

# Littoralization and Urbanization

Lebanon scale





Co-Evolve4BG

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

# Littoralization and Urbanization Lebanon scale



جمعية أمواج البيئة  
AMWAJ NGO



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## OVERVIEW

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

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## REVIEW

### Contributors

**Talal DARWISH**, Pr.

📍 Center of Remote Sensing, CNRS, Lebanon

**Amin SHABAN**, Pr.

📍 Center of Remote Sensing, CNRS, Lebanon

**Sana ABI DIB**, PhD

📍 Lebanese University, Faculty of Literature and Human Sciences, Lebanon

### Reviewers

**Mahmoud MOUSSA**, PhD

📍 National Engineering School of Tunis, Tunisia

### Supervisors

**Béchir BEJAOU**, PhD

📍 National Institute of Marine Sciences and Technologies, Tunisia

**Nahed MSAYLEB**, PhD

📍 Lebanese University, Faculty of Agriculture and Veterinary Sciences, Lebanon

## LAYOUT

**Khouloud ATHIMEN**, Engineer, Technical Coordinator

📍 National Institute of Marine Sciences and Technologies, Tunisia

**Houaida BOUALI**, Engineer

📍 National Institute of Marine Sciences and Technologies, Tunisia

**Mohamed Ali BRIKI**, Engineer

📍 Coastal Protection and Planning Agency, Tunisia

**Mouna MRAD**, PhD

📍 Water Technology and Research Center, Tunisia

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## I. Introduction

This document consists of deliverable 1 from phase 1 related to littoralization and urbanization of tourist areas in Lebanon. It starts with a general presentation of Lebanon and its coast. Then, it is going to analyze urban population growth and the country and coast urbanization. Besides, a detailed review of published literature is fulfilled to display the change of the urban population density between 2009 and 2019 as well as the impact of urban sprawl on limited natural resources.

Expanded over 210 km in length, the Lebanese coastal area is characterized by a narrow coastal plain in the center and relatively larger plains both in the North and the South. Despite its limited area (8% of the area of the Lebanon), the coastal area encompasses 33% of the total built-up area in the country which hosts 55% of the total population (CDR, Dar al-Handasah, IAURIF, 2003).

The national Decree 144 (1925) defined the coast as the area delineated with water divide line during the winter including the sand and gravel beaches. Within a stretch of 500 m all along the coast, the industrial, commercial, and financial activities are concentrated in the major Lebanese cities. In total, urbanization occupies 40% of the country area, while agricultural and natural areas (beaches, dunes, etc.) constitute 41% and 19% respectively.

In the absence of strong regulations and governance, Lebanese coast littoralization has been affecting the land-sea ecosystem functions and integrity as well, due to large solid waste disposal resource, liquid waste effects on coastal landscape, water quality and biodiversity. The historical urban development along the coastal area showed a slower trend in the first half of the twentieth century.

Nevertheless, after the 1990s, it showed more accelerated paths exacerbated by rural exodus at the onset of large urbanization movements after the end of the civil war and on the background of marginalization of the agricultural sector. This evolution of coastal urbanization was accompanied by the flow of Syrian refugees escaping the war and crises in their mother country. Therefore, the density of population increased in the coastal cities reaching more than 111,000 capita/km<sup>2</sup> in Beirut with a larger number of slums and informal settlements in the peripheries.

## II. Littoralization and Urbanization of the Lebanese coastal line

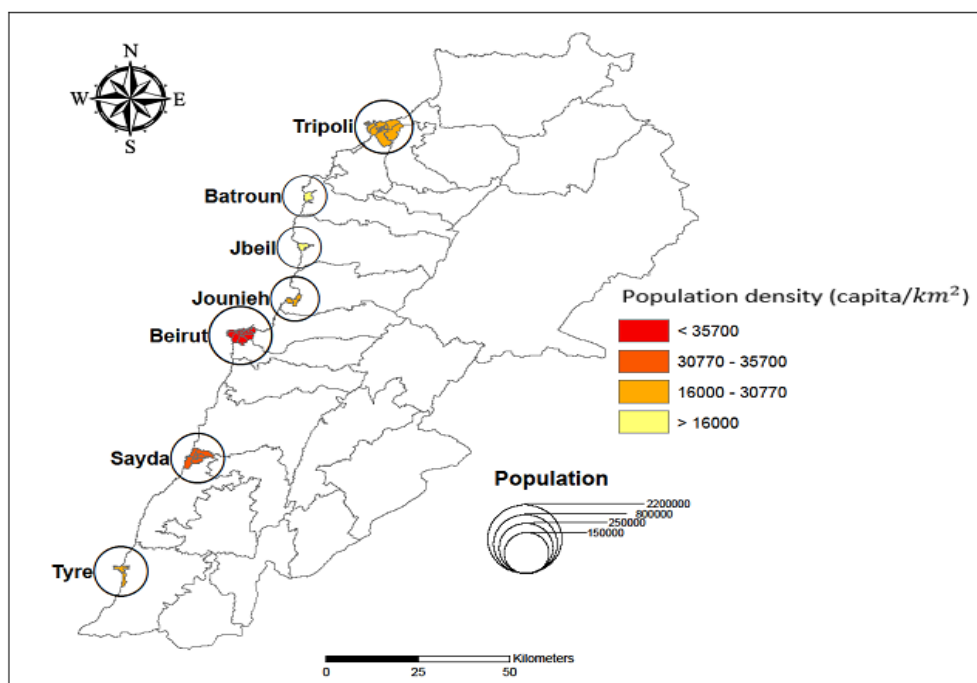
Lebanon is a “small country” with a population of 4,223,553 (World Bank, 2010). However nowadays, after the Syrians Refugees crisis, the non-declared population is around 6,500,000 residents. According to UN-Habitat, recent figures have shown that 87% of the targeted population currently lives in urban areas, with the majority - estimated at 64% - residing in large agglomerations. In fact, they mostly occupy both Beirut and Tripoli metropolitan areas. Thereby, considering Lebanon as one of the most urbanized countries on both global and Arab scale.

### II.1. Pressure from urban expansion

The rapid urban expansion has spread extensively along the Lebanon Mediterranean coast, stretching 200 km from the North to the South, and as well around major cities where most of the industrial and commercial centers are located. It is concentrated in and around the following main coastal cities: Tyre, Saida, Beirut, Jounieh, Jbeil, Batroun and Tripoli (Figure 1). To illustrate this fact, a map has been set to display the population density in the previously mentioned cities.

The only required data to generate this map was “the actual number of residents in those cities”. Yet, compiling data was really challenging since the population rates on websites and Google engine were not accurate. Therefore, measures were to be taken to overcome the trouble. In fact, it was essential to get in touch directly with local municipalities and to refer to doctoral students who researched major cities’ demography.

This map shows that the highest population density (Table 1) at those cities is Beirut (more than 111,000 cap./km<sup>2</sup>), then, Saida (35,714 cap./km<sup>2</sup>) and the least dense city is Batroun (7,109 cap./km<sup>2</sup>).



**Figure 1.** Population density on the Lebanese coastal strip.

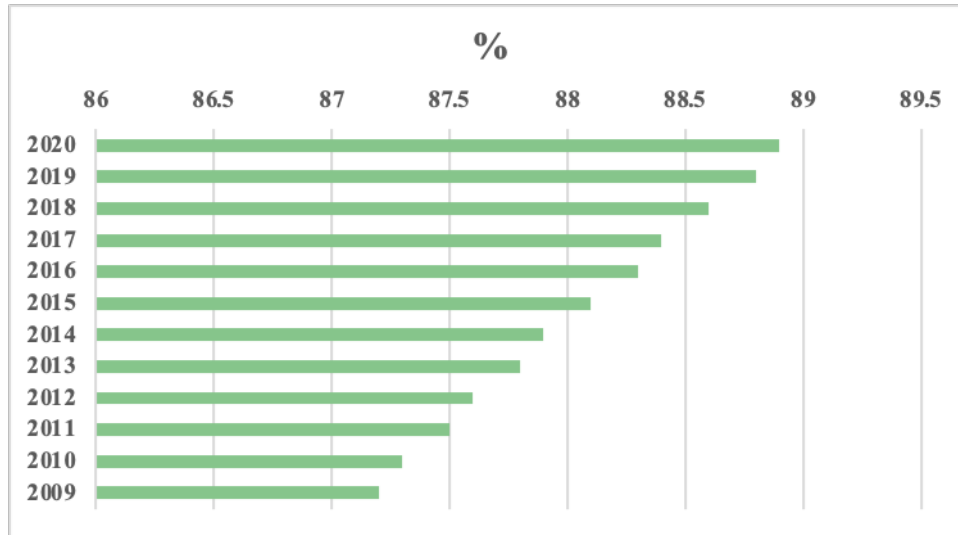
**Table 1.** Population density in the main coastal Lebanese cities

| City    | Population<br>capita | Surface area<br>km <sup>2</sup> | Population<br>density cap./km <sup>2</sup> |
|---------|----------------------|---------------------------------|--------------------------------------------|
| Tripoli | 800,000              | 27.3                            | 29,304                                     |
| Batroun | 30,000               | 4.22                            | 7,109                                      |
| Jbeil   | 80,000               | 5                               | 16,000                                     |
| Jounieh | 150,000              | 5.35                            | 28,037                                     |
| Beirut  | 2,200,000            | 19.8                            | 111,111                                    |
| Saida   | 250,000              | 7                               | 35,714                                     |
| Tyre    | 200,000              | 6.5                             | 30,769                                     |

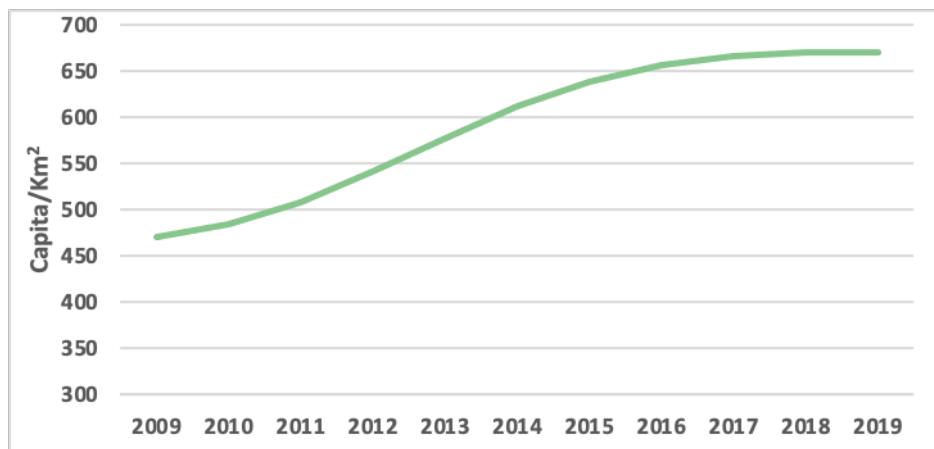
## II.2. Dynamics of urban expansion

Urban population (% of total population) of Lebanon increased from 61.06% in 1971 to 88.93% in 2020 and from 87.2 to 88.9% between 2009 and 2019 (Figure 2), growing at an average annual rate of 0.77% (WB, 2021).

Population density at the national level varied significantly between 2009 and 2019 from 470 to 670 capita/km<sup>2</sup>, highlighting the dominant vertical growth of major cities (Figure 3). In this regard, Lebanon total population jumped from 2,803,044 in 1990 to 6,855,713 capita in 2019 (UN, 2019).



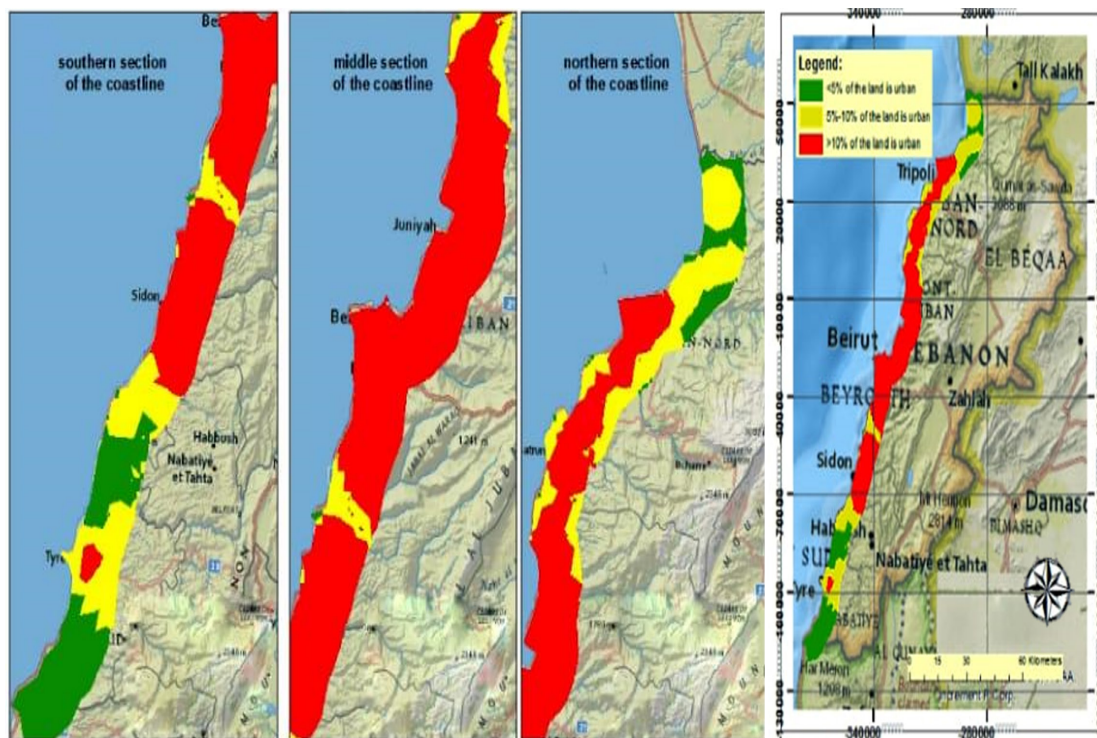
**Figure 2.** Development of urban population % and its increase between 2009 and 2019 (WB, 2021).



**Figure 3.** Dynamics of population density in Lebanon between 2009 and 2019 (UN, 2019).

### II.3. Urban density on the coastal area

To reach the level of urbanization and the percentage of urbanized shoreline (urban density) “Urbanization Map” was drawn. In fact, it shows urbanization density level in 2000 (Figure 4). Yet, major problems and obstacles were faced when compiling and collecting data. Results showed that the trend in density level at the Lebanese has remained the same for 20 years with a slight rate increase. In the following Map, 3 density categories are represented: less than 5%, between 5 and 10% and more than 10%.



**Figure 4.** Percentage of urbanization of the Lebanese coastal area (CDR, Dar al-Handasah, IAURIF, 2003).

There are several factors driving Urbanization. These are economic, social, and cultural. Cities represent both economic growth engines and livelihood opportunities to the population, which in its turn have stimulated urbanization, hence littoralization.

Challenges, on the other hand, are numerous. In fact, they range from the intricacy of providing both equitable economic opportunities and easy access to social services for all population, and to difficulties in securing safe places and making the urban environment healthier and more sustainable.

Moreover, a solid waste management plan and sewage treatment should be implemented and respected, especially that Lebanon has for decades witnessed a rapid and uncontrolled urban growth and coastal sprawl.

New constructions are massively increasing, especially at the coastal zone, where most of the Lebanese population resides. Thereby, contributing to the uncontrolled urban expansion due to the construction laws violations (UNEP/MAP and Plan Bleu, 2020).

With limited planning regulations or let's say lack of regulations' enforcement, the urban areas are increasingly covering larger areas. At the same time, urban disparities emerged significantly. Therefore, the Urban Master Plan, prepared by the CDR, should be respected in order to reduce the impacts of those challenges.

## II.4. Threats from urban expansion

Furthermore, the following key economic sectors are also more concentrated in the main cities along the coast, as well as the larger informal market and services: construction/real estate, service industry and tourism (exception is the agricultural sector). However, agriculture and fisheries are suffering from the consequences of those threats. In fact, fishery is the most vulnerable sector that should be endorsed and protected.

Additional threats of the population growth in urban areas are illustrated below:

1. Rapid increase in water demands for domestic use in urban cities.
2. Mismanagement of water resources, with very low water storage capacity.
3. A high amount of precipitation loss to the sea.
4. Low operational maintenance of the water distribution network and absence of an official management scheme for the water sector.
5. Solid waste anarchic dumpsites at coasts.
6. Marine pollution / sea water pollution.
7. Polluting industries that cause water and air pollution.
8. Polluting transport sector.
9. Tourism local and natural resources high consumption:

Apart from high-water consumption, an additional effect of the rapid demographic growth is the significant increase in the volume of solid waste generated in urban areas in Lebanon. Therefore, out of the average 1.57 million tons of wastes generated in Lebanon per year, around 65 percent are generated in urban areas. Since July 2015, Lebanon has been facing a severe solid waste crisis that led to the creation of 1,700 dumping sites, nearly in each area, and to the compilation of garbage in the streets Beirut city.

After presenting the main urbanization threats, Lebanon has made some good initiatives to conserve and manage its marine and coastal biodiversity. For instance, elaborating national laws and ratifying international agreements that bind the Country to their obligations: ICZM Protocol (ratified by Decree No. 639/2014); The Cartagena Protocol on biosafety; Law No.387/1994, related to the ratification of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.

### III. Urban expansion at the national level

Urban expansion has been a direct driving force causing the loss of natural resources in the country. While ancestors preferred settling over hilly and sloppy lands overlooking the plains and depressions, recent Lebanese have opted more for the construction along the roads and as well at the expanse of cultivated lands.

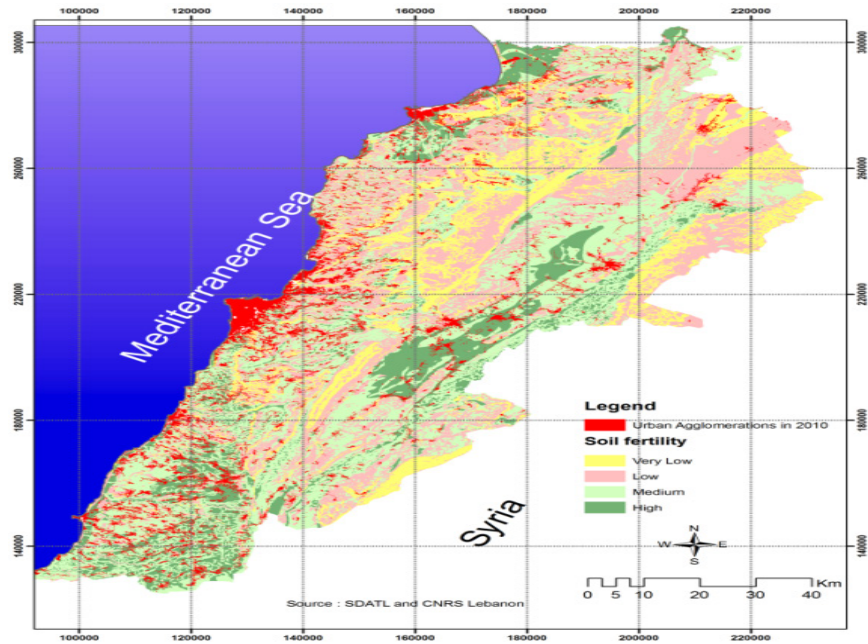
The comparison of the land use map to the urban settlements' expansion between 2000 and 2010 (Figure 5), showed a total loss of 308 km<sup>2</sup> of prime land resources (Figure 6). Among lands converted into concrete, a total of 194 km<sup>2</sup> (63%) belong to agricultural lands, 53 km<sup>2</sup> (17.2%) and 50 km<sup>2</sup> (16.2%) occurred at the detriment of wooded land and grassland respectively.

Less than 11 km<sup>2</sup> (3.7%) of recent urban development has expanded throughout the unproductive lands while ignoring the sustainability of current urban planning. Besides, it required the necessity of implementing land use planning, agro-ecological concepts in land categorization and urban zoning in the country (Figure 7).

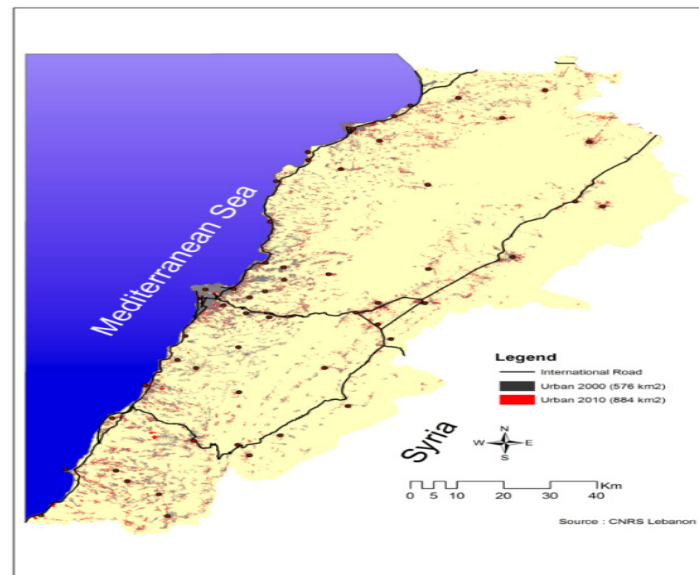
According to the soil aptitude map to agriculture based on multiple factors joining geomorphology, soil characteristics and problems (Figure 5), the best productive lands are spread on the coastal plains and in the intermountain depressions and valleys. These areas proved to be the most dynamic urban expansion during the last 30 years.

Comparing the land cover map to the urban settlements expansion between 2000 and 2010 (Figure 5), results showed a total loss of 308 km<sup>2</sup> of prime land resources (Figure 7). Among lands converted into concrete, a total of 194 km<sup>2</sup> (63%) belong to agricultural lands, 53 km<sup>2</sup> (17.2%) and 50 km<sup>2</sup> (16.2%) occurred at the expanse of wooded land and grassland respectively.

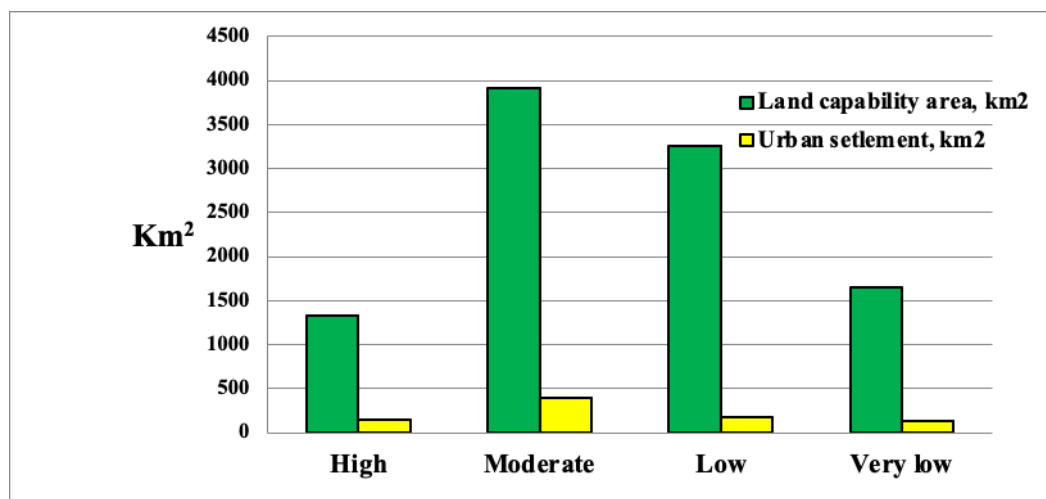
It is worth mentioning that less than 11 km<sup>2</sup> (3.7%) of recent urban development has expanded on unproductive land ignoring the sustainability of current urban planning and the necessity to implement land use planning and agro-ecological concept in land categorization and urban zoning in the country.



**Figure 5.** Land capability and historical urban agglomeration on fertile lands in Lebanon (CNRS).



**Figure 6.** Urban expansion in Lebanon between 2000 and 2010 (<https://www.data.unhcr.org>).



**Figure 7.** Cumulative land sealing of productive lands by urban expansion between 2000 and 2010 in Lebanon (FAO, 2012).

The area of highly productive lands consists of 133,700 ha while the moderately productive soils with one major or two slight, manageable problems, such as sheet erosion, restricted drainage or infiltration and aeration related problems cover 390,800 ha.

The low productive land area is suffering from severe infertility and management factors cover 325,500 ha while the area of non-arable lands is only 165,000 ha. Moreover, the most affected area by urban sprawl is the coastal strip between 0 and 400 meters above sea level representing 19.3 % of the country surface.

The East Levantine Canyons (ELCA) is considered by the CBD of the Parties as ecologically or biologically significant Marine Areas (EBSAs), requiring management for sustainability (UNEP/MAP and Plan Bleu, 2020).

This assessment is based on criteria such as the following:

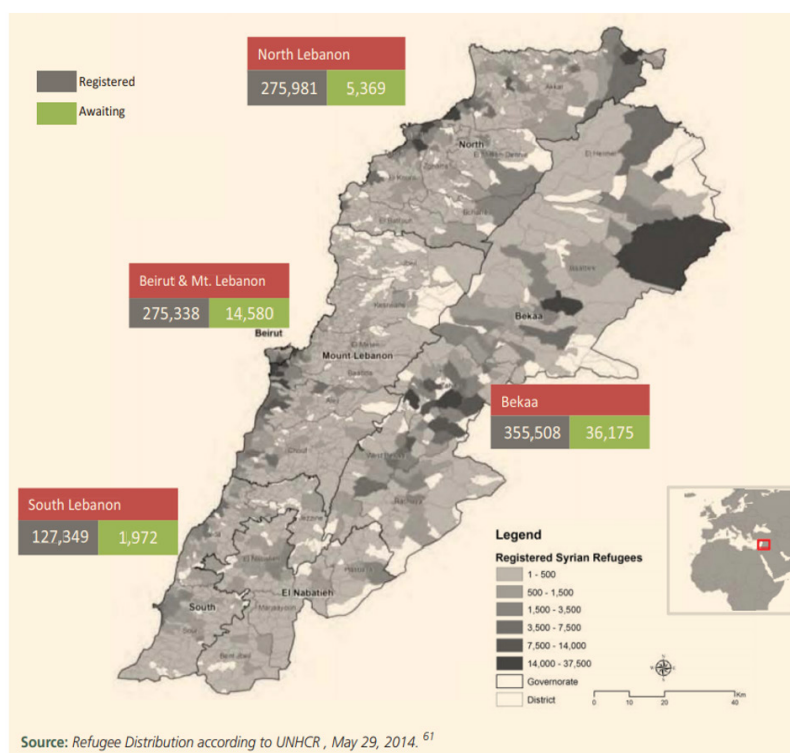
- (i) uniqueness or rarity.
- (ii) special importance for life history stages of species.
- (iii) importance for threatened, endangered or declining species and/or habitats.
- (iv) vulnerability, fragility, sensitivity, or slow recovery.
- (v) biological productivity.
- (vi) biological diversity.
- (vii) naturalness.

## IV. Pressure from informal settlements

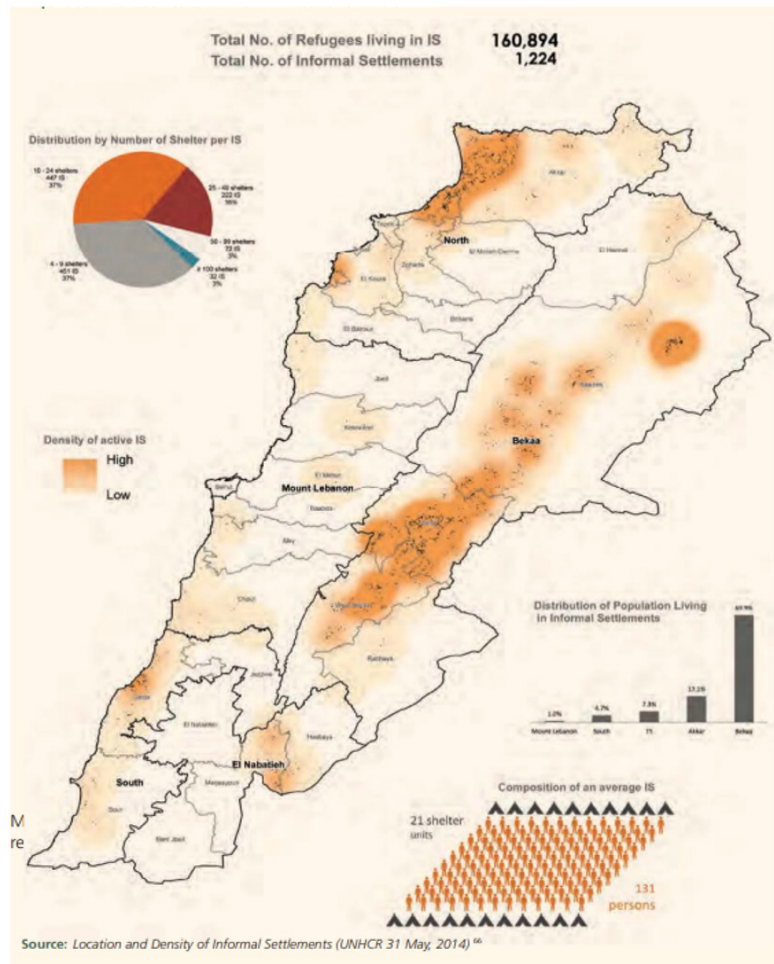
Starting from 2011, with the outbreak of the Syrian crisis, thousands of refugees moved to Lebanon. In fact, a total of 16% of Syrian Refugees are living in informal settlements, concentrated mainly in rural areas along rivers and on the coastal area north of Tripoli, Batroun and South of Beirut and Saida (Figure 8).

The population of the refugees living along the coastal area in informal settlements account for more than 280,000 in the north (Figure 9), and more than 290,000 people in the south of Beirut while the southern coastal strip hosts around 130,000 people (UNHCR and UN\_HABITAT, 2014).

A total of 12-18% of these refugees is not wastewater connected, thus non treated wastes are ejected directly into the water streams. Thereby, multiplying the pressure from local, dense population, and affecting both the river's and sea's water quality.



**Figure 8.** Distribution of Syrian Refugees in Lebanon <https://www.data.unhcr.org>.



**Figure 9.** Location and Concentration of informal settlements in Lebanon.

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## DISCLAIMER

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