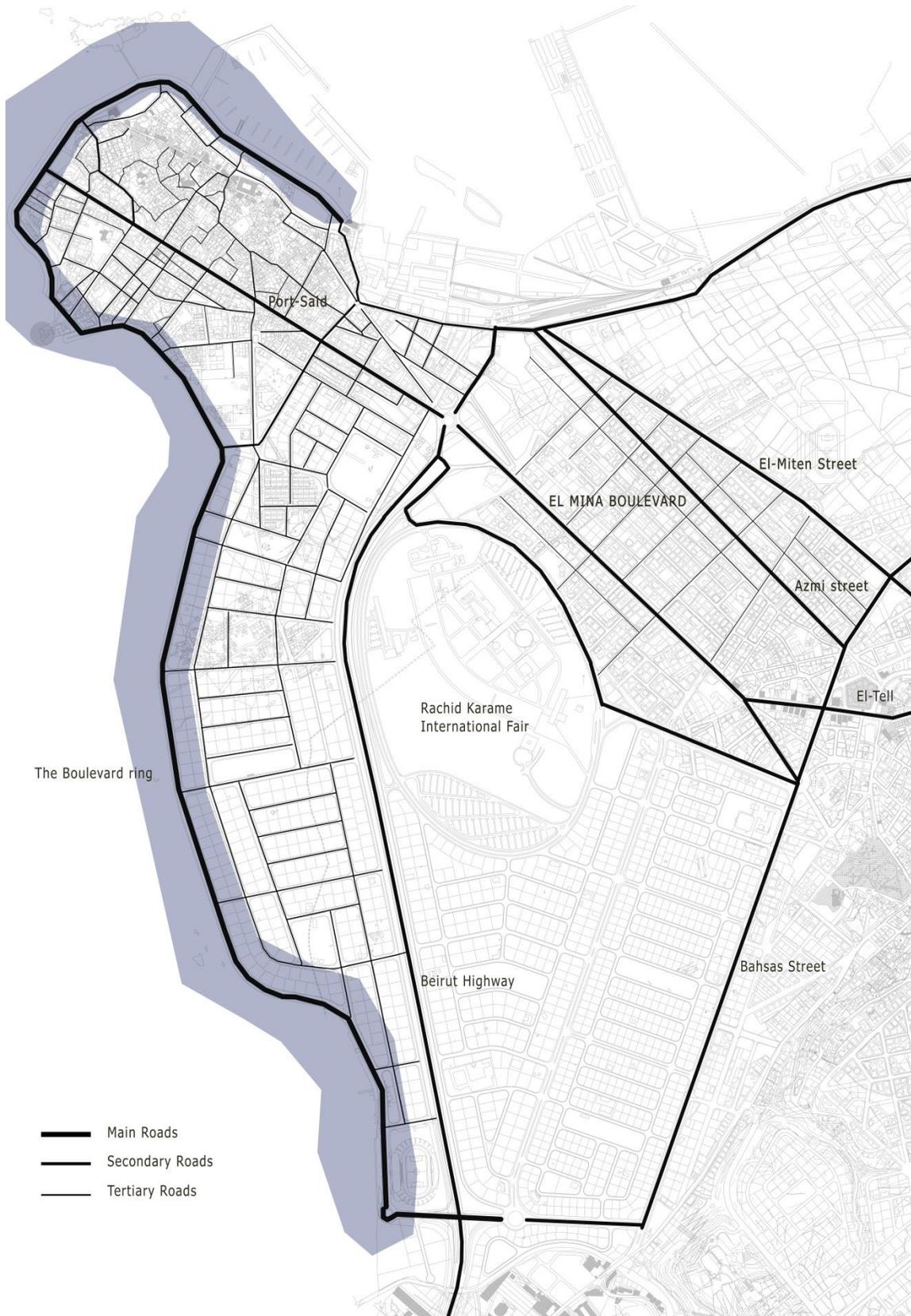
As for Tripoli-Batroun highway, it creates a strong edge that separates the whole city of Mina from Tripoli which in turn impedes the pedestrian access from Tripoli to Mina and its coast. In addition, this situation results in the over congestion of the boulevard of Port-Said, mainly because of the absence of shortcuts or cut-through towards the coast (Fig. 42).

Aside from that, some inner roads of Mina get really suggested, especially the Port-Said boulevard and the small old entrance roads towards the coast of Mina. In addition, the Istiklal and Jamal Abdel Naser highway along the coast get really congested in the afternoon due to people visiting the coast with their cars for recreation (Fig. 44).



**Figure 41: Sketch of the edge created by the Tripoli-Batroun highway,**

**Source: Author**



**Figure 42: Map of the existing road structure hierarchy, Source: Author**



Figure 43: Map of the most congested roads according to different times, Source: Author

b. City inner networks / Alley ways

Most of the internal streets of Mina channel commuters from the city towards the sea. The ones existing in the old Mina core are historical pathways that follow an organic grid connecting the different neighborhoods directly to the coast. Furthermore, these passages are enlivened with multiple local activities that relates to coastal activities (fish selling, fish restaurants, fishing kit, boat reparation, etc.). Moreover, these pathways are human friendly witnessing high pedestrian movement. This is because almost all of the fishermen, who head towards the coastline on a regular basis, use these pathways for accessing the sea. However, these passages encounter many visual obstructions due to the construction of violating buildings at their ends. Also, they are lately being deteriorated urban conditions due to the lack of maintenance, lack of people awareness and the lack of institutions' and parties' solicitude in these areas.

Looking at the southern part of Mina, and particularly at the streets connecting the expanded city with the sea, it is noticeable the width difference of the streets in the comparison with the old alleyways as shown in Fig. 46. This street network commutes pedestrian passengers through long distances merely shaded and unprotected from the prevailing winds making it difficult and unpleasant for the foot passengers to take these ways for accessing the coast. Aside from that, the parked cars all along the sidewalks render mobility harder along these stretches.

Moreover, the functions performed along these stretches do not specifically connect with the sea, increasing by that their rupture and alienation from the coast.

However, the coastal walkway remains one of the most used pedestrian walkway and it encounters different congested areas (as shown in Fig. 47) that differ according to the activities taking place along the coastline.

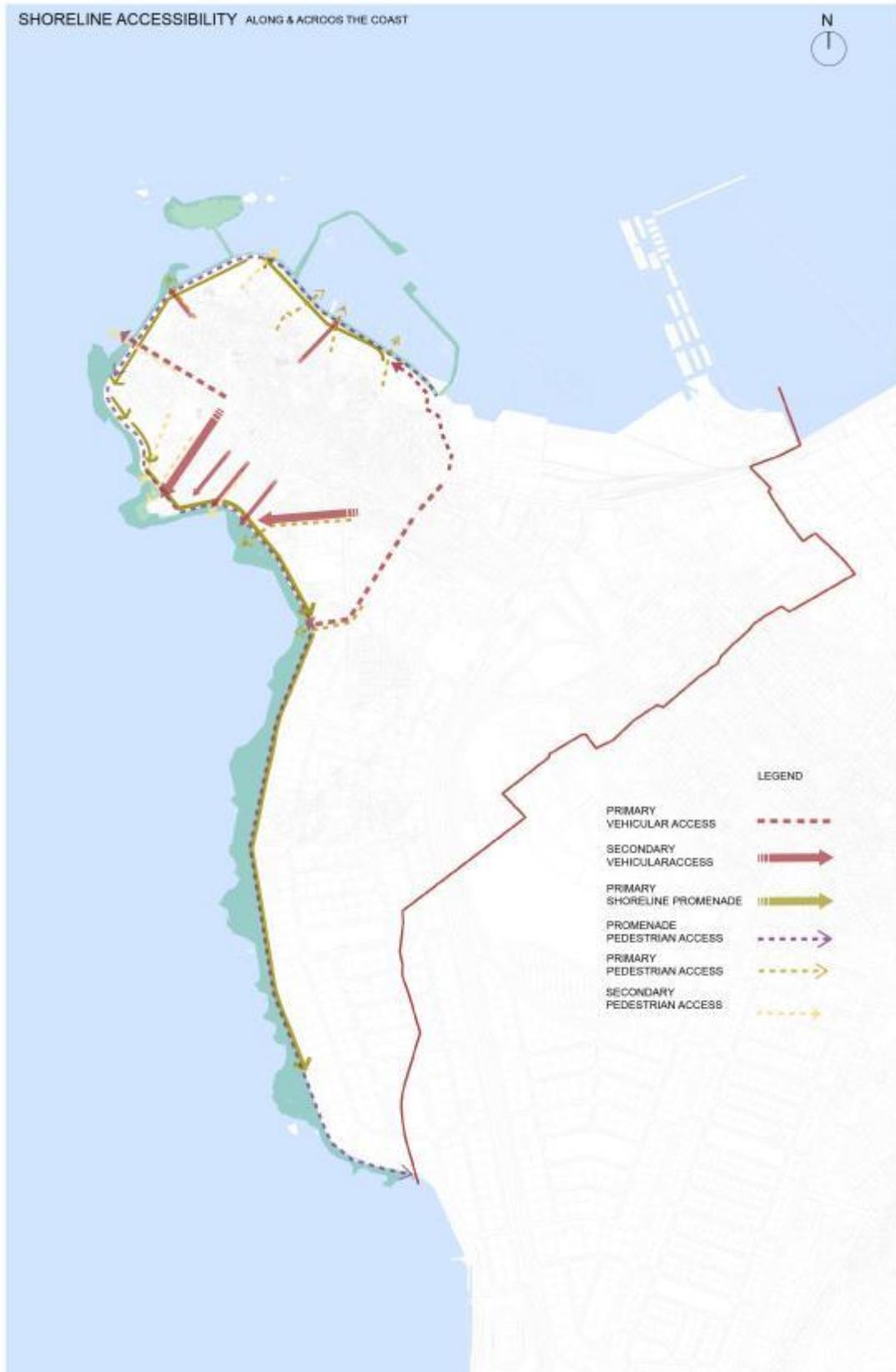


Figure 44: Map of the different pedestrian old and new alleyways of Mina, Source: Author



Figure 45: Map of the congested zone with pedestrian flows, Source: Author

### ***7. Occurring activities affecting the coast of Mina***

The previously explained land-use informed the occurring/socio-economic activities happening along the coastline. For instance, multiple related fishing activities take place along and next to fishing port and market, such as: fishing, fishing kit preparation in boats, fish selling, informal small sightseeing and cafes, cafes in boats, narguileh smoking, (boat trips), etc (Fig. 47).

Moving forward, touristic and recreational activities occur near Abdul-Wahab Island, as we can observe people practicing various physical activities, chilling on benches, walking or fishing with a hook. We can notice as well the extensive presence of street vendors along this stretch for they can find the largest number of visitors in this area (Fig. 47).

The ripple of these activities extends toward the Hammam el Makloub area, adding to it some swimming activities that occur particularly next to the sand dunes present in front of the old khan (between the island and the Hammam el Makloub). Near the Hammam, some individuals do fishing on the elongated vermitidae platforms (Fig. 47).

Looking into beach zone, a number of affordable cafes and restaurants activities are accentuated in this region, similar activities extends towards the coastline, where we can observe people putting their own tables and chairs and enjoying the site natural beauty. Also, swimming activities and picnic congregation along the sand dunes stretching on the southern part of Mina.

All of the aforementioned activities, are replicated in the southern part of Mina but in a lower intensity/manner due to the absence of development and the presence of large vacant lands along this coast stretch (Fig. 47).

The above mentioned dynamics reflect how informally most of the activities are occurring, and how they indirectly connect with the waterfront ground floor uses. This inform us on the

necessity to organize these activities and to incorporate them within a system of networks that overlap and connect the different activities within each other's, for achieving good coastal dynamics and street life along the coast. It shows as well the need to integrate these activities within a whole set of natural open public space that protects and enhances the cultural and visual characteristic of the coast.

a. Dynamic Vs Static

Consequently, the dynamic zones of the coastline are the one the most noisy, such as the fishing port and the Abdul-Wahab Island. These regions need to be re-connected with the city and other parts of the coast in order. They need as well to be calmed down through the addition of green spaces for providing a better quality of space for its users (Fig. 48).

On the other hand, some of the calm spaces represent passive static places such as the coastal stretch elongating between Abdul-Wahab Island and the Hamam al-Makloub, and the other stretch elongating in front of the undeveloped lands in south Mina. These regions needs to be revived and animated with different activities and allocated purposes. This could be done through replicating and extending the dynamics happening on the other parts of the coastline towards these static areas, in order to animate and revive these areas with urban scenarios and performances (Fig. 48).

SOCIO-ECONOMIC ACTIVITIES ALONG & ACROSS THE SHORELINE

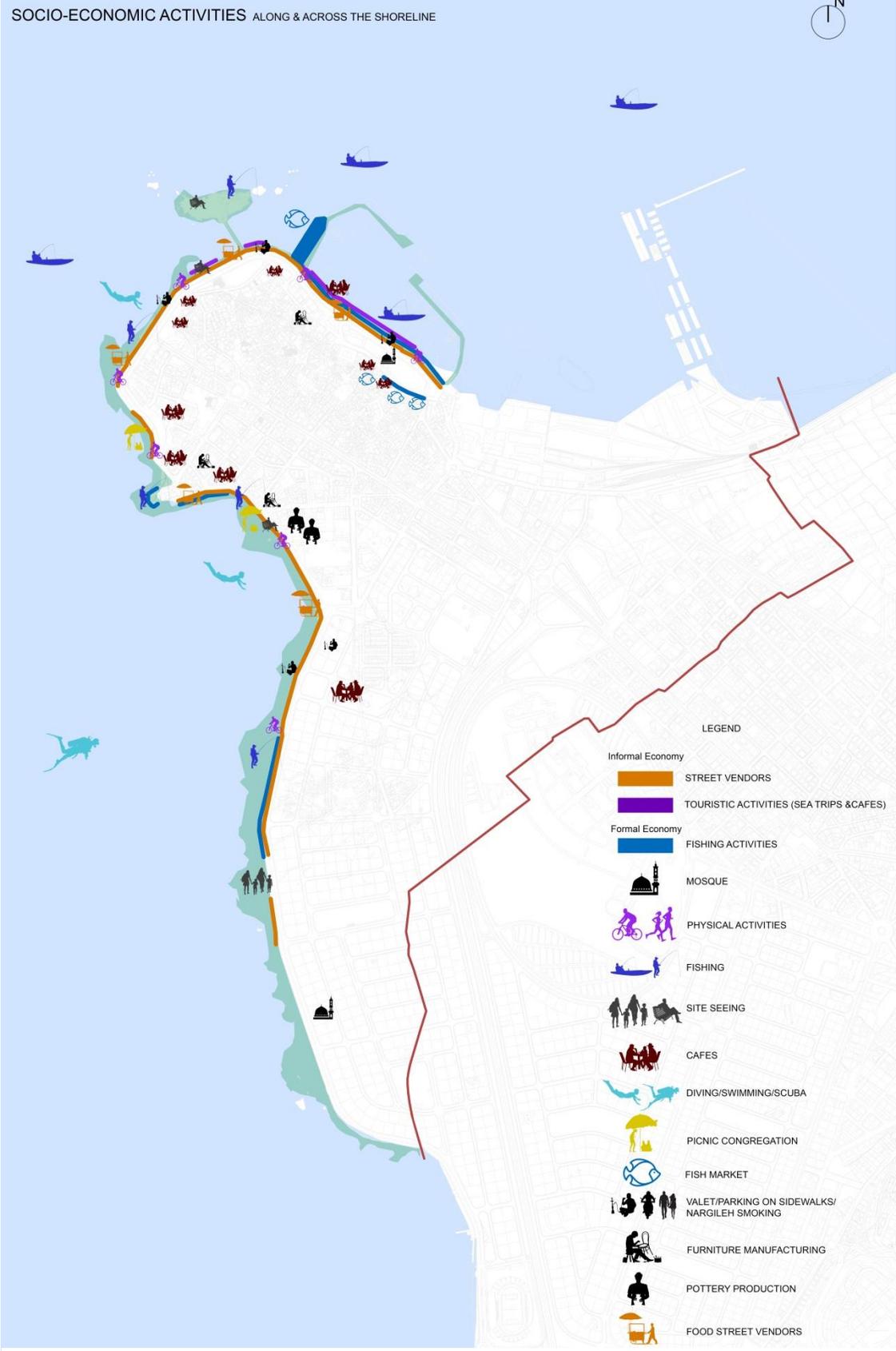


Figure 46: Map of the different activities happening along the coast, Source: Author

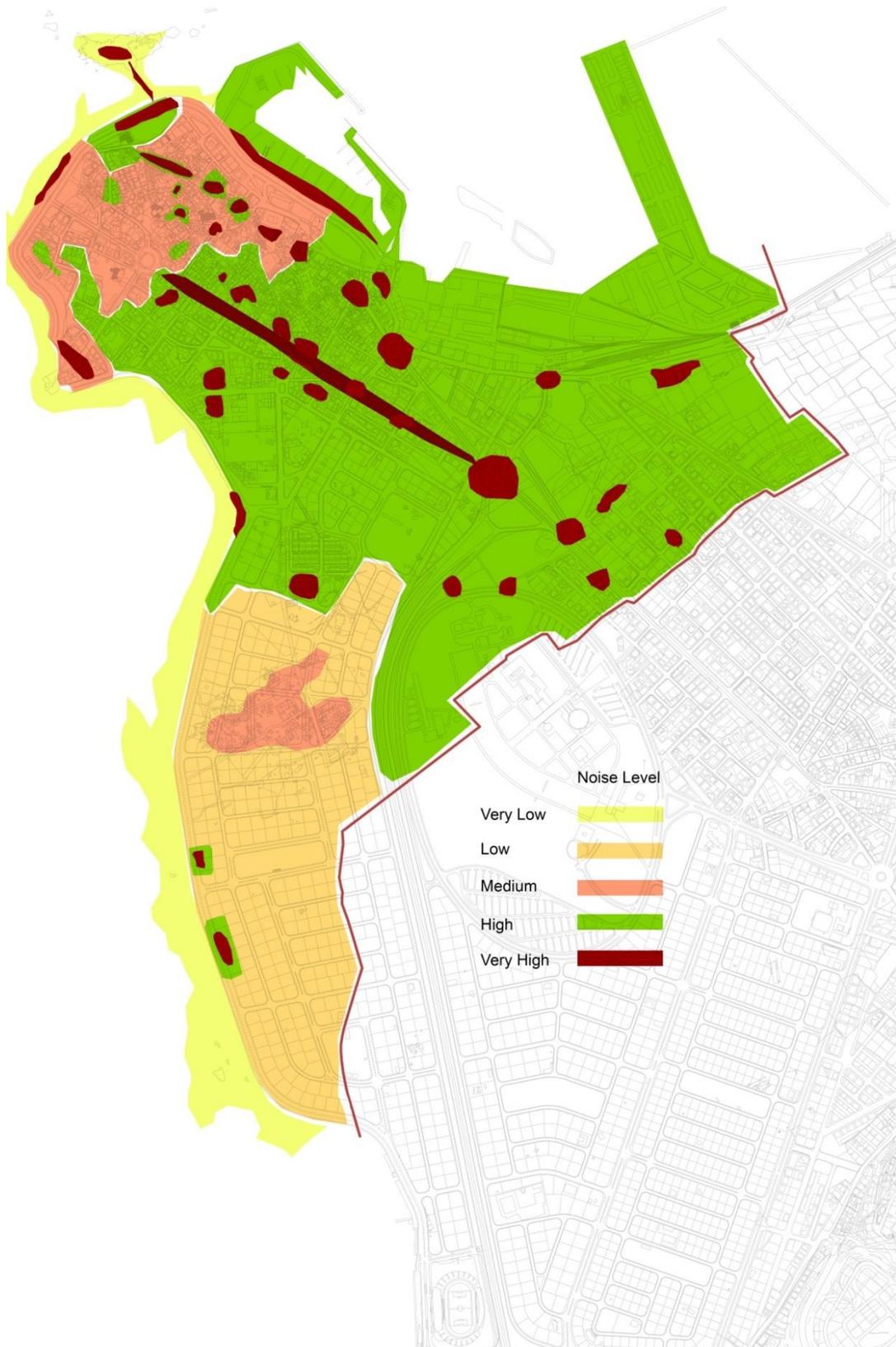


Figure 47: Map of the dynamic vs static places, Source: Author

## 8. Relation to the coastline

There are no green spaces or parks directly next or along the shoreline of Mina. The only public parks that are adjacent to the coastline are separated from the coastline by the highway with its large width and with no safe pedestrian crossing accesses. Furthermore, two of these public parks are fenced, preventing free physical and visual connection to the coast.

This has reflects negatively on the general ambience of the corniche and on the experience of the visitors along the coast.

## 9. Urban Infrastructure

- a. Bins: The coast of Mina is minimally equipped with adequate urban furniture. Nevertheless, most of these bins are damaged that they cannot contain trash.
- b. Benches: The corniche of Mina is poorly animated with urban furniture and specifically with benches. First, only few benches are scattered along the coast. They are not positioned strategically in front of the panoramic view of the sea, and many are damaged as well due to the absence of control, surveillance, management, and environmental deterioration as in Fig. 50.
- c. Public spaces: The coast of Mina is constituted from a one large public space elongated longitudinally along the sea. It represents what is called the “corniche” that is supposed to



Figure 49: The degraded urban furniture along the coast of Mina, Source: Author



Figure 48: Degraded urban furniture along the coast, Source: Author

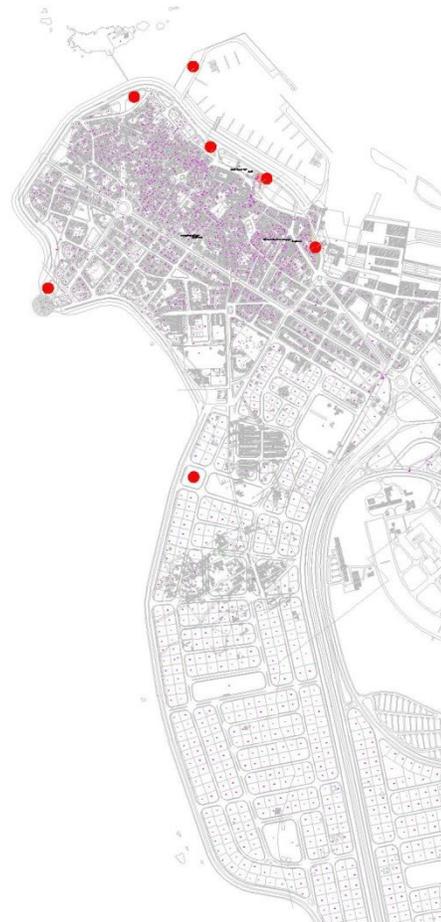
accommodate for all groups of people and for various activities.

The corniche doesn't encounter a diversity of spaces, but it is rather a repetitive one entity that doesn't provide much of the variety of practices and activities. The corniches does not enclose green spaces and public parks as well, which affect negatively the corniche of being an effective public space.

According to the interviews, many of the respondents complained about the absence of littering, security, control and cleanliness on the coastline which makes from the corniche a failure of representing an effective public space.

d. Violations:

Several violations take place along the coast of Mina. Most of them are buildings constructed on the public domain. These violations are: the Municipality of Mina built on a the public domain, Al Waqf el Islamic mosque, the fish market, the army barracks, the entertainment land, all build in the public domain, also, the school of hospitality, and the new cafes build in designated public parks (Fig. 51).



**Figure 50; the existing violations along the coast of Mina, Source: Author based on the Public works report**

## **F. The experience of the users of the coast of Mina**

### *1. Materiality of the coast and urban occupation/ Coastal landscapes*

The coastline of Mina is constituted from a diversity of features, such as: natural seashore enclosing both sand dunes and vermitidae platforms, and rocky shores as seen in Fig. 53.

Unfortunately, several man-made constructions and land reclamation exist along the coast of Mina the sea. This is due to informal initiatives that promoted the formation of ad-hoc constructions, and the establishment of new added lands on the sea surface. This contributed to the occurrence of all of the port expansion, landfill establishment and expansion, and the loss of the natural character of the coast.

In consequence, the shoreline of Mina has lost its identity as it has been facing social and environmental repercussions, particularly along the shoreline because of the ecosystem disruption due to the landfilling happening on the sea. Furthermore, the coastline of Mina isn't providing recreational services for its users, but it rather has been transformed into a mere public space for minimal economic activities.

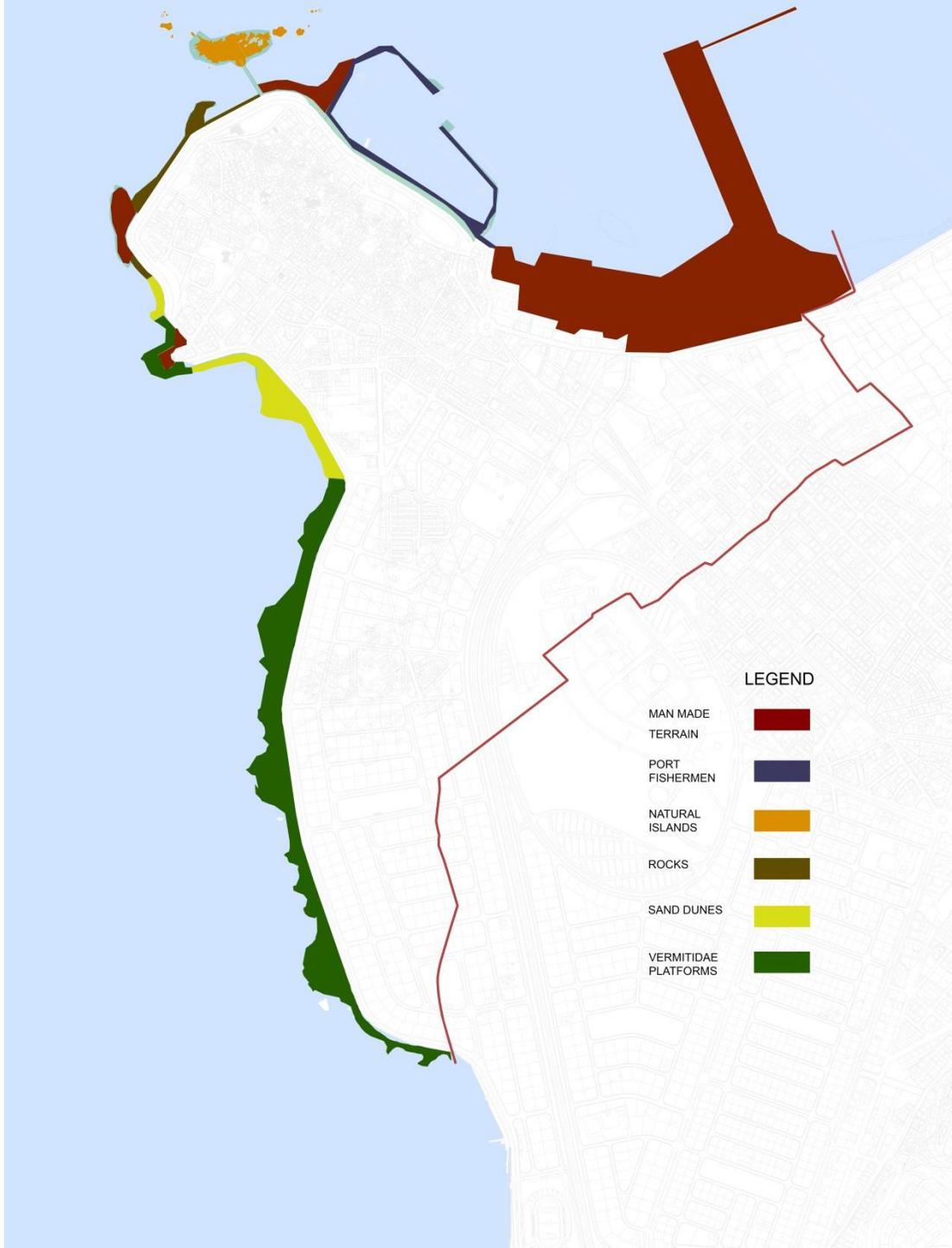


Figure 51: Map of the materiality of the coast, Source: Author

## ***2. Existing Ecosystem***

The coastal zone of Al Fayhaa' is of limited capacity to regenerate itself. It is subject to several pressures including the port and its new extension in the new economic zone; tourism developments, discharge of untreated wastes both in liquid, and solid states. (UNEP, 2009)

## ***3. Fauna & Flora***

The North of Lebanon is rich with biodiversity in terms of flora and fauna. The location, geology, topography, climate and soil are among the reasons for its rich biodiversity (UNEP, 2009).

## ***4. Land cover and Topography***

Mina is a flat area with no severe or important slopes (El-Hajj, 2013 – Lebanese Armed forces). This topography has attracted extensive urban constructions and expansions all over the city and along its coastline. By that, the land cover of Mina has been mainly constituted by urban built-up areas, urban industrial areas (The Tripoli port area), and urban non-built areas (undeveloped lands in the south of Mina) (Fig. 53, 54, 55, and, 56) (El-Hajj, 2013 – FAO, 1991).

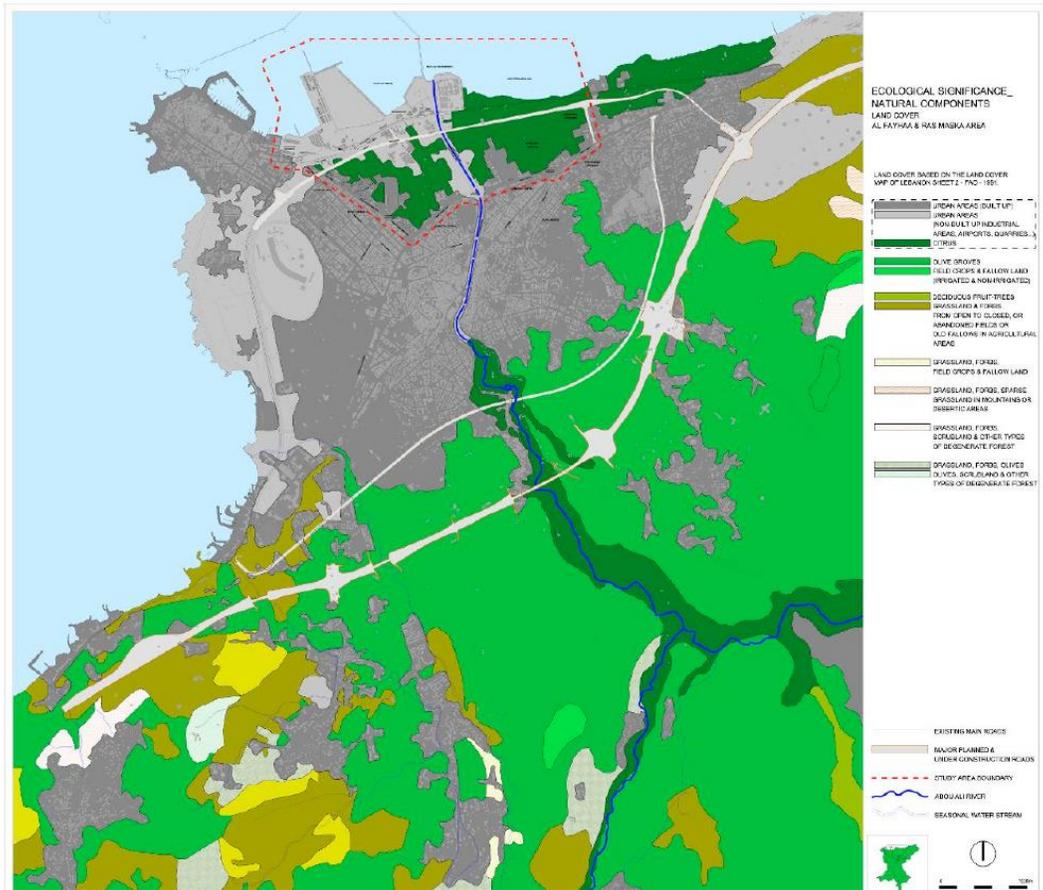


Figure 52: Ecological Scheme of Mina, Source: El-Hajj, 2013

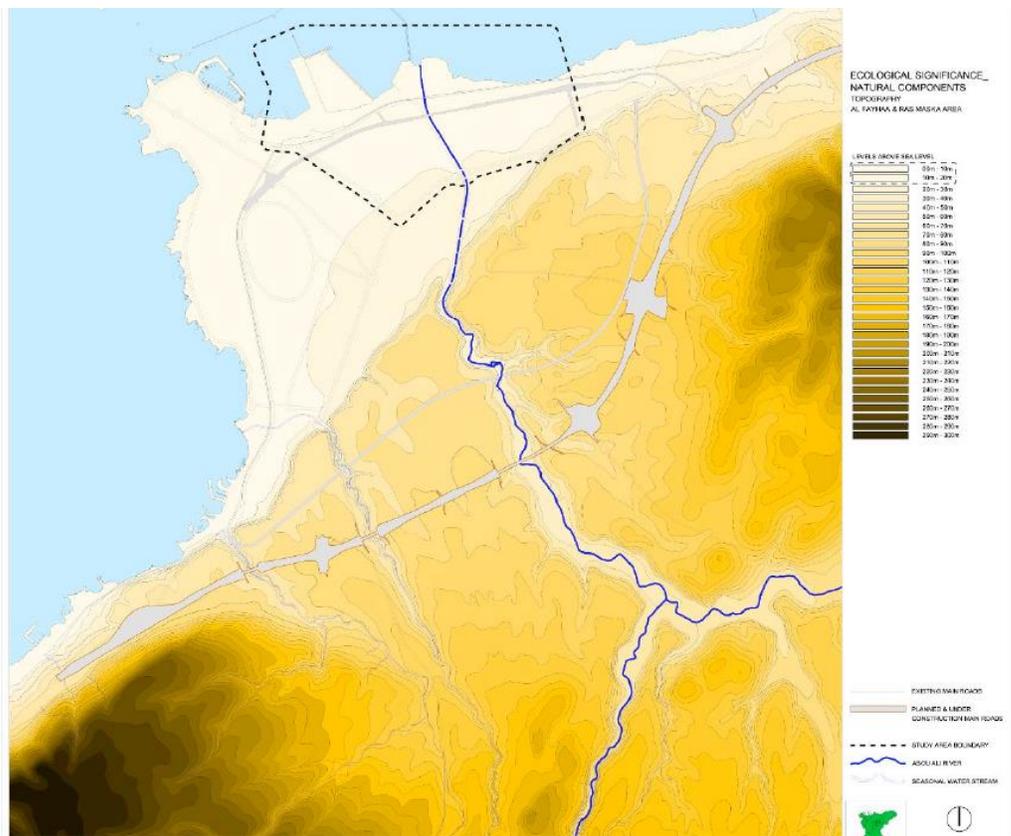


Figure 53: The topography map of Mina, Source: El-Hajj, 2013, The Lebanese Army

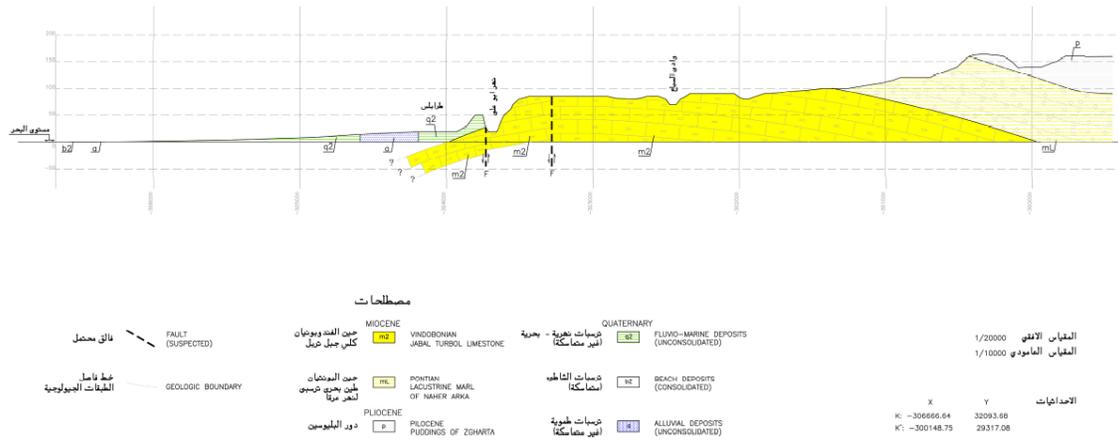


Figure 55: Section of the topography of Mina, Source: Harmandayan, 2002



Figure 54: Aerial photo showing the flat topography of Mina, Source: Municipality of Mina

## 5. Wind direction

The coast of Mina is mainly subjected to south-western winds resulting from air fluctuations happening in the Mediterranean Sea. Another main North- eastern winds flow approaches Mina and is responsible of the low temperatures occurring along the coast during winter (Fig. 58).

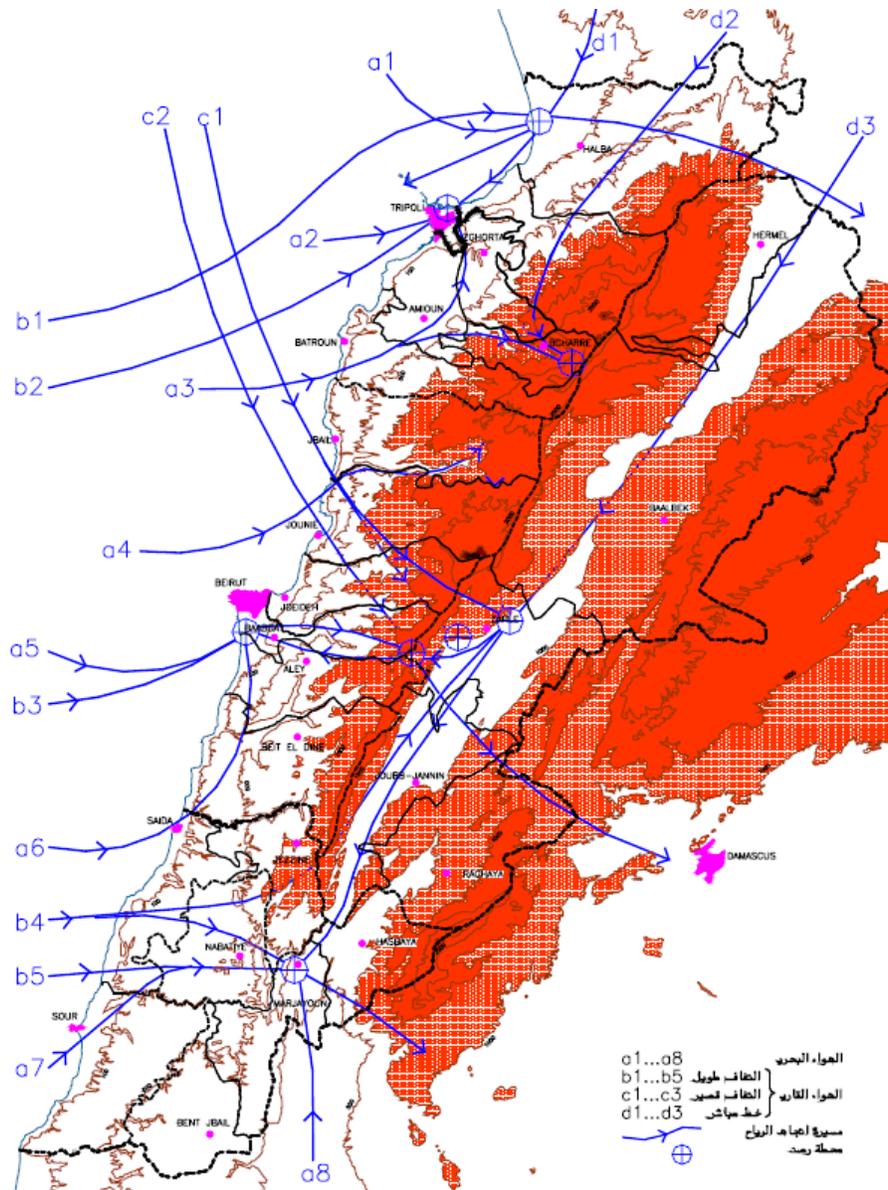


Figure 56: Wind map of the whole Lebanese lands, Source: Harmanadayan, 2002

## 6. Shadow / Sun Path

The Fig. 58 below shows the different paths of the sun during different seasons. This informs us that in the coast of Mina it is mostly sunny and has a south-west direction.

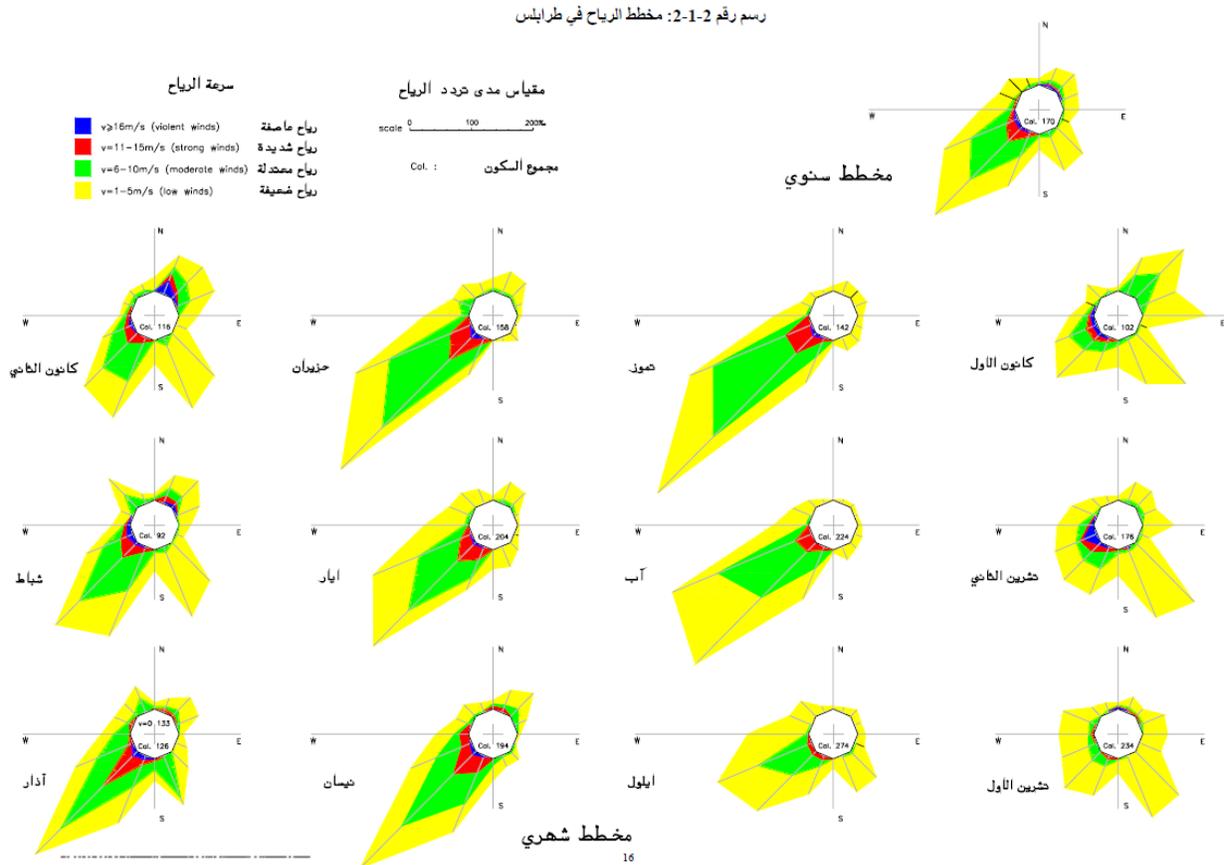


Figure 57: Diagram of the sun path and heat during the different times of the yea, Source: Author

## 7. Deteriorated Urban environment

- Environmental assessment: Mina coastal city has been witnessing for the past 40 years a degradation of the environmental conditions due occurring rapid urban growth, lack of green open spaces, traffic congestions, deteriorated infrastructure, and environmental hazards.

These processes have led to the deterioration of the urban environment of various neighborhoods in Mina, such as: the old core of Mina city, the slums in the southern un-developed lands in Mina, and the “Hay el Abid” near the cemeteries (Fig. 59) (Harmandayan, 2006).

b. STP: Multiple sewer channels pour directly in the sea water of Mina along its shoreline. This untreated sewage harms directly the environment by deteriorating the water quality and destroying the marine resources and ecosystem. This is a part from the strong bad smell that disturbs the users of the coast.

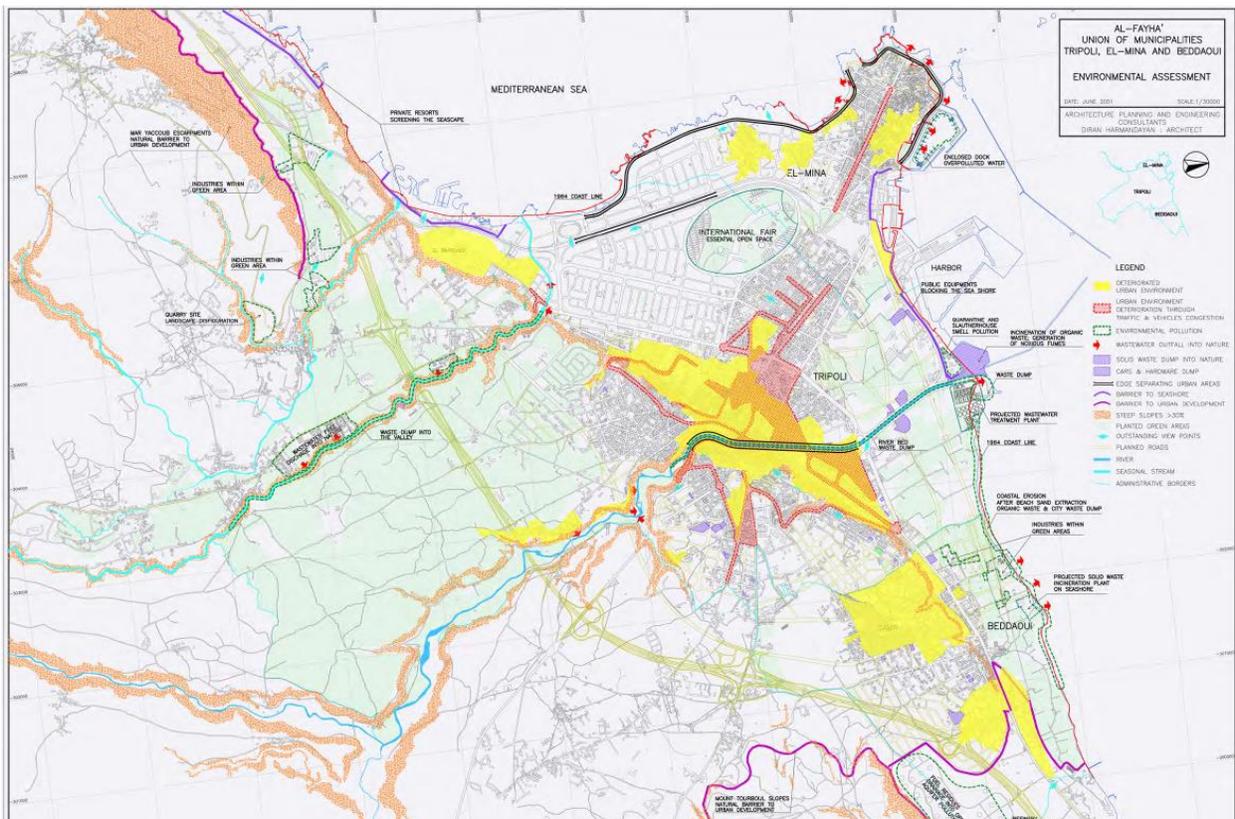
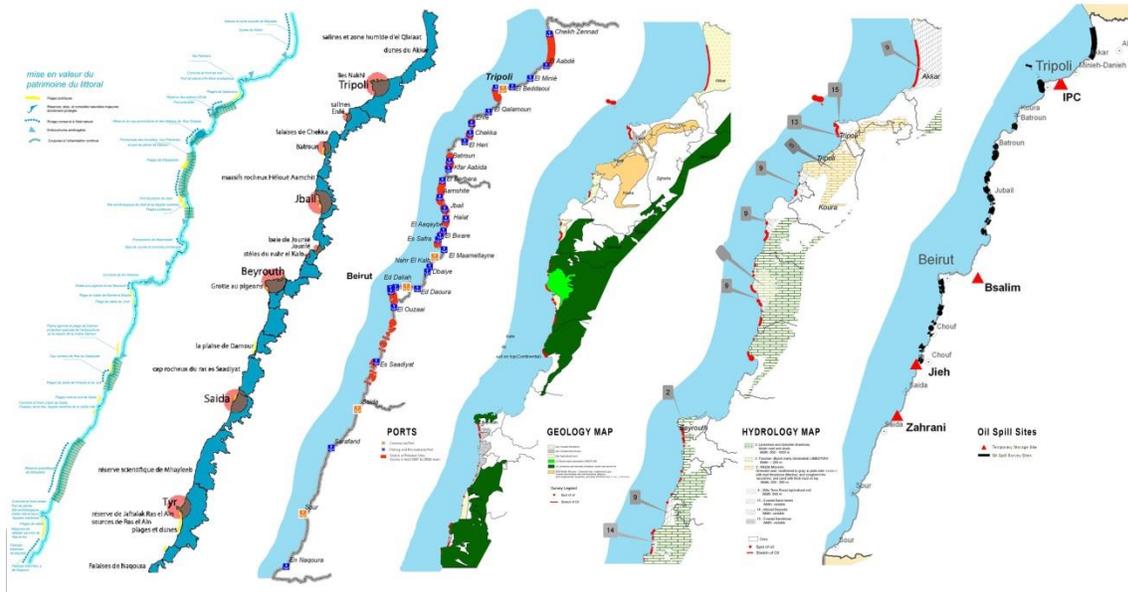


Figure 58: Map showing the different deteriorated places in Mina, Source: Harmandayan, 2002

Therefore, the sewer system in Mina needs to be directed to a well identified and established sewage treatment plant that recycles the sewer products before discharging them into the sea.

a. Oil spill: During the July/August 2006 war, the Israelis attacked the oil depots at the Jiyeh power plant leading to discharge of nearly 15 thousand tons of fuel oil into the sea severely polluting the marine environment in many locations along the coast (Fig. 60). Amongst the affected areas is Palm Island Nature Reserve (PINR) threatening its rich biodiversity.

Several threatened species are found in Palm Island Nature Reserve and may be susceptible to the oil. The critically endangered seal *Monachus monachus* was a regular visitor until the late 1960s.



**Figure 59: The different characteristics of the shoreline of Lebanon with the different polluted spots, Source: NMP, and the ministry of environment.**

The plant species *Euphorbia pithyusa* and *Cressa cretica* are nationally endangered. Benthos fauna includes two nationally threatened gastropod species: *Vermetus triquetrus* and *Dendropoma petraeum*. There are two globally endangered fish species, namely *Epinephelus marginatus* and *Mycteroperca rubra*. (UNEP, 2009)

b. Landfill and dumpsters: Although the landfill of Mina is part of Tripoli territorial boundary, however, it has an important negative impact on the environmental status of the sea and therefore on the environmental and ecological conditions of the coast of Mina.

c. Urban Noise: According to the study done by Balamand University on the types and levels of noise pollution, different active and noisy areas were identified while other calm and serene regions were denoted. The noisiest areas are accentuated along the commercial spine of Mina due to the intensive economic activities, and heavy traffic occurring that. Also, the coastline highways, particularly at its entry near the fishing port, the Abdul-Wahab Island, and near Al-Hammam Al-Makloub represent the noisiest areas of the coastline. This is due to the intensive presence and flow of visitors (vehicles and pedestrians). Adding to that, several other spots scattered along the city represent noisy areas.

Apart from the highly noisy spots in the city, all of Mina especially near Tripoli endorses a good percentage of urban noise. This is due to the character of Mina of being a dynamic city incorporating a variety of activities and uses. The only calm areas exist in the southern part of Mina, along the coastline, endorsing the region of the undeveloped lands. Also, the shoreline itself is considered a calm area for what it represents of serenity and relaxation to its users.

### ***8. Flooding risks***

According to the GFDRR (general facility for disaster reduction and recovery), the risk of flood hazard is very low in Lebanon. Diran's study on Mina, shows that the coastline of Mina protected from flooding risks whereas the whole coastal area is identified as an area least exposed to flooding risks. Nevertheless, the southern coastal region of Mina is entitled high subject of water logging due to its existent land cover and topography (Fig. 61).

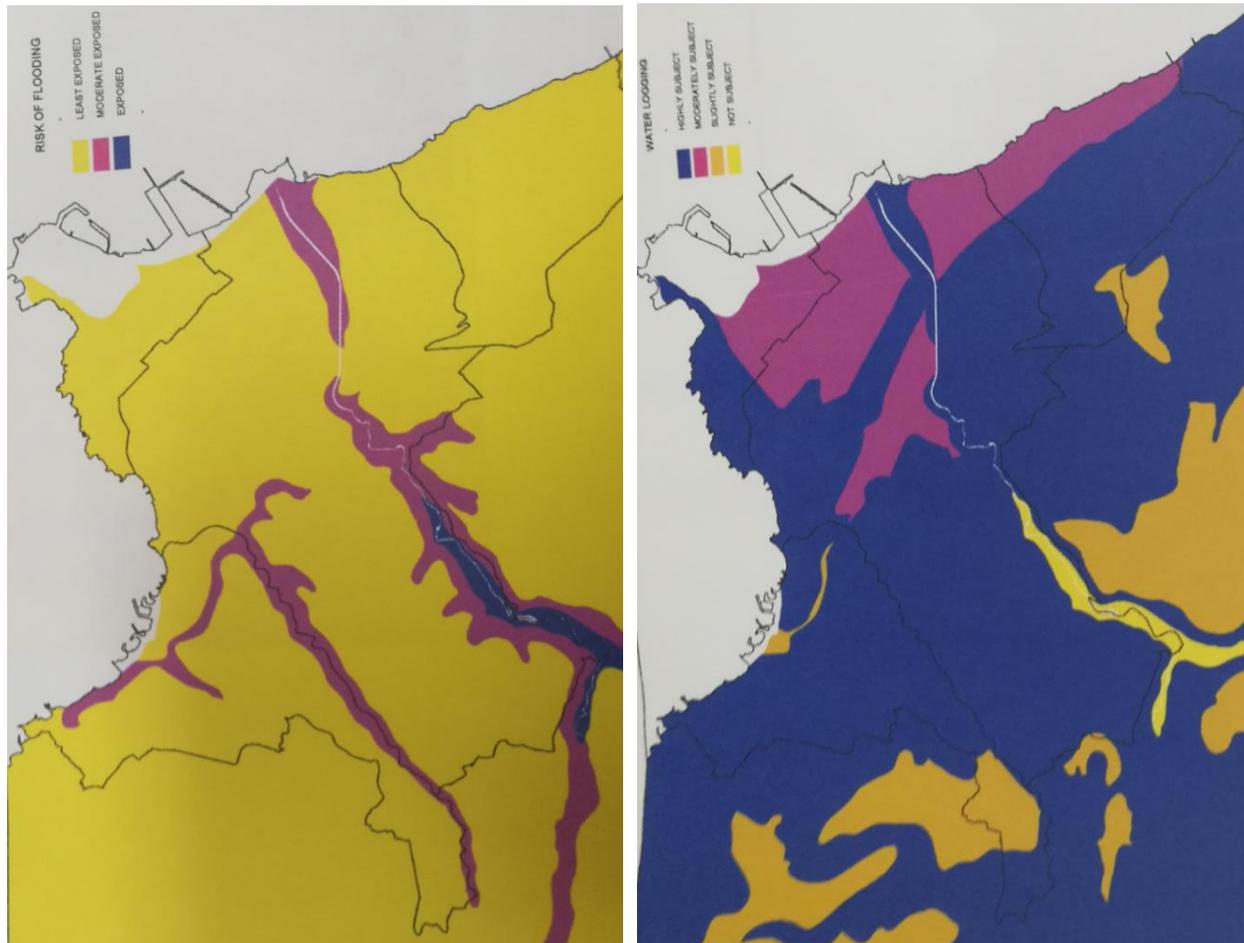


Figure 60: Flooding risks and water logging in Mina, Source: Harmandayan, 2002

## G. The coastal culture of Mina

### 1. *Socio-economic status*

Mina city accommodates low to middle income groups, whereas the unemployment rate attains 21% (CDR, 2006). Low-income groups settle mainly in the old core of Mina, mostly because the wage's average of the families living in the old Mina core varies between 300,000 and 400,000 LB.P (CDR, 2006). In addition, the living conditions of the people in old Mina core are very low where the proportion of the apartment size in comparison to the size of the family is very little. 70% of the places are between 50 and 100 m<sup>2</sup> which means that the space allocated for each person is 10 m<sup>2</sup> (CDR, 2006) (See Fig. 62).

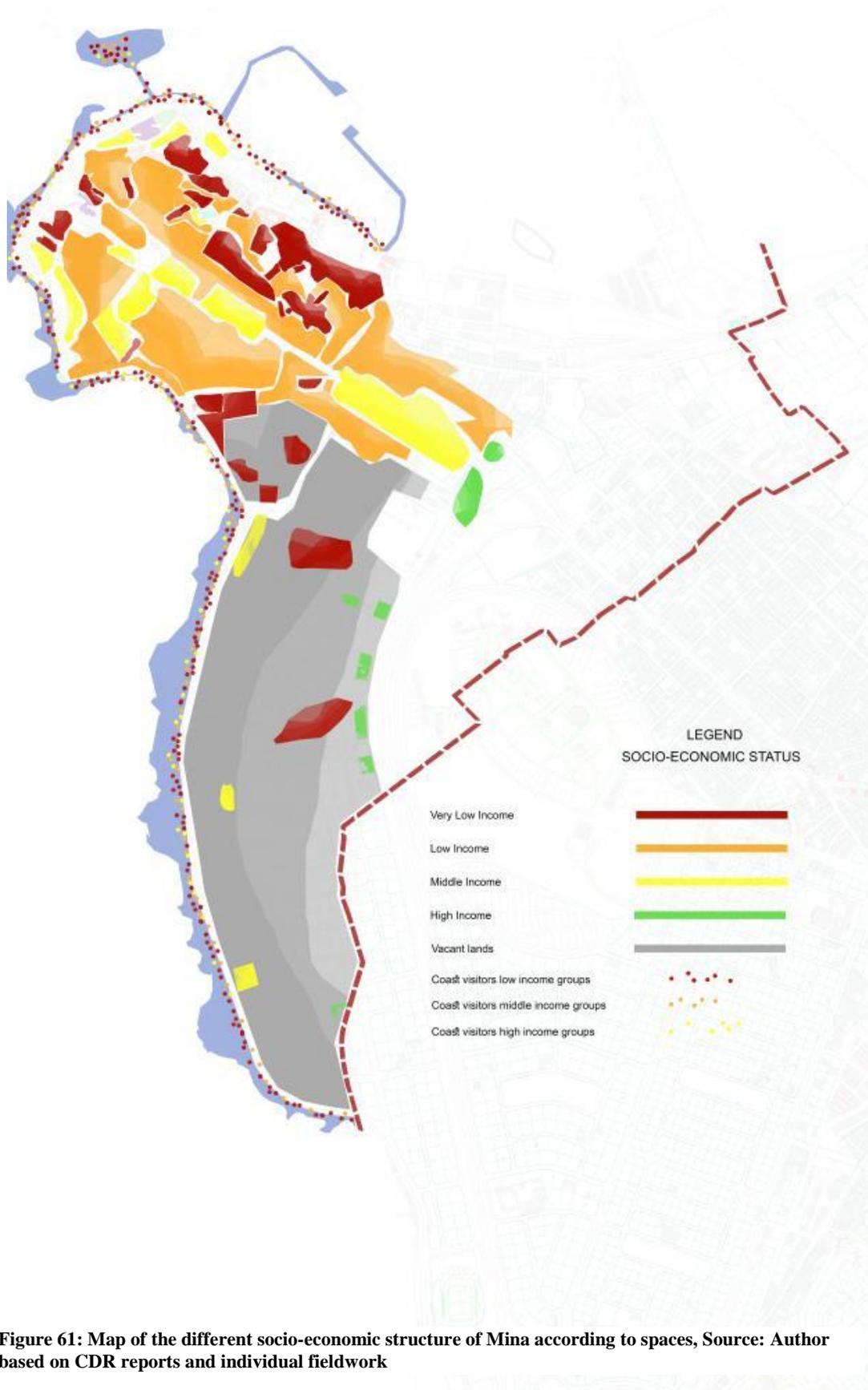
Furthermore, the interviews held with the residents of Mina revealed that going outside Mina old core towards the expanded south of the city, wealthier families live there. These families represent middle to low income groups since the average of their monthly wage varies between 600\$ and 1000\$. On the other hand, the coastline of Mina is a host for different income groups but mainly low-income people. This assumption was made based the interviews which revealed that 70% of the coast visitors have an income that varies between 0 and 600,000 LB.P.

### ***2. Coastal behavior and practices***

The interviews revealed the strong relationship of the residents of Mina and coast dwellers with the sea. This is due to the memories they assimilate to the sea and coastline. Moreover, Mina dwellers undertake several activities and practices which are the result of their lives close to the coastline, such as: Morning walk, fishing, swimming, Fish selling, boat repairing, fish restaurants, etc. This highlights the relationship and effect of the coastline of shaping the different aspects of the city and the behavior of its dwellers. Therefore, the condition and status of the coastline have a direct effect on the city and its existence.

### ***3. The society and culture of Mina***

Mina is a multi-diverse city that reflects a good example of co-existing. The interviews revealed that Mina residents' attachment to their city is one of the key characteristics for fostering a mixed city that accommodates both Christians and Muslims.



**Figure 61: Map of the different socio-economic structure of Mina according to spaces, Source: Author based on CDR reports and individual fieldwork**

## **H. SURVEY ANALYSIS**

To build a comprehensive understanding of the different coast users' background, cognitive relation with the coast, perception and position from development projects that might occur on the coast of Mina, I conducted a total of 50 semi-structured interviews all along the coast and its inner regions. I identified eight main groups: residents, street vendors, shop owners, fishermen, visitors, activists, municipal members and developers.

One of the main challenges and difficulties I encountered during the interviews is the fear of some of the participants to give their honest opinion. Also, it was hard at some points to make sure that the respondents understand well the questions, since some of them were responding irrespectively to the question. Adding to this, since none of the development projects was actually announced publically, I wasn't able to conduct any interview with the involved developers.

I tried to balance my interviews between different existing stakeholders, age, and sex. I was able to interview 18 residents (mostly teachers, engineers and housewives), 18 visitors, 7 fishermen and 7 shop owners and street vendors. Also, 36% of the participants are between 18 and 26, 24% between 27 and 36, 17 % between 37 and 47, 13% above 47, which reflects an age balance between the interviewees. However, 68% of the participants are females, since most of the residents' participants were housewives who spend time at their homes during the day.

From the first section of the questionnaire, I was able to conclude that Mina endorses mainly low to middle income groups, as 62% of the 32 respondents to the income question earn 100 to 400 \$ per month (mainly fishermen and street vendors). Whereas 50% of this group have no actual income, which means that 31% of the survey participants don't make a penny.

In addition, the different stakeholders have different experiences with the coast. According to the various answers of 47 respondents, I was able to identify the following:

38% of the respondents portrayed Mina as being the place for enjoying natural beauty in the city. 32% consider Mina as being mainly their place of residence. 27.5 % of the respondents find in Mina a place for escape and relaxation, while 10.6 % see Mina as a hub for recreational activities. Only 6.4 % of the respondents labels Mina as a touristic destination.

Adding to this, I distinguished the different roles of Mina according to its users understanding, where I derived five characters that define Mina from the 43 respondents' perspective. 46.5 % of the respondents classify Mina as a "**Natural Beauty**" for what it encounters of various natural components and panoramic views. 20% of the 43 respondents see Mina as a "**Deprived City**" accommodating the poor since it has been overlooked on different sectors and levels. 16.3 % of the respondents consider Mina as an "**Urban, busy City**" as it offers various economic services. Nevertheless, 16.3 % of the respondents perceive Mina a "**Recreational Hub**" for tourism and multi-diverse activities, for the present recreational and touristic elements present there. Finally, 14% of the respondents identified Mina as an "**Escape and Relaxation spot**", since the coastline with the sea extending along it, present a calming element for its users.

The second section of the surveys reveals that the coast of Mina represent an essential role in people's everyday lives, and a unique place for recreation and relaxation. In fact, 60% of the interviewees visit the coast for relaxation purposes and recreational activities, while the other 40% for work. Most of the people who visit the coast, established a direct and intimate relationship with it, since 38% of the interviewees answered that they visit the cost of Mina every day, particularly fishermen who visit the coast on a regular basis to undergo their work.

Although most of the coast's users visit the coastline on a regular basis, but the time spent in it is very minimal and limited to morning and afternoon hours. This reflects the deteriorated spatial and environmental conditions of the coast. This assumption is based on the respondents' answers, where 36.7% of participants affirmed that they spend less than 2 hours on the coast, mainly because the lack of shadow, uncleanness, and absence of urban furniture. Only fishermen who represent 26.5% of the respondents is the group spending the longest time on the coast (more than 4 hours) by virtue of their jobs. Also, the interviews showed that 36% of the interviewees prefer to visit the shoreline in the morning, where they can avoid disturbing climatic conditions (as sun, wind, etc). On the other hand, 26 % of the interviewees choose to go to the "corniche" in the afternoon after work, with their families for fun and relaxation.

On the other hand, the coastline of Mina happens to represent an initial source of escape, and one of the only large public open spaces of the city. 34% of the interviewees expressed their happiness when visiting the coast. 24% feel relaxed once they are next to the sea and 20% are comfortable when visiting the sea. This is because of psychological feelings they get once they are on the coastline and next to the sea as *escape* and *relaxation*. Also, the *panoramic view* provided by the coastline and the sea is one of the main reasons that make the coast users happy and comfortable once visiting it. The other 22% conveyed anxiety and tension once they are on the coast, for what they face of *difficulties* in their coastal jobs (as fishermen and street vendors), or for what they find on the coast from *trash*, and *unethical behaviors*. Therefore, developing and revitalizing the coastline of Mina becomes essential to enhance the quality of the space for the users and to enable it to deliver exceptional services and places for its users.

The fourth section of the surveys reveals the type of accessibility towards the coast. The questions of this section demonstrated the strong direct and historical connection of the coast

with the inner city that has imposed by its turn a strong attachment of the people with it.

However, these important relations encounter some challenges mainly due to the deteriorated urban environment of the coast. For example, although 71.4 % of the respondents have an easy and quick access to the coast (42% with their private cars and 28% walking), 29.6 % respondents expressed their struggles while approaching the coast. This is due to what they expressed as *insecurities* on their ways such as: erratic dogs, limited lights, heavy constructions, traffic, etc.

Many of the respondents' chose fishermen port and the area Abdul Wahab Island as the most visited parts of the coast, where 46.9% of the participants visit only the fishermen port. This percentage decreases as far as we go to the other parts of the coast. This pinpoints on the existence of disruptions and dividing areas along the coast, where not all the places of the coast are used equally.

Most of the coast users of Mina (65, 3%) visualized the coastline as a natural corniche. However, 22.5% of the respondents go for developing the coast while only 12.2 % expressed their wishes to transform the coast into a natural seashore rich with a diverse ecological assets. Consequently, it becomes challenging to enhance the situation and condition of the coast of Mina, by trying to compromise between the need to develop and make economic profit from the coast, and the desire to make it more environmental friendly and sustainable.

Aside from all that, the coast of Mina requires an extensive improvement on the hygiene and cleaning level. In fact, 95.9 % of the participants pointed on the necessity to make the coast of Mina cleaner. Also, 75.5% of the participants insisted on the importance of valorizing the natural aspects of the sea. The other two significant coast's characteristics for the interviewees were the

presence of free public beaches and the provision of better urban furniture (38.8 % and 34.7 % respectively).

On another note, the users of the coast of Mina are aware of protecting the coastline, whereas 72 % of the participants supported the idea of volunteering in coast cleaning campaigns. This reflects the concerns of the users of the coast of Mina about improving the shoreline conditions.

The fifth section highlights the lack of awareness of all of Mina residents, visitors and professionals are of the existent, proposed development projects intended to take place along the coast. 68% of the respondents have no clue about any of the proposed development projects on the coast. Also, the 14 % who answered “yes” did not actually know any details about the proposed projects and plans that could threaten the public aspect of the coast. Mainly, fishermen are the respondents who have heard of about a plan to relocate them next to the landfill, while others acknowledged TEAM project as the main development project that is targeting the coast. This informs us on the developers’ intentions to achieve their –ambiguous- goals of implementing illegal and violating projects along the coast. However, the strong and emotional relation existing between the users of the coast of Mina and the shoreline is reflected in the participants’ anger to see the coast of Mina and its waterfront highly developed (74%).

Surprisingly, some of the respondents showed their dis-interest in the status of the parts of the coast that they don’t visit or doesn’t affect them. This highlights the necessity to make the coastline of Mina a continuous entity that concerns users with each part of it. On another note, only 49% chose to oppose the intended development projects, while 28.6 % preferred to stay anonymous. This is because 13% of the interviewees feel that they don’t have power for stopping these projects while 10.6% think that these projects are good initiatives for Mina.

Furthermore, the interviewees who decided to stand up against development projects chose to do it through protesting (63.4 %), or in community groups (41.5%), or to volunteer in unprofitable organizations (31.7%). Others suggested to encounter these intentions through seeking help from politicians and political parties, or through conveying their complaints to municipal authorities. Positively, 40.4 % believed that they have the power to stop these development projects, as they believe that as a stressing large group can affect and change important decision-making.

Nevertheless, Mina and Tripoli residents and coast visitors have lost trust in governmental and municipal authorities. 54.2 % think that the coast should be managed by the people themselves. 27.1% preferred to see the coast run by private companies for luxurious purposes. 14.6 % believed that only the municipality could protect the public realm and preserve the natural aspect of the coast. Although a good number of the coast users of Mina are politically affiliated, however, they do not have trust in politicians and the government for what they are facing from negligence and lack of trustworthiness.

On the other hand, 52.6% of the respondents expressed the importance to easily access the coast for all different groups of people. 47.4% seek a safe and healthy environment, 44.7% look for green public spaces and parks along the coast. Adding to this, 30% of the respondents hope for a cleaner and more hygienic coast. 22.5 % intends to see the coastline of Mina better developed and improved on all levels. 15 % aspire for retrieving the public aspect in the coast and shoreline of Mina where they can find easy and continuous public access to the sea. 12.5 % aspire to find on the shoreline and waterfront of Mina, touristic and recreational activities that can revitalize the coast of Mina and the whole city. 5 to 7.5 % seek to find more natural elements and development components in the coast of Mina that could foster its competitiveness amongst other coastal cities in Lebanon and worldwide.

## I. Privatization threats:

In 2015, rumors were circulating about a residential development project proposed by Al-Fattal<sup>6</sup> that would take place on the southern lands of the coast of Tripoli. Due to journalists' and activists' attempts to unlock the secrets of this project, one master plan was obtained and circulated to the public as shown in (Fig.63). This project proposes land reclamation from the sea surface, and an exception was filed to increase the FAR. The developers claimed that they intended to provide job opportunities for city inhabitants. The claim was however unsubstantiated and the project fell in the same pattern of large for profit development resorts.



**Figure 62:**The first part of the cornice of Mina englobe several social and economic practices, such as fishing and fishing ports, Tripoli's port, bicycle riding, the ecological islands and the old city. Source: shamaa, Nariman. 11 May 2015. الواجهة البحرية إلى الواجهة

<sup>6</sup> Al-Fattal: is a developer who tried several times to become a member in the municipality of Tripoli in order to authorize multiple development projects for his own profit.

A number of municipal council members stated that this project was proposed several times to the municipal council, requesting FAR exceptions. However, the municipal council at the time kept rejecting this project and refusing to give it any exception (Tadmuri, 2017)<sup>7</sup>.

In 2016, another rumor was circulating concerning a large mega-project that would allow encroaching development along the coast of Mina and block the seafront, undermining its role as an open unbuilt shared space. The plans, studies and proposals of this project were never published or circulated to the public. However, the rumors declare that this project is the outcome of the agreement of a number of businessmen and politicians to occupy the seashore and to divide its profit among them. These rumors proclaim that a group of businessmen founded an enterprise

called TDH<sup>8</sup> and they conspired with two land owners to reclaim the possession to a 30000m<sup>2</sup> on the sea surface (Fig. 64) (Shamaa, 2017). The intention of such a coalition between the TDH



Figure 63: The 30000m<sup>2</sup> lot on sea surface which is claimed to be owned by Al-Shebbani and Al-habib. Source: Shamaa Nariman. 31 January 2017. Al-Akhbar Newspaper. قضم شاطئ الميناء: سقوط أملاك خاصة سهواً هو كذب. <http://www.al-akhbar.com/node/271806>

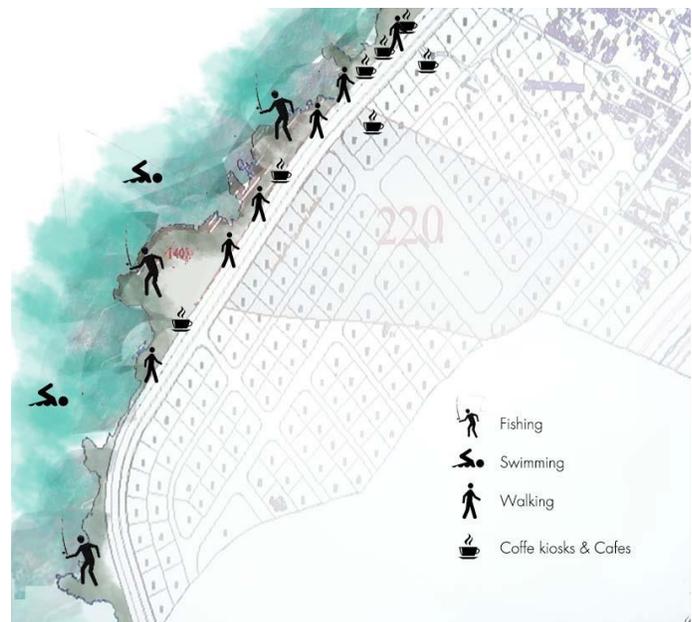


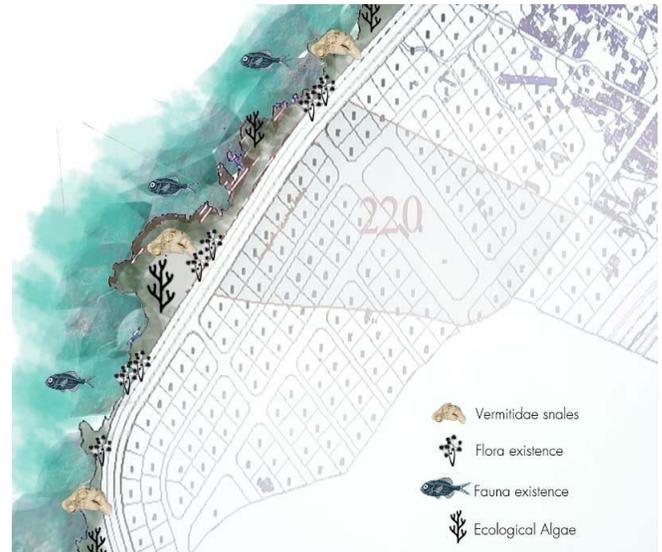
Figure 64: Social practices and cultural heritage map. Source: Author

<sup>7</sup> Khaled Tadmuri; a Professor in the Lebanese University third branch and a member of the Tripoli's municipality. He declared the aforementioned in an interview held with him on

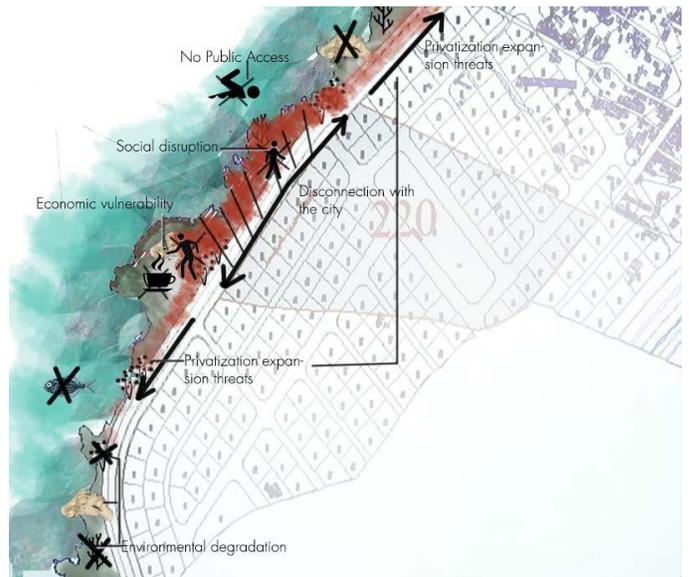
shareholders is to benefit from their power at different levels, in order to get juridical support and to benefit from an economic opportunity to accumulate capital by investing on the public domain (Shamaa, 2016).

In fact, the construction of such large scale developments would have had many negative implications on the environmental level. It would cause negative environmental and/or social externalities such as increase in the flooding risks and the underground water pollution rates (He, J. F., et al, 2007). In fact, this stretch of the coast represents an ecological rocky coast rich with extensive presence of biodiverse fauna and flora (Issa, 2009) (Fig.66). A lot of rare species and fish exist in the sea water of Mina and along its shoreline will be facing the problem of extinction and thus contributing to ecosystem deterioration (Shamaa, 2017).

As aforementioned, most of the social activities taking place along this stretch (Fig.65) will be



**Figure 65: The coastline of Mina is a very rich and biodiverse coast with fauna and flora. A large number of rare species exist in its sea water and along its coast. Source: Author**



**Figure 66: Fig25. Economic, social and environmental problems threatening the life of the coast of Mina due to privatization projects. Source: Author**

<sup>8</sup> Shareholding enterprise founded for the application of the Tripoli by sea project. A group of investors, developers and politicians are shares in this institution as: Toufic Dabboussi, Elias Ayoub, Anas Chaar, Ziad Monla, Talal Anklis, Oussama Kbaiter, Said Hallab, Samar Hallab and Omar Hallab (Source: Shamaa, Nariman, 10 May 2016. Al-Akhbar Newspaper. مشاريع ردم البحر: الناخب الأكبر في بلديتي طرابلس والميناء. <https://narimanshamaa.joomla.com/79-2016-05-16-13-30-50>).

disrupted and lost (Fig.67). Fishermen will be evicted and will lose their capability of accessing the sea to fish; the public will have no longer access to the coast's shoreline and its maritime value. This is apart from the kiosks' that will be demolished and the kiosks' owner livelihood that will be threatened. (Tahtah, 2014).

Nevertheless, these rumors have been denied by public authorities who were claiming that none of these intentions are correct. This triggered Tripoli's municipality in some cases to show some of the proposed private development plans and highlight their rejection of the proposal (the case of Al-Fattal project).

Thus, the coast of Mina and Tripoli are threatened by numerous development claims at different levels. It is facing privatization threats and environmental degradation. Hence, immediate and fast responses to mitigate these threats are needed.

Immediate and long-term strategies and interventions accompanied with community activism should be generated in order to manage and protect the seafront of Mina and Tripoli. These strategies should be accompanied with urban and landscape interventions that equip the seafront with public amenities; enhance its social, cultural, ecological, and economic values; and improve its accessibility.

### **1- Grass root response to privatization efforts:**

Reacting to the aforementioned news, social activists conducted multiple movements in order to refuse the implementation of such projects. As a response to the several efforts of Al-Fattal of acquiring an approval for the residential towers project he is intending to erect on the southern lands of Tripoli coast and due to the rumors that the municipality is willing to accept and authorize this project, social activists, NGOs and citizens started protesting to prevent the

establishment of such a project. Al-Akhbar online newspaper published several articles discussing this issue. In 2015, Mrs. Nariman Shamaa<sup>9</sup> wrote about the importance of supporting “Bahrouna Barrouna” campaign in order to protect and save the maritime public domain that is being violated along the shoreline of Mina and Tripoli. This campaign is initiated in order to request the suspension of the hearsays of giving a construction permit for “Al Fattal residential towers” project which will take place along Tripoli’s shoreline and which goes against the height, exploitation and public domain violations (Shamaa, 2015). While as a response to the hearsays of the TDH project, activists started to enlarge the scope of their movements and to make collaborations with other regional and national campaigns, NGO’s (الحملة, جمعية الخط الأخضر) (المفكرة القانونية, الوطنية لحماية الشط اللبناني) and municipality’s members in order to stop such actions. They conducted continuous protests with the support of the lawyer Nizar Saghie and other municipality members in order to deny the legitimacy of giving owning lands’ permits on sea surface and thus allowing the construction mega-projects along the coast (Fig. 68).

These activists’ essays and social initiatives of protecting the coast through different ways of objections becomes one of the strong potentials of preserving the coast’s identity, environmental characteristic and social and economic status. They show that developers will always have to worry about the public opinion and reactions towards their proposed development projects. In fact, community and citizen activism remains one of the main assets that help obstructing the establishment and implementation of inconvenient projects with negative impact on people’s lives and their built environment. Therefore, the civil society and community will need to be involved in the process of the coastal development.

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<sup>9</sup> Nariman Shamaa: Journalist in Al-Akhbar newspaper and a social activist. She started the “بحرنا برنا” campaign and published multiple articles that examine Mina coastal privatization threats.

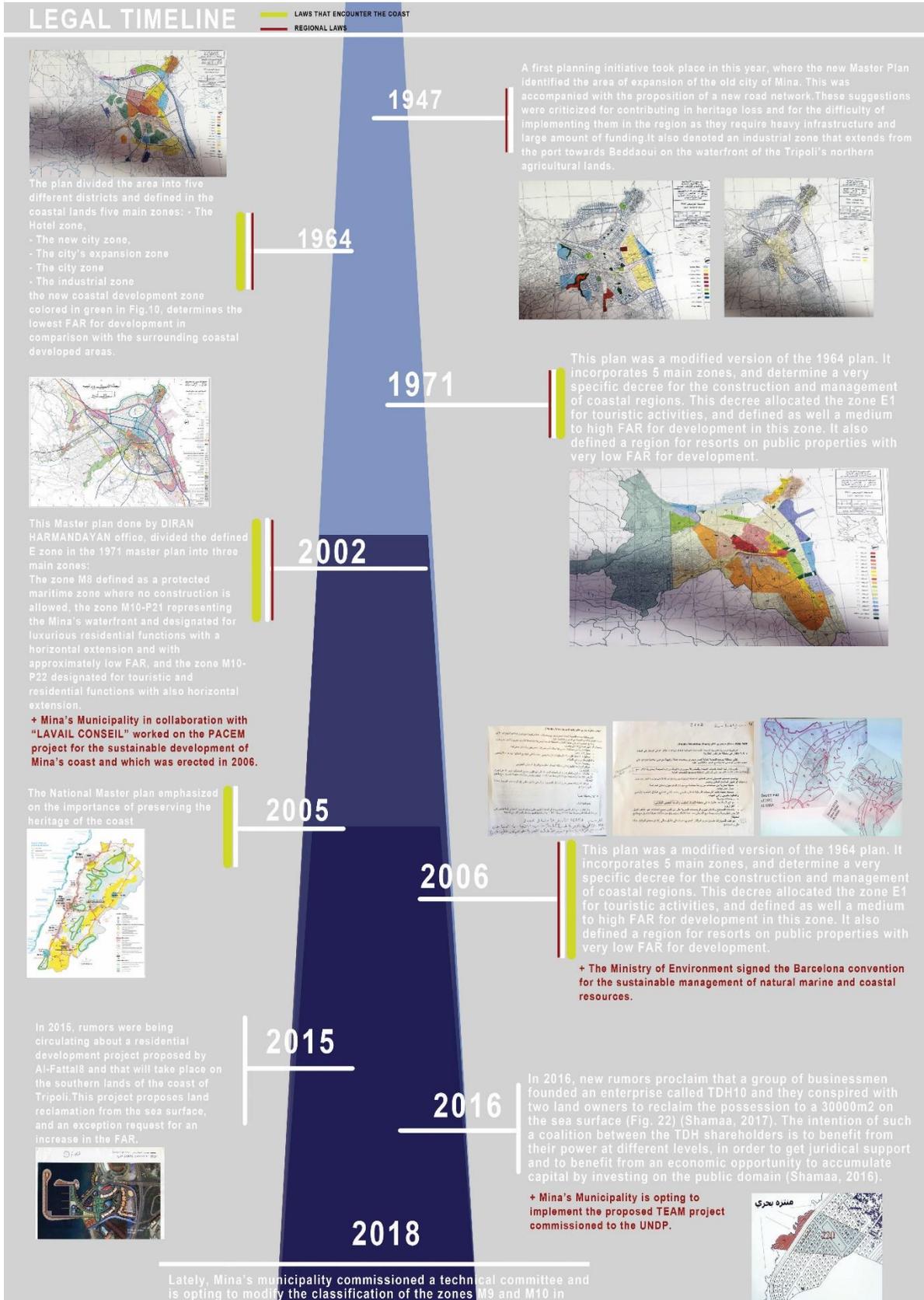


Figure 67: Legal timeline of the different master plans, regulations and projects taken in the coast of Mina, Source: Author

## **J. Recent proposals for the coast of Mina:**

Many strategic development plans for coastal management in Mina were proposed as a response to Mina municipality recurrent demands and mitigation attempts to the multiple aforementioned privatization efforts. Two of the most known and recent proposed projects are: the PACEM project proposed by LAVAILL CONSEILS with the municipality of Marseille-France in 2009 for the sustainable development of the coastal zone of Al-Fayhaa community, and the recent TEAM project proposed by UNDP and TEAM consultants in May 2017 for the design of the rehabilitation activities needed for El-Mina coastal area and corniche façade.

### **1. PACEM, the “*Programme stratégique de développement durable de la zone côtière* » :**

The proposed PACEM’s Master plan for urban development and coastal management came after intensive research of the city’s context and status on the local and regional level. The main vision of the study was to emphasize the local context and social and environmental potentials. The projected master plan identified three main character zones with three main functions: Zone 1 designated for the urban character reinforcement; zone 2 intended for the marine and coastal activities; and zone 3 to create a balance between the environment and the development (PACEM, 2009). Besides that, the PACEM proposed plan suggested to develop the new empty agricultural lands in the southern part of el-Mina as a residential modern area as shown in Fig. 69. Although the PACEM project analyzed and involved multiple components in the planning development, it failed in presenting a sustainable vision for local development purposes. The PACEM project proposed mixed use for the coast, with a clear identification of the priorities and the importance of communicating with people. However, all of the proposed activities were directed to serve mainly tourism and entertainment rather than provide local residents with

economic opportunities. For instance, although the zone 1 is designated for urban character reinforcement purposes, it allocated coastal places for the erection of a public aquarium, observatory and restaurants to attract visitors. Also, zone 2 identified for seaside character reinforcement allocates pools, parks and beaches for entertainment activities (Fig. 69).

Nevertheless, the PACEM strategic master plan focused mainly on the coastal line and did not take into consideration the inner areas as a study area for redevelopment. Only, in the third zone,



Figure 68: PACEM Master plan for the coastal development of el-Mina, Source: PACEM, 2009

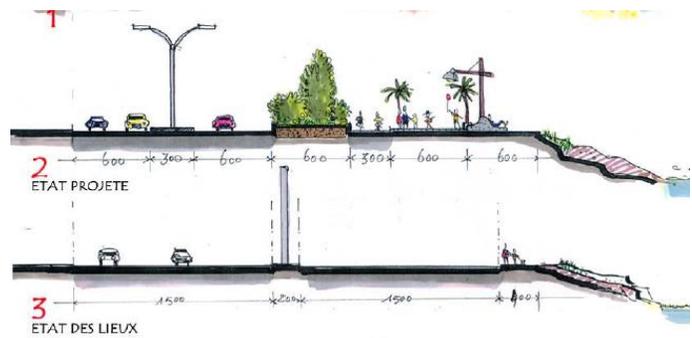


Figure 69: PACEM plan proposition for the residential coastal development on the first lots' profile of el-Mina coast, Source:

PACEM proposes a block development of the inner lots. Yet, these proposed residential blocks looked only into climatic and environmental planning principles and overlooked all social and economic dimensions (Fig.70).

Consequently, Mina remains in dire need for a holistic strategic Masterplan that encounter strategies for the improvement of people's quality of life and that strive for a balance between social, economic and environmental interests.

***2. TEAM report for the assessment and design of the rehabilitation activities  
needed for El-Mina coastal area and corniche façade***

However, Dr. Rajab<sup>10</sup> explained that following the election of the new municipal council in 2016, a sustainable development plan for the coast of Mina was commissioned by the UNDP. This was because the new municipal council didn't want to undertake and work on projects that were proposed in the period of the previous municipal council such as PACEM.

Hence, the UNDP with collaboration with TEAM consultants started a whole new process of investigation, analysis, and participatory meetings to comprehend the issues, struggles and potential of el-Mina coast (TEAM, 2017).

a. The main goals of the proposal are: Public health and safety, quality of life, environmental sustainability, economic sustainability and social equity (TEAM, 2017).

Accordingly, the study undertook new and well-defined design development guidelines that state the following (TEAM, 2017):

- Optimize the mobility on the streets and enhance public space practices
- Define the identity of public space based on the relationship between water and the urban fabric.

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<sup>10</sup> Dr. Mosbah Rajab: Professor at the Urban Planning department in the Lebanese University. He shared these comments with us during an interview held in

- Enhance the waterfront to continue reinventing its role through a variety of different programs and uses.
- Treat the boulevard as a multimodal street, and the waterfront as a great public space that is unique and well connected with Tripoli and Mina road system. Change the role of the existing Boulevard of El Mina to a secondary collector road with a recreational nature that provides a higher degree of movement for the pedestrians and bicycles (Fig. 71).
- Implement a plan that is able to accommodate to future unpredictable myriad changes.



**Figure 70: The proposed road design and plan of the TEAM project, Source: TEAM, 2017**

The TEAM proposal focused on suggesting infrastructural interventions and adjustments rather than generating a comprehensive, people oriented vision and plan for El-Mina coast.

Accordingly, TEAM project is not contextual. This is because of its design approach that overlooks the seashore importance to only develop a new road network that transform the existent road to a boulevard that include a bus lane. Hence, TEAM proposal is not specific to El-Mina coast and its components, since it doesn't reflect and interact with the context and character of Mina and therefore can be implemented in any context.

Furthermore, TEAM proposal neglected every relationship and connection with the inner coastal zones. In the suggested intervention, the only areas of intervention are on coastal line.

Consequently, TEAM proposal requires intensive modifications before being implemented for it should encompass different social, economic and environmental layers.

In sum, PACEM and TEAM projects' proposal suggested strategies that focus on only one level and neglected all of the components that affect people's lives.

Hence, it is essential to reconceive a new study for El-Mina coast sustainable development, since the proposed plans are not holistic and doesn't include all of the needed and required levels for the redevelopment of the coast.

Two interviews were conducted with Dr. Mosbah Rajab<sup>11</sup> and Dr. Jamal Abed<sup>12</sup>, who are currently members of a technical committee founded by Mina municipality for changing and increasing the FAR in the southern region of Mina since it has high potential for development and investment. Both Dr. Mosbah Rajab and Jamal Abed weren't satisfied with the existent proposed master plans and development projects for el-Mina. They showed disagreement and disapproval with the new municipal intensions of increasing the FAR and lands' value and highly criticized some of the study's suggested ideas. Their main concern was TEAM's project proposal weaknesses, for they are highly involved in the projects' assessment for the redevelopment of the coast of Mina.

Both Dr. Rajab and Abed considered the TEAM project as an unsuccessful, parachuted and alien project. This is due to the irrelevant proposed intervention for the road management. Dr. Rajab

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<sup>11</sup> Dr. Mosbah Rajab: Professor and coordinator of the Urban Planning Department at the Lebanese university. He declared the aforementioned declaration in an interview that took place on the 17<sup>th</sup> of February 2018.

<sup>12</sup> Dr. Jamal Abed: Dean of the Architecture Department at Azm with him on the 4<sup>th</sup> of February 2018.

described the proposed new corniche as totally inadequate particularly because it doesn't respect and take into consideration the coastal aspect of the area and the rights to maritime activities. He claimed that the TEAM proposal doesn't represent a holistic approach, but it rather focused only on the street network, which could be implemented in any context since it wasn't specific for a coastal area like Mina. Similarly, Dr. Abed noted that the project might result in traffic congestion problems rather than solving the current road and infrastructural issues. Therefore, the TEAM project is not contextual and not responsive to the local character of the area. It also goes in detail into the technical field, overlooking the environmental and social aspect and importance of the coast. Moreover, Dr. Rajab also explained how the PACEM project ignored some of the existent social, economic and environmental problems present in el-Mina and didn't allow reconnecting the old city with the coast. The PACEM master plan didn't succeed to empower and highly involve the residents in the local context.

Therefore, the municipality's initiatives are still not successful. This is mostly due to the pressuring economic and urban privatization threats and due to the subjectivity of the proposed coastal management studies and proposals. Indeed, it is highly difficult to include all of the coastal urban components in the design scheme when developing a sustainable plan for coastal management and development. Thus, it remains difficult to mitigate privatization efforts that affect the social and environmental performance of the coast of Mina and consequently deteriorate people's relationship with their environment.

Hence, new strategies, tools and frameworks should be formulated in order to develop a strategic urban management and redevelopment program for the coast of Mina and its surrounding.

### ***3. TRIPOLI 2020***

Al-Fayhaa 2020 is a municipal led initiative that endorses a sustainable development strategy project (AFSDS) for Al-Fayhaa union of municipalities. It incorporates a framework that defines future activities aiming to support the sustainable development of Al-Fayhaa.

Tripoli 2020 has a vision of a developed community with regional pivotal role, enjoying prosperous living conditions with emphasis on heritage and cultural values of the city. This is attempted to be achieved through promoting social justice, improving citizens' competencies and job creation opportunities, strengthening citizens' national loyalty and shared community responsibilities, reviving the values of their heritage, and stimulating private and public institutions with local and regional impact to benefit from available opportunities.

The main goals of this project are the proliferation of integrated territorial management and enhancement of urban spaces (Tripoli 2020), 2015). This includes:

- Upgrading historical quarters in the cities of Al-Fayhaa
- Improving the environmental situation on the cities of Al-Fayhaa
- Improving the touristic situation of Al-Fayhaa Cities.
- Organizing the public transport in the cities of Al-Fayhaa and Setting an institutional and organizational framework for the public transport net.
- Placing the cities of Al-Fayhaa on the path of sustainable development and sticking to Lebanon's commitments in the Copenhagen Conference.

- Providing the union of the municipalities of Al-fayhaa with practical tools to manage the execution of the projects.

This will be realized through enhancing the city competitiveness through job creation plans, re-organization and re-activation of the industrial zone, and re-activation of a strong public transport system including railways. This project consists as well on promoting social development by improving the housing conditions for the poor, empowering the artisanal sector in fields, alleviating delinquency problems among poor young people, activating the role of the citizen, and re-activating the implementation of the agenda 21 for the cities of Al-Fayhaa based on the sustainable development path. Nevertheless, Tripoli 2020 is concerned about developing the economic sector of the union of municipalities. This will be achieved through sustaining, Organizing and empowering economic sectors, improve the cultural and living image of Al-Fayhaa, reinforcing the link between the immigrants of the North, and improving of the Al-Fayhaa Cities' Image. All of the aforementioned goals and strategies are envisioned to be implemented throughout a methodology that consists on Diagnosis, Framework, Action plan and indicator system (Tripoli 2020, 2015).

The City development strategy (CDS) of al-Fayhaa aims to incorporate public private partnerships (PPPs). Also, the CDS involved stakeholders from the community and the business sector (as the Prime Minister H.E., French development Agency (AFD), the municipalities of Marseille and Barcelona, and the Organization of Mediterranean Cities (MedCities), the (UNEP), and (UN-HABITAT). It defined and involved as well different sectors such as: urban planning sector, environmental sector, tourism sector, transport sector, logistic sector, social framework sector, economic sector, governance sector (Tripoli 2020, 2015).

## **K. Proposed management plans and signed conventions**

### ***1. Lebanon's Marine Protected Areas Strategy by the MOE***

This report has been developed by the Ministry of environment in which several Lebanese coastal zones are defined as protected areas. However, in Mina only the Palm islands (located very deeply in the sea) are acknowledged by the ministry as protected areas. The rest of the coast of Mina remains neglected with no law, program or decree that preserve it. Also, the main principles for protecting these defined areas are not enough for achieving a comprehensive protection of these zones. Thus, a new law or program should be dismantled for better protecting natural, ecologically important zones including the coast of Mina.

### ***2. Barcelona's Convention***

In 1975, 16 Mediterranean countries and the European Community adopted the Mediterranean Action Plan (MAP). The Convention for the Protection of the Mediterranean Sea against Pollution (the Barcelona Convention) was adopted on 16 February 1976 and then modified in June 1995 by the Conference of Plenipotentiaries of the Coastal States of the Mediterranean Region. The amended Convention, entitled, "Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean" was entered into force on 9 July 2004.

The signing countries are entitled to abide by the different erected protocols for all of the Barcelona convention, dumping protocol, emergency protocol, Land-based sources (LBS) protocol, specially protected areas (SPA) protocol, offshore protocol, hazardous protocol, and ICZM protocol.

The signing party shall take all appropriate measures in accordance with the protocols of the Convention. They should be responsible of combatting pollution of the Mediterranean Sea and protect its marine environment. They are entitled as well to get involved in the formulation and adoption of protocols for the implementation of the Barcelona convention. Adding to that, the signing country should pledge itself to promote measures for the protection of the coastal and marine aspects and environment from any type of pollution.

The main identified elements of the integrated coastal zone management of the Barcelona convention are as follow (Protocol on ICZM, 2008):

- a. Protection and sustainable use of the coastal zone (Article 8): Identify zones where construction should not take place and generate new criteria for sustainable use of coastal zones.
- b. Economic activities (Article 9): Ensure that the coastal and maritime economy doesn't harm and is responsive to existing natural coastal resources and aspects. This includes all of the agriculture and industry, fishing, aquaculture, tourism, and sporting and recreational activities sectors
- c. Specific coastal ecosystems (Article 10): Well-defined coastal ecosystems are recommended to be protected as *wetlands and estuaries* (through national coastal strategies, plans and programs that prohibit activities with negative effects on wetlands and estuaries, and restoring degraded coastal wetlands), *Marine habitats* (by adopting protecting legislations, planning and management, and encouraging regional and international cooperation for marine protection programs implementation), *coastal forest and woods* (generate measures to preserve existing coastal forests), and *dunes* (rehabilitation plans).

- d. Coastal Landscapes (Article 11): Adopt measures that protect coastal landscapes with their specific aesthetic, and natural and cultural value.
- e. Islands (Article 12): The signing parties should involve coastal population to participate in the protection and interaction of islands and existing coastal ecosystems through national coastal strategies.
- f. Cultural Heritage (Article 13): The parties should foster for protecting the cultural, archeological and historical heritage of coastal zones, including underwater cultural heritage.
- g. Participation (Article 14): Ensure efficient governance and appropriate formulation and implementation of coastal and marine strategies, plans and programs or projects, through the participation of all of the territorial communities and public entities concerned, economic operators, non-governmental organizations, social actors and concerned public. Furthermore, it is required to provide free and easily accessible information for all the people.
- h. Awareness-raising, training, education and research (Article 15): Organize awareness campaigns on the national, regional and local levels.

The achievement of the aforementioned ICZM elements could be happen through the adoption of coastal management specific instruments such as:

- a. Monitoring and observation mechanisms and networks (Article 16): particularly through updating national inventories of coastal zones.
- b. Mediterranean strategy for integrated coastal zone management (Article 17): develop a common regional framework for ICZM, regional action places and other operational instruments for the promotion of sustainable development.

- c. National coastal strategies, plans and programs (Article 18): these strategies opt to identify determined objectives and priorities for ecosystem management.
- d. Environmental assessment (Article 19): this consists on regularly running environmental assessment of plans and programs affecting coastal zones.
- e. Land policy (Article 20): these policies intend to integrate coastal zone management, reduce economic pressures, maintain open areas and allow public access to the sea and along the shore.
- f. Economic, financial and fiscal instruments (Article 21): adopt adequate economic and fiscal tools for supporting local, regional and national initiatives for ICZM.

All of the above instruments for the successful implementation of an ICZM should be adopted with respect to risks affecting the coastal zones (natural disasters, coastal erosions, and natural hazards), international cooperation (Training and research, exchange of information, and transboundary cooperation and environmental assessment), institutional provision (focal points, reports, and institutional coordination, and meeting of parties), and final provisions (relationship with the convention, relation with third parties, signature, ratification, acceptance or approval, accession, and entry into force).

However, the Barcelona convention requires the conduction of regular meetings and conferences for the assessment of the proposed action plans and for the management and update of the developed strategies, guidelines, amendments and recommendations.

### ***3. Mediterranean Strategy for Sustainable Development 2016-2025***

The Mediterranean Strategy for Sustainable Development 2016-2025 represents a strategic policy framework for securing a sustainable future for the Mediterranean region in line with Sustainable Development Goals. It consists on balancing socio-economic and environmental goals all together, adapt international commitments to regional conditions, guide national strategies for sustainable development, and stimulate regional cooperation between stakeholders in the implementation of sustainable development (UNEP, 2016).

The Strategy is built around the following vision: A prosperous and peaceful Mediterranean region in which people enjoy a high quality of life and where sustainable development takes place within the carrying capacity of healthy ecosystems. This strategy considers that working with nature and within environmental standards help securing long-term effective strategies and plans. This is why this strategy focuses on balancing between environment and development and all of the constituting sectors of the coast. It consists as well on opting to achieve a balance between general large scale and local scale plans, also between national and regional stakeholders for the erection of a commonly-agreed framework.

However, considering what the Mediterranean Sea is rich with diverse ecosystem, it is being faced with considerable pressures due to over-densification and urban encroachment. This has been hindering the easy and successful achievement of a sustainable Mediterranean basin (UNEP, 2016). In fact, the Mediterranean is subject to high climate change risks. This is why the new Mediterranean strategy is being developed according to the United Nations Conference on Sustainable Development (Rio+20) for achieving a sustainable development of these coasts.

This strategy focuses on increasing the collaboration between the south and north shores of the Mediterranean, such as the Union for the Mediterranean and Horizon 2020 initiative to depollute the Mediterranean Sea by 2020. It focuses as well on regional specific activities such as looking at the most significant sources of environmental degradation in the region. This is achieved through consisting on involving all of the stakeholders, cooperation, solidarity, equity and participatory governance.

The strategy incorporates six objectives, that tackle environmental and development goals, and provide as well an integrated approach to address sustainability issues. This includes: 1. Ensuring sustainable development in marine and coastal areas; 2. Promoting resource management, food production and food security through sustainable forms of rural development; 3. Planning and managing sustainable Mediterranean cities. 4. Addressing climate change as a priority issue for the Mediterranean; 5. Transition towards a green and blue economy; 6. Improving governance in support of sustainable development. However, these strategic directions aim at providing guidance and inspiration for the most effective implementation of a sustainable strategy for the management of the Mediterranean coasts.

#### **4. IMAC- ICZM**

The IMAC project was initiated through the coordination of different partners (Balamand, MOE, Adelphi, Greece and Italy) to stimulate a sustainable development of coastal zones in North Lebanon in order to enhance their quality of life and ecosystem, through non-statutory, voluntary and cooperative approaches. The main vision of this strategy is: *“The responsible development of the coastal zone of North Lebanon to realize opportunities for its thriving coastal communities while making wise use of the rich natural resources of the area without foreclosing the prospects of future generations”*.

The objective of the IMAC's project entails promoting tools of ICZM and raising awareness of its benefits, and establishing long-term mechanisms and management procedures that are endorsed by all stakeholders. This came as a response to the deteriorated condition of the Lebanese coast due to uncontrolled urban sprawl, anthropogenic activities, increased privatization of the shorefront, outdated legislations, lack of laws' application, reduced public access to the beach, solid waste dumping, wastewater discharges, sea filling and sand extraction.

To achieve that, IMAC methods focused on participating all of the municipalities, line ministries, public institutions, academia, private sector and civil society for contributing in the process of:

- (1) Assessing the coastal zones conditions
- (2) Establish a new ICZM commitment between all stakeholders
- (3) Propose improvements of the existing laws and legal and institutional settings.
- (4) Prepare an action plan for improving ICZM.

The coastal strategy aims to provide guidance to policy and decision-makers, the community at large and to private sector. In this way, the strategy should serve as baseline document for local stakeholders to get active in the absence of a national framework. This strategy entails five key themes: Community well-being, Environmental quality and nature conservation, economic products and services, land use management and public participation and access to information.

One of the main recommendations that came out of the IMAC process is the creation of a coastal forum consisting of all those with an interest in the coast, and presenting all the opportunities and priorities perceived by the local stakeholders. It also highly encourages communication and dialogue between all of the stakeholders.

The main stakeholders are: the community (the principal player), agricultural sector, fisheries sector, tourism sector, industrial sector, municipalities, and environmental organizations and research centers.

In fact, this proposed coastal strategy by the IMAC project lines up with several previously proposed management plans such as:

- The CDR's physical master plan which plans and organizes land uses in a way to conserve and protect natural, cultural, environmental and heritage features. This plan highlights the importance of establishing national parks, in line with the rehabilitation and preservation of remarkable coastal sites, dismantling illegal installations on the public maritime domain and establishing free access to it, and developing and adopting a seafront law.
- The CAMP project by the UNEP-MAP, which identified a clear coastal zone amended with the designation of the National Council of Environment as a management body by law 444/2002 which, however, has not been enforced yet.
- The national Action Plan for the reduction of pollution of the Mediterranean from land based sources which provide platforms for the reduction of pollution of the Mediterranean Sea.
- The study on coastal pollution and water supply project preparation of an environmental monitoring plan conducted by CDR-LACECO-SAFEGE in 2000 and which comprises an assessment of the legal and institutional framework.
- The CDR's regional environmental assessment report on the coastal zone of Lebanon prepared by Ecodit-Iaurif in 1997 and which comprises an assessment of the legal and institutional framework, in addition to an analysis of development scenarios.

The strategic plan for the sustainable development of the coast consists on a series of recommendations to achieve a balance between development and environmental protection.

This strategy consists on the following:

a. On the Agricultural level:

- Valorize the agricultural plains stretching from Anfeh to Ras Maska.
- Valorize Akkar's large agricultural terrain with its rich agricultural, biological and natural biodiversity.
- Protect the Al-Minieh agricultural lands from urban encroachment.

b. On the Industrial level:

- Limit the extension of the industrial works happening in Chekka and their pollutants.
- Integrate the concept of the management of the rain collectors as the best solution to reduce the pollution rate in the northern rivers.

c. On the Transportation level:

- Control the urban expansion in Koumba to avoid its intersection with the industrial zone in Salaata.
- Control the urban expansion in Tripoli towards Ras Maska for the protection of the environmental health.
- Propose an urban expansion of Tripoli towards the east.

d. On the Natural level:

- Protect the cliffs of Ras Chakaa for their ecological importance.
- Protect the Jawz River from the urban crawling and pollution.
- Protect Akkar's agricultural terrain and its different ecological components.

- Protect and valorize the touristic importance of the natural beaches of all of: Kfaraabisa, Batrun, Heri and Akkar.
- Place setbacks boundaries on the shorefronts of the low urbanized cities stretching from Batroun to el-Jawz River, and from Anfeh to Hrayshe.
- Propose a corniche along the coastal line stretching from south Tripoli towards the fishing port in Mina with green spaces along it.

e. On the Heritage level:

- Protect the heritage places and buildings as the: Phoenician wall in Batroun, the salt mines in Anfeh, kouba and klaiaat, and the historical fishing port I Mina.
- List some of the historical sites on the local touristic map for its protection.

f. On the Fishing level:

- Along with the strategic national physical master plan, it is recommended to establish marine farms along the Akkari coast for it has rich diverse biodiversity along it.
- Maintain the fishing ports in Batroun, Anfeh, Chekka, and establish the necessary infrastructure for the marine farms in Akkar.

More specifically, this general strategy was explained and detailed into more detailed strategic actions that opt to the improvement / to achieve defined goals and themes:

- a. Community well-being: in order to improve the living conditions of local communities along the coast of North Lebanon, and to maintain the cultural identities, traditions and skills.
  - Provide economic incentives to improve living conditions of economically disadvantaged groups.
  - Generate jobs consistent with traditional livelihood

- Improve basic public services
- Preserve cultural identity by protecting heritage sites and places
- b. Environmental quality and nature conservation: To maintain and enhance a clean and healthy coastal environment for the benefit of present and future generations.
  - Reduce the impact of coastal and sea based activities on water quality.
  - Improve management of solid waste
  - Reduce air and noise pollution sources
  - Protect and restore biodiversity and areas of environmental importance
  - Provide education and technical assistance, research and monitoring on environmental.
- c. Economic product and services: Ensure the economic development of different sectors and communities along the coast through the sustainable use of the natural resources of the coastal zone.
  - Support upgrading and diversification of economic products (promoting small and medium scale enterprise, improve facilities for tourism)
  - Improve marketing of Lebanese products (N/A)
  - Encourage training and scientific research aimed at improving economic performance.
- d. Land use management: Support the development and implementation of proper land use planning along the coast which integrates different coastal uses in a sustainable way, identifies suitable development areas and opportunities, protects areas of natural and cultural importance and offers proper urban and rural transport for all population
  - Establish consensus on the future land use of the area (Revise existing regulations to facilitate management of the coast and prepare policy proposals to ensure control of the occupation of the public maritime domain)

- Designate areas for special purposes taking into account recommendations of the NMPMLT and MAJAL diagnostic plan
- Improve urban and rural transport infrastructure and services
- e. Public participation and access to information: Create space and mechanisms for participation and communication where coastal inhabitants and organized groups can join efforts to support the sustainable use of the coastal zone and to improve the knowledge base as well as access to information on coastal issues.
  - Ensure active participation of local communities (Ensure direct involvement)
  - Establish a framework for the acquisition and sharing of coastal information and databases (Promote sharing and access to coastal information databases)
  - Launch and support awareness raising campaigns (Raise community awareness)
  - Support associations, syndicates and cooperatives (Enhance their role to ensure financial support)

On the other hand, the implementation of the strategic plan for the sustainable development of the coast requires a suitable local mechanism for cooperation and communication – as the coastal forum- between all stakeholders. It recommends as well the understanding of the legal and governmental structures that controls or affects the coast. In fact, various laws took place in the Lebanese legislations regarding the management, and protection of the coast, the use and management of the natural resources, the control of the touristic sector and the fishing activities, etc. However, one of the important legislative existing frameworks is keeping the environment law erected in 2002 and which consists on defining a minimum of 200 m distance from the highest level of the sea in the winter before constructing along the shoreline. Moreover, on the

national level, Lebanon signed the Barcelona convention in 2001 for the sustainable development of the coast.

This coastal strategy is very holistic, and do not go into the details of the coastal performances and requirements. However, this strategy proposes the Coast of Mina-Tripoli as a one large public space for diverse activities, emphasized with the valorization of the importance of the Fishing port in it. It focuses as well on the ecological aspects of the coast and deploys strategies to protect its natural resources. Moreover, the proposed coastal strategy perceives the coast as part of a larger system composed of agricultural lands, rivers, industrial zones and urban expansions. This makes from the proposed coastal strategy a very holistic one that integrates all of the sectors together and visualizes them as a network of interdependent relationships and actions, which may overlook the special character of the different character zones constituting this large stretch of the coast.

Hence, this strategy acts on the regional level, therefore, a more detailed and focused strategic plans need to be developed to sustainably, locally manage the coasts. Also, although this strategy acknowledges the development pressures threats happening on the coast, and the limitation of the public accessibility to the coast, yet it doesn't propose any solution or plan to control them or end their harm to the coast. Moreover, the laws are still ambiguous and the methods of funding are not practically efficient. Regarding the problem of the lack of collaboration between the different governing parties and involved stakeholders, the solution was through the coastal forum, and the developed platforms for connection, dialogue and negotiations. Nevertheless, incentives need to be issued to encourage parties want to discuss with others on a regular basis.

## **L. Conclusion**

### ***1. Physical Obstructions***

Starting the late 90s, the coastline of Mina witnessed several spatial transformations. After the reformation of the shoreline in 1938 into an artificial coastline, several land reclamation occurred on the shoreline. The port and its extensions, the abandoned train station, and the extended industrial zone represent a major physical disconnection between the city, the coast users and the sea. Also, the presence of private properties directly along the shoreline (as Mikati's residence and the Hammam el Makloub) accentuates the physical dis-connectivity of the city dwellers with the coastline. Nevertheless, all of the military points established on the shoreline block the public from accessing the shoreline. These provoked visual obstructions for coast's users disrupting the visual continuity (Fig. 72).

### ***2. Visual Obstructions***

The present physical obstructions are not the only source for visual obstructions. Visual obstructions in Mina are not limited to the physical obstruction occurring along the coastline.

As mentioned before, the city pathways towards the shoreline do not allow direct sights of the sea. Several constructions of new structures occurred at the end of these pathways, obstructing by that the direct visual corridors towards the sea. Moreover, the presence of intensified activities along the coast is the main source for visual obstructions. Particularly, the fishing port encountering extensive presence of fishing boats, café boats, fishing reparation, and car access and mobility along the coast, prevents the coast visitors from enjoying the calm and serene view of the coastline and the sea (Fig. 73).

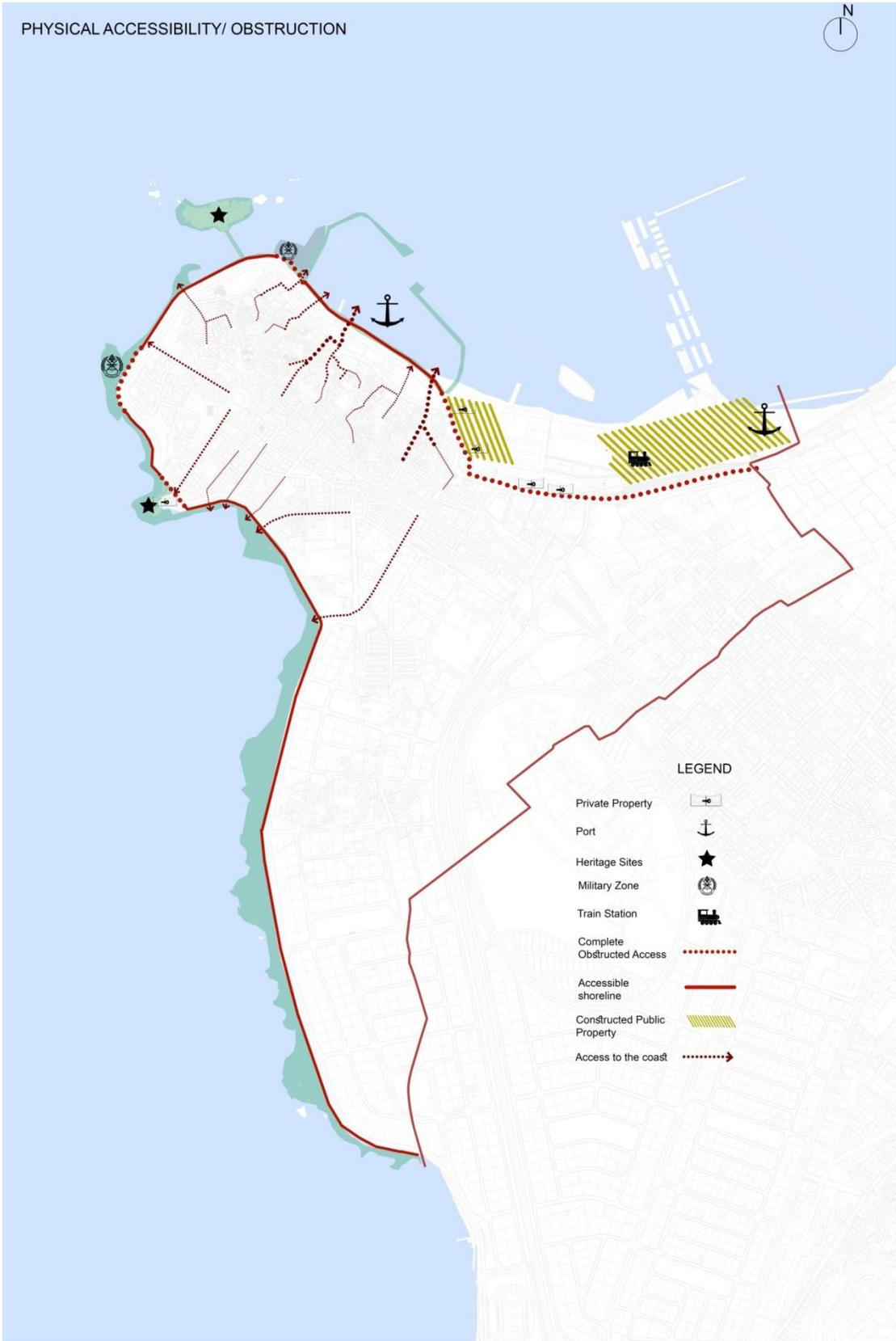


Figure 71: Map of the different existing physical obstructions along the coast of Mina, Source: Author

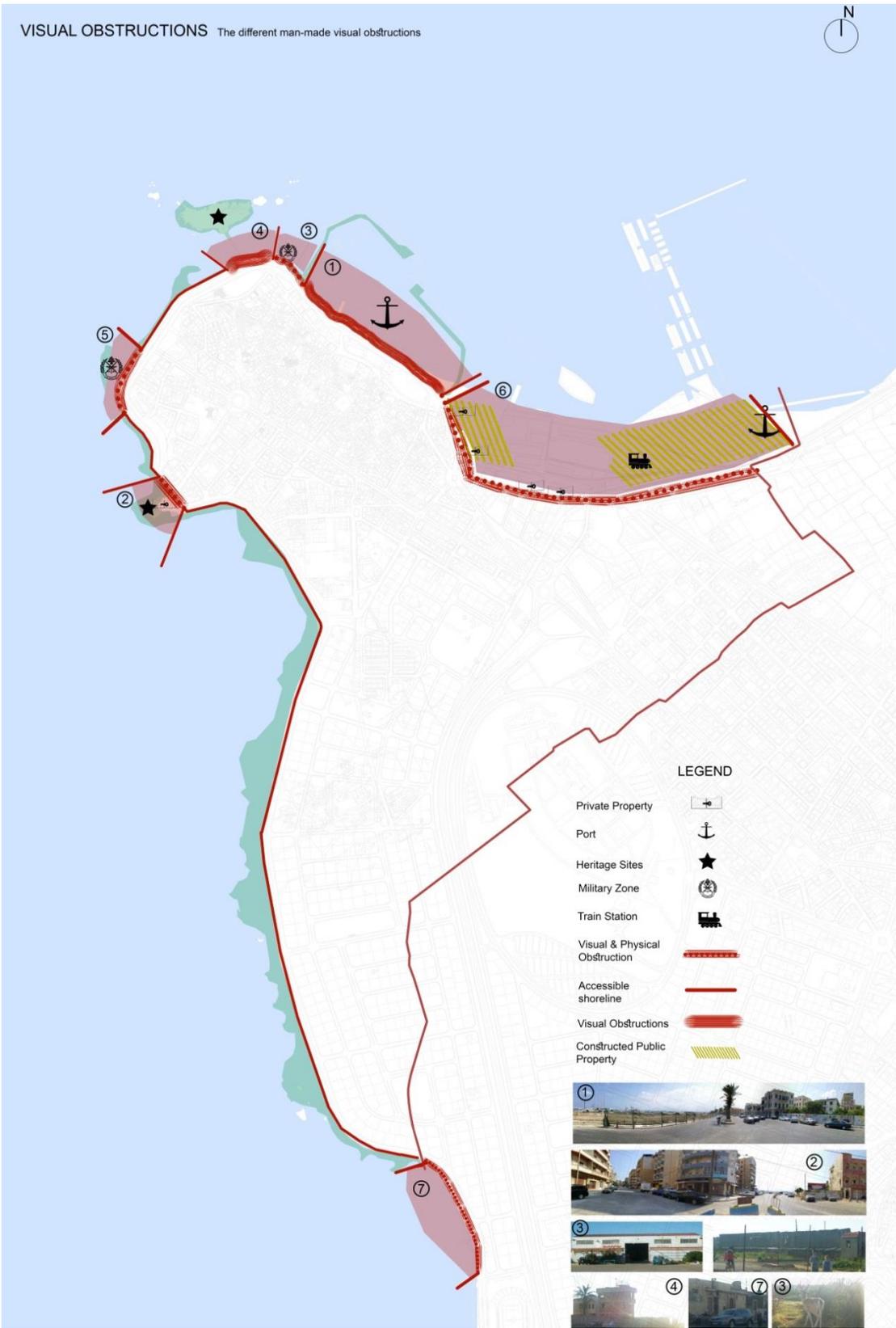


Figure 72: Map of the various visual obstructions along the coast, Source: Author

### ***3. Violation of public access & Vulnerable areas***

The aforementioned obstructions contributed to the preclusion of the coast dwellers from easily accessing the shoreline and enjoying its natural and beautiful visual aspects.

Consequently, this phenomenon is banning coast users from their initial rights of enjoying an easy and unlimited access to the sea. By that, coast users are discouraged to re-visit the coastline of Mina for they cannot freely enjoy their experience on the coastline, the publicly classified open natural space.

However, the most vulnerable areas of the coast of Mina are:

- The “Bassatine” zone, as it is facing ongoing development threats that could deteriorate the urban environmental conditions of the area and violate public rights, and also exclude low-income groups (Fig. 74).
- The “Port Said” area and its sand dunes. This is because of the decrease of flow of people in this zone and the absence of economic activities in its ground floors, which has been repelling users from approaching or staying in this coastal region (Fig. 74).
- The “fishing port” area, for what this industry and zone are facing from lack of maintenance and support, and reflecting by that on the whole urban environment of the zone (Fig. 74).

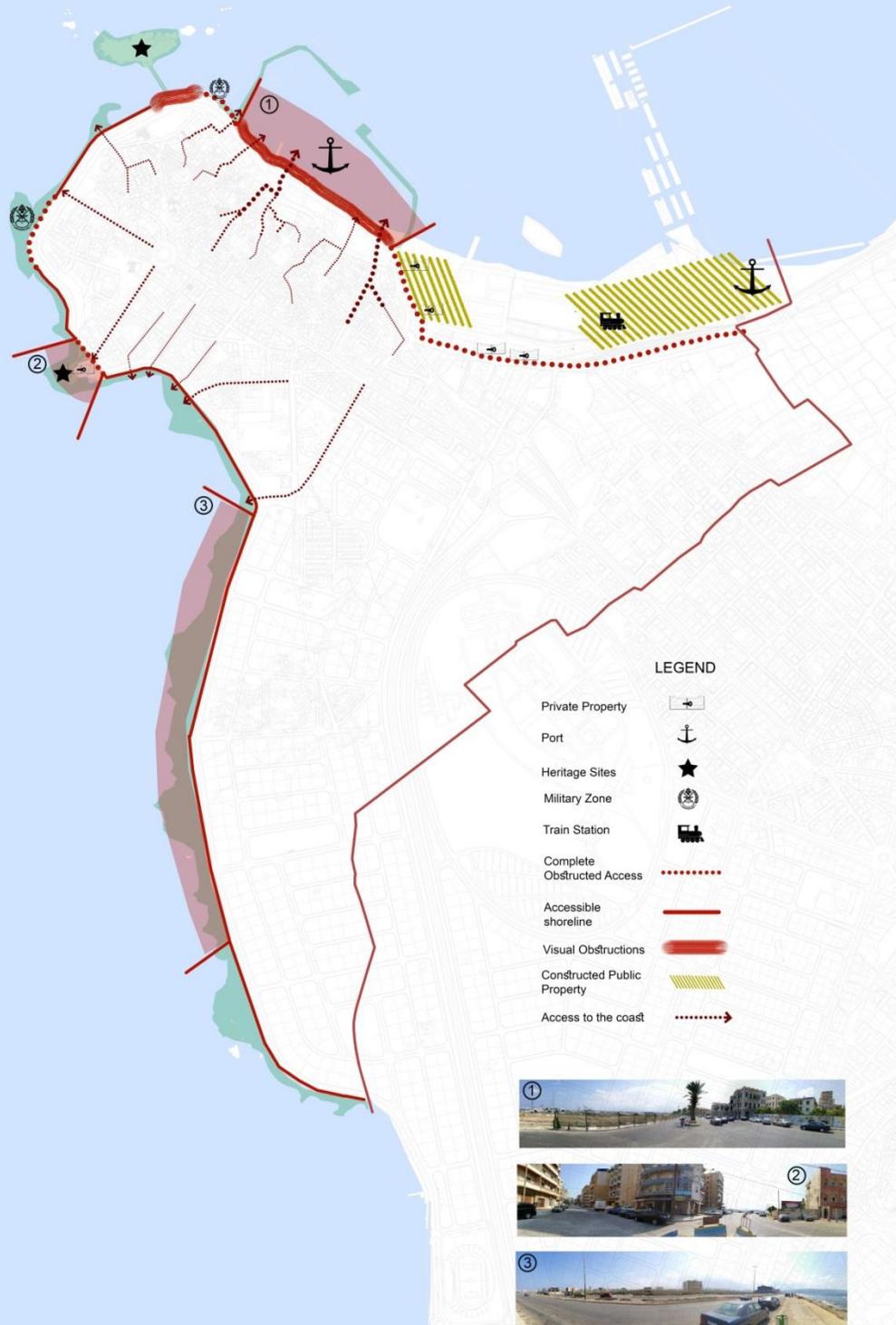


Figure 73: The most vulnerable areas along the coast of Mina, Source: Author

## **M. Stakeholder Analysis and communication assessment**

### ***1. Existing stakeholders and their different interests***

a. Mina Municipality: adopts and formulates strategies, guidelines, and initiatives to manage the coast and improve its environmental and economic conditions. Yet, the existing connections and relations between some municipal members and developers or politicians drove the municipality to adopt strategies and/or allow the implementation of plans that aim to serve the private interest rather than preserve and protect the coast of Mina.

b. Union of Municipalities: Al-Fayhaa Union was established in 1982, including the municipalities of Tripoli, Mina and Baddawi. Theoretically, the union should advise/influence on municipalities' performances and decisions. However, nowadays, the role of the union is limited to conducting research and managing solid wastes. This is mainly due to the lack of financial and human resources.

c. Ministry of Public works: is responsible for managing the public domain in Lebanon, including the coastline of Mina since it is classified as part of the maritime public domain. Worthy of consideration, the coastline of Mina witnessed several property violations facilitated by the Ministry of Public Works such as, the reclaimed lot 220 from the sea, the military points, the construction of the municipality of Mina, the hosting educational campus, the mosque of the Islamic endowments, among others. These actions were covered and approved by the ministry of public works through property dropping or illegal permits.

d. Ministry of environment: is responsible for protecting the environment of Mina and its existing coastal and marine resources. Yet, the influence of this ministry on management and protection decisions related to the coast is minimal.

e. Developers: This group is comprised of investors who mostly descend from rich Tripolitan families. These individuals are often well-connected which in turn helps them influence the decision making process regarding coastal investments. In many cases, developers collaborate with authorities/politicians when establishing investments on the coast and thus, they share economic interest and profits.

f. Fishermen: represent a large number of Mina families and are present along the coast. Fishermen have an essential economic relationship with the coast since it provides their access to the sea and support to their livelihoods. In addition, fishermen represent an important voting block of Mina; therefore, their opinion on coastal issues is vital for the municipality, the politicians and also the developers.

g. Syndical of fishermen: intended to represent the fishermen in Mina and provide them with financial assistance. However, the syndicate often fails to protect fishermen and provide them with needed financial support. As such, its role remains limited, and has no effect on any of the groups involved in the management of the coast of Mina. As a matter of fact, 70% of the interviewed fishermen expressed their dis-trust in the syndicate and their preference to directly contact the municipality or active politicians in the area.

h. Community groups: Coast visitors, Mina residents, shop owners: The coast hosts a diversity of users who have different political and social affiliations, as well as various interest and ways of engagement with the provided space. It is important to note that active political figures in Mina present an additional factor that affects the above mentioned community groups and the way they deal with issues related to the protection/development of the coast namely, Mikati, Kabbara, Hariri, and Rifi.

i. Politicians: Active politicians/ political figures in Mina and Tripoli often use the coast to advertise for their political campaigns, promising the implementation of development plans/ investments that would benefit the public etc. Moreover, some politicians provide a political cover for developers/investors in the area in return for economic/financial gains.

For example, former Prime Minister Najib Mikati is directly involved in coastal issues particularly, the fishermen struggles. Mikati's residence is located directly on the coastline. According to my interviews with (fishermen), Mikati is planning to establish a bay for yachts and/or a large coastal resort next to his residence.

j. NGOs and activists In Mina, there are various non-profit organizations interested in different issues regarding the community, its social welfare, economic support, and the quality of its environment.

Looking at the coastal issue of Mina, few NGOs were involved in the development of the coast and its protection. For instance, we love Tripoli is a youth-led organization promoting cultural, social & environmental activism in Tripoli, Lebanon which has been undertaking beach cleaning campaigns along the years for the protection of the marine resources in Mina and enhancement of its built environment. Nevertheless, UNDP adopted many initiatives for the enhancement of the coast of Mina and its built environment, namely the TEAM project which aims to enhance the quality of life of Mina community, and encourage the environmental and economic sustainability of the coast.

Although, the proposed project involved community participation through informal interviews, however, the main group involved with the UNDP is the municipality.

Only civil campaigns as (الحملة المدنية لحماية شاطئ الميناء) and (برنا بحرنا) with the support of individual activists, and some of the municipality members were able to stand against the development pressures and violations occurring on the coast of Mina.

## 2. Connection and communication

The above mentioned stakeholders have established relations, linkages and communication platforms among themselves (Fig.75).

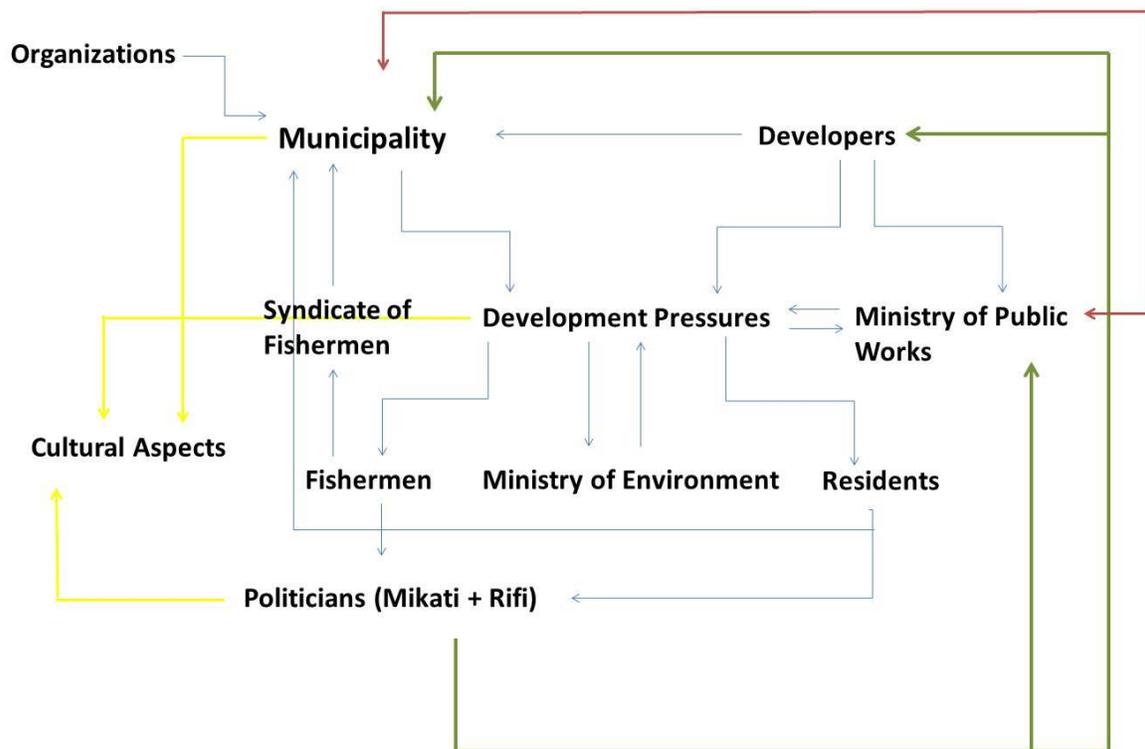


Figure 74: Diagram of the relations, connections and power between the different stakeholders, Source: Author



## CHAPTER V:

### DATA ANALYSIS

#### **A. Introduction**

Based on my fieldwork and existing case studies, it is evident that the coast of Mina suffers from severe spatial degradation. Its public open spaces are poorly equipped; they lack green spaces and adequate urban furniture. Moreover, Mina suffers from severe urban environmental degradation as well as a deteriorated urban infrastructure. Furthermore, many locations along the city's coast are visually and physically blocked to public access due to illegal constructions which block the free and unconditional access to the sea. Adding to this, the lack of support and commitment of governmental authorities and municipality is leading to the loss of the marine activities and characteristic of the coast and its identity.

Despite these constraints, the coastline of Mina is host to multiple activities and vibrant public practices. This is why, the spatial conditions of the coast of Mina require specific, in-depth assessment that would lead to a proposal for an intervention approach that opts to improve the space and environmental quality of the coastline and its surrounding.

In order to achieve that, I have analyzed and assessed the undergone surveys, case studies, and existing conditions of the coast. This helped me develop specific criteria for the identification of the different character zones of the coast of Mina, which will help me propose adequate design interventions relative to each character zone.

## **B. Survey Findings**

The coast of Mina represents an interest for several stakeholders. I identified those as: the coast's visitors, residents, fishermen, street vendors, shop owners, Mina and Tripoli municipality, NGOs, and developers. Each one of them has different interest and goals based on how they perceive the coastal region of Mina. Based on direct observations and different responses I was able to depict the main major needs and expectations of the involved stakeholders on different levels (refer to table 17), also the different tensions and agreements among them (Table 16).

The main tensions rely between the developers and the municipality of Mina with all of the other involved stakeholders of Mina. The developers advocate for the construction of development projects along the coastline with a partial support from the municipality, while all of the others stakeholders especially the residents of Mina and the NGOs refuses such projects for protecting the public real, free access to the beach and the ecological character of the coast.

On the other hand, shop owners show tension with street vendors who take their customers and view without paying taxes. Also, a large number of the residents of Mina showed their hate towards the visitors of the coast as they consider them the reason for crowding the place and littering it. Finally, NGOs are continually questioning the municipality's small and weak intervention towards enhancing the coast of Mina and also their different positions towards protecting the coast.

However, all of the stakeholders agreed on the importance of cleaning the coast, improving the walkability, ensuring security, providing its continuity and establishing more green areas.

Table 16: Analysis of the different stakeholders needs and opinions of the current situation in Mina, Source: Author

	Spatial	Socio-cultural	Environmental	Economic	ICZM studies	Development pressures	Tensions
Coast users / non residents	linking corridors enhancement, and enhancement of public spaces Better urban furniture	Preserve the marine identity of the area	Provide a better Sewage network, and more bins	Seek the presence of recreational activity and dynamic marine related economy	Ignore its different assets but agree on most of its principles	Support if doesn't clash with their rights	
Residents	Beach cleanliness,	Preserve the coast for the residents of Mina	Sewage Network Green spaces	Revitalization of the economic cycle along the coast by animating with touristic local and recreational functions			Coast users and visitors
Fishermen	Lights disposition	Security and Safety	Less pollution Fishing management	Support of the fishing industry			Syndicate of Fishermen
Shop owners	Better coastal connection with the inner parts of the city		Less pollution Cleaner coast	Attract more outsiders to increase the people flow and by the economic dynamics			Street Vendors
Street Vendors	Better walkability		Cleaning the Corniche More green Spaces	Fear to be removed and wish for extensive flow of people and proliferation of recreational activities			
Municipality	Enhance the corniche walkway and attract more people to the coastline	Preserve the marine identity of Mina and its coast and protect all cultural - heritage sites and structures	Clean walkway Green spaces	Promote the coast as a touristic destination for the manifestation of heritage and cultural presence	Prefers small scale strategies but also encourages the implementation of such a framework	Support if well regulated	All stakeholders
NGOs ( بحرنا برنا، Public works)	Preserve the continuity of the coast and advocate for the right of equal and just accessibility to the sea	Exacerbate the social marine identity of the region and improve people's quality of life	Protect the marine resources and restore the damaged ecosystems	Seek for the provision of diverse local job opportunities	Highly advocate for the implementation of a complete ICZM approach	Mainly against but agree if controlled and do not violate public rights and the environment	Municipality
Developers	Envision a highly luxurious touristic area that accommodates high-end residential and commercial services	Capitalize on existing heritage	Promote the inauguration of green spaces with mere integration of sustainability measures (solar panels)	Profit from the coastal assets for development profits generated from investments in the residential, recreational and touristic sectors.	Underestimate	Support	All stakeholders
AGREEMENTS	Cleanliness, Walkability, Shoreline Continuity, Security, Green Areas,						
PRINCIPLES	Improve the built environment by improving connections towards the coast (improving walkability) and creating new innovative recreational and gathering clean and lit spaces	Preserve socio-cultural heritage and strengthen the social and marine identity of the region while improving people's quality of lives and providing security and safety	Enhance the urban environment by cleaning the beach and the establishment of green spaces for the inauguration of new ecosystem networks	Integrate mixed-use, recreational, innovative activities and functions with a focus on local economy	Formulate an ICZM framework that integrate all of the different sectors of the coast in an all-inclusive way to achieve a sustainable development	Direct and Regularize the proliferation of development projects in a way that guarantee the free and just visual and physical access to the coast	Create a platform within ICZM that allows the optimum coordination between all stakeholders

### **C. Assessment of the existing regulatory frameworks**

The different existing statutory and non-statutory management and regulatory mechanisms in Tripoli-Mina, such as the zoning master plan, the Lebanese national property law, and the Barcelona convention, dictated the current conditions of the coast. Therefore, I opt in this section to assess all of the existing regulatory frameworks, management plans, and development projects for identifying main principles for the sustainable development and management of the coast of Mina.

Mina zoning plan identifies a zone M8 as a maritime public domain for protecting the shoreline and its public characteristic, and preserving its rich ecosystem (see Fig. 76). However, many violations take place along this zone as the Waqf Mosque, the army points, the entertainment park, and the technical school.

Also, Mina zoning plan includes a modern subdivision of the southern development zone, which have impacted the urban fabric of the zone and will have negative repercussions on its future growth since it is characterized for its large scale design and non-human friendly scale. Nevertheless, the amended decrees for the implementation and management of the master plan were paraphrased from Harmandayan's study (refer to page. 99) to keep the management of the coast of Min ambiguous.

Furthermore, Mina 2010 current master plan did not integrate any environmental nor socio-cultural considerations for protecting ecological and heritage areas that need to be preserved which could allow the proliferation of various violating and illegal constructions and developments along the coast. Therefore, the zoning plan of Mina needs to be rethought in terms of urban environment, cultural heritage, and

sustainability, and should be amended with local and regional laws and decrees that totally prevent any modification and miss-usage of the plan.

On the other hand, the national Lebanese laws for property management of coastal lands are not comprehensive and adequately formulated to protect the coast from any external threats. These laws outline the different types of properties, the authorized practices and the possible penalizations for the violations of the latter (le littoral, 2017). Nevertheless, these regulations lack measures of effectiveness and transparency as they do not declare definitive procedures of managing coastal properties and possible violations.

Consequently, the newly proposed zoning plan for Mina should be aligned and backed up with intransigent, integrative and all-inclusive national laws and decrees that enable a holistic and complete protection of the coast with well-defined violations' penalties to ensure the processing of effective coastal management procedures. However, although the existence of a Marine Protected Areas Strategy for Lebanon, the existing marine resources of Mina (marine ecosystems, fauna, flora, etc.) has been damaged due to the absence of management and protection. This is because this strategy focused only on natural reserves and ignored the presence of a rich biodiversity that needs to be protected along the coastal line of Mina and other coastal Lebanese cities (Ministry of Environment, IUCN, 2012).

In addition, signing the Barcelona convention was not enough to guarantee the protection of the different environmental, cultural and economic assets of the coast and the successful implementation of an ICZM for the sustainable development of Lebanese coasts. In fact, Barcelona's convention and protocols are not being implemented and are facing difficulties in law enforcement since it has not been amended with supportive

decrees and laws. Besides, Barcelona's convention principles and protocols need to be narrowed down into detailed local strategies, more specific to the context of each coastal regions and cities in order to easily implement it and ensure its optimum functionality. Although the enormous effort of the IMAC-ICZM project to translate the Barcelona's signed protocol into strategic vision and action plans generated within a participatory approach and community participation, it still undermines thorough and meticulous strategies for the sustainable development of the coast. In fact, the IMAC treated the northern coast as a one entity, upon which allocated different uses and meanings for the coast. However, these suggestions need to be refined in order to match with the on-ground reality and the specificity of each region of the northern coast as they are not similar and portrays different situations.

Finally, on a more zoomed and detailed level, all of the proposed strategic projects and plans for the development of Mina and its coast are very broad, and missed the inclusion of an ICZM approach for the sustainable development and management of the coast. They neglected as well the importance of the protection of marine resources, and natural ecosystems in Mina, and did not tackle the mitigation issue of CO<sub>2</sub> emissions along the coastline. Accordingly, nature based solutions and strategies need to be addressed in proposed strategic plans for the sustainable development of the coast of Mina, in order to include all of the composing assets of the coast. Moreover, all of the abovementioned regulatory and management mechanisms and projects failed to integrate the social layer. Thus, the newly proposed strategic and management plans for Mina should elaborate an all-inclusive approach that deals with all of the environmental, ecological, social, cultural and economic measures.

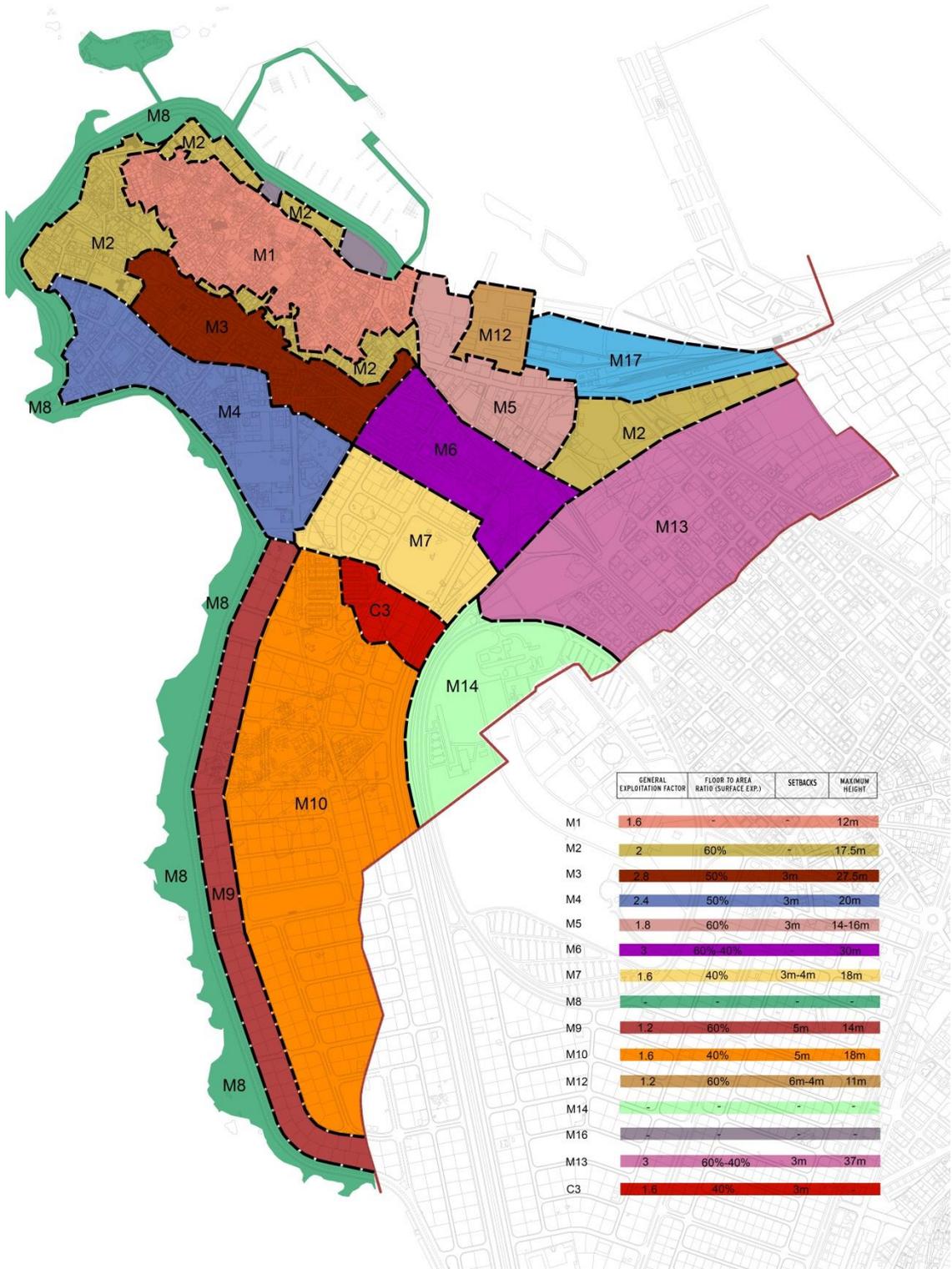


Figure 75: The zoning map of Mina- Tripoli last devised in 2010, Source: Author

## D. Case Study Analysis

The analyzed case studies in chapter II of all of Summer-Side Toronto, Barcelona and Santa-Catarina have similar objectives for achieving a sustainable development of the coast, such as enhancing the natural and cultural aspects of the coast, while allowing an organized economic development. In the following section, I identify the main criteria and principles inspired from the case studies, for the identification of character zones and different ways of sustainably developing the coast as it is considered to be a better approach for more efficient and fit-to-context revitalization plans.

1. ***Spatially:*** The spatial characteristics of a zone help defining its special character and various components for redesigning it upon its main spatial potentials and constraints. The spatial characteristics of a zone help understanding the urban fabric and identity of a zone and improving by that its maritime character while ensuring the optimum functioning of its conceived new activities.
2. ***Socially:*** Identifying the social dimensions of a zone help understanding the social structure of the zone and by that acknowledging the different people's needs, and the different social dynamics that needs to be reinforced according to each zone.
3. ***Culturally:*** This helps the identification of the existing historical and heritage site in each zone and by that the definition of the adequate strategy, plan or policy that needs to be adopted for preserving these structures and increasing their economic profit.
4. ***Economically:*** Acknowledging the existing economic conditions, structure and dynamics of a zone help in the right envisioning of an efficient economic plan and land-use proposal for the zone.

5. ***Environmentally:*** The environmental characteristics of a zone determine the needed level and type of intervention for restoring its ecological features and ecosystem.
6. ***Legally:*** The legal principles of a zone show the legal structure and functioning in a zone, also the level of threat and need for additive plans, policies or regulations.
7. ***Connection and relationship with the coast:*** Depicting the type of the relationship of the city with the sea in each zone is essential for understanding the importance of the coast for the zone and the type of relationship with the coast. This help in better conceiving an adequate vision for increasing the linkage between the city and the sea.
8. ***Development pressures:*** In an intention to direct development pressures from harming the public rights and the environment, it is important to depict the different types of existing and possible developments that could take place in a zone. This helps as well better identifying the various methods and ideas for redirecting them.
9. ***Shoreline Continuity:*** Identifying the conditions of the shoreline and its continuity help in integrating new design ideas for enhancing and animating the costal line and walkway is an added principle for ensuring a continuous shoreline.
10. ***Coastal resources:*** This includes the preservation of all coastal tangible and intangible resources as sand dunes, beaches, wetlands, bio-diversity, fauna and flora, etc. This helps controlling natural phenomena for protecting the available coastal resources.
11. ***Community engagement:*** To guarantee an effective involvement of the different stakeholders in the decision making process, it is important to define the community engagement rate for better managing the development process of the coast.
12. ***Integrated coastal zone management:*** It is important to address each zone within an ICZM framework for better determining the importance of applying an ICZM approach for the development of the zone.

### E. Identification of character zones

Based on the present social, cultural, economic, and environmental criteria of the coast, I identified different threats that should be addressed and potentials that can be capitalized on for future interventions (Fig.77 and Table 17). This allowed me as well to define seven character zones on the coastline:

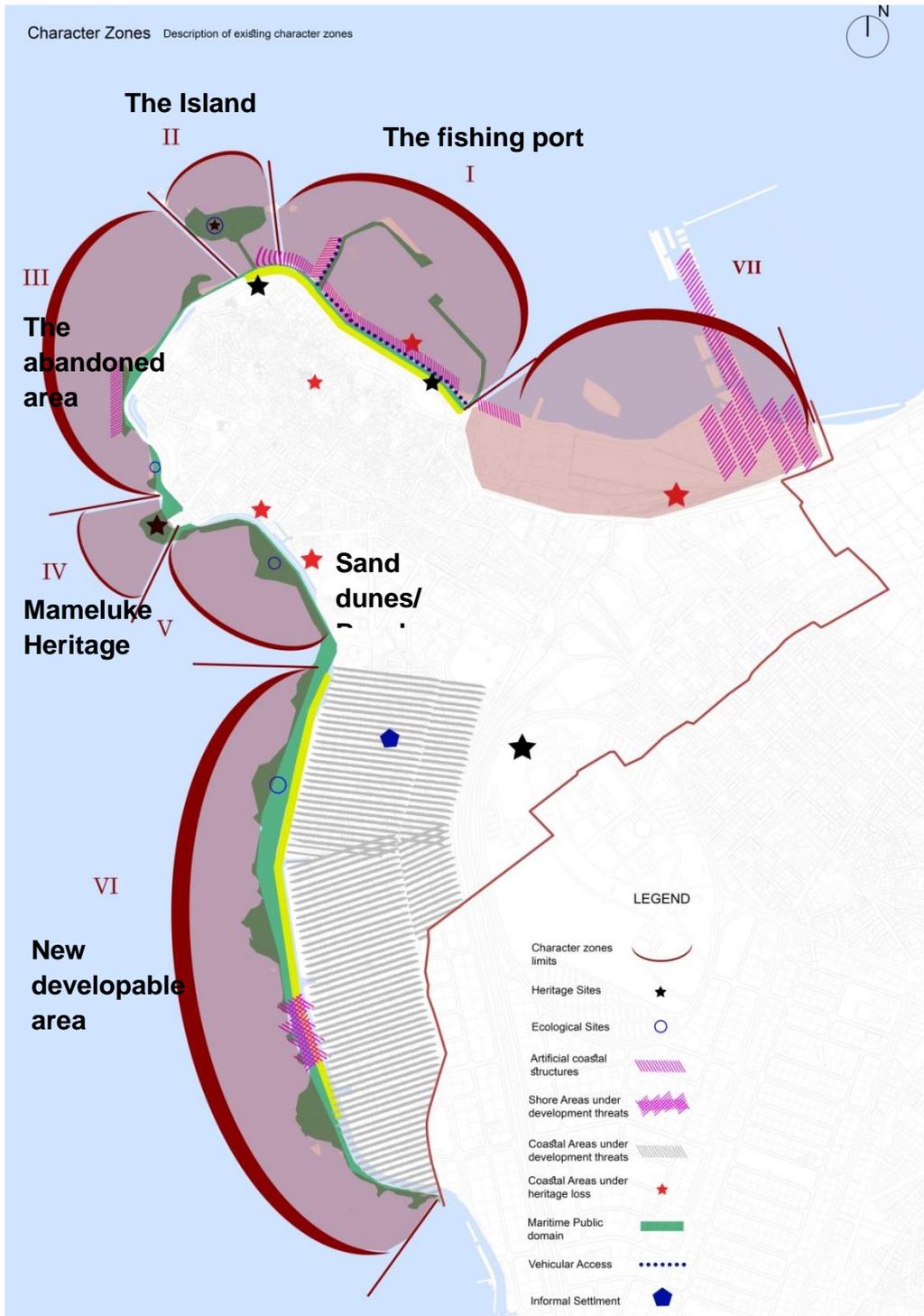


Figure 76: Map of the 7 identified character zones according to the different characteristics of the zones, Source: Author

**Zone 1:** The fishing port area extending from Mikati's residence until Abdul-Wahab Island. This area is highly disconnected from the old inner city. Additionally, it faces mobility issues since vehicles are allowed to access the corniche threatening pedestrians' pathways. More importantly, the lack of adequate laws that protect fishermen creates an additional risk factor. On the other hand, this area is still regarded as the home for one of the oldest and most historical professions that characterize the coast of Mina. It is the most populated and it hosts a wide variety of recreational activities directly related to this zone or to the palm islands.

**Zone 2:** This zone is comprised of Abdul-Wahab Island, and it constitutes a special scene. This zone attracts a large number of visitors since it has a zoo, a historical wall, strategic panoramic view of the sea, and a natural marine life such as, vermitidae platform and sand dunes. Unfortunately, Abdul-Wahab Island's environmental condition is in regression due to the lack of maintenance and management by the concerned municipality.

**Zone 3:** This zone elongates from the Abdul-Wahab Island until the amusement park. This region receives little flow of coast users due to the lack of economic activities. It suffers from a deteriorated urban environment due to presence of wastes along the coastline. Also, the sand dunes present in this area are highly degraded with the litter scattered all along it. In addition, this zone also has several empty stores on the ground level or abandoned old buildings. These buildings could present a great opportunity for the revival of heritage and historical buildings and practices along the coast.

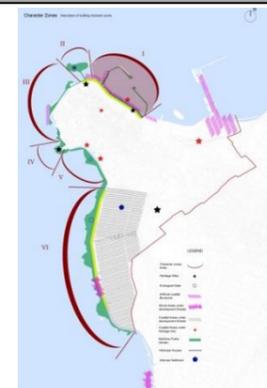
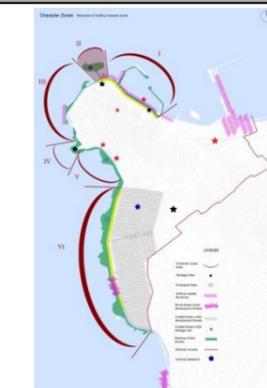
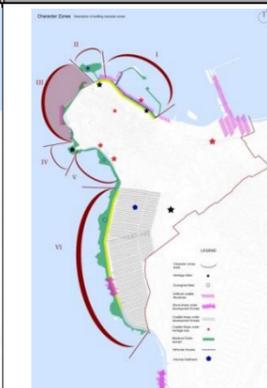
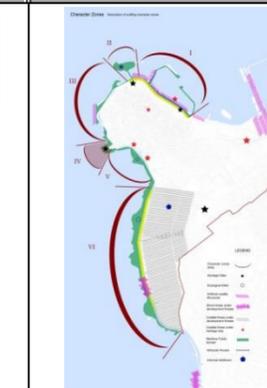
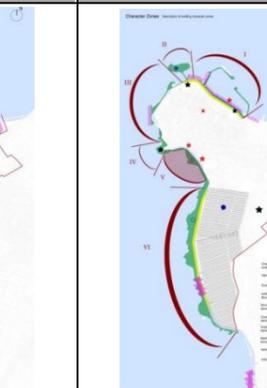
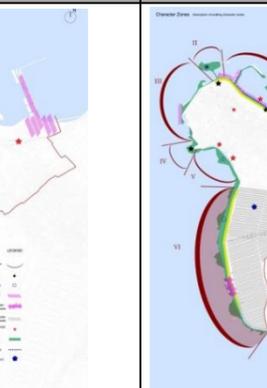
**Zone 4:** represents the area of Hammam el Makloub. This region is completely isolated, visually and physically, from the sea, and does not provide pedestrian pathways. It is a

highly congested zone with unorganized public space. Furthermore, Hammam el-Makloub, being a private property, is overlooked and neglected instead of being an attracting cultural and historical asset. On the other hand, this zone endorses a good number of fishermen who established some sports for hook fishing along the existing vermitidae platform.

**Zone 5:** This area stretches from the Hammam el-Makloub until the sea garden round about. This zone endorses large sand dunes and incorporates a wide variety of domestic recreational activities such as (sight-seeing, street vending, swimming, biking, jogging, etc). It is a strategic region well-connected with the inner city serving the city dwellers of the expanded Mina. However, this region suffers from a degraded urban environment due to the litter that extends all over the existent sand dunes. In addition, the traditional activities occurring along the waterfront on the ground floor are closing and being replaced with moderate cafes.

**Zone 6:** This zone encloses the region elongating from the round sea garden until the end boundary of Mina. This zone has faced several transformations, such as the establishment of the informal cafes accommodating the low-income people all along the coastline blocking the view. These cafes were relocated to the inside in a classified public garden of Mina. It is also suffering from lack of maintenance, littered walkway and coastline and small number of dwellers make the place less dynamic than the other coastline regions. Although this region is attracting new constructions and development projects along its waterfront, but it still has not established a well-defined character and identity for its coastline and region. This aspect created from it a strategic place attracting developers to invest in it and also threatening it shoreline with investment proposals.

**Zone 7:** The port area known as the “المحجر الصّحيّ”, Al Mahjar Al Sohhi. In this area, the coastline is inaccessible and not visually attemptable. Although this area is one of the greatest economic hubs for Tripoli, it represents one of its most isolated coastal areas. This is because of the existing land-uses which repels coast users and coastal dwellers from approaching this zone. Also the presence of the garbage landfill at the east-northern boundary of Mina, next to the Abu-Ali River and the port created another stressor source repelling people from this zone. However, the presence of the historical Train station and Burj Sibaii near the port and in the middle of this zone could be a potential opportunity for revitalizing and reviving this zone. Turning these historical structures into cultural, recreational spots could be a strategic occasion to attract touristic economies and re-stitch this area with the inner city.

CHARACTER ZONES		ZONE I	ZONE II	ZONE III	ZONE IV	Zone V	ZONE VI	zone VII
								
THREATS / WEAKNESSES	SOCIAL	Loss of the traditional and heritage character of the area Disruption of social practices due to the public space bad conditions	Presence of a very wide types of site seeing activities from people all over the north	Decrease of the social activities flow/intensity along the shoreline. Medium connection with the inner city	Complete visual and physical obstruction Deteriorated public domain (Absence of sidewalks)	Disruption of the social and spatial connectivity with the inner city	Spatial and urban transformation	High rupture between the city, its people and the stretch
	CULTURAL	Deterioration of the Fishing port value Very Dense Historical Urban Fabric	Abuse of the municipal public lands Under estimation of the roman columns and Ottoman wall on the Abdul-Wahab island Lack of maintainance in the historical island	Absence of clear identity for the zone	Ignorance, overlooking and lack of maintenance of the existing heritage buildings and structures	Repelling entrance towards the inverted bathroom High rates of Closing handicrafts industry	Evolving area along the years, coming back from highly agricultural lands and sand dunes	Lack of maintenance of the existing heritage and cultural structures
	ECONOMIC	Deterioration of the fishing industry due to the lack of protection policies and support	Loss of the local economy and the street vendors Presence of high percentage of empty stores	Decrease of social activities performances along this stretch High presence of empty and abandoned structures along the coast	Small urban spaces for economic activities	Local and handicrafts industry are struggling and endangered to closing	Increase of the economic value of the lands and properties	Closing of many industries Implementation of the national highway which divert the vehicular flow from the area
	ENVIRONMENTAL	High rates of water pollution Sidewalks piled with rubbish	Construction on the Abdul-Wahab island Garbage on the shoreline Presence of an uncontrolled sewer	Littered sand dunes Presence of a sewer pipe that goes/pour in the sea	Constructions very near to the coast High traffic flow along this stretch	High rates of water pollution and littered shoreline	Ecological resources at risk and littered shoreline	PORT remnants Industrial remnants Presence of the landfill

Different Aspects	people relationship with the coast	Connected through the strong relationship of the residents of Mina with sea and especially the fishermen port and fishing activities	Destination for a majority of people even outside Mina. So it is theoretically connected with the people and the longitivity of the shoreline but not really physically connected with the inner city urban fabric	Medium connection although the presence of a major axis stretching from the inner city towards the coast ( The connection is mainly a vehicular one rather than a pedestrian connection )	highly disconnected from both the sea and the city	The proximity of the coast to some urban agglomerations makes from it a place with a medium level of connectivity with the inner city	The only relationship that exists on this stretch is the extension of the social activities happening horizontally along the coast at its Previous stretches	Very low connection with this stretch of the coast due to the presence of a highly industrial area
	development pressures	High presence of several development encroachments such as the private residences, the army settlements and the fish market.	Presence of army settlements near the island	Presence of army settlements on the coast	Already pressured with historical buildings	Absence of development	Being empty and with low social importance, the area is under high development threat with the presence of rumors stating the interest in developing on this stretch of the coast	Highly developed area with industrial services and private investments
	shoreline continuity	The crowdedness of this stretch of the coast creates different types of obstacles while approaching the coast	Presence of visual and physical obstructions banding any vertical connection along the coast	Presence of physical and visual obstructions along the stretch because of the army settlements	Represents a major disruption for the shoreline continuity due to developments along it, absence of sidewalks and	The shoreline is somehow continuous along this stretch with no presence of physical or visual obstructions	There are no visual or physical obstructions along this stretch. However the urban landscape of this region is not well maintained.	The shoreline continuity is highly disrupted along this stretch due to the presence of industrial and private developments along it
	coastal resources	Fishermen	Island	SAND DUNES	Heritage building and informal fishing activities	SAND DUNES	VERMITIDAE PLATFORMS	N/A
	COMMUNITY ENGAGEMENT	High community engagement and attachement to their coast	Very wide and general community engagament	Medium	Medium	Medium	Medium	Very Low / Absent
	POTENTIALS /	SOCIAL	Extensive and Diverse social practices	Attraction of people from all over the city and the northern governorate Location between the old historical zone and the new development zone	Presence of very determined corridors (pedestrian and vehicular) and pathways towards the city Connection with the Major	Proximity to the city buildings and urban fabric	Location between the old historical zone and the new development zone Location near main arteries and social clusters	Extension of the social practices toward this zone

			Axis of the city				and Abu Samra Proximity to Abu Ali river	
	CULTURAL	Presence of the fishing port which constitute part of the Heritage	Presence of the Ottoman wall on the Abdul Wahab Island Preservation of the roman columns in public lands	Absence of cultural and heritage aspects	Presence of the Hammam Lmakloub	Perseverance of the unique small local handicrafts industries	Adjacent to Tripoli International Fair Attraction for various regional and local activities (Olympic Stadium, BAU, Large events place)	Presence of the Train station Presence of the Bursbai heritage building Presence of the Port
	ECONOMIC	Resistance of the fishing industry Presence of small local industries	Occurrence of various economic activities related to the touristic role of the Abdul-wahab island	The location of this area at the intersection of the Major Port-said Axis with the coast could represent a potential opportunity for extending the commercial and social activities and people flow towards the coastline	Presence of the Hammam Lmakloub and recreational activities such as the entertainment park	Presence of special and rare crafts' industries (pottery)	Location of the area in an undeveloped zone very near to the Tripolitan boundaries and various cultural structures ( The Olympic stadium, BAU and Tripoli international fair)	Presence of the Train station Presence of the Bursbai heritage building Presence of the Port Presence of the different types of recycling industries Presence of governmental and social services Presence of various types of industries
	ENVIRONMENTAL	Presence of some protected areas as the Palm islands	Establishment and maintenance of a small zoo next to the Abdul Wahab Island Procurement of a continuous supervision and protection on the Abdul Wahab island	Sand Dunes	Presence of vermitidae platforms and fishermen using the stretch	Presence of sand dunes	Presence of a diverse fauna and flora	Abu Ali river meets the sea

Table 17: Table of the different character zones identified according to each zone components and different spatial, social, economic and environmental components, Source: Autho



## CHAPTER VI:

### INTERVENTION

#### **A. General Strategy**

The sustainable development of the coast of Mina could be achieved by adopting an ICZM approach that allows for a cross-sectional integration of different sectors with both horizontal and vertical coordination (FAO, 1996). In fact, an ICZM approach will help introduce new responsive and flexible management plans which in turn encourage diversity, effective governance, and optimum balance of opinions, as well as different development and cultural and environmental interests.

Land use management, participatory approaches and round tables, transparent and accessible data platforms, awareness and incentivizing programs are all preliminary tools that can be used for the effective application of ICZM in Mina. However, environmentally-led design intervention tools are key for the implementation of sustainable design proposals of an ICZM of the coast. For instance, nature based solutions such as, hybrid blue green infrastructure are intervention methods that can be used for the restoration and revitalization of the coast and the conception of “*livable shorelines*”. These concepts allow shorelines to adapt to different future natural and man-made risks while improving their environmental conditions and reinforcing their connections with the city (Raymond, Christopher M., et al, 2017 ; Cohen-Shacham et al., 2016).

This design and planning framework intends to secure a resilient waterfront and coastal community that incorporates both ecological functions and recreational needs for the city and for the achievement of a sustainable development of the coast of Mina (Fig. 78).

1- SUSTAINABLE DEVELOPMENT (Vision)

1.1. INTEGRATED COASTAL ZONE MANAGEMENT (Framework)

1.1.1. Nature Based solutions & Balance of Opinions (Concept)

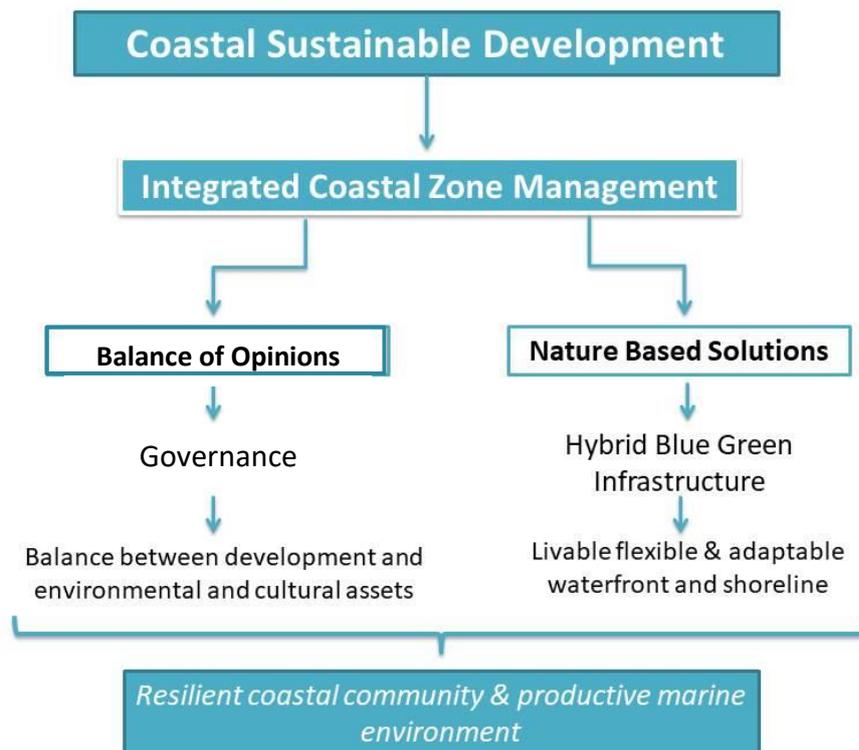


Figure 77: Theoretical Framework for the sustainable development of Mina, Source: Author

**1. ICZM**

Taking into account the complex governing structure, poor coordination and administrative fragmentation in Lebanon and more specifically in Mina, ICZM remains

an effective approach for addressing the sustainable development and management of the coast of Mina.

Indeed, ICZM enables the development of long-term and sustainable management plans of coasts in contexts where integrated and holistic planning and policy frameworks are absent (FAO, 1996). Moreover, it ensures the coordination and integration between different ideas, legacies and participants, and allows for the full involvement of all the stakeholders (Fig. 79). This addresses any possible disputes that may arise from conflictual interest of different stakeholders (FAO, 1996; Soriani, S., Buono, F., & Camuffo, M., 2015). Furthermore, the ICZM planning tool will minimize costly delays in project implementation and make the most efficient use of infrastructure (FAO, 1996).

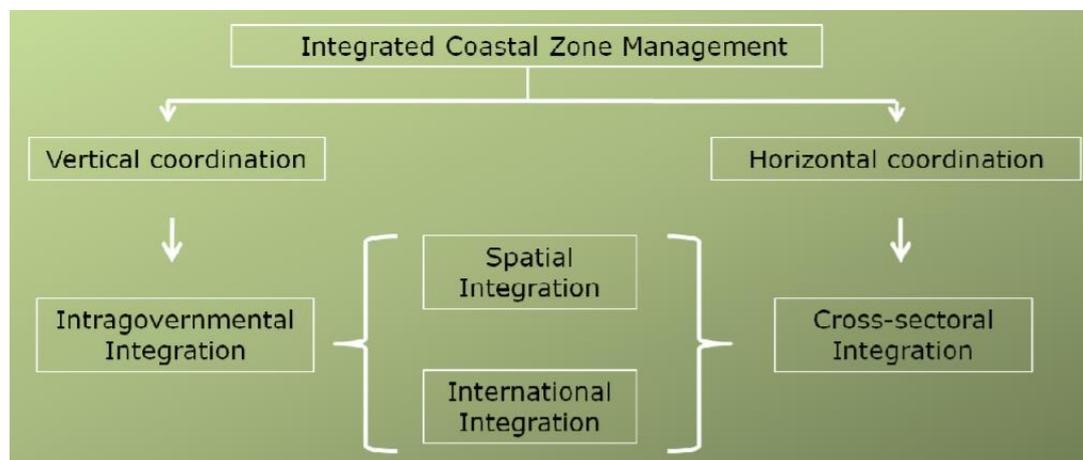
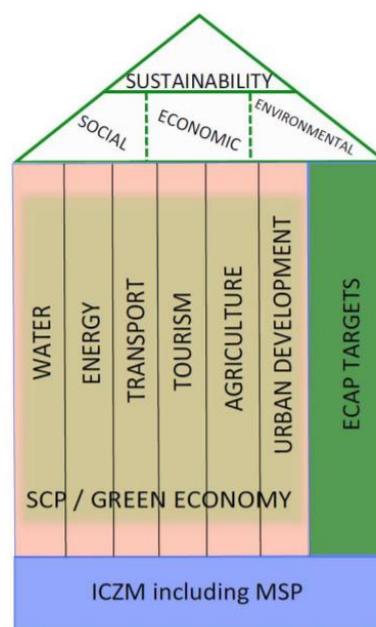


Figure 78: Integrated Coastal Zone Management structure, Source: Soriani, S., Buono, F., & Camuffo, M., 2015

More importantly, the ICZM ability of coordinating different initiatives of coastal economic sectors contributes to the inauguration of long-term optimal socio- economic management plans and outcomes (FAO, 1996) (Fig. 80). This can address recurrent conflicts that often occur from the change of coastal plans when new local and national

governing bodies are elected. On the other hand, the fact that Lebanon has signed the Barcelona convention on the ICZM protocol and several studies, projects and proposals were developed on the effective implementation of an ICZM strategic plan for the Northern coasts (IMAC-ICZM project), it becomes easier to embrace an ICZM local approach for the sustainable development and management of the coast of Mina.

Therefore, I privileged in my thesis an ICZM local framework inspired from the general ICZM international definitions. This framework falls in line with the national and regional ICZM proposed plans, but is at the same time adapted to the context of Mina and characteristics. It opts to initiate an integrative collaboration between public and private sectors for the sake of generating innovative ideas for the development of the coast and its sustainable management. It also requires the development of policies, regulations, tools and incentives for the long-term management and evaluation of these plans. Moreover, a wide accessible and transparent platform of data will be proposed for the interchange of information in Mina municipality allowing by that easy cooperation, management and modification in any devised plan for the coast and its



**Figure 79: ICZM characteristic of involving various sectors, Source: Soriani, S., Buono, F., & Camuffo, M., 2015**

management.

It is important to note that the ICZM approach in Mina will not only incorporate planning strategies for integrated balance plans, but will also include design strategies for ecological and social sustainable development of the coast, as nature based solutions. This is vital for preserving a healthy coast environment and guarantying the successful and effective implementation of an ICZM approach in Mina.

## **B. General Analysis and first conclusions**

Building on the previously analyzed coast's components, regulatory framework, and people's interest and best practices, I identified the main issues that need to be addressed in the coast of Mina. Moreover, I propose different strategies and design interventions to be included in my developed framework for the improvement of the coastal performance of Mina. This was done based on the four basic dynamics that affect the performance of the coast in relation to the city.

- 1. *Stimulus and motivation:*** The main cause that triggers people to visit the coast, use it or even perceive it as a source of income and profit is the culture and habits they inherited from their parents in addition to their own experiences along the coast which can intrigue emotions and memories. However, some of these experiences, related memories, and assumptions can be associated with negative feelings and may therefore discourage people from approaching the coast.
- 2. *Path:*** Although most of the old paths and roads connecting the city to the coast are still the main and prominent linkages of the city to the sea, many issues encounter these linking passages. The narrow old pathways are used mainly by fishermen and residents,

while the other major roads are used by all different visitors of the coast, especially outsiders. However, to improve people's experience towards the sea, and promote sustainable accessible paths to the coast of Mina, it is required to improve the urban conditions of these linkages. Therefore, these connecting pathways should be highlighted as green, walkable, secure and lively spaces. Indeed, these pathways could be animated with diverse commercial and marine-related activities which will entertain users heading towards the coast, maintain secure set-ups and a pleasant walking experience, and attract more visitors to the coast while providing ecological preservation and integrity (Kotsoni, Dimelli, and Ragia, 2017).

- 3. *Experience:*** Guaranteeing a good and unique experience along the coast is essential to re-enforce its relationship with the city dwellers. Although the coast of Mina incorporates a diversity of recreational and dynamic activities and provides users with valuable experiences, it still lacks appropriate public spaces that integrate innovative diverse uses. Therefore, considering that the coastline of Min represents a strategic place for sightseeing, relaxation and recreational practices, new strategies and concepts should be elaborated for the enhancement of the urban settings of the coastline. This includes greening the walkway and public spaces, introducing creative urban furniture, improving the infrastructure, enhancing the quality of the spaces, re-establishing damaged ecosystems and cleaning coastal public spaces

Adding to this, regulating the built environment could be a helpful tool to improve the experience of the people along the coast. This can be done through introducing new laws and decrees for zoning and height control.

- 4. *Management:*** In order to ensure the reiteration of the different activities along the coast, and guarantee their secure manifestation, regulatory frameworks and

management plans should be re-worked and re-conceptualized such that they include various components of the coast (Marcucci, Daniel, et al, 2010). These management plans should provide incentives to incite people to visit, work and invest along the coast. Moreover, new regulatory frameworks should be developed in order to control the damaging behavior of people of the built environment or/and the illegal constructions along the coastline.

### **C. Problem Identification**

Similar to many coastal cities, Mina is undergoing rapid urban growth and extensive development along its shoreline leading to the degradation of its coast. This situation is exacerbated by the lack of effective governance, institutional management and community awareness which is in turn increasingly threatening the marine environment and heritage of the area as well as restricting people's access the sea. Today, Mina is characterized by a deteriorated urban environment, inadequate public open spaces, and declining infrastructure. This had a great impact on the social and environmental life along the coast and exaggerated the disconnection of the city to the sea, as well as the shoreline continuity.

### **D. Vision:**

Sustainably develop the coast of Mina for a productive marine environment and resilient coastal community.

### **E. Goals and Objectives:**

This thesis aims to achieve sustainable development of the coast of Mina through (a) guiding and re-directing potential development initiatives, (b) protecting and preserving the coastal urban heritage in the area, the fishing industry and other coastal

communities, (c) restoring the ecological coastal networks to preserve biodiversity and improve the environmental conditions of the coast, and (d) providing an urban free open public space that can be used by different groups

#### **F. Sector by Sector Strategy**

As the ICZM planning tool consists of incorporating various sectors and tries to achieve collaboration, integration and a balance of interest between them, I identify five main sectors – similar to the IMAC-ICZM strategic action plan-: Community and well-being sector, Environmental sector, Economic and services sector, Management sector, and Participation sector.

Each of these sectors represent main components of the coast of Mina with their different challenges and weaknesses, which helps in formulating different strategies for their improvement. Moreover, every main sector incorporates various sub-sectors that significantly affect the functioning and performance of the main sectors. Accordingly, based on my thorough analysis of the conducted fieldwork, observations and gathered data, I identified various sub-sectors of the coast of Mina and accordingly deduced the main issues and strategies that need to be addressed for the development of each sector.

**1. *Community and well-being sector:*** This sector includes mainly communities depending on the coast in their daily lives, or have a direct or/and indirect relationship with it. I enumerate all of the fishing communities, agricultural sector, indigenous people, heritage and cultural sector and the infrastructural sector as it provides the residents with basic needed services.

- a. Fishermen community: according to my data, the fishing community represents around 38% of Mina families. These families have always suffered from very bad living

conditions. They rely on fishing as a main living resource and lack the support of their syndicate. This highlights the need to support and empower fishermen as they represent a major constituent of Mina and contributor to its local economy. Indeed, the empowerment of this group will have positive impact on tourism as well.

- b. Heritage and cultural sector: Mina and Tripoli have always been known for their rich heritage. The city hosts different historical monuments that date back to the Phoenician, Roman, Ottoman, and Mameluke eras. This heritage is not limited to the tangible built environment but extends to the intangible socio-cultural heritage, comprised of different trades, crafts and heritage practices that have identified Mina as a culturally rich city. Moreover, the city also home for several traditions that are strongly related to the sea such as walking, jogging, fishing, swimming, etc. Therefore, preserving the urban maritime heritage of Mina is essential for the conservation of the city's character and for reinforcing the existing social and built heritage.
- c. Residents: The community of Mina is diversified in terms of social and income groups, however, according to my fieldwork and conducted interviews, most of the residents and coast visitors expressed their strong attachment to the coast and their aspirations of protecting it from non-indigenous users. Therefore, awareness on inclusivity is much needed for encouraging diversification, openness, and social integration. Accordingly, the development plan for Mina should focus on empowering its various local communities by inaugurating an organizational local municipal body. This body should be composed of indigenous people, municipal representatives that are willing to collaborate with the private sector in order to come up with new strategies, bottom-up plans and political and monetary support in an intention to promote good governance favoring co-creation and co-benefits.

## ***2. Environmental sector:***

- a. Water Sector: the sea water represents the main natural environmental component of the coast. As mentioned earlier, several human practices have been affecting sea water quality such as: uncontrolled fishing activities, high rates of oil tenure from the industrial port and fishing port, and 2006 oil spill, waste water discharges, beach litter, floating waste, etc. This has been degrading the water quality of the sea, the ecosystem networks and accordingly leading to the loss of biodiversity and marine species.
- b. Green networks: Regardless of the high percentage of green and open spaces in Mina city, the coast of Mina lacks the presence of green open spaces and natural settings. Adding to this, the green spaces are often residual lots resulting from ad-hoc planning and poor distribution of lots and land-uses. Thus, transforming the coast of Mina into a healthy, sustainable and resilient natural coast is essential for re-establishing coastal natural ecosystems in the city, improve environmental settings for healthier lives, and mitigate natural risks.

## ***3. Economic and services sector***

- a. Fishing Activities: Unfortunately, this sector is facing daily pressures due to increasing competition with illegal fisheries (that use dynamites), unregistered fishermen, polluted seawater in Lebanon and the cheap imported fish from Turkey. Moreover, 80% of the fishermen are not transmitting their profession to younger generations.
- b. Agriculture Activities: Over the time, the agricultural sector disappeared from the coast of Mina. Regardless of the presence of 80% of undeveloped land in the southern part of Mina, which originally represented “Tripoli-Mina Basatine”, these lands are no longer

used for agricultural activities. This has left several implications on the environment in the area and the quality of lives of its residents.

- c. Industrial Activities: Similarly to many major cities, the coast of Mina encompasses a good variety of industrial activities along it, such as port activities, wood manufacturing, boats mechanics, and other. These industries are quite important, but unfortunately, some of them are disappearing such as the wood and pottery production.
- d. Real Estate Market: Recently, development interests and real estate market have been leaning towards acquiring the new area of Bassatine of South Mina. This has been leading to speculations and increase of lots' prices and consequently of development prices.
- e. Tourism sector: Recreational activities and urban heritage are the two main touristic drivers in Mina. This sector is quite small and somehow limited to the spring and summer seasons when sea trips are possible. Also, these activities are highly affected by social, political and environmental factors. All of these various industries need to be controlled and re-directed towards more equitable, green, and sustainable concepts.

#### ***4. Management sector:***

- a. Land-use: The existing land-use of Mina is highly diversified but lacks the existence of regulatory mechanisms.
- b. Management and Regulatory Body: the main official regulatory body of Mina and its coast is the municipality. However, this local government suffers from coordination difficulties as well as the absence of initiatives and efforts for development and improvement. Therefore, an integrated planning and regulatory framework should be developed for the sustainable management, enhancement and flexible organization of the land-use plan of Mina.

## ***5. Participation***

- a. Local environmental Organizations: People's participation in the decision-making in Mina is limited to the occasional reporting of problems that faces different groups. This creates a miss-trust between authorities and people, which in turn is leading to a wide miss-communication of needs, problem identification, projects and solution implementation.
- b. Access to information: The lack of management, organization and commitment left Mina municipality and all other research institutions without relevant and enough needed data on the city. Reflecting on that, a strategy should be developed for the establishment of an interactive platform for discussion, co-creation of data input and information sharing. This tool could act as an incentive for social interaction, integration and participation of different stakeholders in decision making.

### **G. Urban Flexible Platform as a hybrid Blue Green Infrastructure for Nature Based solutions (City Design level)**

Following the precedent problem identification, main vision, objectives, planning and design recommendations, and selected strategies, I develop a design intervention that revives the waterfront's public spaces, restores the sea-land effective and interactive interface, and proliferates a new controlled green economy.

Indeed, in an attempt to transform the underutilized spaces of the coast of Mina into productive landscapes, I aim to transform the coastline into an intermediate integrated open public space and establish a flexible public urban connecting space (referred to in the text as urban platform). This space acts as a dynamic coastal landscape of transitional fluxes that reconnects the city with the sea, and proliferates equilibrium between nature and human-made actions.

This space is a combination of hybrid nature based solution that serves as an infrastructural tool towards re-establishing lost connections with the different assets of the city: nodes, roads, waterways and green networks. This allows the smooth transition from one system to another and eases the transition from the sea towards the city. Consequently, this linear platform will encompass several interacting layers that work both vertically and horizontally. It will also conceive the coastline of Mina as one shared public entity that is permeable for new connections with new developments, community, infrastructure, and heritage. Furthermore, conceived as a flexible multi-functional urban space, it will present ecological solutions for the enhancement of the environmental conditions, restoration of marine ecosystems, biodiversity and resources, and mitigation and adaptation to climate change challenges. On the other hand, it will present at some other defined strategic spots an economic driver for recreational, leisure and touristic activities including marine museums, aqua parks, parks, cafes, etc.

The implementation of this design concept requires the initiation of soft engineering approaches such as: realign and re-naturalize the shoreline by removing some of the hard man-made structures, and introducing new ecological structures that serve the designated function of each place. Moreover, a restoration of the natural coastal vegetation, beaches and landscapes will be undertaken for the ecological re-embellishment of the continuous publically shared coastline.

In sum, the aim of this platform is to provide a variety of potential strategies to make the waterfront more adaptive and integrative in a way to promote public involvement and access to the sea, and to be more resilient in the face of increasing coastal hazards.

The maps below (Fig. 81 and 82) show the main opportunities and constraints in each character zone and shows accordingly the preliminary concept that connects existing important nodes of Mina city with the shoreline creating a connection network of movement, economic activities and multiplying ecosystems. These connections are linked all together along the coast within a coastal flexible platform that transfers these activities and connection from a zone to another, all along the coast of Mina. Fig. 83 and 84 shows the main strategies for implementing the concept.

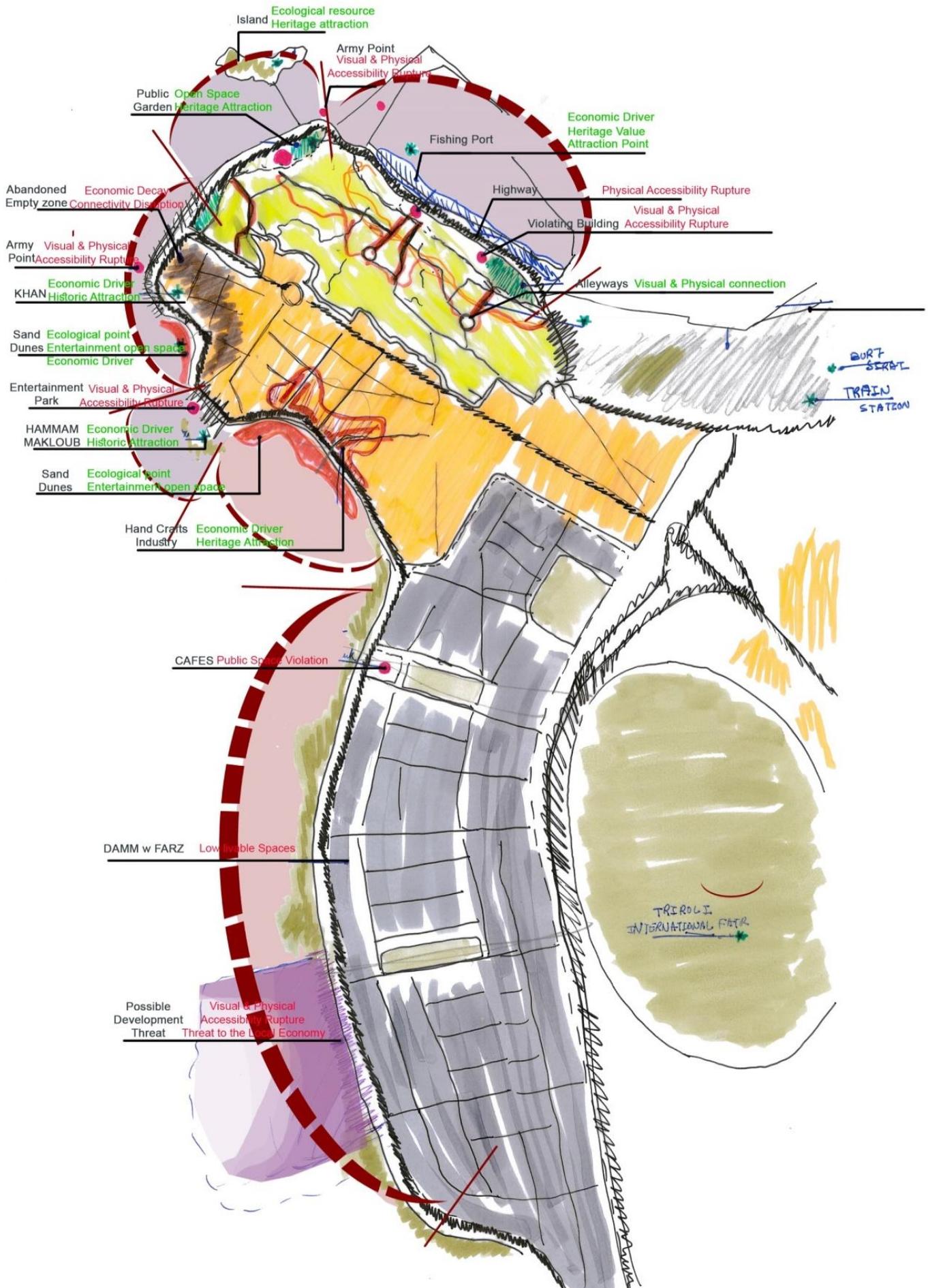


Figure 80: The main opportunities and constraints of each character zones, Source: Author

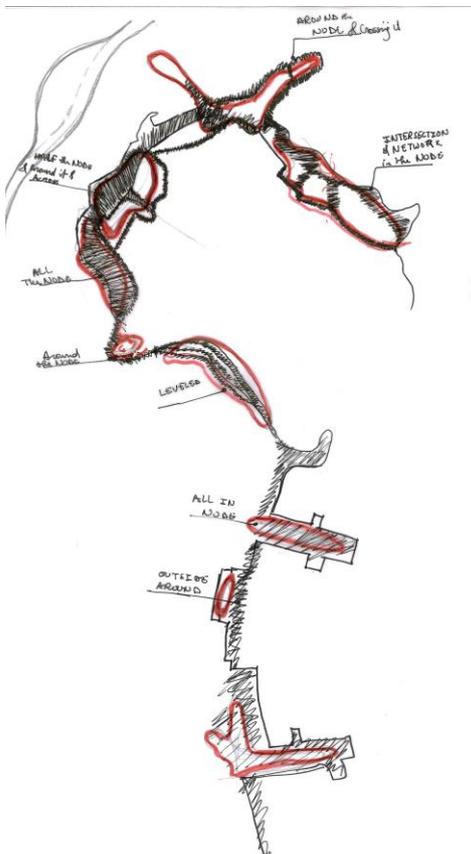
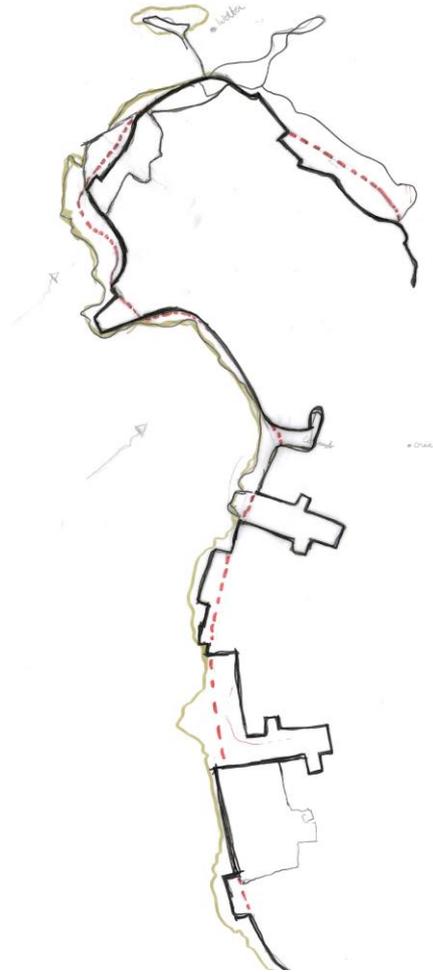
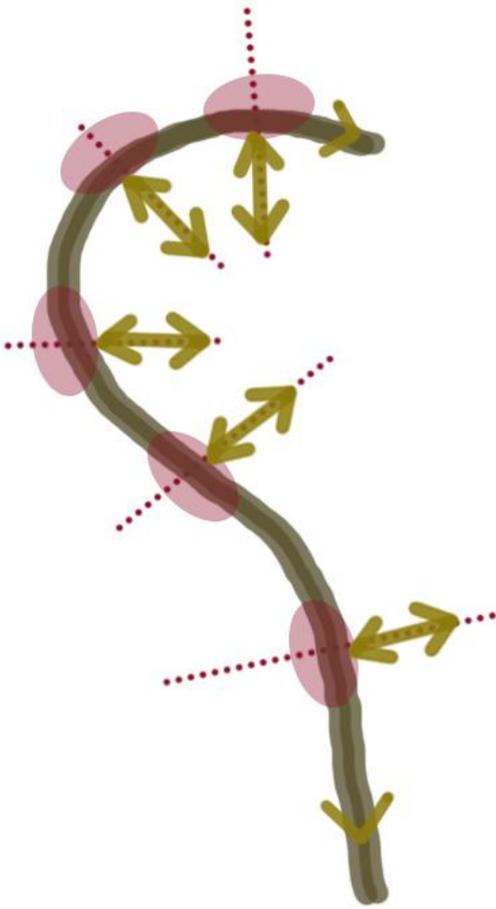


Figure 81: The main concept of restoring longitudinal and transversal connections along the coast through different types of conceived spaces and connections, Source: Author

# Strategy

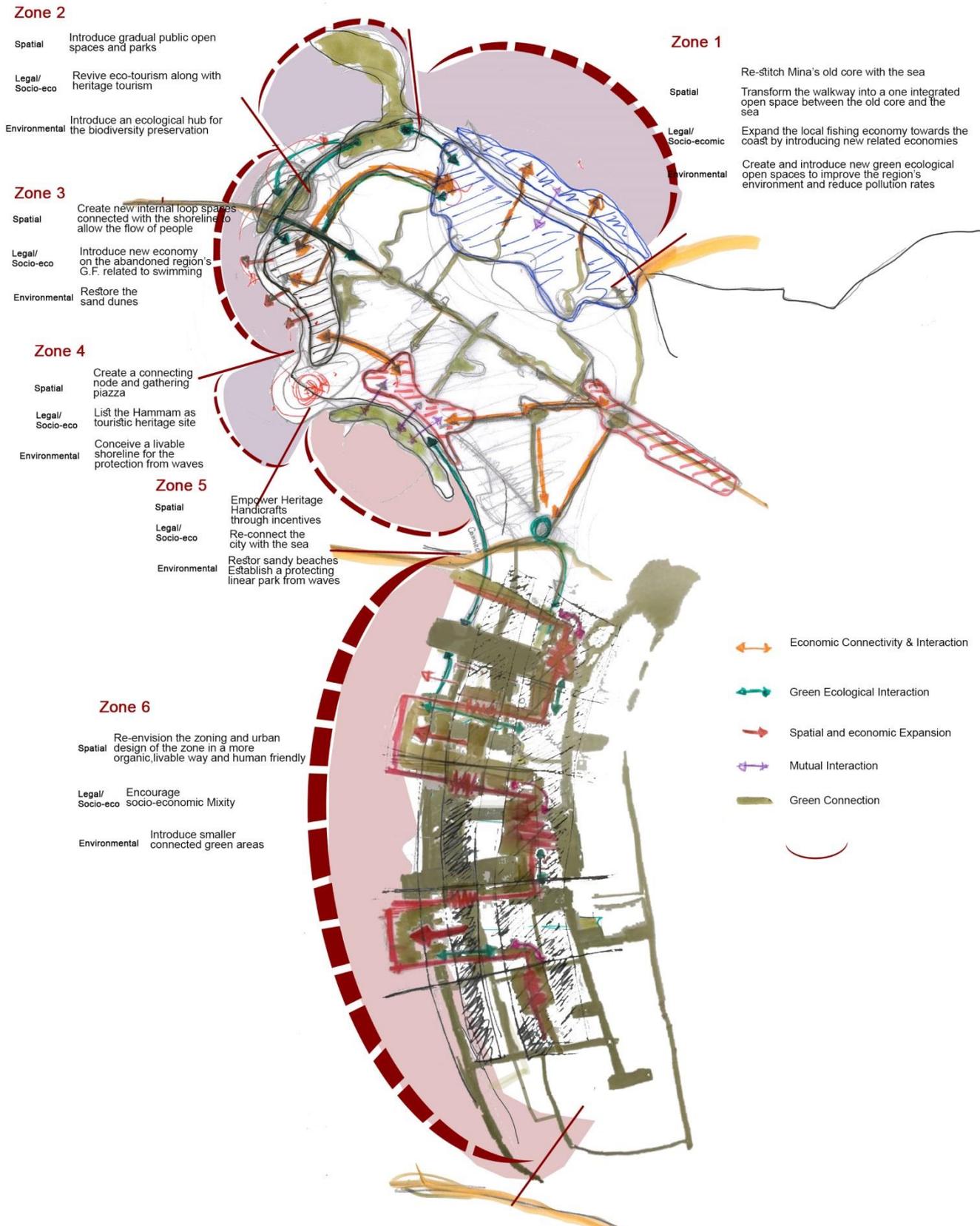


Figure 82: The main strategies for the concept development and implementation, Source: Author



**Figure 83: The main strategies for the concept development and implementation, Source: Author**

## **H. Case Study:**

New Jersey's northern shore represents an ideal case study for sustainable, resilient coastal development. This shoreline has been evolving throughout the years, especially on the touristic and economic levels. It has been known as well for its strong cultural identity and coastal significance. This had a great impact on the environmental and ecological conditions of the shore and its community. Therefore, the concept of this project tackles the economic, ecological and cultural assets of the coast in order to build a holistic understanding of the coastal dynamics and propose long-term sustainable solutions that promote resiliency of the coast. Accordingly, this project identifies three different contextual zones that require specific strategies and interventions.

The first area (Barrier Island) is the most vulnerable stretch along the New Jersey shore in terms of environment and ecology. It is prone to various changes in form and function. This is why the project proposes to combine both ecological and cultural services in a way that creates an iconic recreational space. Adding to this, a TDR strategy is proposed to preserve and enhance coastal properties and provide stability of the development economy.

The second zone (Headlands) is characterized by its wide open views and its attraction of new investments especially along the waterfront, and the accommodation of middle to high income groups. Additionally, this zone encounters several natural hazards. Therefore, it is proposed to construct a very strong boardwalk separating the beach from inland to reduce socio-economic stresses, improve walkability along this walkway and reduce beach erosion risks.

The third zone (Inland Bay) consists of increasing the level of integration and an improved ecological environment. Therefore, the project suggest reclaiming underutilized in-lands to use them as public spaces, in an intention to introduce recreational activities, integrate water management for improving water quality and protect existing habitat.

These strategies help in layering the different actions in order to address flooding risks issues, and make the coast more resilient. It helps in reinforcing as well east-west connections in order to increase community participation and integration. All this contributes to promoting co-benefits and provide ecological and economic benefit.

These strategies could be adapted and implemented in the context of Mina in order to improve the environmental and socio-economic assets of the coast.

### **I. Zone Design level**

The concept of the urban flexible platform focuses on four interactive components:

“Integrate – Connect – Develop – Sustain”

This consists mainly on turning the waterfront and the walkway into an accessible public space for economic, cultural, and recreational uses. However, the method and concept of application of these driving forces differ from a zone to another.

#### **Zone 1: Preserving the historic fishing port**

This zone represents the busiest highest populated area in the coast of Mina. Indeed, this area hosts the historical fishing port and is the richest when it comes to hosting other historical assets. Therefore, I suggest the following:

a. On the physical level:

- Re-organize the fishing port parking: implementing long wooden decks perpendicular to the corniche that allow fishing boats to park along them rather than along the corniche line. This helps procuring wider visual breakthroughs between parked boats (see n.1 on the 2d plan of Fig. 86). In between these created wooden decks and at the end of the extended pathways coming from the old core, I suggest to incorporate natural edges with sand dunes for restoring the disrupted ecosystems, fauna and flora in this zone due to the extensive fishing activities. These naturalized edges will create attractive and pleasant coastal places at the end of the deteriorated historical pathways to the coast (see N.2 on the 2d plan of Fig. 86).
- Introduce new temporary structures for encouraging economic (especially fishing related) activities to take place along the coast, and preserving the coastal marine heritage of Mina.

b. On the management level:

- Extend the social and economic activities happening along the coast in wards, by allowing the continuity of the coastal spaces inwards (see N. 3 on the 2d plan of Fig. 86) in order to re-inforce the coastal-city relation by reviving older part of the coastal city through connecting them to the economic flows happening along the coast.
- The abovementioned interventions require the improvement of the existing infrastructure and the different connecting roads and pathways towards the fishing port. This includes the implementation of safe pedestrian access routes towards the coast across the huge highway which should be transformed into a green walking friendly boulevard (N.4 in Fig. 86).

- Transform the existing large parking place next to Mikati's house into a large public landscaped piazza for diverse uses (N.5 in Fig. 86). Also, transform the fish market's fridge between zone 1 and 2 into a natural coastal park that connects with Abdul-Wahab Island and communicate with the inner parts of the coast (N.6 in Fig. 86). This park will represent a transitory public space allowing the establishment of new natural ecosystems by presenting a habitat for new marine species. It will act as a natural purifier of the fishing port pollutants.
- This zone will be managed and maintained by the local government in order to empower the existing local fishing industry and extend it along the coast, and protect fishermen rights and needs.
- NGOs are invited to initiate awareness campaigns on the importance of preserving the coast and its public aspect. Adding to that, inter-sectarian groups should be encouraged and formed between different ages and groups such as political leaders, developers, key stakeholders and community leaders in the coast.
- On the short run, store owners, street vendors as well as dwellers, should be engaged in protecting the coast by helping them to form coalitions, supported by non-governmental organizations such as NGOs. These coalitions would lobby for upgrading the coast's different degraded zones as the fishing port, and the sand dunes area, in order to provide better places for recreational/economic activities.

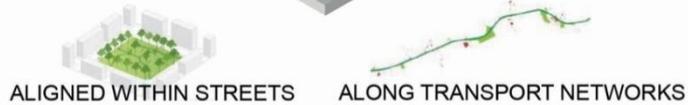


**CURRENT DRIVING CRITERIA**

SHORELINE TYPOLOGY



OPEN SPACE TYPOLOGY



BUILDING TYPOLOGIES



OVERALL DENSITY



INFRASTRUCTURAL PROBLEMS



EXISTING VIOLATIONS

RECLAIMED LAND FOR THE FISHING MARKET AND ARMY

PEOPLE ENGAGEMENT



EXISTING REGULATIONS

THE SYNDICAT OF FISHERMEN  
ZONE M2 & M8

**CONCEPT**



INVOLVED STAKEHOLDERS



POSSIBLE RESOURCES

Figure 84: Analysis of the different physical, social, economic and environmental component of the first identified zone (historic fishing port) of the coast of Mina, Source: Author



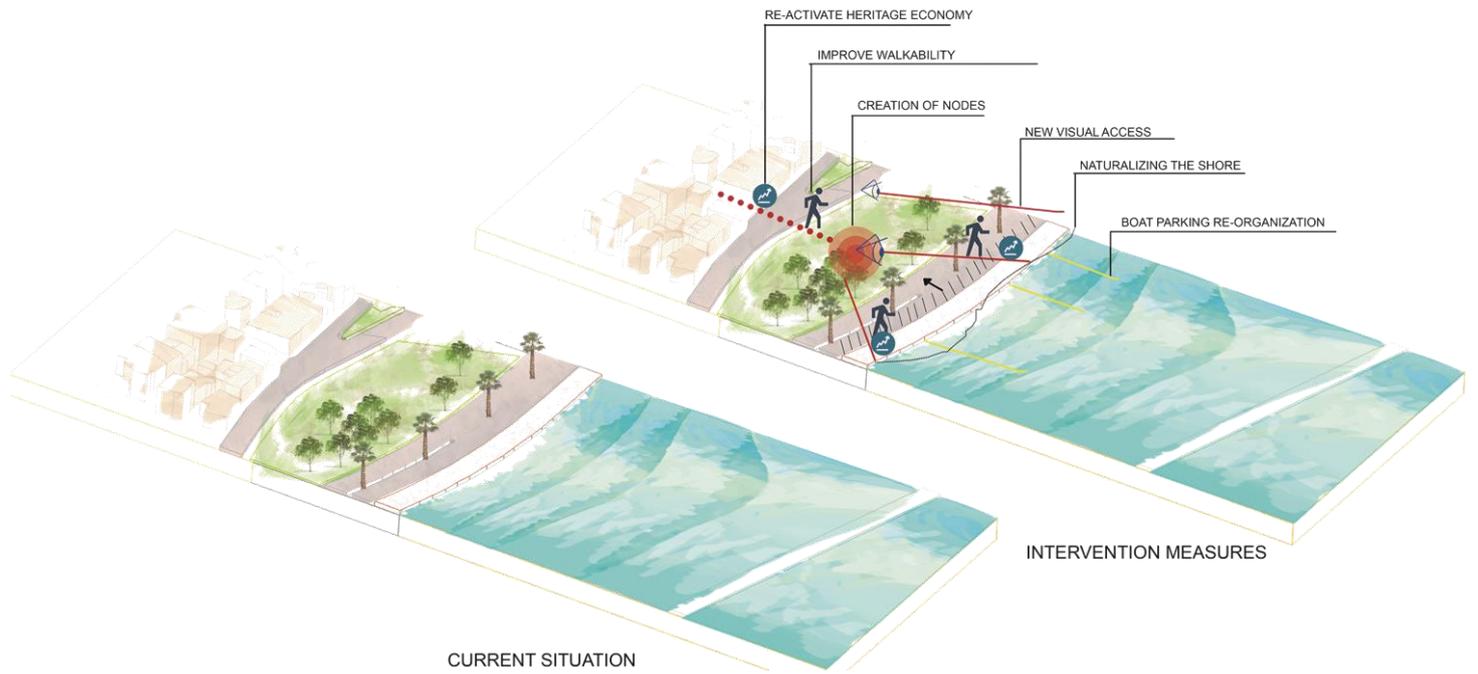


Figure 86: The design outcome for preserving the fishing port with its different principles, Source: Author

# IMPLEMENTATION MEASURES

## SPATIAL



## SOCIAL



## ENVIRONMENTAL



## ECONOMIC



## LEGAL

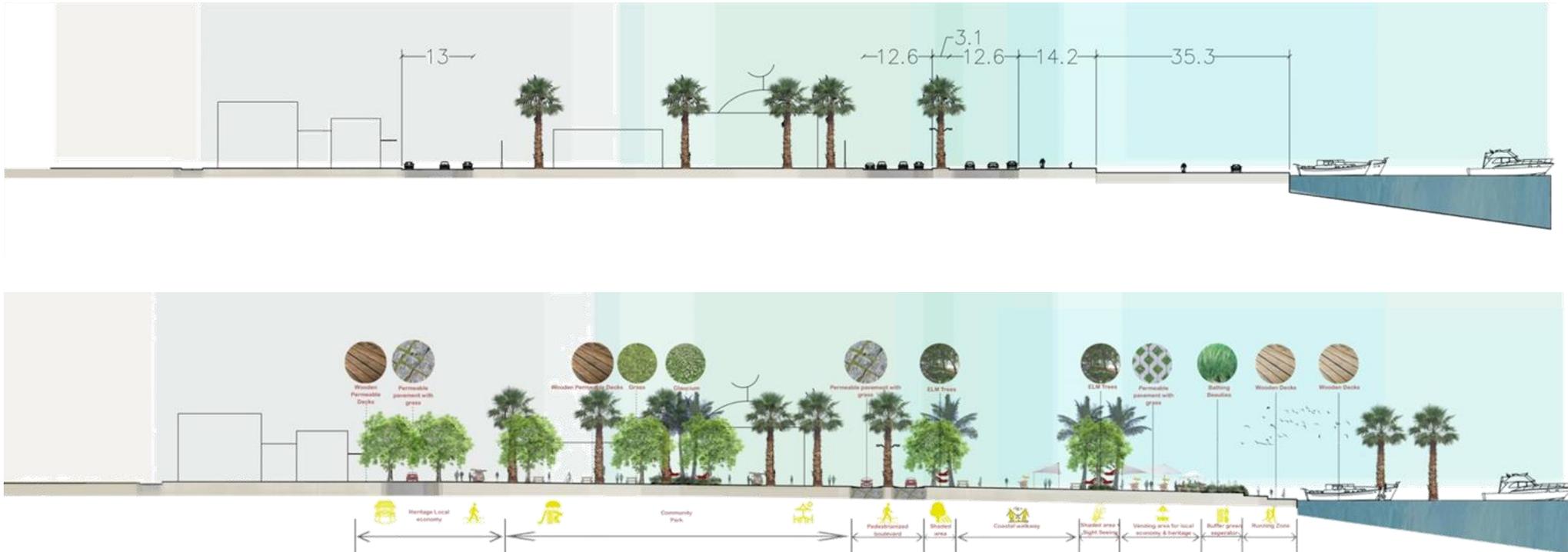


Figure 87: General sections that shows the design intervention for preserving the fishing port with its different principles, Source: Author

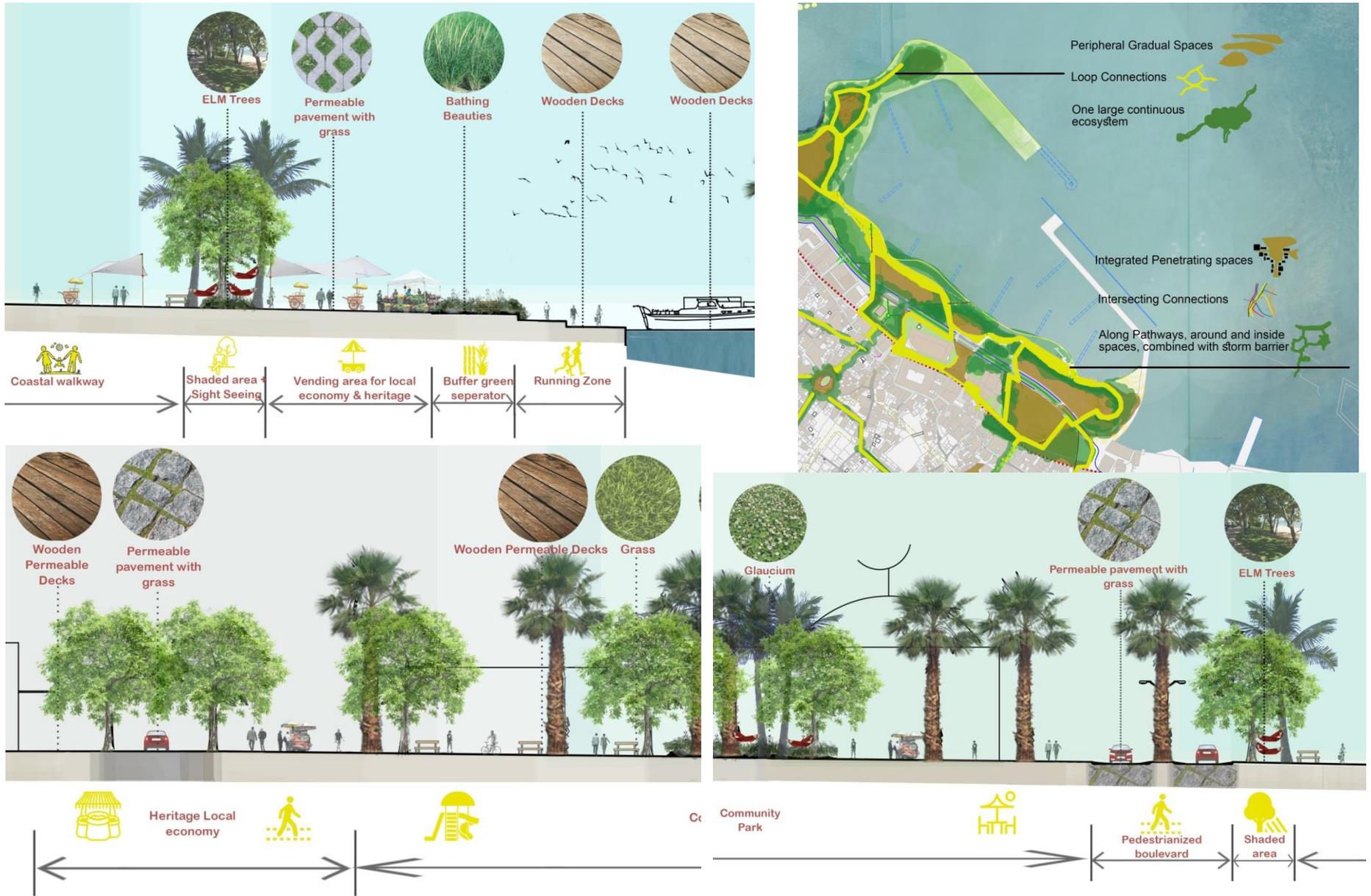


Figure 88: Zoomed in sections that shows the design intervention for preserving the fishing port with its different principles, Source: Author

## **Zone 2: Establishing a natural ecological hub in the island area**

This zone is an ecological area characterized by a diverse fauna and flora. It represents a main attracting point to a large number of visitors and tourists because it provides wonderful sightseeing spots and a wide range of street vendors selling groceries along the walkway. It is important to note that this zone hosts excessive diverse domestic uses which are deteriorating its ecological system and heritage value.

- a) On the physical level: I propose to connect this zone with the previously proposed natural coastal park through implementing connecting paths and pedestrian connections with the inner existing public park of this zone in front of the island. (N.1 in Fig. 90) This will help restoring the zone's unique marine ecosystem rapidly and reduce the over extensive use of the island.
- b) On the management level: I propose to list this zone as a natural reserve within the listed coastal protected areas by the "Ministry of environment". This should be done by the municipality with the support of interested NGOs and campaigns such as "Bahrouna Barrouna" and "الحملة الوطنية لحماية الشاطئ اللبناني". This will help protect the environmental and heritage aspect of this zone and enhance its ecological importance. In addition, managing this zone should happen through a public-private partnership. This helps running and maintaining the proliferation of street economy and other recreational and cultural activities that will be managed by the private sector. However, these economic activities will occur within a specific plan that takes into account the natural and ecological marine aspects of the area. This plan will be managed by the municipality and concerned ministries (environment, tourism and public work).

**02**

**Zone 2- Establishing a natural ecological hub in the Island area**

**CURRENT CONDITION**



**DESIGN IMPLEMENTATION CRITERIA**

SHORELINE TYPOLOGY

OPEN SPACE TYPOLOGY

BUILDING TYPOLOGIES

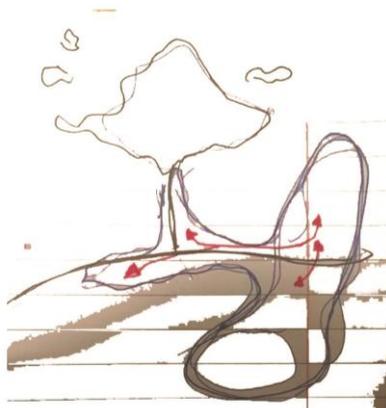
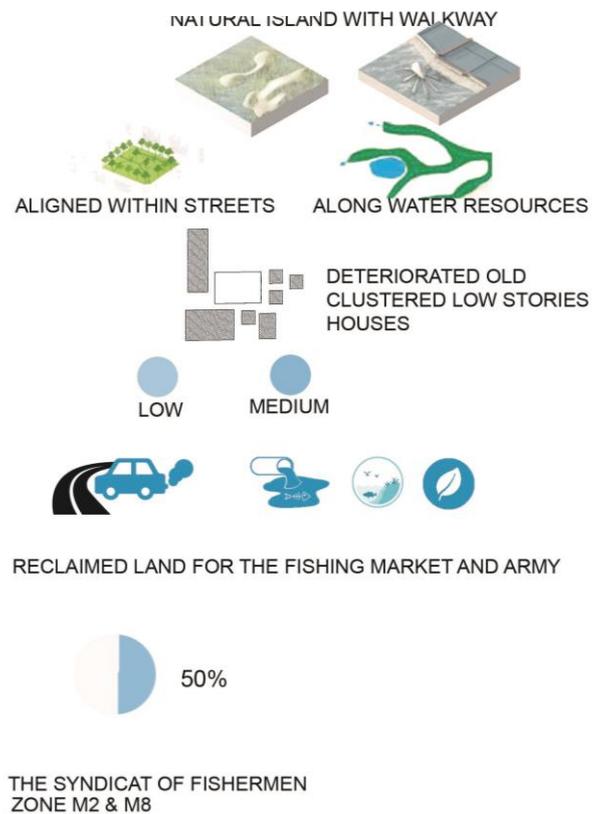
OVERALL DENSITY

INFRASTRUCTURAL PROBLEMS

EXISTING VIOLATIONS

PEOPLE ENGAGEMENT

EXISTING REGULATIONS



**INVOLVED STAKEHOLDERS**



**Figure 89: Analysis of the different physical, social, economic and environmental component of the second identified zone (natural ecological islands) of the coast of Mina. Source: Author**



Figure 90: The Design intervention for establishing a natural ecological hub in the island area

Source: Author

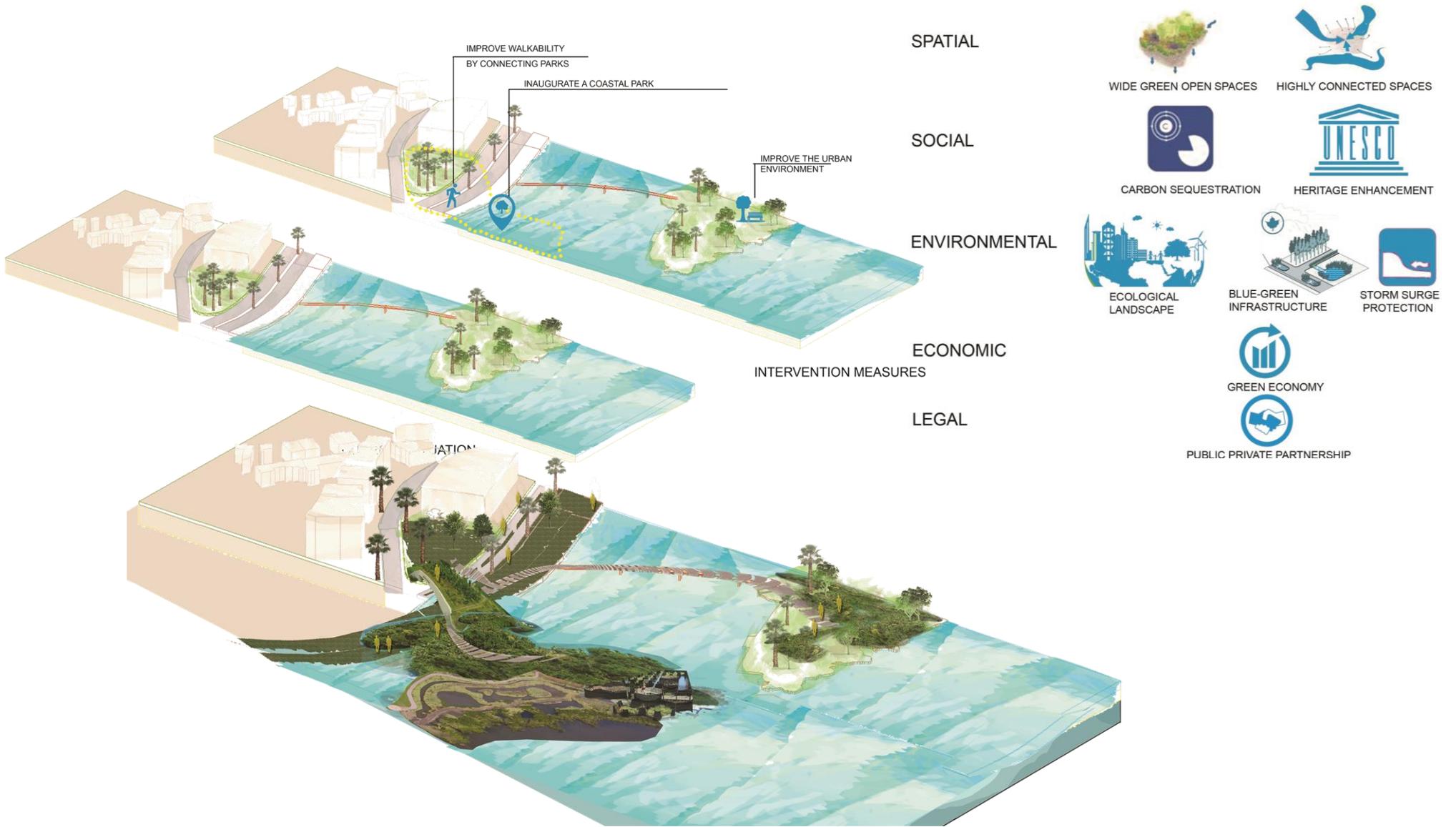


Figure 91: Design outcome for establishing a natural ecological hub in the island area, Source: Author

**Figure 92: Sections explaining the adopted solutions for establishing a natural ecological hub in the island area, Source: Author**

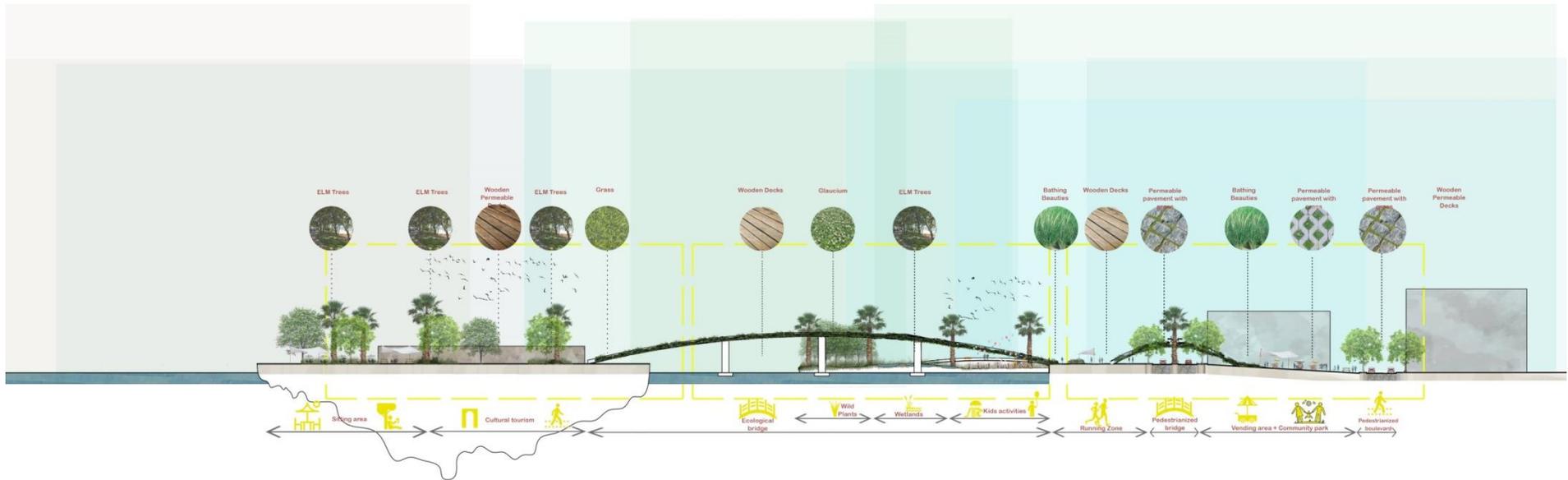
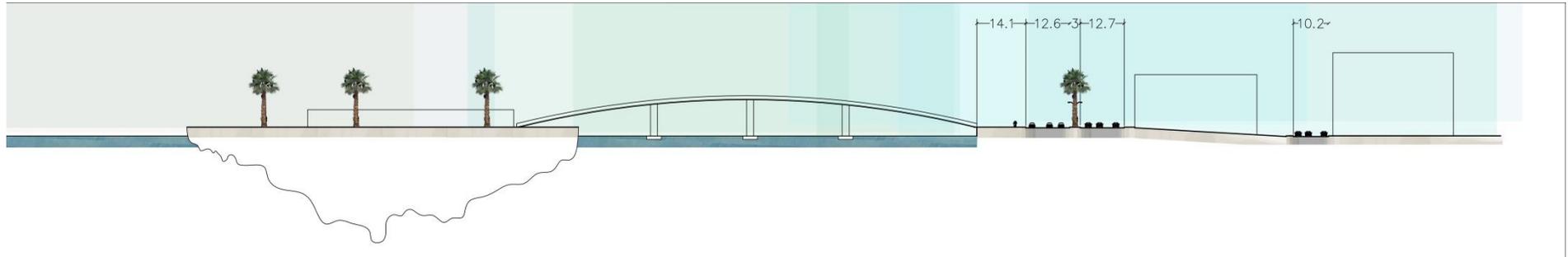
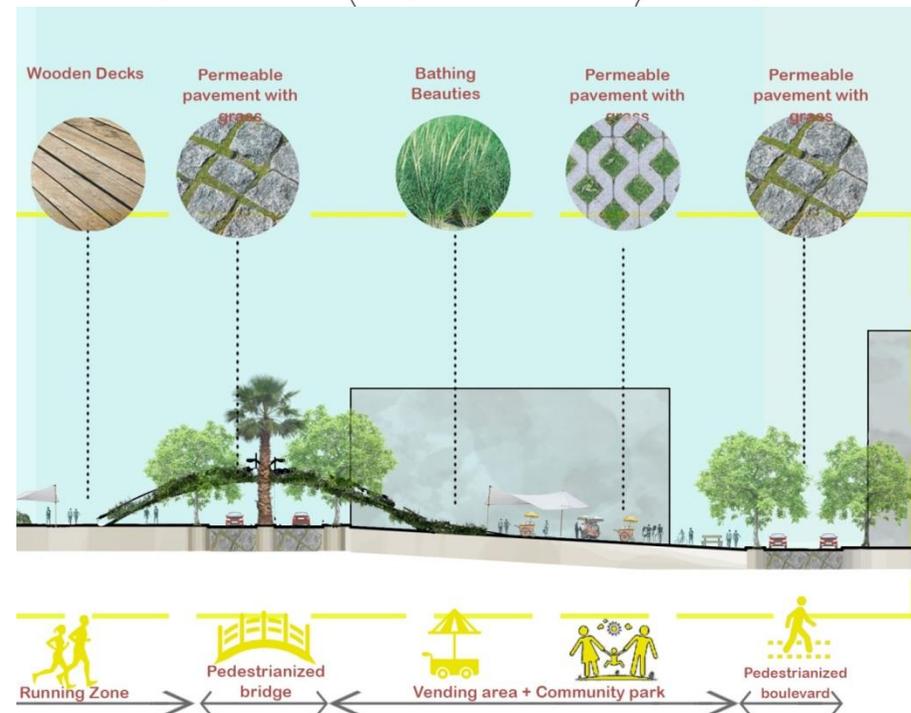
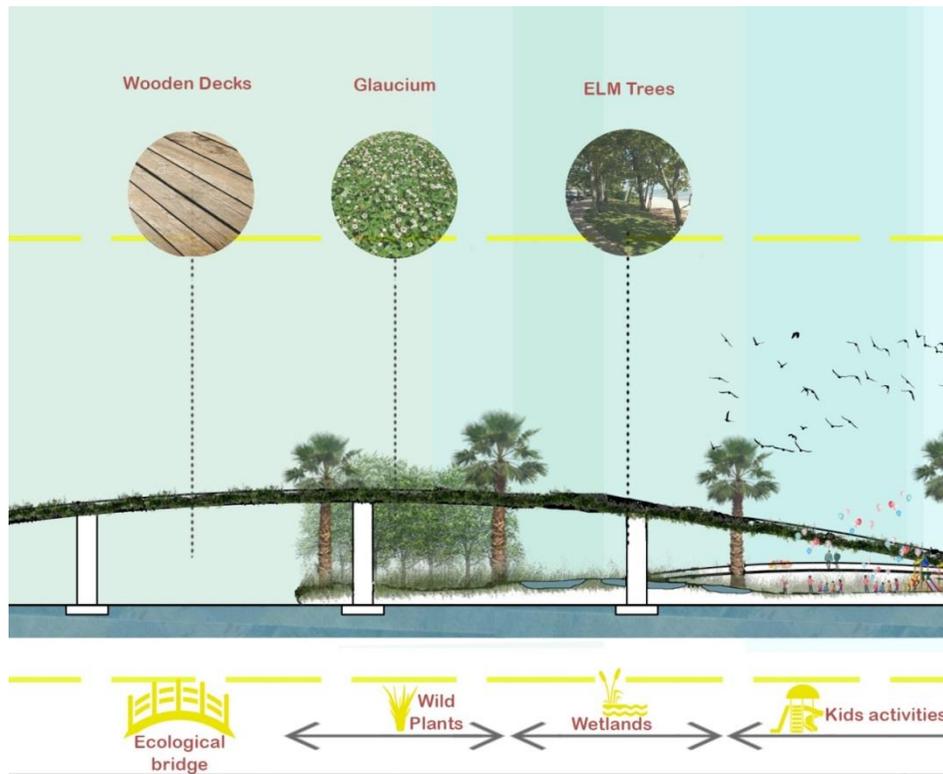
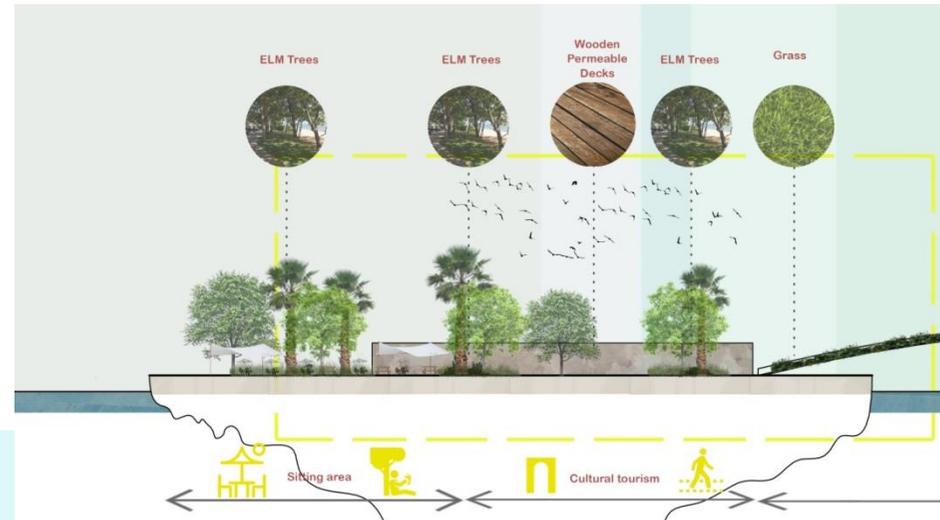


Figure 93: Zoomed in sections explaining the adopted solutions for establishing a natural ecological hub in the island area, Source: Author



### **Zone 3: Reviving the decayed linking zone of Port-Said**

According to the analysis, this zone represents the most vulnerable area as it lacks the presence of people and continuation of economic activity. It also suffers from a shortfall in the usage of the waterfront's ground floors. More importantly, this area contains wastewater pits that pour directly into the sea destructing by that all natural marine ecosystems. Fortunately, this zone encloses sand dunes that date back to before 1930s (Map. ), and it is strategically located at the end of the major historical connecting route (Port Said Boulevard) from Tripoli's old core towards the coast. This is why I propose to re-activate this zone and turn it into an experimental area that re-emphasize and restore the existing sand dunes, and initiates upon that, new recreational economies. This will help replicating inwards these new proposed ideas with supporting elements and strategies as following:

1- On the physical level:

- Clean and widen the existing sand dunes in the north-west of the coast of Mina and transform it into a bathing beach, while establishing new terraces along its edge on different heights levels. (N.1 in Fig. 94)
- Introduce new socio-recreational spaces along the walkway of this zone and inwards all along the waterfront's ground floor of this zone (N. 2 in Fig. 94), and create areas of extensive grass planting of the beach (N.3 in Fig. 94).
- Inaugurate a green urban civic experimental space at the end of the Port-Said Boulevard and connect it with the restored sand dunes through wooden pedestrian pathways along the walkway (N. 4 in Fig. 94). This public space will allow physical and visual free access to the sea and will incorporate tidal pools which will attract the flow of people from zones 1, 2, 4, and 5.

2- On the economic level:

- Adding to this, new small economies should be introduced to this zone along the corniche (mainly groceries selling, and beach and swimming utilities) in form of small temporary kiosks run by the municipality (this type of kiosks already exists there and empowers people with special needs) (N.5 in Fig. 94). This will animate the area with various uses which have a potential to be transferred inwards through designing new connecting green pedestrian pathways towards the inner waterfront zones.
- Rehabilitate the “historical khan” by allowing the initiated economies on the seashore to settle and expand inside of this khan (N.6 in Fig. 94). This contributes to revive both the economy and the heritage of this one.

3- On the management level:

- Encourage the municipality to impose taxes on closed/empty shops while providing subsidies for investing in these shops. This helps encouraging the local community to engage in re-investing in the waterfront of this zone.

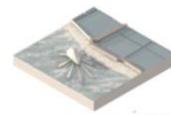
In sum, the urban platform in this zone acts as an experimental structure that allows the incorporation and transmission of new activities and spaces and their interaction with both sea and inner lands. It shrinks and expands according to the different coast materiality allowing by that the revitalization of this abandoned zone.

# 03 Zone 3- Reviving the decayed linking zone of Port-Said



## CURRENT DRIVING CRITERIA

SHORELINE TYPOLOGY



CONCRETE WALKWAY WITH VERMITIDAE PLATFORMS

OPEN SPACE TYPOLOGY



ALONG TRANSPORT NETWORKS

BUILDING TYPOLOGIES



AXIAL DISPOSITION OF THE BUILDINGS

OVERALL DENSITY



INFRASTRUCTURAL PROBLEMS



EXISTING VIOLATIONS

RECLAIMED LAND FOR THE FISH MARKET AND ARMY

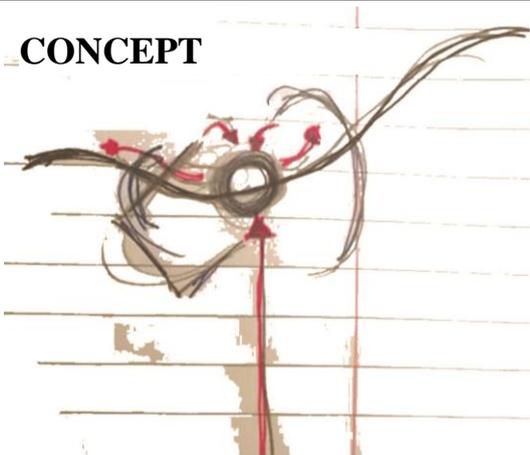
PEOPLE ENGAGEMENT



EXISTING REGULATIONS

ZONE M2 & M8 & M4

## CONCEPT



## INVOLVED STAKEHOLDERS



## POSSIBLE RESOURCES



Figure 94: Analysis of the different physical, social, economic and environmental component of the third port Said zone, Source: Author

## 2D PLAN



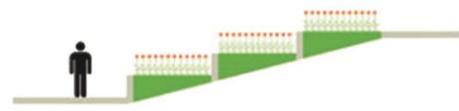
Figure 95: The Design intervention for reviving the decayed Port-Said zone

Source: Author

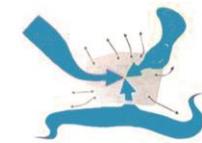


## DESIGN IMPLEMENTATION CRITERIA

SPATIAL



URBAN PLATFORMS



HIGHLY CONNECTED SPACES

SOCIAL



HERITAGE RESTORATION

ENVIRONMENTAL



ECOLOGICAL LANDSCAPE



SAND-DUNES

ECONOMIC



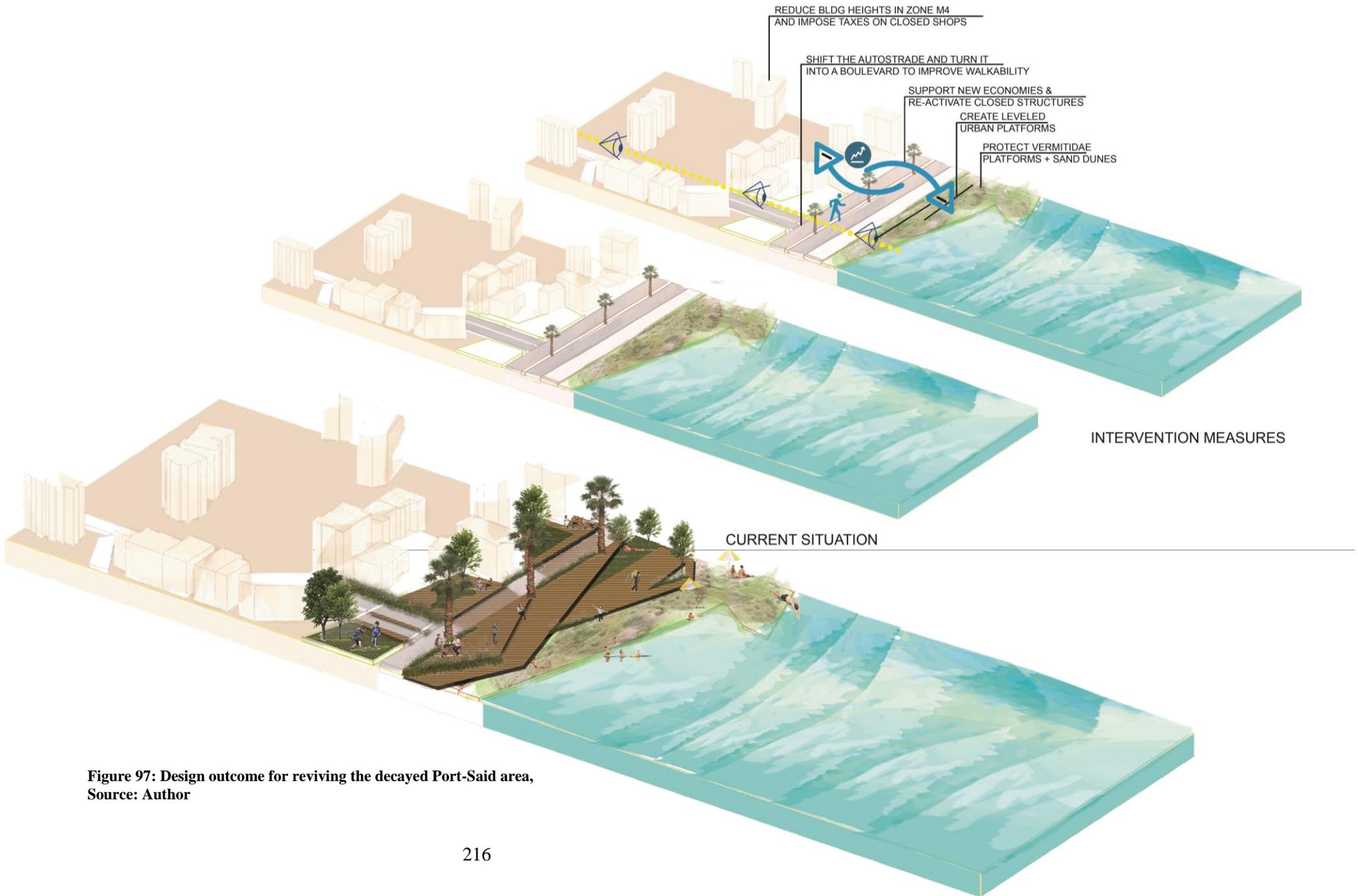
INTRODUCE NEW ECONOMIES & SUPPORT THEIR EXPANTION

LEGAL



PUBLIC PRIVATE PARTNERSHIP

Figure 96: Design outcome for reviving the decayed Port-Said area, Source: Author



**Figure 97: Design outcome for reviving the decayed Port-Said area,**  
Source: Author

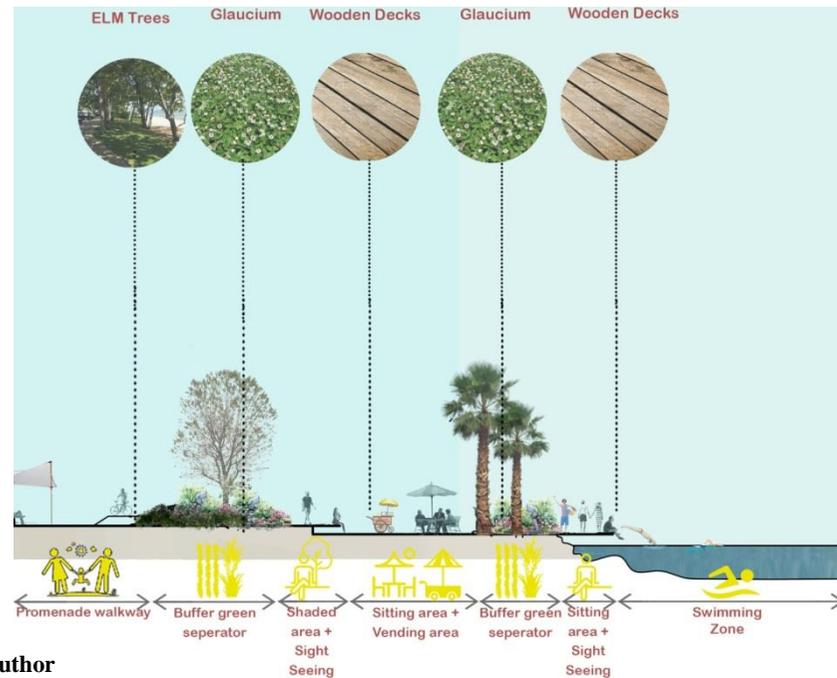
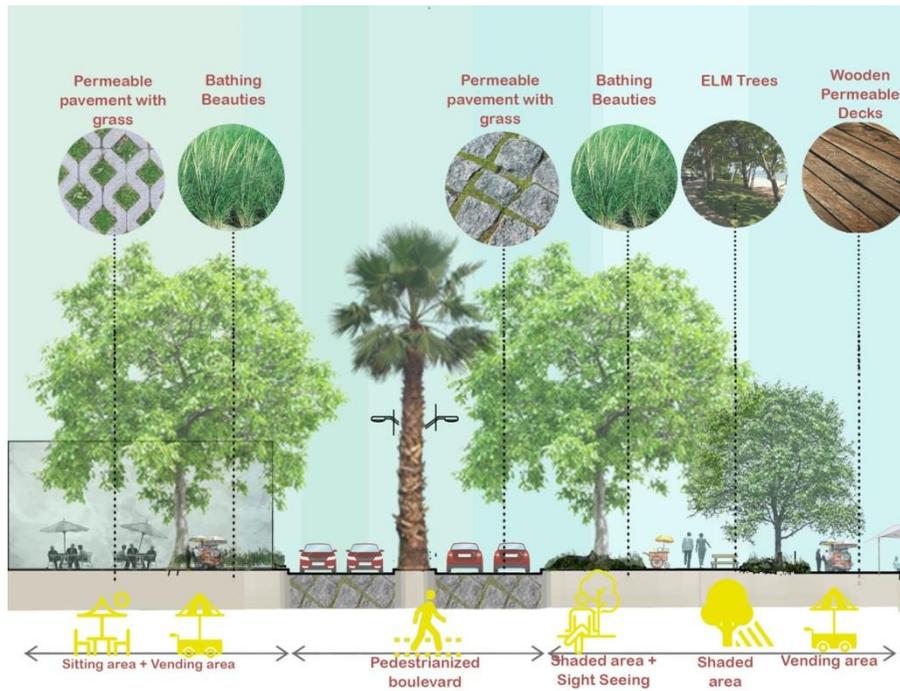
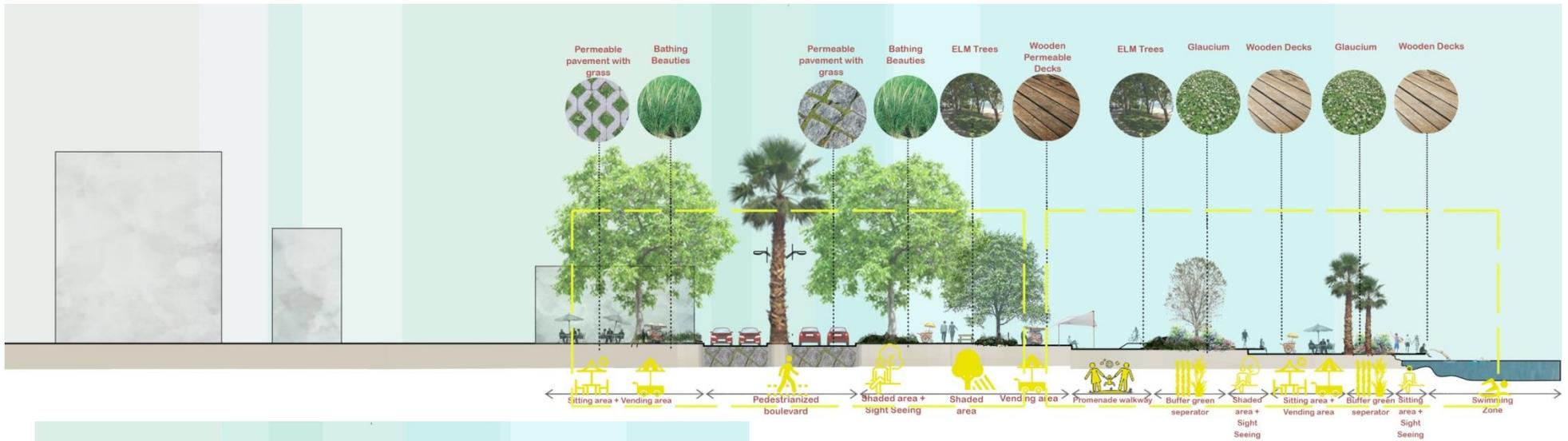


Figure 98: Design sections showing the revival of the decayed Port-Said area, Source: Author

#### **Zone 4: Re-stitching the Hammam-el Makloub area with the shoreline**

This area is characterized by high population and construction density, proximity of buildings to the sea, congestion as well as the presence of full physical and visual obstructions towards the sea. However, this zone encloses a very important historical monument that has been ignored and deteriorated for ages. Therefore, I propose to mold the urban platform in this zone in a way to reclaim the aligned coastal lands with the sea and to explore and revive the relationship of the sea area with its adjacent communities.

This includes:

1- On the physical level:

- Conceive a new public open piazza/platform designated to host daily random activities and other special events such as festivals. (N.1 in Fig. 97)
- Reclaim the land which falls right next to the sea and which is occupied by “Al-Sidawi” (a powerful individual with strong political power and connection) who’s been using this “Public domain” land for running his own private business as an entertainment hub. This reclaimed zone will be connected to the restored sand dunes in zone 3, through wooden paths, which will help inviting more people to this area and transmitting the flow people in zone 3 towards it (N.2 in Fig. 97). This help resolving the social and physical disconnection that used to take place there.
- On the other hand, I propose to activate the “Hammam el Makloub”, which is privately owned by Mr. (will fill his name once I’m back in Lebanon) and listed by the municipality as a traditional building. This will be done through transforming the “Hammam” as an open museum and historical site for the public, while incorporating some recreational activities inside of it as: museum, cafes, and real hammams (baths).

This could be effectively done by listing the building as a heritage site by the Ministry of Culture. Also, it is required to forge collaboration between the municipality, the ministry of culture and tourism and the owner of Hammam el Makloub and incentivize him to restore, maintain and preserve this building and open it for the public. This could be done with local government support that should provide him with subsidies, and the management of urban public space around the structure. This will help protect and valorize this heritage building and create a new attraction anchor point for people from both sides of the coastline and by that re-animate the place and re-connect it with the existing shoreline.

2- On the management level:

Looking at the susceptibility of this zone to excessive winds and high waves, the urban connecting space is re-imagined in this area as a natural protecting tool from winds, waves, and sea level rise. This will be done by introducing new innovative structures along the sea edge of this zone that incorporate new marshes and wetland landscapes for embracing migrating species displaced by sea level rise (N. 3 in Fig. 97).

# 04 Zone 4- Re-stitching the Hammam-el Makloub area with the shoreline

## CURRENT SITUATION



## CURRENT DRIVING CRITERIA

SHORELINE TYPOLOGY

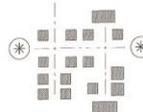


CONCRETE WALKWAY WITH VERMITIDAE PLATFORMS

OPEN SPACE TYPOLOGY

NONE

BUILDING TYPOLOGIES



AXIAL DISPOSITION OF THE BUILDINGS

OVERALL DENSITY



INFRASTRUCTURAL PROBLEMS



EXISTING VIOLATIONS

THE ENTERTAINMENT LAND

PEOPLE ENGAGEMENT



EXISTING REGULATIONS

ZONE M2 & M8 & M4

## CONCEPT



## INVOLVED STAKEHOLDERS

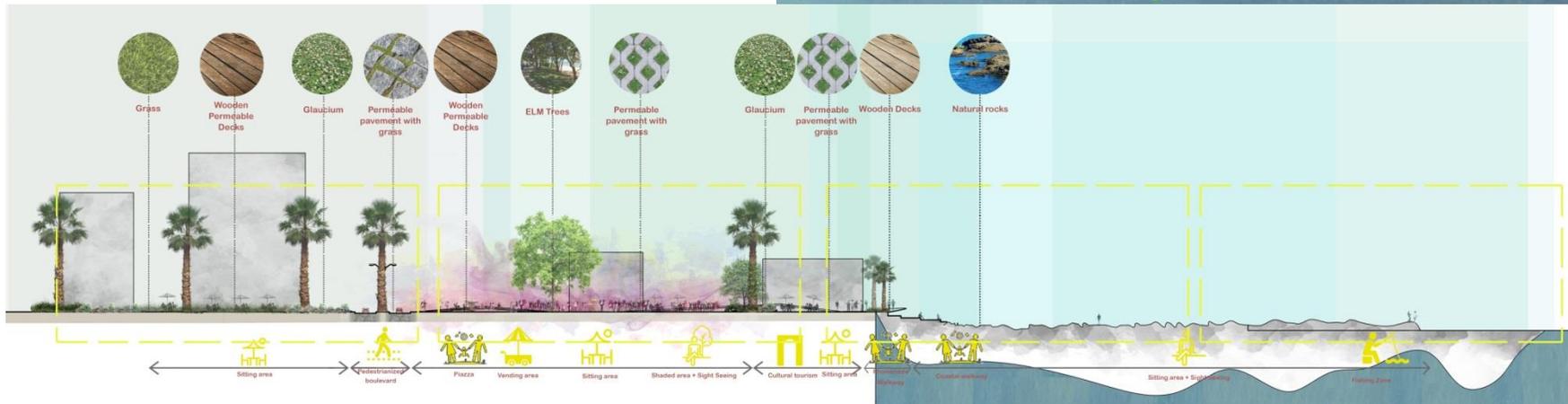
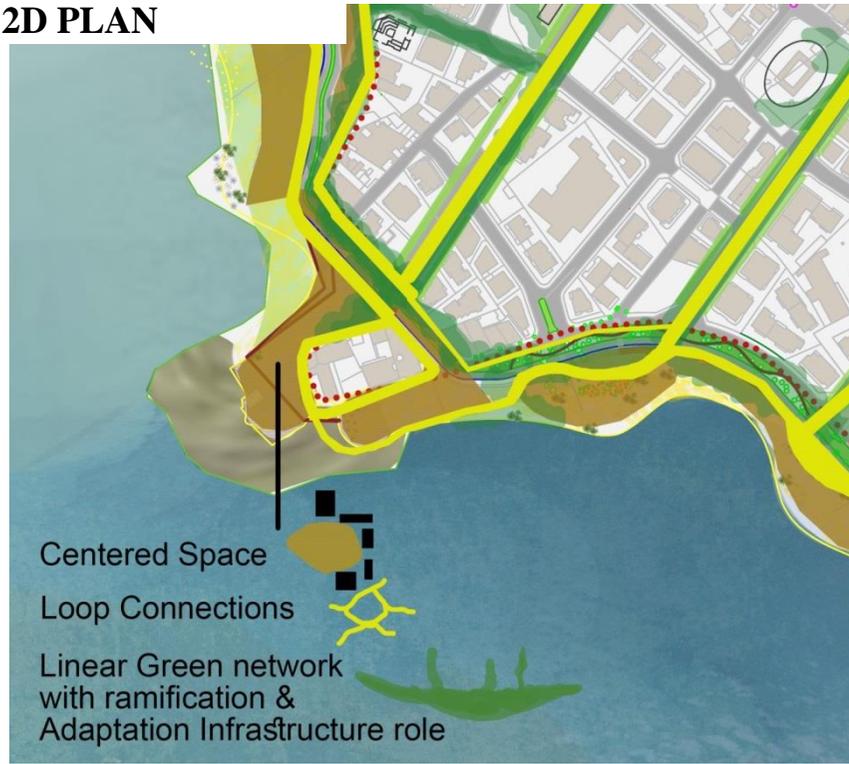


## POSSIBLE RESOURCES



Figure 99: Analysis of the different physical, social, economic and environmental component of the fourth Hammam el-Makloub zone, Source: Author

**2D PLAN**



**Figure 100: The Design intervention for re-stitching the Hamma el-Makloub area with the shoreline Source: Author**

# Design Criteria

SPATIAL



SOCIAL



ENVIRONMENTAL



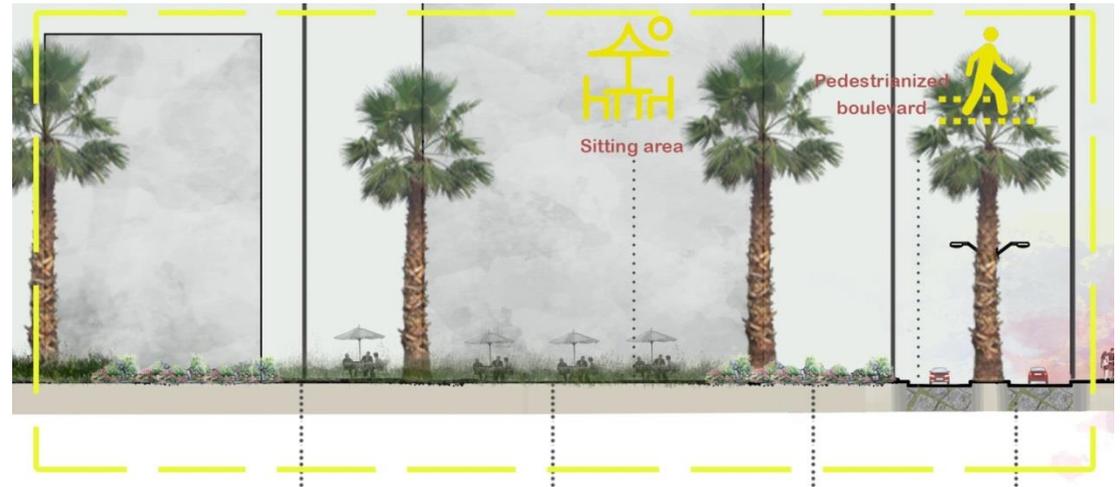
ECONOMIC



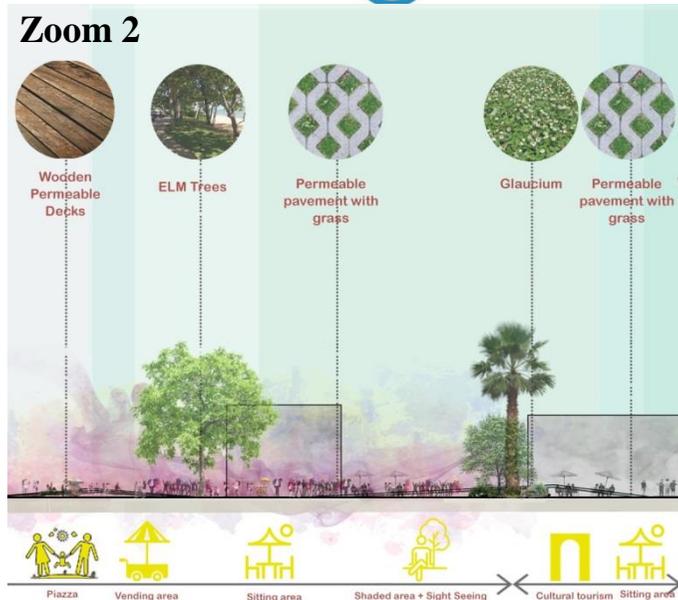
LEGAL



## Zoom 1



## Zoom 2



## Zoom 3

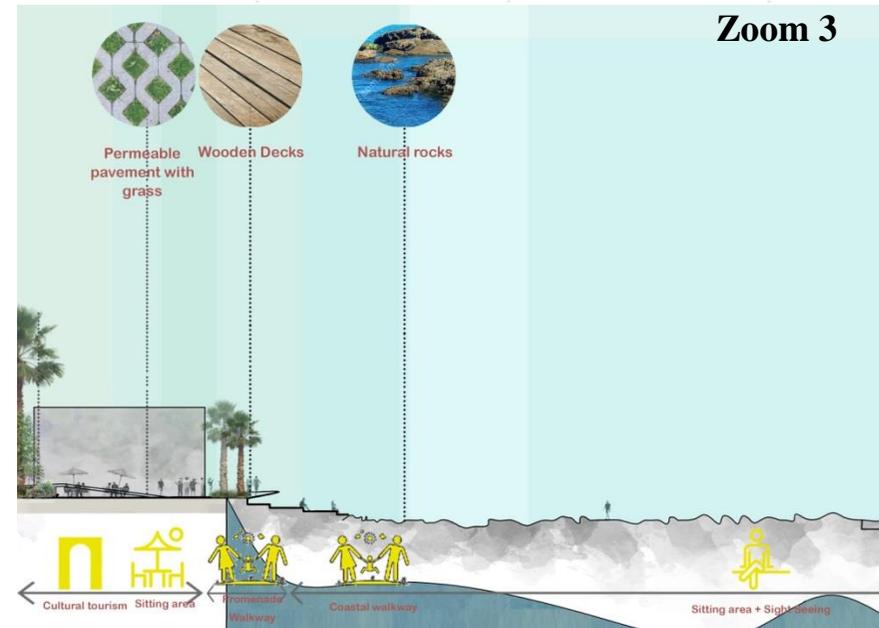


Figure 101: The Design intervention for re-stitching the Hamma el-Makloub area with the shoreline Source: Author

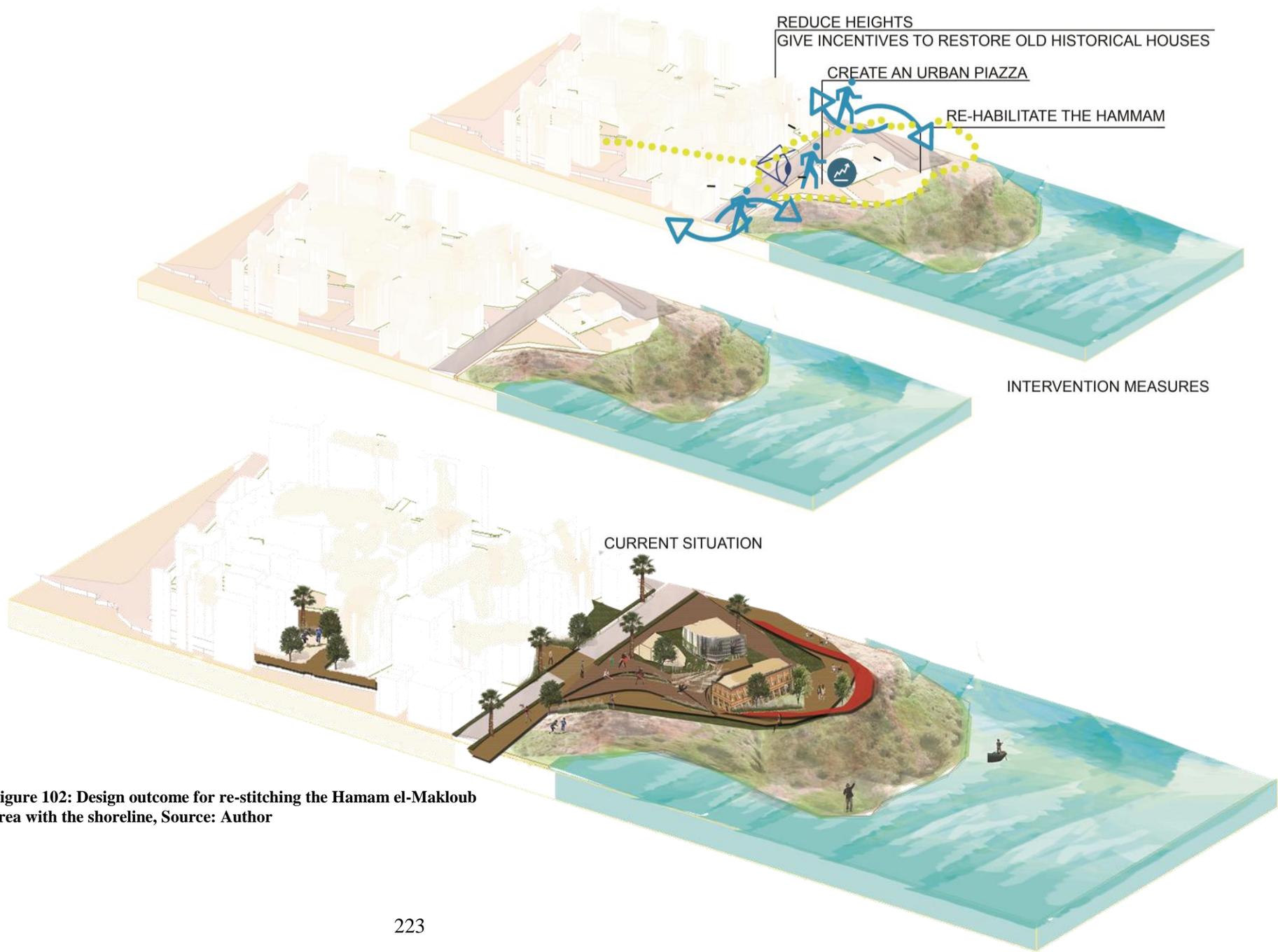


Figure 102: Design outcome for re-stitching the Hamam el-Makloub area with the shoreline, Source: Author

## **Zone 5: Restoring the sand dunes of the residential area to the public**

Although this zone presents a strong attraction for Mina coast visitors, which by its turn is leading to the initiation and proliferation of new small local economies along the ground floors of its waterfront (cafes, small restaurants, etc.); this zone is encountering the loss of some heritage handicrafts such as furniture manufacturing, and pottery industry. Nevertheless, the existing sand dunes are facing environmental degradation due to thrown litter. Thus, the urban flexible platform in this zone is will rethink the existing beach edge as a flexible open public space for bathing.

### 1- On the physical level

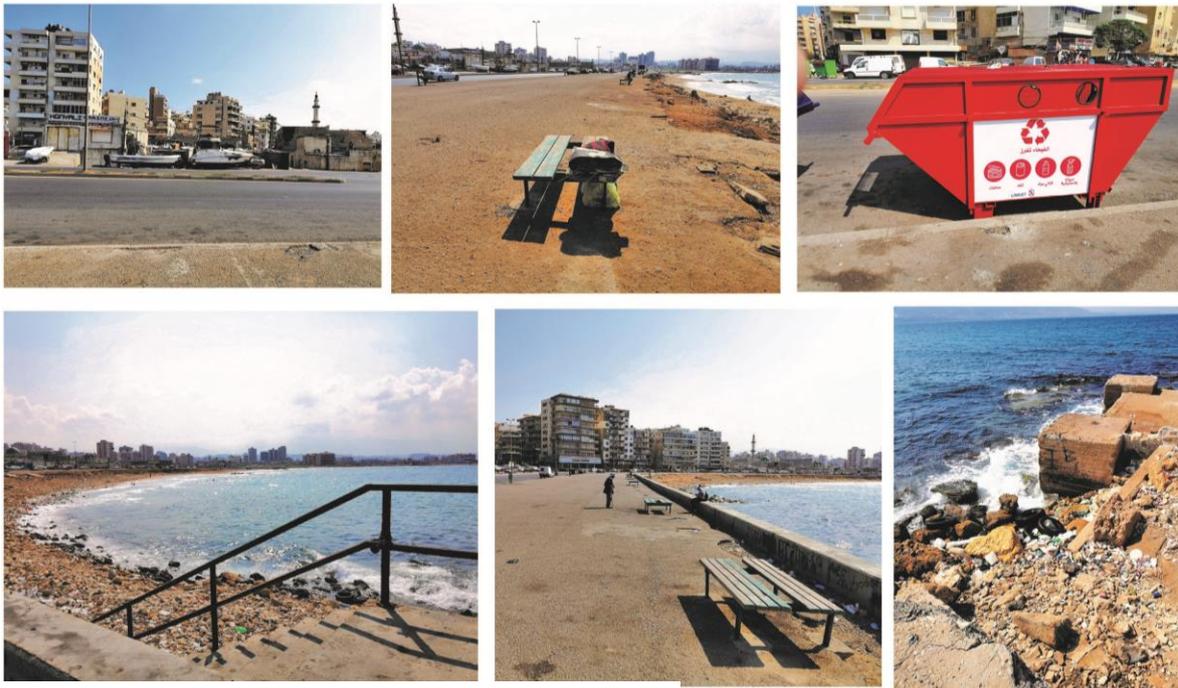
- The platform will endorse organic shapes and will incorporate several levels of platforms that will help improving the sea-city relationship and promote ecologically healthier landscapes. (N.1 Fig. 101)
- The platform will be both an experimental and civic space. It will foster the expansion of social interaction through the installation of seating and creative urban furniture all along the walkway and the sand dunes. (N.2 Fig. 101)
- Also, the sea-land edge will be softened and naturalized. It will encounter as well new natural tools to capture sand and form by that, natural dunes over time. This will help creating protection and habitat area for beach wildlife. (N.3 Fig. 101)
- Inaugurate a linear inner park along the road which helps absorbing strong south-eastern winds and protect by that the inner corridors of the city. Also, this park will play the role of a protector and water absorber during sea level rise. (N.4 Fig.101 )

### 2- On the management level

- This zone will be managed by the municipality of Mina in collaboration with ministry of environment, using collected money from organized activities along sand dunes.

# 5 Zone 5- Restoring the sand dunes of the residential area to the public

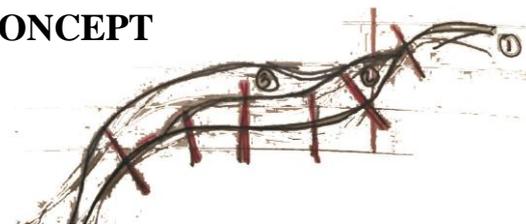
## CURRENT SITUATION



## CURRENT DRIVING CRITERIA

SHORELINE TYPOLOGY		CONCRETE WALKWAY WITH SAND DUNES
OPEN SPACE TYPOLOGY		GREEN LINE ALONG ROAD NETWORK
BUILDING TYPOLOGIES		AXIAL DISPOSITION OF THE BUILDINGS
OVERALL DENSITY		
INFRASTRUCTURAL PROBLEMS		
EXISTING VIOLATIONS	NO VIOLATIONS EXISTING IN THIS ZONE	
PEOPLE ENGAGEMENT		
EXISTING REGULATIONS	ZONE M8 & M4	

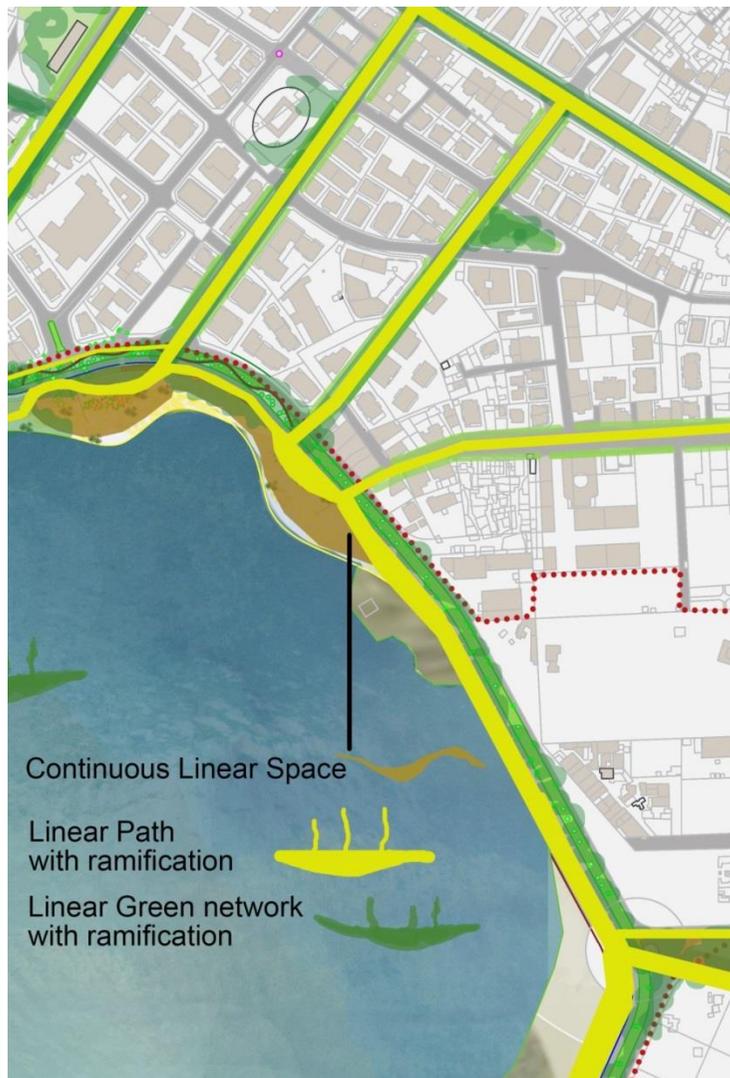
## CONCEPT



## INVOLVED STAKEHOLDERS



Figure 103: Analysis of the different physical, social, economic and environmental component of the fifth residential zone, Source: Author



**CONCEPT**



**2D PLAN**

**Figure 104: The Design intervention for restoring the sand dunes of the residential area**

**Source: Author**

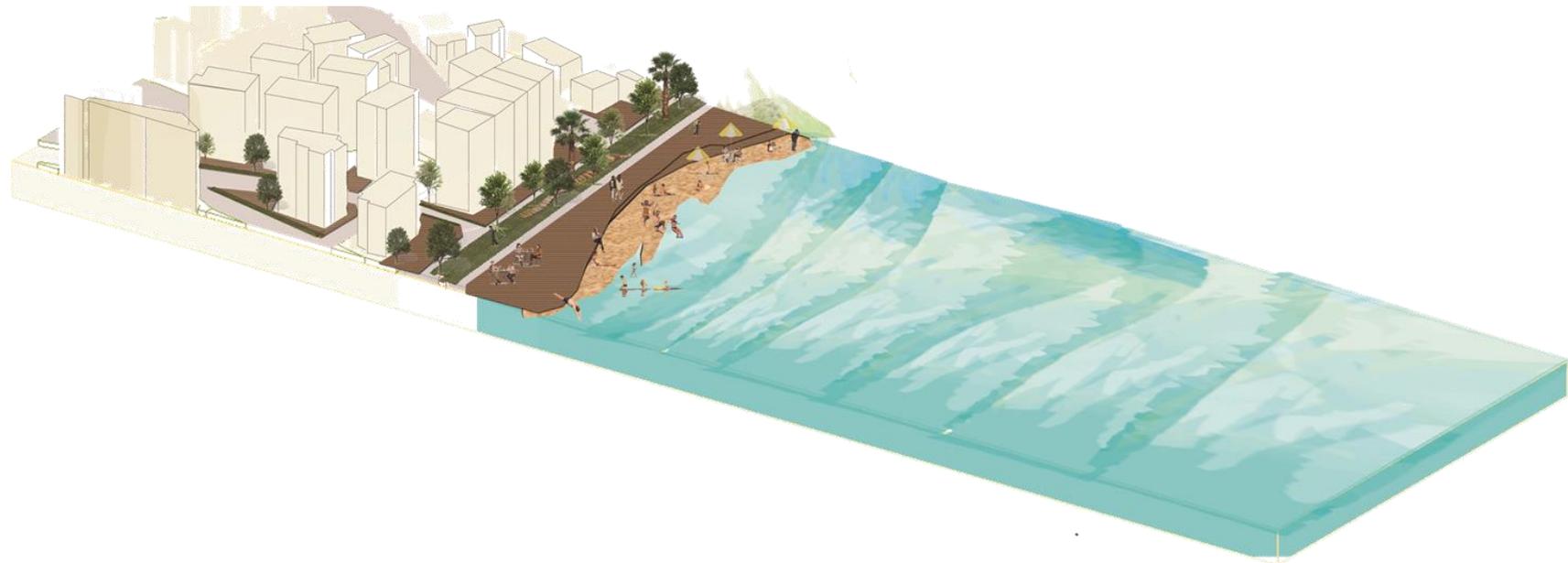
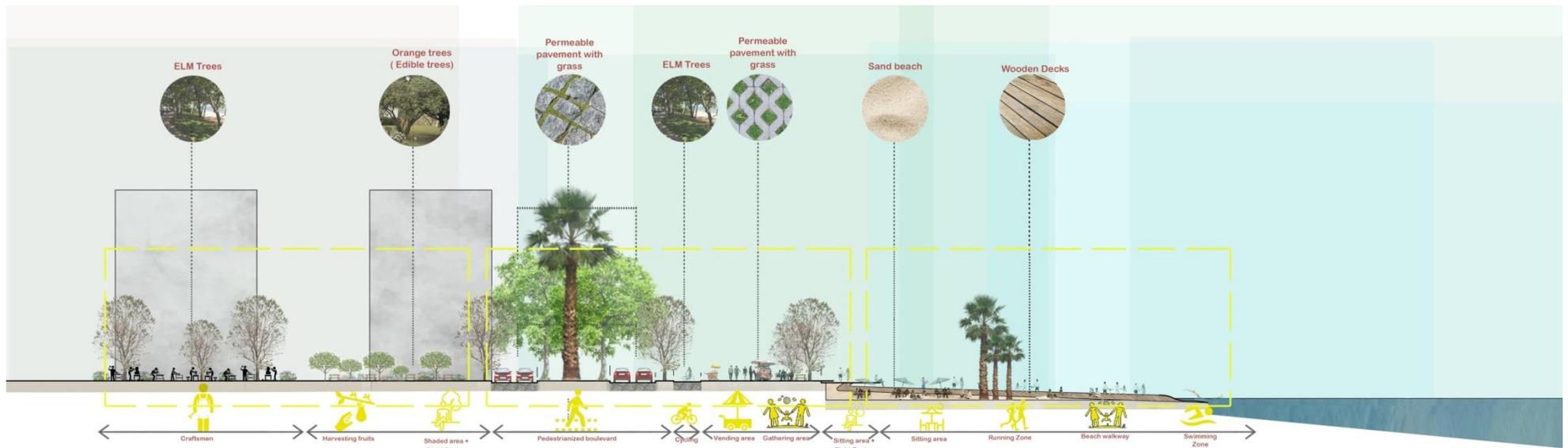
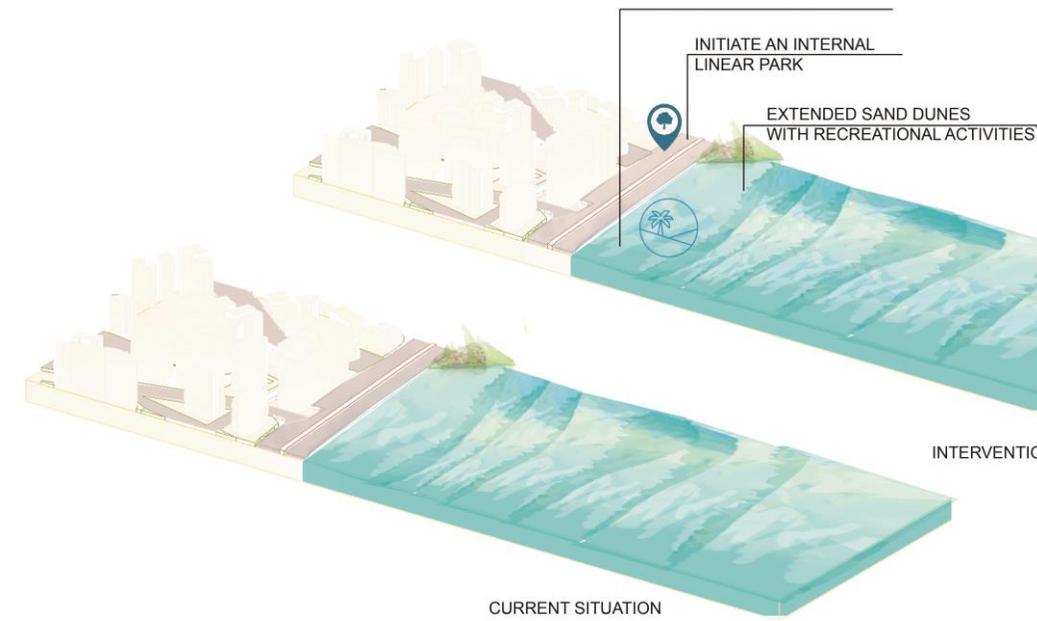
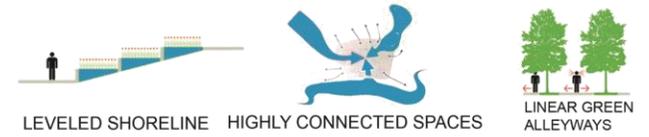


Figure 105: Design outcome for restoring the sand dunes of the residential area, Source: Author



## IMPLEMENTATION MEASURES

SPATIAL



SOCIAL



ENVIRONMENTAL



ECONOMIC

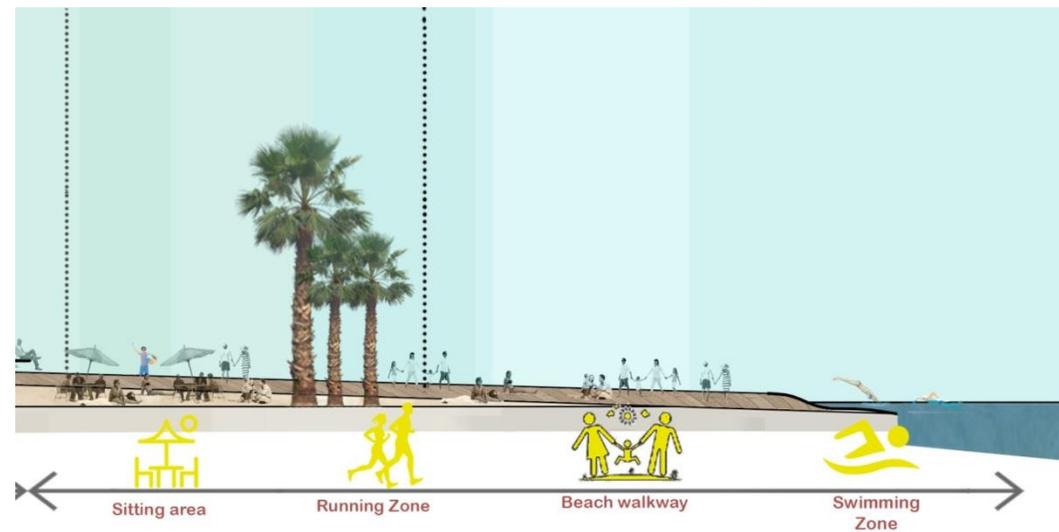
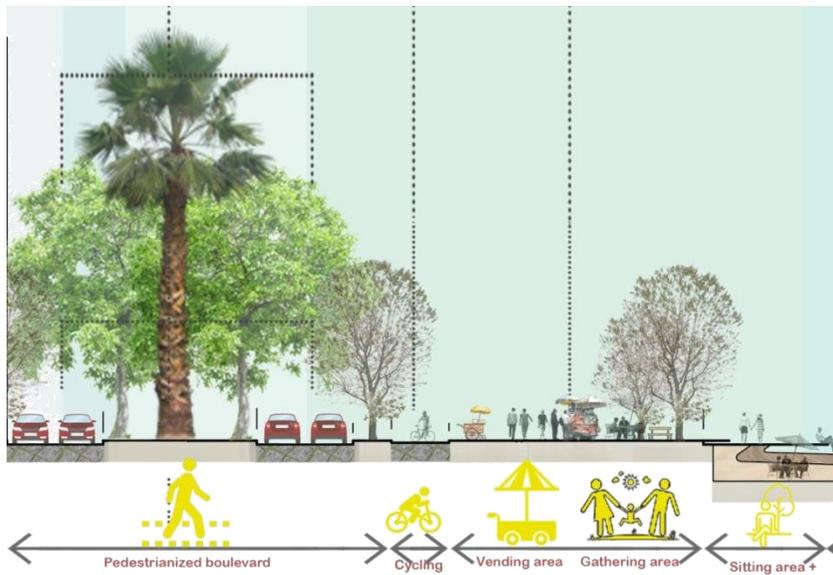


Figure 106: Sections of the restored sand dunes of the residential area, Source: Author

## **Zone 6: Manage the new developable area**

This zone represents a strategic place for the proliferation of development, beach tourism and culture due to its neutral and instable status. The fact that this zone is still empty makes it susceptible to diverse changes and vulnerable to several threats and exploitations.

This zone encounters the presence of vermitidae platforms that characterized a rich ecosystem of fauna and flora. Also, it is characterized with its modern plot design and distribution and the allocation of 3 main inner large public zones and parks. As a result to all of these factors, I propose:

### 1- On the general master plan level:

- Re-organize this zone as a newly developed area that draws a new modern and competitive part of the waterfront of Mina and emphasis on seeing the gradual transformation of the coast of Mina from highly historical to highly modern.
- In this area, the urban platform plays an essential role as an essential integrator and connector of the sea with the waterfront and inner lands. This is through conceiving integrating platforms that connects the shoreline with the inner parks of the zone with large pedestrianized flexible platforms and pathways (N.1 in Fig. 105). This helps in valorizing community's engagement and integration for guaranteeing that the new modern developments stay in the context of respecting public participation and wealth. It contributes as well to improve the anticipated city-sea relationships and continuous interaction.
- Also, the flexibility of the area will allow the introduction of new sustainable strategies and schemes for the preservation of the ecological aspect of the area, the free public

physical and visual access to the sea, and new hybrid recreational areas that allow the coast of Mina to grow economically and compete amongst other coastal cities.

2- On the sustainability and innovation level:

- This zone is prone to high water logging risks; therefore, similarly to zone 5, I suggest the implementation of extensive green spaces along the walkway and along the road, so it can retain rainfall water and sea level rise. (N. 2 in Fig. 105)

3- On the physical level:

- Various levels of accessibility with innovative landscapes will be introduced in this zone to allow optimum integration of development with ecology, recreation and natural beach experience. This is done by establishing on these elevated platforms various spaces that host different economic and recreational activities, but also natural spaces of rich ecological biodiversity (N. 3 in Fig. 105). This diversification of the beach economy in an ecological way helps protecting the shore from future unexpected changes.

4- On the economic and development level:

- Re-integrate recreational activities such as small cafes and kids' playgrounds on newly proposed wooden platforms above the vermitidae platforms (N. 3 in Fig. 105). These platforms should be protected from any human intervention for preserving their ecological value. Also, new public pools can be introduced next to the existing natural pools in the vermitidae layer (N. 4 in Fig. 105).
- New developments are allowed to take place only inwards, in the pooled zone. These developments should abide by the zoning regulations of zones M9 and M10 (4 and 6 floors respectively). Moreover, new regulations should be added to these zones in order to accommodate the existing informal settlers of "Haret el Tanak" and its surrounding.

These 900 families should be re-settled inside of this zone as relocating them outside of this area could have different physical and psychological negative repercussions (Godwin, 1993).

5- On the management level:

- This is why, I suggest to devise a tax incentive and additional floor rate ratio for developers in zone M10 to invest in mixed use buildings and to provide 15% of their allowed exploitation for inclusionary social housing.
- Public open spaces should be preserved in this zone by the municipality in collaboration with existing residence via awareness programs and campaigns organized by the municipality. This is in order to guarantee the persistence of a good quality of neighborhoods and livable spaces.

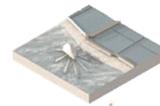
# 6 Zone 6- Manage the new developable area

## CURRENT SITUATION



## CURRENT DRIVING CRITERIA

SHORELINE TYPOLOGY



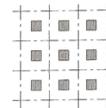
CONCRETE WALKWAY WITH VERMITIDAE PLATFORMS

OPEN SPACE TYPOLOGY



GREEN LINE ALONG ROAD NETWORK

BUILDING TYPOLOGIES



AXIAL DISPOSITION OF THE BUILDINGS

OVERALL DENSITY



INFRASTRUCTURAL PROBLEMS



EXISTING VIOLATIONS

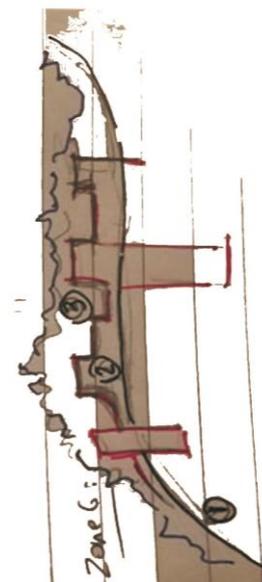
NO VIOLATIONS EXISTING IN THIS ZONE

PEOPLE ENGAGEMENT



EXISTING REGULATIONS

ZONE M8 & M4



CONCEPT

Figure 107: Analysis of the different physical, social, economic and environmental component of the sixth to be developed zone, Source: Author



Figure 108: The elaborated plans for the re-envisioning of the developable area, Source Author

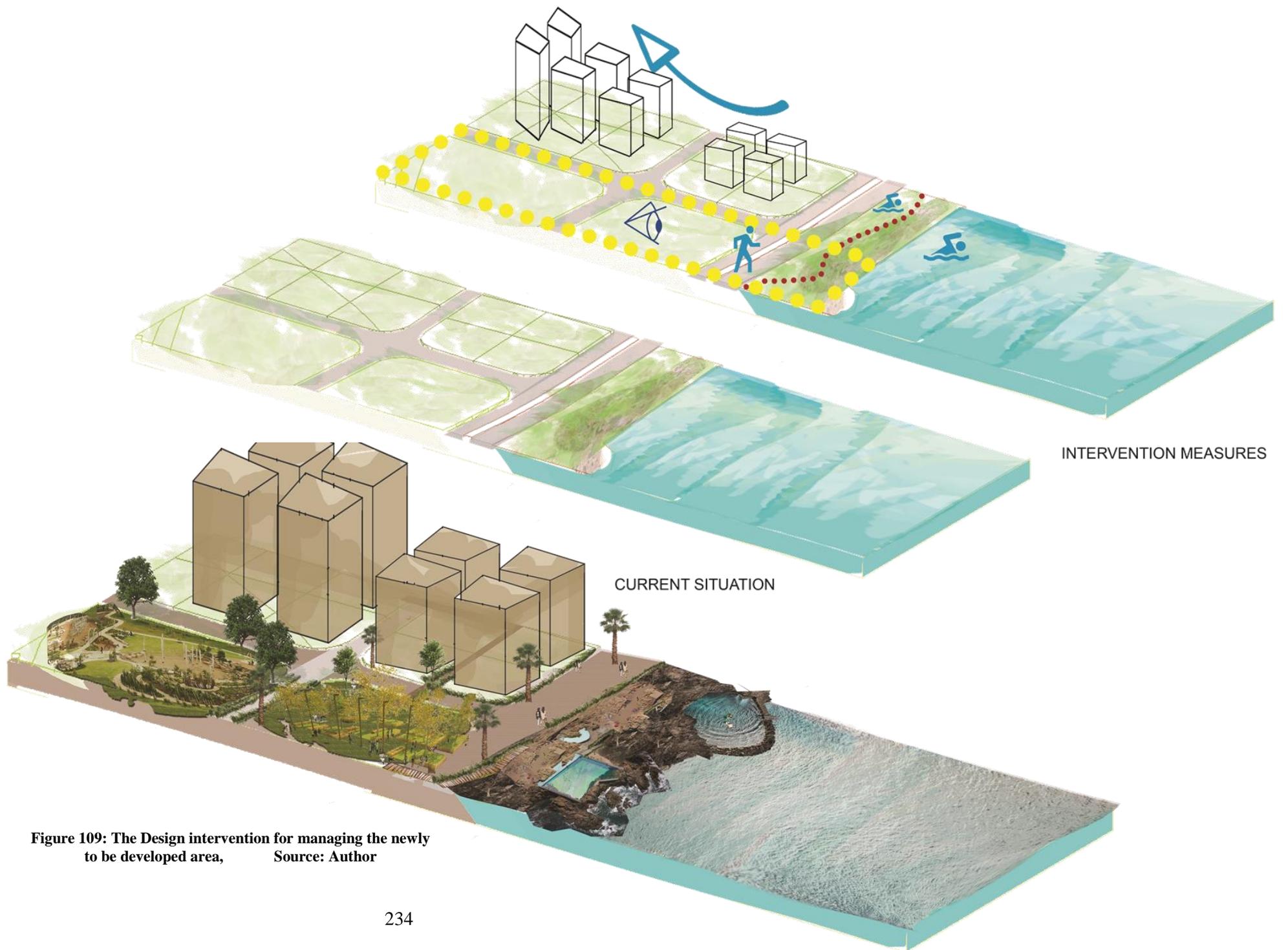


Figure 109: The Design intervention for managing the newly to be developed area, Source: Author

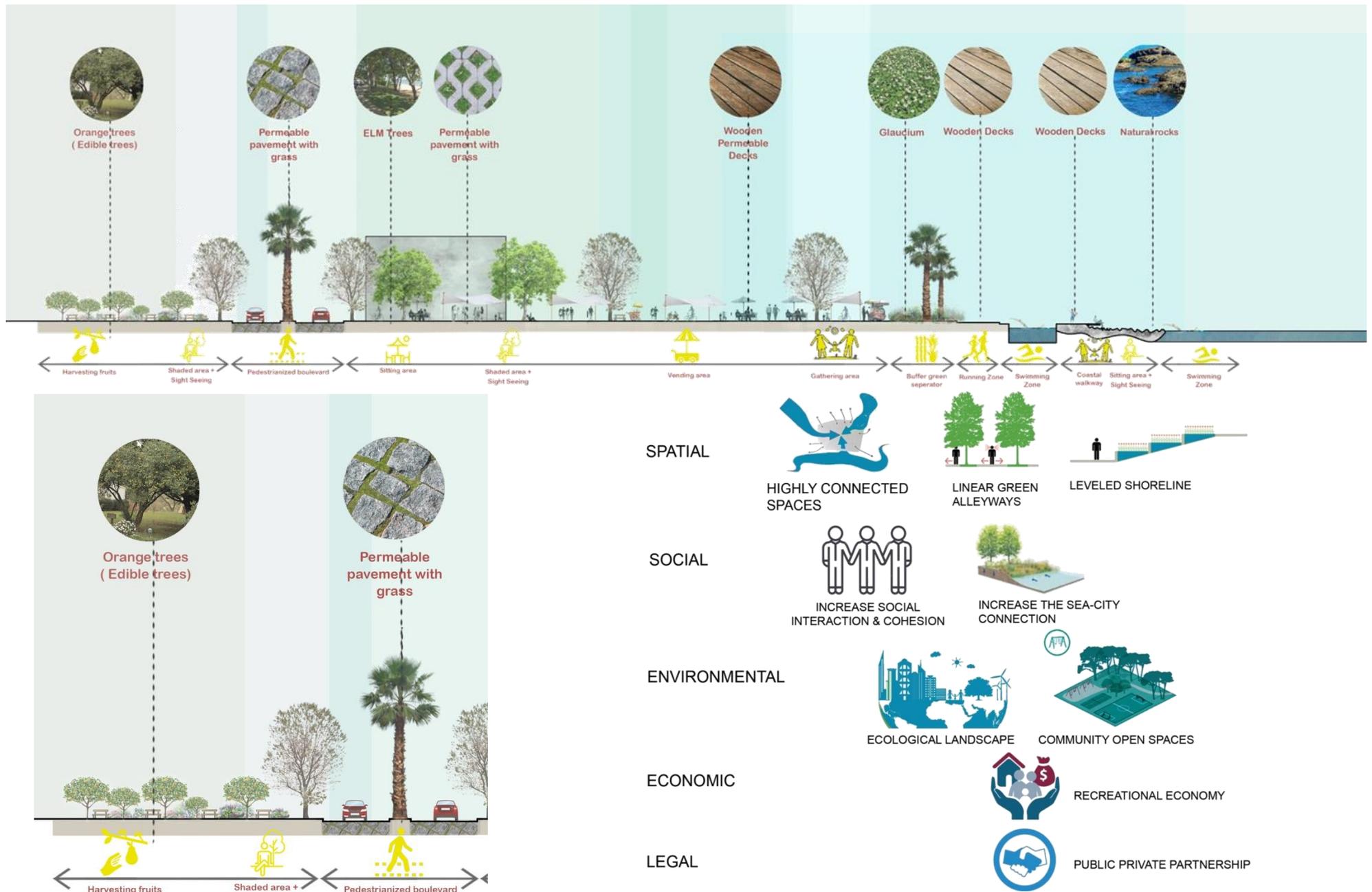


Figure 110: Design outcome for managing the newly to be developed zone, Source: Author

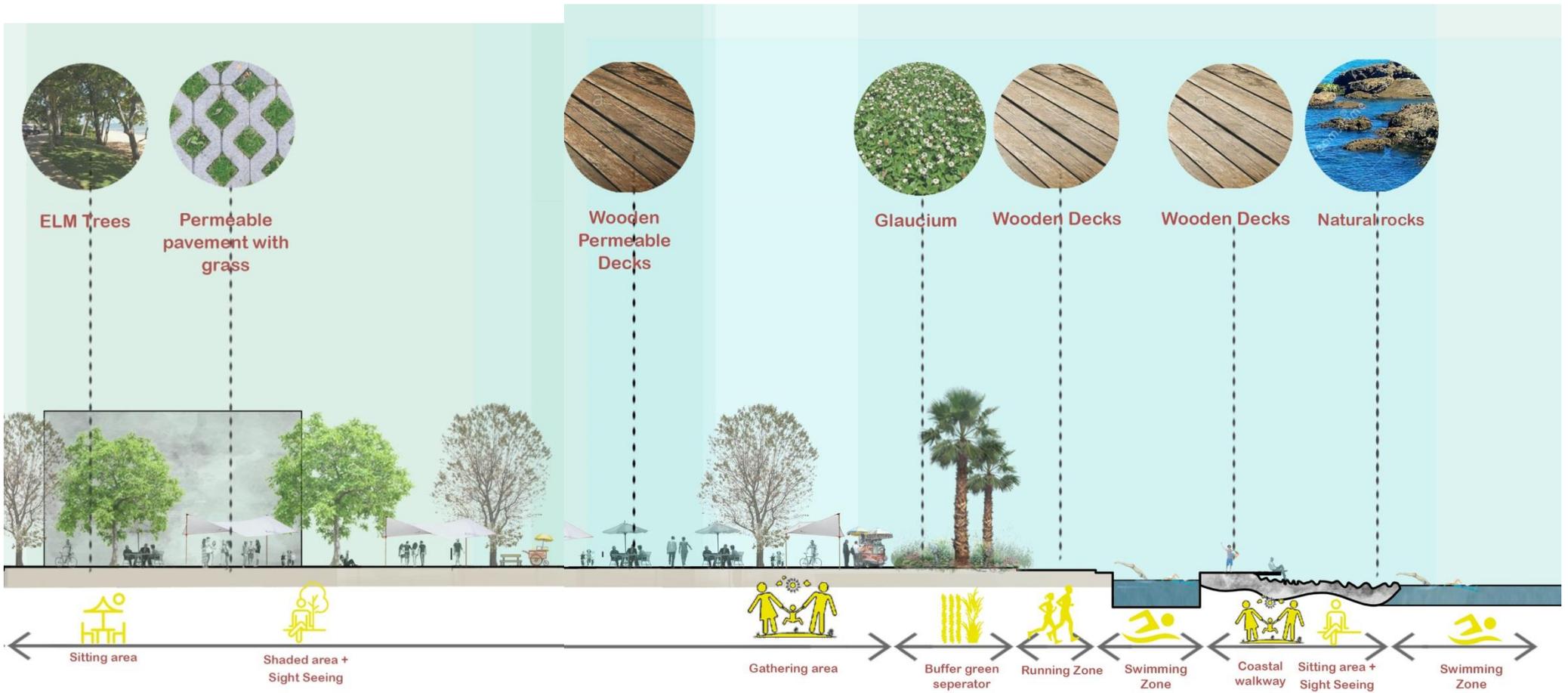


Figure 111: Zoomed in section showing the management of the newly to be developed zone, Source: Author



**Figure 112: General 2D detailed plan of the design intervention for the redevelopment of the coast of Mina, Source: Author**



## Chapter VII:

### Discussion and Conclusion

#### **Research Findings and limitations**

This thesis has focused on tackling the issue of achieving a balance between development and environment for the sustainable coastal development. I have elaborated an institutional prototype framework that focuses on ICZM (Integrated coastal zone management) for the development of planning and design solutions allowing the sustainable development of coastal zones.

The main findings in this thesis are that incorporating environmental goals in the perceived economic activities on the coast, help redirecting economy towards a more sustainable one and by that start achieving a balance between economy and environment. Also, the incorporation and adoption of new planning tools such as public private partnerships (PPP), land swap as well as applying taxes and monetary incentives remain as main tools for redirecting and better allocating development in a coastal city.

Nevertheless, the thorough research of the different ICZM principles, methods of implementation, goals and objectives showed that the different ICZM characteristics of allowing maximum collaboration and interaction between different stakeholders, sectors and components help in achieving sustainable development in rigid and complex settings like Lebanon. Also, its consistency on incorporating design and planning strategies and components help in tackling and improving coastal zones on different levels, which leads to holistic, all-inclusive and effective interventions as it treats coastal zones on all the possible and required field and components.

On the design level, my findings highlights the importance of defining character zones on a more detailed and local level, while at the same time design the areas in a larger continuous and complementary context. An additional finding that requires further investigation is the proposal of ever-changing, flexible design that enhances the proposed adaptability of the coastal zones that is usually enabled using new innovative design tools and interventions as nature based solutions and hybrid systems.

However, this thesis showed that working both on the design and planning levels is essential for the successful implementation of an efficient management and development plan. It showed as well how it is important to treat each coastal zone of a city differently for guaranteeing achieving a right balance between development and environment.

For instance, the approach adopted in the old historical core and fishing port consisted on re-connecting the city with the sea, restoring old alleyways, and empowering the local economy and rich fishing heritage. This is because development in this zone needs to be re-directed towards being part and a support to the existing local economy, which helps in protecting heritage while at the same time reviving economy and allowing urban development to happen.

Furthermore, a complex and scattered context like this zone requires more achievable and down-scale approach of integrating developers within the existing economy rather than banning them from developing or pushing them to invest in large industries. In addition, empowering the local economy and re-enforcing the people's relationship with the coast help in protecting the coast from any external threat or possible violating activity.

On another hand, addressing development in the new developable area differs a lot from the first zone, where new and strict decrees should be issued for preserving the coast and controlling development directions. For example, restricting development projects from being established on the sea surface or immediately next to the coast help in preserving the just and equitable urban structure of the zone and in assuring the perseverance of free access to the sea. Also, encouraging new economies and investments to take place in the inner parts of the zone through giving monetary incentives and tax reductions help in revitalizing the area with new creative activities.

Finally, this thesis showed how different implementation approaches specific to the context is key for ensuring an efficient balance between development and environment. Also, it proved that combining all of these approaches and strategies under a one major aim and within a planning framework while allowing flexibility of interaction between different character zones help in providing a more integrative, efficient and holistic planning and design approach.



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