Saida Urban Sustainable Development Strategy

Local Expert Team

Strategic Diagnosis Report

Green / Open Space Network

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1.0 Introduction

The interface of sea and mountain are integral to Saida’s identity past, present and future. Hills and foothills, rivers valleys and streams, coastal plain and sea combine to create an exceptional landscape setting that has been ingrained in the collective memory and integral to the identity of Saidawis. Historically, the sea has served as an outlet for trade and fishing, the wide coastal plain and abundant freshwater secured the prospering of agriculture. Both shaped the urban economy, providing maritime related livelihoods for sea traders, bahara, and fishermen, or agriculture-based livelihoods, for farmers, bustanji.

Up until the late 1960s, Saida’s urban footprint was limited to the walled city and its immediate surroundings. Since, the urban footprint has expanded with mixed commercial and residential buildings filling up the coastal plain, incrementally replacing agricultural uses and new suburban, mainly residential development, in the hills overlooking Saida: Al-Hilalieh, Abra, Al-Bramieh, Mieh w Mieh, and Sharhabil. And although agriculture still constitutes 33 % of the area of municipal Saida, rising land values and declining agriculture profitability are a direct and imminent threat to what remains of agriculture in the coastal plain. At the same time, motorways and boulevards impact the urban landscape fragmenting and destroying the green halo that encircled Saida. The ecological and spatial integrity of rivers and seasonal watercourses is also threatened. Waterways are channelized, covered in part, like Al-Barghouth, or in total, like Al-Qamleh, at a time when wastewater from a growing population is discharged into the watercourses pouring into the Mediterranean. Solid waste disposal is still problematic, despite municipal initiative to improve the conditions of the Municipal garbage dump (Jabal Al-Zbala). Municipal green areas are limited to traffic related medians and roundabouts, the public beach which together with the Municipal Stadium and historic cemeteries, make up to 3% of the municipal area. Apart from the Maritime Boulevard, Saida has no public parks. Ultimately, these changes adversely impact Saida’s environment, erode urban distinctiveness and homogenize the urban landscape just as they undermine public health and the quality of living.

Strategic analysis of the urban landscape of Saida draws on the initial findings of Phase I: “Landscape, Environment and Ecology” by pursuing three tracks of investigation:

- Water Resources:
  - Rivers and Seasonal Watercourses
  - Coastal Landscape
  - Springs and groundwater
- Agriculture
  - Extent
  - Diversity and mode of production
- Municipal Green/Open Spaces
o Municipal Green Areas
o Sports
o Cemeteries
o Urban Waterfront
o Railway Corridor

Adopting a landscape methodological framework, strategic analysis for Transversal Issue 2

Green/Open Space includes:

- Spatial mapping of landscape resources
- Description and quantification
- Identifying trends that are impacting the urban landscape
- Defining the legal framework for future planning
- Formulating a vision and strategic objectives for key landscape components

Available data on marine and riparian resources are generally limited. The CHUD Report\(^1\) includes a generic environmental assessment of the coastline, the marine and the Awali River, but doesn’t include spatial assessment of the coastal landscape and the riparian corridors. There is no data on the spatial distribution and agricultural land uses and types of production within Municipal Saida. Analysis of agriculture therefore had to be foregrounded by mapping, based on aerial photographs, and verified by field visits, interviewing farmers and landowners\(^2\). There was also no mapping or quantification of municipal green/ open spaces, which were mapped and verified through site visits and discussion with those private/corporate bodies undertaking horticultural management of the green areas\(^3\).

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\(^2\) Interview with Ghassan Kotob, Agriculture Land owner, Friday May 10, 2013
\(^3\) Interview with Ramiz Ossayran, contractor for maintenance of Municipal green spaces (2013), Field visit and consultation about the municipal green open spaces, March 28 2013 &Maher Al-Sayess, CEO NTCC, May 10, 2013
2.0 Problem Definition/Analytic Reading

The focus of Transversal Issue 2, Green/Open space Network, embraces by definition all green areas within Municipal Saida, past, present and those with future potential for greening, such as natural and agricultural heritage, river and sea landscapes.

Key findings of the critical analysis can be summarized in the following:

a) Coastal urbanization, a typical pattern in Lebanese coastal cities, threatens the unique landscape setting that accounts for Saida’s distinctiveness. Unplanned urban expansion and unregulated development are transforming its diverse and verdant landscape into a grey, homogenized, characterless fabric;

b) The encroachment of rivers corridors (Al-Awali and Sayniq) and minor watercourses (Abou Ghayath, Al-Qamleh, Al-Barghouth and ‘Ain Al-Zaytoun) by buildings and roads undermines their ecological health and spatial integrity. The failure to enforce statuary protection results in periodical destruction of adjacent properties by flooding during the rainy season;

c) Unmonitored solid waste and sewage discharge affect watercourses and coastal and marine environment, while its biological and visual impacts are not assessed. This process includes the transformation of the coastal morphology as a result of dumping of debris, proposals of a new commercial port and marinas let alone;

d) The expanding urban footprint threatens open landscapes, both natural and agricultural, with the incremental fragmentation and replacement of old orchards and agricultural fields in the coastal plain, just as much as with the destruction of the natural vegetative cover in the hills. The loss of green areas, natural and agricultural, is inversely proportionate to the growth of urban population and building densities, invariably impacting on physical and psychological wellbeing;

e) In the absence of protection laws, increasing urban density also threatens the Ottoman water channels that historically irrigated agricultural land in the Saida coastal plain. In the northern part of municipal Saida, Al-Khasikieh Canal is a key landscape heritage for Saida, acknowledged by all, but nevertheless threatened by the realty development of Al-Wastani Project;
f) The prevailing perception of agriculture as an activity of the past, of no value or potential in the future development of the city, undermines options to adopt a strategy aligned with the 21st century vision of urban agriculture, as a sustainable approach to urban greening.

g) An outdated understanding of amenity and green/open areas foregrounds the creation of *traffic related green areas* and *municipal parks*, ignoring available options for green networks, along river and infrastructural corridors that can better serve the expanding urban footprint. As a result, the potential of existing spatial corridors, including the Maritime Boulevard and the abandoned railway tracks, is overlooked;

h) Saida Municipality outsources management of existing green areas to local contractors. The absence of landscape management expertise within the Municipality in turn leads to the lack of supervision and monitoring of the quality of the management provided by the contractors.
3.0 Position and Guiding Vision

3.1 Position
Transversal Issue 2 investigates the role of the urban landscape, urban ecology and environmental resources, in maintaining a healthy and prosperous city in the 21st century. A ‘landscape framework’ is adopted to counter conventional disciplinary assessment of resources, i.e. as environment and ecosystem, by providing a visible, tangible context for future development. Conceptualized as a landscape, environmental and municipal resources are spatialized to be incorporated into future planning while addressing environmental, ecological, socio-economic and cultural concerns. A landscape approach prioritizes equally on social development, environmental health, ecosystem integrity and preservation of landscape heritage.

3.2 Guiding Vision
The diverse and unique landscape setting of Saida is a valuable resource that has accounted for urban distinctiveness in the past and has potential to provide character and specificity for future development. The vision for Transversal Issue 2 is to protect and enhance existing landscape components (river, marine, coastal, agriculture) through sustainable strategies by developing green/blue networks contributing to socio-economic development and quality living, comparable with the top ranking cities in the Mediterranean and elsewhere (Figure 1).
The proposed vision builds on two of the six characteristics identified by the CDR for Saida: the seafront and the agriculture, *Al-Sahl Al-Zira‘i*. Within this framework for Transversal Issue 2, the specific aims are twofold:

(a) To maintain a healthy urban environment, to contribute to the ecological integrity of terrestrial, riparian and marine ecosystems, to protect and enhance the landscape heritage of Saida including natural and agricultural features;

(b) To integrate marine, riparian and agricultural landscapes into a green-blue multifunctional landscape network, providing opportunities for economic development, amenity and recreation and reaffirming Saida’ urban distinctiveness.

Through the critical analysis of identified landscape components, Transversal Issue 2 focuses on reading the urban landscape as a whole, identifying processes of change and transformation, and the challenges, i.e. strategic objectives, for realizing the proposed vision. The latter includes:

(a) Safeguarding natural environmental resources  
(b) Providing quality amenity and recreational spaces  
(c) Providing a range of livelihoods from natural and eco-tourism, branded quality agricultural production and waterfront recreation  
(d) Rectifying the process of spatial homogenization triggered by unplanned development  
(e) Aligning per capita green areas to WHO standards and ensure quality of urban living

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4 Lecture delivered by Ibrahim Shahrou, ITU, Saida, April 17, 2013
4.0 Tracks of Investigation and Analysis

4.1. Agricultural landscape

Position
Agriculture is at once a managed semi-natural ecosystem, a means for the production of food, a source of livelihood and a physical entity, a landscape. In and around cities, agriculture acquires additional value because it serves as green/open space that improves the quality of urban living both by visual and ecological impacts. A landscape framework for the strategic analysis of agriculture in Municipal Saida therefore prioritizes the value of agriculture (a) as green/open space and (b) as landscape heritage integral to the historical development of the city and its collective identity.

Vision
Strategic protection of Saida’s agricultural landscape as integral to the heritage of the city and as potential green space in future development

Historical Background5
Agriculture was at the heart of Saida’s economy, an outcome of the city’s significance as an administrative center and market town. Produce from the fertile lands of the surrounding region was marketed from Saida. Locally, the wide coastal plain, fertile soil and abundant water encouraged the prospering of fruit production. Large orchards filled Saida’s coastal plain just behind the gates of the old walled city.

As mentioned in the Introduction of this report, Saidawi families are divided between bahrieh, (people of the sea,), those who earned a living from fishing or trading and thus lived within the gates of the city, and basatnieh (people of the fields), people who lived and cultivated the fields. Such terminologies are still used today to designate families especially with regard to family background and heritage, even if agriculture and fishing are not practiced anymore by the designated families. The basatnieh people were in their majority peasants who worked land own by prominent families. With time, basatnieh families could afford to buy a limited portion of agricultural land, usually long and narrow east-west plots that were in turn subdivided into narrower strips to maintain equal accessibility to water for all owners6. The narrow cadastral configurations served to cultivate citrus, namely oranges up to the beginning of the twentieth century.

5 This section is developed with the contribution of Lynn Jabri.
Agricultural basatin (orchards) not only were pillars of the city economy, but also had a remarkable recreational value for the inhabitants of the city. These basatin were also used for afternoon promenades and picnics during Fridays and other holidays, marking spring memories of the inhabitants with orange blossom scent prevailing everywhere in the city, and attracting people from Beirut and Tyre (Sour).

**Morphological, Environmental and Ecological Assessment**

The absence of spatial mapping of the extent of agriculture in Municipal Saida, due to changes in parcellation and ownership (i.e. the Al-Wastani project), required a new field survey to be conducted in February 2013 to provide a baseline for the Strategic Diagnosis. The field survey located the extent and uses on the ground, mapping agricultural lands and identifying trends. (Figure 2)
Figure 2
The fieldwork included a lot-by-lot survey and a comparative analysis with recent aerial photographs, plus interviews with farmers and owners to determine agricultural production and management practices, productivity and profitability and to gauge local concerns with the decline of agriculture.

According to the survey findings, arboriculture, mainly of fruit trees, dominates all agricultural lands. Mapping agriculture (Figure 3) highlights spatial differences between cultivations in different districts of Municipal Saida like Al-Wastani and Dekerman.
Surveyed orchards can be classified into the following:

a) **Monoculture Orchard**: those with more than 90% of cultivated surface dedicated to one species (loquat, citrus or banana)

b) **Mixed Orchard**: where one species occupies more than 50% of total cultivated surface

c) **Garden/Orchard**: a combination of decorative and edible plantations typical of the whole Mediterranean Basin, usually serving a household

d) **Green Houses**: plastic covered cultivation mainly of legumes and table vegetables.

At the northern edge of Municipal Saida, lands south of Al-Awali River, the plots are typically large with monoculture prevailing. In the central part, the southern section of Al-Wastani, plots are subdivided into smaller units with different owners, most probably the result of inheritance. These are mostly mixed orchards with, in a few cases, one dominating specie. In the southern part, Dekerman, large monoculture landholdings dominate, either citrus species or banana, though there is also a high concentration of greenhouses.

Moving longitudinally from north to south, the agricultural band has different widths. The fieldwork also highlighted a major difference in the social and land tenure level between Al-Wastani and Dekerman. Cultivations range mainly from monocultures of Banana, Citrus species (clementine, orange, bitter oranges, mandarin, and lemon) and Loquat (picking up as orchard monoculture) to other varieties like Avocado, Pomegranate and Mango cultivated in mixed orchards.

The spatial configuration of plots differs as well. In the northern Al-Wastani district, plots are narrower and include scattered re-parceled or land-pooled plots with land ownership rapidly changing hands. There is a clear trend of appropriation of agricultural land by influential Saidawi families (Hariri, Zeidan) as capital for reality speculation and future development. Agriculture resists in some cases, with hired Syrian laborers usually living on the land in temporary shacks. In other cases, the land is hired out following its sale, as for example the zone of qayye’a. Few old basatnieh families continue to cultivate the land around their houses, regardless of land-pooling, more as a family traditional practice than for profit.

Cultivation in Al-Wastani district is directly affected by availability of water. Some of the orchards are dying because the irrigation system is no longer managed –not all the farms have wells, nor are wells shared. As a result, many orchards are left unattended and dying out. Meanwhile, in Dekerman, agriculture continues with families from Saida still inhabiting and cultivating lands, though the prevailing trend is generally that of tadmin, outsourcing cultivation and management of the orchards. Management too differs, cultivation in the southern part being intended for mass production.
The general findings from mapping and field survey are herein summarized:

Agriculture in Municipal Saida occupies 232 ha, of which 48 % is citrus, 32 % banana and 11 % mixed orchards (Figure 4)

![Chart showing agriculture distribution](image)

**Total Agriculture: 233 Ha, 33% of Municipal Saida**

Figure 4

- The parcelation of agricultural lands follows the direction of irrigation canals, extending in latitude, from east to west.
- Many orchards sell their produce directly to small vegetable shops in the city, bypassing the wholesale market;
- Fruits such as guava and mango were introduced in the past 15 years and are proving successful, though not yet intended for mass production;
- Citrus orchards are increasingly being replaced by banana cultivation due to its easier and more cost effective management, and also to its short lifespan (3 years), providing an interim solution, while authorization for realty development of agricultural lands is pending;
- Many small orchards are transformed into private gardens;
- Many orchards are being entirely removed, paved and used as temporary parking, or for car retail and mechanic shops;

**Legal Framework:**

With the beginning of construction of roads and buildings outside the limits of the historic city in the late 1930s, the Municipality took an active decision to forbid any construction on agricultural lands. This was due to economic reasons as well as to an interest in the preservation of the esthetic and environmental value of the basatin that were “an attraction to many Lebanese” 7 emigrants returning during spring vacations. Public awareness of the collective value of the orchards surrounding the city and filing up Saida’s coastal plain led to

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such measure to protect agriculture from urban expansion. Michel Ecochard, in his 1958 master plan for Saida, similarly advocated for the preservation of agricultural lands in the coastal plain by restricting construction, referring to the “city of everlasting spring”\(^8\).

Ecochard’s master plan was reversed in the late 1967, but it was not before the 1980s, with the Israeli invasion of southern Lebanon, that the latitudinal parcelation of agricultural lands started to take over, due to pressing urbanization and related damages to the irrigation network. The latter was also superseded by the development of north-south infrastructures that were carved out in the agricultural landscape, destroying its historical configuration. Today a new configuration prioritizes through streets and chessboard subdivision, threatening to overtake what remains of the historic east-west cadastral and drainage corridors that used to connect coast and mountain.

Presently, the adopted master plan of 1995 clearly identifies an agricultural zone with medium to low density residential development (Zones D, E and F) (Figure 5 and appendix 1). Present zoning however is limited to a passive regulation that fails to actively protect and support agriculture. The main reason why agricultural lands remain intact today is because of the lots geometry restricting and limiting projected developments. Nevertheless, clear zoning lays solid foundations for future strategies to protect and regenerate agriculture in Municipal Saida.

Figure 5\textsuperscript{9}

\textsuperscript{9}Master Planning Zoning 1995, Decree 6552
**Identified Trends**

**Trend # 1 Shrinking Agricultural Landscapes**

In the 1960’s Saida had close to 470 ha of agriculture lands. A look at the urban history of Saida shows that the major catalyst for transformation of agricultural lands happened in the 80’s after the re-parcelling of Al-Wastani (Figure 6). The city has lost almost 50% of its agriculture lands in almost 30 years. A similar pattern is applying almost everywhere in the city of Saida, however it is still much more concentrated in Al-Wastani. In Dekerman, this dynamic seems shyer as land sale did not stop agricultural activity. The central area of the city, between Al-Qamleh and Al-Barghouth was the first to be replaced by early extramural urbanization. Very few orchards remain therein, constituting small openings within densely built up neighborhoods.

![Figure 6](image)

Overall historical mapping accounts for the rapid loss of agricultural lands, i.e. their transformation from productive landscapes to realty pools accumulated for future development. Mapping aerial photographs over the last decade (2003, 2009 and 2011) and comparing them with findings of the February 2013 survey offers a clear representation of the shrinking of agricultural lands (Table 1 and Figure 7). In 8 years, 2003-2011, Saida lost more than 47 ha of its agricultural land: 27 ha between 2003 and 2009; 8 ha between 2009 and 2011; 10 ha between 2011 and 2013. The average loss of agricultural landscapes can be calculated at a pace of 9 ha every two years.

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10 Lands that are vacant (not built nor cultivated) in time of survey, were excluded from the calculation of agriculture lands as the focus is on productive agriculture land only (in time of survey)
<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2009</th>
<th>2011</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture lands area (ha)</td>
<td>278</td>
<td>251</td>
<td>243</td>
<td>233</td>
</tr>
</tbody>
</table>

Table 1

Figure 7
Trend # 2 Fragmentation of Agricultural lands
The land pooling and subdivision project of Al-Wastani was initiated in the 1980s and picked up on market dynamics in the past 10 years. The re-parcelation of the lots changed the cadastral grid from agricultural longitudinal lots to their latitudinal subdivisions (Figure 8). This change affects the productivity of the orchards and breaks the irrigation network. Land speculation is making more convenient for owners to sell individual small lots (rather than large chunks) for commercial rather than development.

Trend # 3 Outdated Practices and the Prevalence of banana monoculture
With the exception of some newly introduced fruit trees species, agricultural practices did not evolve. Failing to respond to the changing context, with an expanding urban footprint and rising land values, agriculture in Municipal Saida seems economically not feasible. The Banana cultivation is the only form of adaptation to current trends, employed as a short-term solution towards re-development (Figure 9). Its short life cycle and easy management makes it more

\[11\] Ahmad El Kalash, Saida 1873 – 2001
profitable then citrus cultivation in terms of yield, economic profitability and management costs.

![Figure 9](image-url)

**Trend # 4 Prioritizing Realty Development over Agriculture**

The loss of agricultural landscapes in Municipal Saida is not only due to agricultural production being no longer profitable economically. Land speculation for realty development also plays a big role. Projects like the one in Al-Wastani trigger land speculation, which in turn undermines agricultural uses. As a result, the value of orchards and agricultural lands is reduced to a property reservoir.
Future challenge

Having identified the trends impacting agricultural landscapes in Municipal Saida, the next step, Phase III, is to identify planning tools to protect agricultural enclaves in strategic locations, to develop a legal framework for selected preservation and to formulate strategies to align management and production of green areas with 21st century standards for urban agriculture.
4.2. Water Resources: Rivers, watercourses and Marines

**Position**
Water is undeniably an important environmental resource but just as importantly, water in the environment entails complex natural cycles that link visible features, rivers and the sea, springs and wells, hidden components, underground water, and intangible ones, elements of the climate, precipitation and ambient temperatures. These components are intricately connected, regulated through hidden ecological processes. The ecological planning framework applied in the strategic analysis of water resources in Municipal Saida focuses on these features as landscape but considers equally relevant (a) ecosystem health, whether riparian or marine, including the spatial integrity of river corridors and marine waterfront (b) cultural significance, of water landscape as natural heritage of the Saida city and (c) the potential of these landscapes as amenities and as part of sustainable future urban greening strategies.

**Vision**
Protect the ecological health and spatial integrity of Saida’s water resources as multifunctional landscapes that include river and coastal corridors embodying the dual relationship of the city to sea and mountain

**Historical Background**
Straddling the Mount Lebanon foothills and the Mediterranean, landform has directed the east-west flow of rivers and seasonal watercourses. In turn, watercourses have historically influenced the east-west alignment of agricultural lands and movement trunks linking sea and the regions east of the mountains. (Figure 11) Similarly, large agricultural holdings are located along Al-Awali River, for example those owned by the Jomblat and Za’atari families. Just as significantly, the development of an efficient irrigation system relying on Al-Awali River came to support agriculture in the northern part of Saida’s coastal plain.

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12 This section is done with the contribution of Lynn Jabri.
Jabri, L. (2012). Dis/re-secting the city of eternal spring an urbanistic investigation on the counter figure of Saida. Belgium: Katholieke Universiteit Leuven.
Two irrigation systems were developed. In Al-Wastani, irrigation relied on a system of surface water withdrawal (jar), while in Dekerman it relied on wells and water mills (nawa’ir). Due to the higher costs of ground water extraction, land values in the south of Saida were lower\(^{14}\). Lands that relied on water wells had to use animal-operated water mills. Water mills would pool water in an elevated reservoir that would be used to irrigate orchards and fields by gravity. The wells are still used today in Dekerman. The water mills, however, have disappeared, replaced by electric water pumps that distribute directly to the fields making use of drip irrigation.

If in Al-Wastani irrigation has been relatively easy ever since, because of plenty of water in Al-Awali River all year long, with time the Sayniq water flow has weakened, drying out during summer and it stopped benefitting agriculture right in the critical phase from July to September. The Sayniq and the strongest streams of Al-Qamleh, Al-Barghouth and Abou Ghayyath, were used to irrigate adjacent lands on both sides but have since seized to serve as such. Today water in these streams has become scarce partly as a result of climate change but also because construction uphill blocks their watershed. Freshwater springs have similarly dried out because of excessive use. Many located off the coast followed a similar system where water was gathered in reservoirs that were used both for potable water and for irrigation\(^{15}\).

**Khasikieh**

The lands in Al-Wastani were all fed by a wide canal that begins in Al-Awali River valley at a height of 50 meters above sea level, approximately 4 km east of the coastline (Figure 12 and Figure 13). The canal itself can possibly date to the Roman Era but was renovated by the wife of Amir Fakhreddine in the 17th century and came to be named after her, Sultaniyeh, or the Khasikieh\(^{16}\). As such, the Khasikieh is as old as monuments in historic Saida and just as important a heritage. Of equal heritage value, albeit intangible, are cultural practices related to equitable distribution of water to the agricultural properties irrigated by the Khasikieh, mainly in Al-Wastani. Water distribution was the responsibility of the qanawati (the water guard), who was selectively appointed by consensus among the larger land owners. He was a “person of trust” and “charisma” since he had to be entrusted with authority on conflict resolution. The qanawati managed the water in return for a yearly fee collected from all the land owners benefiting from the Khasikieh waters.


Today, the *qanawati* charges an annual cut fee of approximately 600,000 L.L. for each cadastral lot irrigated. His responsibilities begin in May/June starting with clearing of the irrigation canals and repairing them in preparation for the irrigation in July. The *qanawati* manages by proposing a schedule for irrigation, opening and closing flow into privately owned orchards, through *makasser* (barriers), usually a stone proportionate to the width of the channel. Landowners have no choice but to adhere strictly to the schedule. A flow of 20 to 30 minutes is calculated for each dunum (1000 m²) of irrigated land per foot. For the first 3 rounds of irrigation, “when the land is thirsty”, he allows a week for each plot. Thereafter, each plot is irrigated only once every two weeks. During the irrigation, farmers use a mixture of *makasser, oyoub* or smaller openings in the smaller canals that are closed with steel sluices, manually creating irrigation pans and troughs according to the needs of species irrigated. If the appointed irrigation time is not sufficient the farmers negotiate with the *qanawati* for additional time.

Today few farmers use the Khaskiyeh Canal for irrigation. The schedule of irrigation and opening of canals is fixed and they organize accordingly between regular and additional irrigation, without hindering the flow to other fields.

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17 Interview with Ahmad Khalaf, a Syrian worker in Al-Wastani fields, July 12 2012, , quoted in Jabri, L. (2012)
18 Interview with Abu Naim, a Syrian worker in Al-Wastani fields, February 16, 2012, quoted in Jabri, L. (2012))
Environmental/Ecological Assessment

Hydrologic Context

As with most cities in Lebanon, Saida suffers from chronic shortage of potable water and overflow of sewage that inundates streets and property during the rainy season. These problems can be solved and may even represent opportunities for future development.

Situated in the eastern Mediterranean, Saida enjoys the typical moderate climate of coastal cities. As indicated in Figure 14, Saida rainy season effectively lasts from October to March or April, and is followed by a 5 to 6 months dry season.

Rainfall intensity-duration-frequency curves generated for coastal Lebanon (Figure 15) form the basis for assessment and design of wet infrastructure in Beirut, in Saida and in other cities.

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21 This section is developed with the contribution of Dr. Nadim Farajallah
Total annual rainfall in the area of Saida ranges between 600 mm and 700 mm as shown in Figure 16. Temperatures vary from a minimum of 2.75°C in January to an average maximum of 31.7°C in August with high evapotranspiration requiring plants to be irrigated frequently, and high water consumption.

Rivers and streams

The finger like topography of the hills edging Municipal Saida opens six main valleys that serve as natural paths for the flow of watercourses. Two main rivers, Al-Awali River to the north and the Sayniq River to the south define the northern and southern edges of Saida Municipality. In between are four minor streams, from the north to the south, Abou Ghayyath, Al-Qamleh, Al-Barghouth, ‘Ain Al-Zaytoun. Rivers carry water all year long while smaller streams dry off during the summer.

The source of all six watercourses lies eastwards beyond the eastern boundaries of Saida Municipality. Their watershed includes, minor promontories and streams in the lower and higher foothills of the Mount Lebanon Range (Figure 17)
Based on published data, the drainage area of Al-Awali River is approximately 295 km² and has an average annual flow rate of around 320 Mm³ (million cubic meters) annually (Appendix 4). The Sayniq has a smaller catchment of around 140 km² with an average annual flow rate of about 12 Mm³. Al-Qamleh has a drainage area of about 5.2 km² and the Abou Ghayyath a catchment of 4.78 km². Both streams are ungagged but the flow rates have been estimated at around 0.58 Mm³ annually. Figure 18, 19 and 29 show the catchment areas of the Sayniq, Al-Qamleeh and Abou Ghayyath along with the elevation information. Al-Awali catchment is not illustrated or reported on in this section, as it is too extensive for the scope of this study.

22 There is no measurement done of the flow of the streams, it is rather estimated through models.
Figure 18

Figure 19

Figure 20
Al-Qamleh land use: The 5.2 km² catchment of Al-Qamleh is divided into two general land use categories: urban and agricultural (Figure 21). As can be seen in Table 2, more than 80% of the catchment is agricultural and the remaining 18% is urban or built up. This mix though is constantly changing with more and more agricultural land converted into residential, industrial or tourist developments. The numbers shown may be already outdated.

![Figure 21](image)

<table>
<thead>
<tr>
<th>Kamleh Watershed Area (km²)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.93</td>
<td>Urban areas (built up)</td>
</tr>
<tr>
<td>3.11</td>
<td>Field crops and Fallow</td>
</tr>
<tr>
<td>0.30</td>
<td>Olives</td>
</tr>
<tr>
<td>0.87</td>
<td>Citrus and Banana</td>
</tr>
</tbody>
</table>

Table 2

Abou Ghayyath land use: The land use distribution in Abou Ghayyath is slightly different from that of Al-Qamleh, in that about 45% of the catchment is abandoned grassland or abandoned fields, with agricultural land making up 41%, urban areas 12% and about 2% beach. This is detailed in Figure 22 and Table 3. Again, as beside Al-Qamleh, urban sprawl is continuing to blight the landscape in this catchment.
Sayniq land use: Land use distribution in the Sayniq is split between agricultural (39%), grasslands and abandoned fields (42%), forests (18%) and urban 1%. This is clearly shown in Figure 23 and summarized in Table 4. As with the other catchments, uncontrolled urbanization is accelerating. In addition to that, the Sayniq’s catchment incorporates the single most environmentally hazardous land use – the Saida landfill.
Groundwater Resources

Saida has two relatively large aquifers. The first, the Damour aquifer, lies northward with an extensive area stretching 24 km along the coast. This aquifer supplies Beirut with water and is also used for irrigation of the Damour coastal plain and agricultural lands south of Beirut. Parts of the aquifer discharges into the sea through submarine springs. Figure 24 shows the extent of the aquifer.

![Figure 24](image)

The second aquifer is the Tyre (Sour) aquifer, which extends from south of Tyre (Sour) along the coast for 50 km its upper limits reaching south of Saida (See Figure 25). Its waters are used for industrial, domestic and agricultural purposes.
As to potable water, six wells supply 60% of Saida’s domestic water needs with the remainder coming from the Kfarweh Spring. Of the six wells, five are located within the city and one in ‘Ain Al-Helwe area, with the Palestinian Camp named after the spring located in its premises. The wells are estimated to provide about 27,100 m3/day while the spring yields approximately 10,000 m3/d in the dry season and doubles that during the wet season.

**Marine Resources**

The Saida coast, especially in the vicinity and north of the harbor, is one of the most severely contaminated areas of the Lebanese coast. Industrial, domestic and agricultural solid waste is being disposed off the coast south of the city by the Municipality since more than thirty years, serving also surrounding municipalities. The litter and leachate from this mountain of garbage spreads along the sea floor and are carried northwards by the prevailing northerly currents creating a marine desert in the area facing the discharge point.

High nitrogen concentrations were found in the seawater along the coast and coliform counts (indicator of pollution, especially from sewage) were more than 200 times greater than EPA accepted counts in recreational water in the USA. Finally in a study using sea urchin abundance as an environmental suitability indicator for the area, practically no urchins were found in the area and those that were found had heavy metals in them.

Coastal and marine fauna and flora are considered of the Mediterranean type with a sub-tropical tendency. The habitats recorded along the coastal stretch included rocky, sandy, silty, coastal, neritic and oceanic habitats. Marine flora mostly consists of benthic algae -microphytes
and macrophytes. Sandy/soft bottom habitats are characterized by a soft bottom and are relatively poor in biodiversity and productivity. Beside its ecological consequences, the reduced yield of marine habitat is rapidly restraining the livelihoods of the 500 fishermen living in Saida, their yield consisting mainly of fish and some sea urchins amongst other crustaceans.

In addition, the coastline, especially the sandy beaches, is used as a tourist attraction both for swimming and boating (and some individual fishing), while the Maritime Boulevard or Corniche Al-Bahar, is a promenade destination and a location for many sidewalk cafes. Constructed in the early 1980s, the Corniche had a controversial impact because it destroyed the intimate relationship between Old Saida and the Mediterranean Sea. Plans for the construction of a smaller and larger port, respectively in Alexander Bay and further south, are among the key projects adopted by Saida Municipality. Their impact on the marine ecosystem will be radical and they will equally further spatially disrupt the historic relation between city and sea.

**Water Infrastructure and Groundwater Resources**

Saida is served with a water supply network that draws on water from the Kfarweh Spring and six other wells, plus Al-Awali River, contaminated with sewage, providing water for irrigation. The city does not receive water on a 24-hour basis but rather on a rotational basis similar to nearly all parts of the country. The increasing population and expansion of the urban footprint has increased demand for potable water.

Saida’s sewage network collects effluents from residences and institutions within the city and discharges them via the watercourses to a wastewater treatment plant near the Sayniq River. Saida’s sewage network extends beyond the Municipal boundaries to an area that corresponds roughly to the rivers and stream watersheds (Figure 26). The treatment facility provides secondary treatment and has a capacity of about 34,000 m3/d but is currently not operational. In the meantime, there are nine sewage outfalls discharging into the sea along the coast leading to heightened seawater contamination and making many beaches inaccessible or unusable (Figure 27).

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23 UNESCO criticized the project which diminished the standing of Saida as a world heritage city
Figure 26
Stormwater drainage network has been rehabilitated and upgraded in many parts of Municipal Saida. However, some areas still have a combined sewer/stormwater drainage network. Further, many towns east of Saida discharge their effluent into natural drains or streams such as Al-Qamleh and Abou Ghayyath. (Refer to transversal issue 1 for more details about the sewage/stormwater drainage infrastructure).

Flooding from the channelized streams is an increasingly recurrent event in Saida. For example, during the storms of January 2013, many of the smaller streams that were canalized and/or covered (Al-Qamleh and Abou Ghayyath) overflowed their restricted channels, and overtopped the culverts, inadequately sized to convey their flows. Figure 28 shows the inadequate size of the Abou Ghayyath culvert, especially the inlet whose top is close to the roadway and whose openings are very small (Figure 29). The channel upstream of the culvert is narrow and has a manhole intruding into it. The damage occurred because of the Abou Ghayyath flooding extended to the entire area around the culvert and downstream from it. Figure 30 shows an example of these damages, including deposits of debris. On the other hand, Al-Qamleh culvert (Figure 31) is in a better shape with its one cell culvert being larger than the two cells of the Abou Ghayyath that caters for a similar flow.

Groundwater resources are under growing pressure from over pumping due to increased demand and to contamination resulting from improper disposal of sewage, leaky sewage
networks, leaching from dumping of solid waste and from intensive agricultural activities in the area. More specifically, the Damour aquifer’s exposure to the surface has rendered it vulnerable to pollution. Further, its abutment and proximity to the sea coupled with uncontrolled exploitation has led to its increased salinization. Similarly, the Tyre (Sour) aquifer’s water quality is being undermined by seawater intrusion.

A summary of the analysis of terrestrial water resources in Municipal Saida (Table 5) identifies the strengths, weaknesses, opportunities and threats in the context of Transversal Issue #2.

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Abundance of water resources</td>
<td>• Inability of municipality to control water related/impacting activities upstream of city</td>
</tr>
<tr>
<td>• Proximity of water resources to built-up areas – becoming an attractive feature</td>
<td>• Multi-jurisdictionality of the water sector – city, ministries, CDR, Mouhafaza, etc.</td>
</tr>
<tr>
<td>• Extensive agricultural and un-built areas</td>
<td>• Public ignorance or lack of awareness</td>
</tr>
<tr>
<td>• Wells already developed</td>
<td>• Lack of an integrated water management plan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Willingness of the municipality to engage in and develop sustainable practices</td>
<td>• Proximity of water resources to built-up areas – rendering, to some, a source of nuisance</td>
</tr>
<tr>
<td>• Availability of funds to develop a strategy for sustainability</td>
<td>• Uncontrolled urban growth in terms of population and structures</td>
</tr>
<tr>
<td>• Relative abundance of undeveloped areas to be devoted to sustainable/green water management projects</td>
<td>• Political division within the city crippling decision making</td>
</tr>
<tr>
<td>• Need for water supply and people’s acceptance of use of alternative sources</td>
<td>• Mixing of sewage and stormwater in some networks and streams</td>
</tr>
<tr>
<td></td>
<td>• Increased water scarcity</td>
</tr>
</tbody>
</table>

A summary of the analysis of marine water resources in Municipal Saida (Table 6) similarly identifies the strengths, weaknesses, opportunities and threats in the context of Transversal Issue 2.

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Long coastline</td>
<td>• Lack of municipal control/jurisdiction over all sources of pollution</td>
</tr>
<tr>
<td>• Variety of beach type (sandy, rocky, etc.)</td>
<td>• Expansion/relocation of harbor not assessed from an environmental perspective.</td>
</tr>
<tr>
<td>• Harbor</td>
<td>• Public ignorance or lack of awareness</td>
</tr>
<tr>
<td>• Easily accessible</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Coastal cultural heritage for tourism (on the coast and in the sea)</td>
<td>• Sewage discharges into the sea</td>
</tr>
<tr>
<td>• Rehabilitation of the dump – to remove a major source of pollution</td>
<td>• Pollutants discharged into the sea via stormwater network from a variety of sources</td>
</tr>
<tr>
<td>• Variety of marine habitats – to allow for re-estabishment of marine life</td>
<td>• Saida’s landfill</td>
</tr>
<tr>
<td>• Poorly development Corniche leisure sites – for water sports and as cafes, etc.</td>
<td>• Large scale wastewater treatment facility</td>
</tr>
<tr>
<td></td>
<td>• Commercial harbor activity</td>
</tr>
<tr>
<td></td>
<td>• New harbor plans</td>
</tr>
</tbody>
</table>
Legal Framework

Watercourses, streams and embankment on both sides, are protected by Lebanese law. Decree 05/23107 (Appendix 2) ensures a protection buffer zone on both sides of rivers that should be free from built structures. The reason lies partly in the need to accommodate seasonal fluctuations of water flow but also to ensure that water flow is not restricted through building. Ironically, in the absence of state enforcement of these regulations, the state owned river and stream buffer are used to discharge solid waste, building debris and effluent. Nevertheless, state legislation is a sound foundation not only for protecting rivers and streams but also to reconceptualize them as green amenity corridors. More specifically, river buffer zone for the Al-Awali and Sayniq Rivers is 100m on each side, north and south of the watercourse. The four smaller streams are not included in river protective legislation. Instead they have been incorporated together with adjacent municipal land into road infrastructure in the city, for example Al-Barghouth is turned today into Al-American Street (Figure 32).

Identified Trends

Trend # 5 Open/ Closed Channeling of Minor Watercourses

Stormwater drainage in the Saida area has been critically affected by an uncontrolled urban sprawl that has forced the channeling and even paving over of some streams. Many of the streams that had drained the Saida area are either running through under-sized culverts or have dried out and subsequently paved over, after being rerouted upstream of Saida. This situation has led to flooding due to the fact that the rainfall runoff, previously channeled away by these streams, has now nowhere to go except for the existing stormwater network. These
networks where designed for an area that had significantly more open and pervious spaces than what is currently available and they cannot handle this increased runoff. In addition the streams that have not been paved over have had their channels severely constricted by construction built right on their banks causing any fluctuation in flow to cause flooding in the immediate vicinity and even in farther reaching areas.

![Al-Qamieh Culvert - Inlet](image1.jpg)

![Al-Barghouth - Closed Channel](image2.jpg)

![Al-Qamieh Culvert - Outlet](image3.jpg)

**Figure 33**

**Trend # 6 Spatial Encroachment onto River Domain**

The trend of appropriating river banks/ river public domain either for building purpose or for leisure activities such as restaurants and cafés is very common. Both types of encroachment are not healthy as it is blocking the river flow area as proved during January 2013 storm, when the rivers and the small streams flooded and destroyed a lot of the existing structure on the river banks.
Figure 34

Trend # 7 Unregulated Wastewater Discharge
As much detrimental to the watercourses is the discharge of wastewater from Saida’s sewage network. The network did not, in previous decades, extend from the city to the suburbs and whatever was executed was not designed to serve the number of people that are nowadays hooked up to it. As the population served by the network increases the leaks and failures of the network are going to increase. This situation is exacerbated by the fact that the wastewater treatment facility has not been made operational to the level of treatment it was built for (i.e. currently working as a primary treatment facility rather than a secondary one). The sea is the ultimate recipient of the water movement in Saida area. If the increasing trend in population and urban growth is maintained without mitigating its effect on water quantity and quality, the deterioration witnessed so far with the practical “desertification” of the marine habitat along the Saida coast might reach a tipping point beyond which no recovery can be made.
Trend #8 Mismanagement of Stormwater Resources

The most pressing issue in the case of Saida is that of water scarcity. The flip side of the scarcity coin is that of quality, because as the old water adage says “quality often effects quantity.”

The wells serving the city are being over-pumped to meet an increasing demand due to a growing population. This has led to a drop in the water table and subsequently a reduction in available water. At a time when rainwater harvesting is increasingly being adopted worldwide, stormwater in Saida is discharged into the watercourses, mixed with sewage and discharged into the sea. This is not only wasteful but problematic because stormwater doubles the volume of the sewage discharge beyond the capacity of the new treatment plant at Sayniq. As a result, the Sewage treatment plant functions in the dry season only. For the rest of the year, streams and rivers discharge into the sea, polluting marine habitats and wasting precious rainwater that can be used to recharge the underground water and prevent seawater intrusion.
THE CHEONGGYECHEON RIVER, SEOUL, 2003

The Project:
- A master plan from stream restoration was completed in February, 2003.
- A BRT system is planned as a complement to Seoul’s underground metro system

The restoration project:
- recover the flow of the river,
- encourage biodiversity back to the area,
- create a space where people and nature could interact
- rehabilitate significant historical and cultural sites,
- encourage a center for business and finance,
- uplifting the area while restoring the balance of development between north and south Seoul


Figure 36

QWAIQ RIVER REHABILITATION, ALEPPO, 2010

Objective of this project:
- Upgrade road infrastructure
- Uncover River
- Rehabilitate river banks

Ref: Municipality of Aleppo

Figure 37
**Future challenge**

Having identified the trends impacting water related landscapes in Municipal Saida, the next step, Phase III, is to identify planning tools and strategies to curtail inappropriate uses and mismanagement. Upcoming challenges within Transversal Issue 2 include the following:

- Strategies that safeguard the health of riparian ecosystem
- Strategies that rehabilitate watercourses as green amenity corridors
- Enforcing statuary protection through spatial planning tools
- Strategies for the economic revitalization of river green corridors in tourism, agriculture and related uses
4.3. **Green/Open Spaces**

**Position**
Urban green areas are relatively new in Saida, introduced with modern planning in Lebanon. The landscape framework proposed expands the analysis of green/open areas in Municipal Saida beyond parks, traffic related green areas, sports and cemeteries, by (a) identifying potential green areas (b) reclaiming heritage landscape as place and culture specific green areas, and (c) integrating existing and potential components into a network of green areas up-to-scale with the needs of the growing footprint.

**Vision**
To raise the 3.0 m² per capita green area allocation in Saida to comply with international standards by developing a network of green areas that contributes to quality urban living, health and wellbeing.

**Historical Background**
Radical changes to the urban morphology occurred with the destruction of the city following the Israeli invasion (date 1982). These changes were twofold: first, the establishment of the maritime boulevard which cutoff the historic city from the sea; second, the construction of new roads and water infrastructure. All of Saida’s traffic related green areas, street medians, roundabouts and roadside planting date to this period. Up to that date, Saida’s inhabitants had but to step out of the land castle eastwards to be engulfed by green fields and orchards. Looking westward, the historic city opened directly to a sandy beach and the port (Figure 38). There was no need for green areas or amenity spaces then. Today, with the growing population and the urban footprint extending all the way to the hills, public green spaces are a necessity. Green areas are equally necessary to regulate the homogeneous mix of commercial and residential buildings now occupying more than half of the area of Municipal Saida.

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[24] World Health Organization recommends a standard of 9.0 m² per capita
Figure 38

Morphological and Environmental Assessment
Archeological sites
Saida has a wealth of archeological sites: these open landscapes in addition to their historical value enhance the city character and provide a vital dilution of the built-up fabric. Four archeological sites can be noted: (a) the Temple of Eshmoun lies within Al-Awali River valley at the northern edge of Municipal Saida; (b) the Land Citadel or Al-Barr Citadel, also known as the Castle of St. Louis; (c) Necropolises which include the burial sites in ‘Ain Al-Helwe (beside the Palestinian Camp), ‘Aya’a Necropolis located near Al-Qamleh Stream in the midst of agricultural fields, and the Greek Roman Necropolis, located near Elia Roundabout; (d) the Roman Burial site near Al-Shohada Square.

Municipal Green Areas
According to the mapping undertaken (Figure 39) and the terms and conditions of the municipal contract for the maintenance of municipal green areas (Appendix 3) a total of 46 spaces are identified. These include roundabouts, street medians and islands, corniche, public beach and public gardens comprising a total of 2.2 ha (excluding new planned municipal park) that make up 3% of the Municipal Area. (Figure 40 and Table 7)
Municipal green areas (Figure 41) can be divided into two categories: public gardens and traffic related green spaces.

First, public gardens which include Ta’mir Park, the Kinayat (Eucalyptus) Grove at Al-Awali River estuary and the land allocated to the future city park. The latter is of 2.2 ha allocated as part of the land pooling and subdivision of Al-Wastani Project. This trapezoidal shaped park corresponds to a city block is designed as a formal garden and includes a public library, community center and recreational activities\textsuperscript{25}.

Ta’mir garden is a small public garden of 1,255 square meters fenced and maintained by the municipality to serve the population of the ‘Ain Al-Helwe Palestinian Camp and its peripheries\textsuperscript{26}. This garden includes large fig trees, Ficus nitida, date plams, Phoenix dactylifera, Phoenix sylvestris, Olea europaea, and Citrus limon. The garden is designed with a water fountain, a children’s play area and a small coffee shop.

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|}
\hline
Green Municipal Areas & Area (m\textsuperscript{2}) & \% Green Areas \\
\hline
Roundabouts and squares & 54391 & 22\% \\
Corniche and Public Beach & 130714 & 53\% \\
Street Median & 24690 & 10\% \\
Gardens (Ta’mir Garden and Kinayat Grove) & 14255 & 6\% \\
Proposed Municipal Garden & 22000 & 9\% \\
\hline
Total & 246050 & \\
\hline
\end{tabular}
\caption{Green Municipal Areas Table}
\end{table}

\textsuperscript{25} Saida’s Projects, Lecture delivered by Abd Al-Wahed Shehab, April 11, 2013.

\textsuperscript{26} Ramiz Ossayran, contractor for maintenance of Municipal green spaces (2013), Field visit and consultation about the municipal green open spaces, March 28 2013.
and hedges, Pittosporum tobira, paved pathways, benches and lighting. It is a successful example, well kept by a municipal employee that is responsible of maintenance, cleaning and supervision. (Appendix 4)

The Kinayat Grove is intertwined with the city history and valued as such by the people of Saida\(^\text{27}\). The grove used to be the site of scout camps, provided shelter to families whose houses were demolished during the Israeli invasion. The Rotary Club recently reforested the grove. Failing to maintain the renovated landscape, the grove/garden fell into decay. Today the plot is fenced with restricted public access.

![Saida Municipal Park, Serving the city of Saida, 2.2 ha.](image)

![Garden of Ta'mir 'Ram Al-Helwe, 1,255 m²](image)

![Kinayat (Eucalyptus) grove located north the Municipal stadium and related to the city’s memory](image)

Second, traffic related green spaces ( Figure 42) include squares, roundabouts and street medians. Squares and roundabouts are seen as visual landmarks that beautify the city. Noteworthy are Al-NijmehSquare, Saray Roundabout, Al-Shohada Square, Abou Rouh Island, Elia Roundabout. The Saray Roundabout is planted with umbrella pines, but all the other roundabouts include date palms, Washingtonia palms, Ficus trees, Brachychition acerifolius, Acacia spp. and oleander shrubs. Turf grass is also used in some of the larger traffic related green areas. Recently bitter oranges (Citrus sinensis, Arabic, Abou Sfeir) were introduced as street planting because of their significance as a species typical of Saida’s orchards. Street

\(^{27}\) Interview with Ali Dali Balta, Architect, Memory of the city and the rivers, March 23 2013
medians constitute important green corridors of some 8.2 km long, varying in width between 2 and 5 meters. Irrigation is manual, outlets available in all large medians and roundabouts.

Saida Municipality has exerted considerable effort to green and maintain traffic related green areas, especially medians and roundabouts. Maintenance of all municipal green areas is outsourced (Appendix 3), the municipality having neither trained staff nor equipment to undertake landscape management. Although the terms of the contract for management of municipal green areas is comprehensive and detailed, the absence of supervision or follow up by the municipality, due to the lack of specialized staff, is problematic. More significantly, since the Municipality does not evaluate the qualification of the applicants, and the contracts are awarded to the lowest bid. As a result, contractors not uncommonly provide poor quality maintenance and planting.

![Abou Rouh Garden](image)

![Al-Shoukada Square](image)

![Saray roundabout](image)

Figure 42

**The Municipal Stadium and Sports**

Sport fields and sport clubs (Figure 43) are an important component of open spaces in the city. Profiled by location and typology of open sport facilities in Saida, reveal that the only municipally owned sports area is the Municipal Stadium, or Al-Mala’ab Al-Baladi (Appendix 4). Located in the extreme north at the estuary of Al-Awali River, the Stadium is 6 ha in area, with limited public access, hosting an average of three games a week with national teams. Management of the turf grass is contracted separately from the rest of the municipal green

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28 Interview with Ibrahim El Hariri, Agriculture Engineer, Agriculture in Saida, March 28 2013
29 Riad El Dada, Sports Clubs, March 09 2013
areas, to ensure enforcement of international standards for landscape maintenance. The maintenance of the grass (Bermuda grass) is done according to a schedule, and the stadium is classified number one along with Triply Stadium in terms of quality.

Other sports fields and clubs are private clubs and can be divided into 2 categories: (a) 4 host official local and national teams with the authorization of the Ministry of Youth and Sports; (b) other 4 are sports complexes for leisure. It is important to note that the gyms, the clubs of chess, karate and kickboxing are excluded; the focus is on clubs with tennis, basket or football fields. Most playfields are covered, the exception being sports facilities of two educational institutions: the Haj Baha Al-Din Al-Hariri School and the AUST University. (Figure 43)
Figure 44

Cemeteries

Sport Facilities
- Sp 1: Municipal Stadium
- Sp 2: AUST
- Sp 3: Saida Youth Club
- Sp 4: 4B Complex
- Sp 5: Street Ball
- Sp 6: Al-Nadi Al-Ma’ani
- Sp 7: Al-Nadi Al-Ahli
- Sp 8: Ma’arouf Sa’ad Complex
Cemeteries are the breathing lungs of a city, considerably large in area, located in the urbanized core with mature trees. Municipal Saida has three large cemeteries, all located in proximity of the historic core, and treated for additional details within Transversal issue #3.

The Muslim Sunni Cemetery (Al-Jabbana) (appendix 4) located at the eastern edge of the walled city, facing the Audi Palace. The cemetery area is 1.8 ha, planted with cypress trees, Cupressus sempervirens, and other shrubs and climbers notably bougainvillea. The cemetery is managed and owned by the Islamic Waqf, having reached its full capacity 15 years, the cemetery is veritably an urban garden with limited public access.

The Jewish Cemetery is located south of the walled city along the waterfront. After the French mandate, most of the community emigrated from Saida, very few remained, and the cemetery was closed thereafter. It is currently inaccessible, fenced and walled, and in extensive decay.

Both the Sunni and Jewish cemeteries are historical landscape heritage, having reached their full capacity and preserved their green integrity.

The Muslim Shia cemetery is located on the Murex Hill. The cemetery dates back to pre-Ottoman times. It is 8000 m2 in area, continuing to function as burial site. As the Sunni Cemetery the Shia cemetery has a wealth of mature trees, mainly cypresses, and is well managed and accessible to the public.

_Saida Beach and Maritime Boulevard_

The concept of Corniche, or maritime boulevard, didn’t exist in Saida before 1982, with houses of the old city having direct access to the sea, except for the zone of the fisherman port (bahr al-’eid). This historic image is still alive in the minds of many citizens. The earthquake of 1956 and the Israeli invasion in 1982 destroyed a big part of the waterfront and allowed, for the first time, for a small maritime road on the periphery of the old city. In 1996, a big upgrading project of the waterfront was implemented developing the port of Saida and opening the maritime boulevard.

Today, the waterfront forms the largest potential open space in the city, municipal land classified as Maritime Domain.

Three types of spaces were identified in the waterfront: (a) the Corniche; (b) the beach; and (c) leftover spaces on the city’s edge.

The _Corniche_ is a 4.5 km long strip running from the Municipal Stadium until the Garbage Dump. It varies in width from 5 to 33 m (plaza in Alexander Bay). The _Corniche_ is today only socially active in the section facing the Old City and at the Alexander Bay where café have gathered. The rest of the _Corniche_ remains empty with minimal activity.
The beach constitutes of 2.7ha of sand at the northern section of the city. The public beach is a lost potential open space disregarded because of the pollution induced by sewage effluents and garbage. It is important to note that some initiatives are done by NGOs to clean it from time to time. The beach is also physically disconnected from the Corniche due to the difference in level caused by the establishment of the boulevard, and the lack of accessibility points. The left over spaces on the city’s edge are important assets to become green open spaces, reducing the impact of the break between the city and the sea caused by the Maritime Boulevard. They constitute 1.3 ha of misused spaces (mostly as parking lots). The plan of uplifting of the old city façade (a project incorporated in the CHUD program) conceptualizes these public spaces, but financial resources might not be enough to cover all of the maritime strip works. More generally, there is a problem with upkeep of the maritime boulevard which is littered with waste in the strip close to the old city. (Figure 45 and Figure 46)

Figure 45

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CHUD in Saida, Lecture by Nabil Itany, CDR, Beirut, April 11, 2013
DURBAN POINT WATERFRONT, SOUTH AFRICA, 2009

The catalytic project for the 55ha Durban Point Waterfront site.

The design concepts:
• An urban intensity of scale and an urbane character of development
• A structure based on canals, water bodies, boulevards, vistas, urban squares, avenues, lanes and parks.
• An emphasis on easy, safe, convenient and pleasant pedestrian movement
• An emphasis on mixed-use developments

Ref: Durban Point, [http://www.durbanpoint.co.za/](http://www.durbanpoint.co.za/) access on May 17 2013

Figure 46

Figure 47
The Railway Corridor
The railway cutting longitudinally east of Municipal Saida was constructed in the 1940s during the French Mandate to connect Naqoura in the extreme south of Lebanon to Tripoli in the north. The railway reduced its operations with the outbreak of the Lebanese Civil War (1975-1990) and, stopped after the Israeli invasion (1983-84). It was the first transportation axis which cut through the fields and catalyzed urbanization in the area around it, especially in its southern section. The railway was also a promenade for the citizens of Saida, running transversally across it.

The land is property of the Chemin de Fer de L’Etat Libanais (CEL), Ministry of Transportation. It is 7 km long measured from Al-Awali River in the north to the Sayniq River in the south with a width that varies from 12 to 15 m with the exception of the section in ‘Ain Al-Helwe where it widens to 120 meters to accommodate the train station, today incorporated in ‘Ain Al-Helwe Camp. (Figure 48)
Railway

- Railway Set back
- Railway

Figure 48
Accessibility varies from one section to another across the city. In the southern section, the railway crosses the extension area of ‘Ain Al-Helwe Camp, and access is restricted (as part of the military restrictions posed on the camp). In most of its other sections, the track is left free notwithstanding the presence of encroachments.

In the northern section, the railway was transformed into a secondary road in a continuous line from Mourjan Roundabout northward, until the new vegetable market (behind the Super Market Spinneys) southward. In other sections the road disappears in the agricultural fields. Encroachment onto the railway corridor is clear in many locations, be it use of the railway corridor as a parking space or incorporating it as part of the front yard of a house.

The potential of this axis is acknowledged by the local community and some proposals are being discussed for turning part of the northern section of the railroad to a pedestrian walkway (Mr. Ossayran and some Municipal Council members). However it is important to note that its potential is much larger than a simple pedestrian corridor, and it could set an example for sustainable green transportation corridor.
**Identified Trends**

**Trend # 9 Limited Understanding of Urban Green Spaces**
Prevailing understanding of the role of green areas continues to be that of beautification, in the sense that they are landscaped to be appreciated visually. The interest on the aesthetic value of green areas should necessarily be accompanied by recognizing their functional role, for example as soft movement corridors, or appreciated for their cultural, heritage or ecological values. Similarly outdated is the focus on city parks. Regardless of scale, city parks can’t serve the entire area of Municipal Saida.

**Trend # 10 Insularity of existing Green Spaces**
The existing traffic related green/open spaces (traffic medians, road verges, roundabout), in Saida are mainly insular, scattered and disconnected. Street medians and roundabouts are not only inaccessible, but also spatially discontinuous, which undermines their impact visually, functionally and environmentally. In contrast, continuous bands of green areas, for example the maritime boulevard, provide for landscape connectivity which is essential to ensure successful urban greening.

**Trend # 11 Unregulated and Inefficient Management**
Saida Municipality outsources management of existing green areas. The lack of municipal employees with expertise in landscape management, or of a unit dedicated to green area planning and maintenance, causes its inability to oversee and monitor outsourced management and maintenance of green areas, and explains the absence of guidelines for environmentally sustainable design and management, for example use of mulch and in the selection of native species. The lack of budgetary and space allocations for a plant nursery increases the cost of landscape maintenance.

**Trend # 12 Underutilized Marine Waterfront**
The maritime boulevard is incomplete in that it is but a street with wide sidewalks often disconnected from the beach. The drop in level between the street and the beach is often in excess of two meters with no easy access. Nor are there facilities for swimming, for example showers and temporary shade structures. The potential of the waterfront to serve as a multifunctional landscape that engages the entire city is yet to be explored.

**Future challenge**
Having identified trends shaping the planning and management of green areas in Saida, the next step, Phase III, is to identify legal and planning tools that enable and support the development of a green-blue network and guidelines for sustainable landscape management.
5.0 Key Partners

Transversal Issue 2 embraced a wide range of components (agriculture, environment, water resources, green areas). The innovative approach adopted in tackling these components in turn dictates unconventional criteria in selecting key partners that will carry through the strategic interventions proposed at the end of the project.

Potential key partners are accordingly grouped under three broad headings: (a), state agencies; (b), local businesses and local landowners; and third, local institutions.

5.1. State Agencies

Ministry of Environment:
The mission:

- Activate environmental compliance through monitoring, incentivization and deterrence, based on clear and transparent scientific and practical criteria.
- Consolidating the institutional partnership between the Ministry of Environment, non-governmental organizations,

It is a potential partner in this project, as the aim of this transversal issue responds to its environmental policies:

- Promotion of natural sites and reserves and biodiversity
- Activation of the environmental management of water basins
- Planning for urbanization and reducing its environmental implications
- Development of an integrated program for abatement of point source pollution
- Implementation of policies and plans established for municipal solid waste management
- Support of sanitation projects to ensure the safety of the environment

This public agency can provide the legal framework and protection for the success of such a project as it can be the source for attracting sufficient funds for the implementation.

Ministry of Energy and Water:
it is divided between the Ministry in general and the water establishment in specific the Water Authority (Maslaha Al-Mia)

The latter is a key stakeholder as it manages all the water resources available in the delegated area. Its role includes, according to the National Water Sector Strategy and the law 211:

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32 Ministry of Energy and Water, National Water Sector Strategy
Collect, treat and dispose of wastewater based on treatment and outfall sites approve by the ministry; Monitor water quality for distributed water supply and irrigation.

As for the ministry the role is much larger, it includes:

- Monitor, control, measure, study water resources, and estimate water needs
- Monitor the quality of surface and groundwater and set quality standards
- Design and implement large water infrastructure projects
- Perform artificial recharge of ground water aquifers and monitor extractions
- Develop legal framework and procedures to protect water resources from pollution and improve water quality
- Issue permits for water prospection and use of public water and property
- Monitor and regulate WEs and other entities working in
- The water sector 10. Enhance and monitor Water Establishments’ performance of according to indicators set in their business plans
- Set standards and regulations
- Perform expropriation transactions for MEW and WEs
- Ensure public relations and provide relevant information related to water conservation

Enforcing holistic environmental approach to the water resources can be done through the ministry imposing strict guidelines for all infrastructural projects especially what relates to waste water management.

Saida Municipality, Saida-Al-Zahrani Union of Municipalities
As a representative of state authority and an elected body, Saida Municipality becomes a key partner in planning, implementing and managing the proposed green area network. Moreover, amenity services are generally the responsibility of local authorities and all green spaces, whether traffic related or sports, are a property of Saida Municipality as are several of the potential open spaces, for example along the Maritime Boulevard.

The vision proposed for Transversal Issue 2 Green Area Network, and similarly for Transversal Issue 1 Urban Infrastructure, dictates cooperation in planning and management beyond the Municipal boundaries. As living ecological systems for example, river corridors extend beyond the municipal boundaries to embrace those adjoining municipalities to the east (Haret Saida, Al-Hilalieh, Abra, Majdelioun, Mieh w Mieh, Al-Bramieh, Bqosta and Al-Zahrani) In turn, Saida Municipality is burdened with wastewater and discharge from these municipalities and also

solid waste collection. It follows that ecological, landscape and infrastructural networks can’t be successfully tackled with coordination of the Saida and Al-Zahrahi Union of Municipalities.

5.2. Local Businesses, Local Land Owners

New Trading and Contracting Company s.a.l. (NTCC) Established in 1996 by Maher Al-Sayess (CEO) a resident of Saida, New Trading and Contracting Company (NTCC) offers professional and management services leading in the areas of solid waste management, recycling and construction. With more than 1500 employees and a capital of 1,750,000 US$, NTCC was subcontracted two key projects by Saida Municipality. The first is disposal of domestic, hospital and slaughterhouse solid waste and street cleaning. The second is landscape management of all municipal green areas. Responding to the plea of fishermen to the municipality for the disposal of spent motorboat oil\(^{33}\), NTCC has volunteered the design of a prototype collection tank for spent oil offering periodic emptying of the tanks by their own tankers (Figure 50). NTCC is willing ready to partner with the municipality on strategic interventions projects proposed by the USDS related to environment and recycling\(^ {34}\).

![Figure 50](image)

\(^{33}\) First meeting with the Saida USDS Working Group, Feb 13, 2013

\(^{34}\) Interview with Mr Maher Al-Sayess, CEO of NTCC 10 May 2013
5.3. Educational Institutions

Saida has an exceptionally large number of schools and education institutions. Engaging educational institutions, students of all ages and teachers in planning for green areas becomes a means to raise awareness of the environment and Saida’s celebrated landscape heritage.

Engagement takes place on two levels: (a) within school campuses in Saida (Figure 51) with 22 school distributed in the city, some with large campuses such as to note Hariri High School I, Nazih Bizri High School and American Evangelical School, and others with smaller campuses such as Al-Qala’a School, Al-Maqasid School, St. Joseph School, and Al-Dawha school; (b) at the level of Municipal Saida, to include green river corridors, agriculture and the waterfront.
Sport Facilities
1. Municipal Stadium
2. AUST
3. Sa’ada Youth Club
4. 4B Complex
5. Street Ball
6. Al-Nadi Al-Ma’ani
7. Al-Nadi Al-Ahli
8. Ma’arouf Sa’ada Complex

Educational Institutions
1. Rihls I
2. Ma’arouf Sa’ada Secondary School
3. Nazih Bazi High School
4. Rasmikat Al-Qanay
5. Janat Al-Shurug School
6. Government School
7. Girls Elementary School
8. Girls High School
9. Palestine Martyrs School - UNRWA
10. Al-Mqasid School
11. Al-Dawha Al-Mqasid School
12. St. Joseph School
13. Islam High School
14. Al Qal’a Elementary School
15. Al Qal’a School
16. Sidon Educational Institute
17. Sa’das Generation School
18. Za’atari Secondary School
19. Aisha School
20. UNRWA Secondary School
21. UNRWA Schools complex
22. American/Evangelical School

U1: AUST
U2: LIU
U3: Lebanese University

Figure 51
6.0 Conclusion and Strategic Objectives

6.1 Summary of Main Findings
The trends impacting the urban landscape across all three components (water resources, agriculture and green areas) are summarized below (Table 8):

<table>
<thead>
<tr>
<th>TRANSVERSAL ISSUE 2 COMPONENTS</th>
<th>IDENTIFIED TRENDS IMPACTING THE URBAN LANDSCAPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Landscape</td>
<td>Trend #1: Shrinking Agricultural Landscapes</td>
</tr>
<tr>
<td></td>
<td>Trend #2: Fragmentation of Agriculture Lands</td>
</tr>
<tr>
<td></td>
<td>Trend #3: Outdated Practices &amp; Monoculture</td>
</tr>
<tr>
<td></td>
<td>Trend #4: Prioritizing Realty Development over Agriculture</td>
</tr>
<tr>
<td>Watercourses, Marine &amp; Coastal Landscapes</td>
<td>Trend #5: Open/Closed Channeling of Minor Watercourses</td>
</tr>
<tr>
<td></td>
<td>Trend #6: Encroachment onto River Domain</td>
</tr>
<tr>
<td></td>
<td>Trend #7: Unregulated Wastewater Discharge</td>
</tr>
<tr>
<td></td>
<td>Trend #8: Wasting of Storm Water Resources</td>
</tr>
<tr>
<td>Green/Open Spaces</td>
<td>Trend #9: Limited Understanding of Urban Green Spaces</td>
</tr>
<tr>
<td></td>
<td>Trend #10: Insularity of existing Green Spaces</td>
</tr>
<tr>
<td></td>
<td>Trend #11: Unregulated &amp; Inefficient Management</td>
</tr>
<tr>
<td></td>
<td>Trend #12: Underutilized Marine Waterfront</td>
</tr>
</tbody>
</table>

Table 8

In combination these trends are compromising the health of the environment, eroding the distinct and unique landscape of Saida and undermining the quality of life in the city. And while environmental health, mitigating pollution of marine and river resources, is a key to sustainable future development, distinctiveness of the landscape setting, of coast and foothills, agriculture interspersed buildings is a sure asset to resist homogenization of the urban fabric.

6.2 Strategic Objectives
The overall strategic objective is to plan for a Blue-Green Landscape Network that incorporates all the key landscapes identified. The aim is simultaneously to protect the landscape heritage and ensure connectivity, continuous pedestrian movement across the entire city (Figure 52)
Four strategic objectives are proposed to realize the guiding vision for Transversal Issue # 2 namely the Blue-Green Network. Each of the four objectives will address the environmental, ecological and landscape concerns of key components of the network (Table 9):

<table>
<thead>
<tr>
<th>TRANSVERSAL # 2</th>
<th>ENVIRONMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATERCOURSES</td>
<td>INTEGRITY OF ECOCORRIDOR</td>
</tr>
<tr>
<td>SEA/COASTLINE</td>
<td>ECOTONE MGT</td>
</tr>
<tr>
<td>AGRICULTURE</td>
<td>SUSTAINABLE/ORGANIC</td>
</tr>
<tr>
<td>GREEN/OPEN SPACES</td>
<td>SUSTAINABLE MANAGEMENT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOCIO-ECONOMIC BENEFITS</th>
<th>LANDSCAPE HERITAGE</th>
<th>AMENITY, QUALITY LIVING</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOURISM, IRRIGATION</td>
<td>NATURAL &amp; CULTURAL</td>
<td>GREENWAYS</td>
</tr>
<tr>
<td>FISHING, TOURISM</td>
<td>NATURAL &amp; CULTURAL</td>
<td>WATERFRONT</td>
</tr>
<tr>
<td>LIVELIHOODS, BRANDED MARKETING</td>
<td>CULTURAL, QANAYA</td>
<td>AGRI-TOURISM</td>
</tr>
<tr>
<td>QUALITY LIVING</td>
<td>ARCHAEOLOGY, CEMETERIES</td>
<td>GREEN-BLUE NETWORK</td>
</tr>
</tbody>
</table>

Table 9
demonstrates the methodological overlap in planning future green areas between environmental, social, economic and cultural objectives. This integrative holistic landscape framework applied to the analysis of environment and natural resources ensures moving away from the generic concept of ‘urban park’ towards a network of green areas that are anchored in the natural and cultural landscape heritage of Saida, for example, the sea, rivers and watercourses, agriculture. The approach meets the objective of safeguarding environmental
health, offering social and economic benefits, protecting Saida’s landscape heritage while upholding the aim of quality urban living. The following briefly elaborates each of these objectives.

• **Environmental Health**
  The health of the environment is a key component that is achieved by ensuring on the one hand, ecological integrity of key elements (water courses, marine, groundwater) and on the other, public health and safety (seasonal flooding, water pollution).
  
  - **Reuse and Recycling of Waste**
    - Regulate solid waste dumping
    - Contain sewage discharge into rivers
    - Prevent sewage discharge into the sea
  
  - **Sustainable Water Resources Management**
    - Protecting the riparian ecology and river corridors
    - Rainwater Harvesting
    - Recharging groundwater resources
    - Ensuring the health of marine resources

• **Socio-Economic Benefits**
  Environmentally sustainable development invariably provides social benefits (improved public health) but should additionally be sustainable economically by addressing traditional livelihoods (fishing, agriculture, traditional agriculture related cottage industries) and innovative economic enterprises (nature and agri-tourism, recreational services)

• **Saida Landscape Heritage**
  A key strategic objective is to protect Saida’s landscape distinctiveness as bridging marine and land landscape, its historical survival rooted equally in sea-based and rural livelihoods, albeit reframing the landscape to address 21st century vision for the city.
  Strategies for the protection of landscape heritage include:
  
  - **Revive and Protect Saida Agriculture Heritage**
    - Organic and/or sustainable agriculture production
    - Upgrading terraced fruit agriculture in the river valleys
    - Integrating amenity and recreation

• **Amenity and quality living**
  Physical and emotional wellbeing is a key objective of urban living in the 21st century. The quantity and connectivity/continuity of urban green areas impacts directly the health of Saida’s inhabitants and in addition continues Saida’s historical role as offering quality living partly because of open access to the sea and to the verdant orchards surrounding the city.
  
  - **Applying WHO Optimum Standards for urban green areas**
    - Upgrading existing green areas
    - Rehabilitating potential green areas
    - Introducing new green areas and sports
    - Protecting historic and heritage urban landscapes
  
  - **Saida Blue-Green Infrastructural Network 2030**
- Coordinate where possible amenity and transportation infrastructure
- Coordinate where possible amenity and water infrastructure
7.0 References

Interviews:

- **Ziad Hakawati**, Engineer at Municipality of Saida, field visit and consultation about the state of the rivers and streams in Saida, February 28, 2013
- **Ali Dali Balta**, Architect, Memory of the city and the rivers, March 23 2013
- **Maher Abboud**, Associate Professor of Chemistry, March 23 2013
- **Mohamad Ali Abu Alfa**, Surveyor, Relation of Agriculture fields and the social fabric, layers of expansion of Saida, March 23 2013
- **Ramiz Ossayran**, contractor for maintenance of Municipal green spaces (2013), Field visit and consultation about the municipal green open spaces, March 28 2013
- **Ibrahim Al-Hariri**, Agriculture Engineer, Agriculture in Saida, March 28 2013
- **Maher Al-Sayess**, CEO NTCC, Potential Partner, Friday May 10, 2013
- **Nisrine Ghazzawi**, NTCC, Field visit and consultation, Friday May 10, 2013
- **Ghassan Kotob**, Agriculture Land owner, Friday May 10, 2013
- **Amjad Khawli**, Civil Engineer, Khawli Construction, River development, Friday May 10, 2013
- **CDR’s vision for Saida**, Lecture delivered by Ibrahim Shanrou, ITU, Saida, April 17, 2013
- **Saida’s Projects**, Lecture delived by Abd El Wahed Shehab, Beirut, April 11, 2013
- **CHUD in Saida**, Lecture by Nabil Itany, CDR, Beirut, April 11, 2013

Field Visits:

- January 24 2103, Mapping Landscape Character
- February 28 2013 and March 28 2013, Mapping of River Scape
- February 14,16 and 28 2013, Mapping Agriculture
- March 10, 2013 Meetings
- March 18 2013 Meetings
- Working Groups meetings February 13, 2013 and April 18, 2013
References:


**Case Studies:**
Durban Point, [http://www.durbanpoint.co.za/](http://www.durbanpoint.co.za/) access on May 17 2013


The Antique tram of Istiklal Caddesi,*Istanbul for 91 days*, available: [http://istanbul.for91days.com/2013/03/12/the-antique-tram-of-istiklal-caddesi/](http://istanbul.for91days.com/2013/03/12/the-antique-tram-of-istiklal-caddesi/) access on May 15, 2013

8.0 Appendices

Appendix 1: Master Plan Zoning, 1995 Decree 65552
Appendix 2: Decree 05/23107
Appendix 3: Terms and condition of the contract for the maintenance of municipal green spaces and Profile of all municipal green areas
Appendix 4: Templates of Green Open Spaces
### Table: Master Plan Zoning, Approval in 1995 Decree Number 6552

<table>
<thead>
<tr>
<th>Zone</th>
<th>New Plots Requirements</th>
<th>Existing Plot Requirements</th>
<th>Setback</th>
<th>Percentage of Lot Coverage</th>
<th>Floor Area Ratio (FAR)</th>
<th>Number of Floors</th>
<th>Building Maximum Height</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimal Area (m²)</td>
<td>Minimal Façade Length (m)</td>
<td>Minimal Depth (m)</td>
<td>Minimal Area after Alignment (m²)</td>
<td>Minimal Façade Length after Alignment (m)</td>
<td>Minimal Depth after Alignment (m)</td>
<td>Setback from the edge of Road or Alignment</td>
<td>Centered Setback</td>
</tr>
<tr>
<td>A</td>
<td>Archeological, residential, and commercial</td>
<td>Parceling is only allowed when new plots are larger than 200m²</td>
<td>200</td>
<td>12</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>60</td>
</tr>
<tr>
<td>B</td>
<td>Very high residential and commercial density</td>
<td></td>
<td>600</td>
<td>20</td>
<td>20</td>
<td>300</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>C</td>
<td>High residential and commercial density</td>
<td></td>
<td>800</td>
<td>20</td>
<td>20</td>
<td>400</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>D</td>
<td>Medium residential and commercial density</td>
<td></td>
<td>1000</td>
<td>25</td>
<td>25</td>
<td>500</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>D1</td>
<td>Medium residential and commercial density if the building is used for industrial and commercial purposes, the regulation of the zone D would be applied. If the building is used for touristic purposes (hotels, resorts, etc.) the regulations would be 40% for the percentage of land coverage and 1.5 as Floor Area Ratio (FAR) with a minimum of 3m from road or alignment edges.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>E</td>
<td>Residential</td>
<td></td>
<td>1000</td>
<td>25</td>
<td>25</td>
<td>600</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>F</td>
<td>Low residential density</td>
<td></td>
<td>1200</td>
<td>30</td>
<td>30</td>
<td>750</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>I</td>
<td>Industrial</td>
<td></td>
<td>1500</td>
<td>30</td>
<td>35</td>
<td>1000</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>I1</td>
<td>Industrial</td>
<td></td>
<td>1200</td>
<td>30</td>
<td>30</td>
<td>800</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>G</td>
<td>Touristic</td>
<td></td>
<td>5000</td>
<td>60</td>
<td>60</td>
<td>2500</td>
<td>50</td>
<td>40</td>
</tr>
<tr>
<td>G1</td>
<td>Touristic</td>
<td></td>
<td>4000</td>
<td>50</td>
<td>60</td>
<td>1500</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

According to the decree of the setback on the road axis or as shown on the roads network plan with a minimum of 3m from road or alignment edges.
Appendix 2: Decree 05/23107

الجُمُلَاءَ الْأَعْلَى لِلَّتِيْنَمِيْنَ الْمَنْتَصِرَةَ

oman al-musāra

من محضر الجلسة الممكلة بتاريخ 22/5/2006

الموضوع: إلغاء مناطق تحت الدروس في صيدا

- المطلوب: إلغاء مناطق الدروس على جانبي نهر الأولي ونهر سينيق في صيدا.
- قرار المجلس الإلائي رقم 52/2005: تكليف دائرة التصاميم الكشف المحلي ووضع تقرير مفصل عن محيط مجرى الأولي.
- إقترح مصلحة الدروس بتاريخ 30/12/2005: تقرير المناسب بعد نفي المطلب.
- قرار مجلس موضع المناطق المحرومة تحت الدروس بالمحضر رقم 12/13 بشكل عام، متوقعا عند آليات تخفيف المبادأ.

وادي المداولة

قرر المجلس تخفيف عرض المنطقة الموضوحة تحت الدروس على جانبي الأنهار المحددة على الخرائط المرفقة بالمحضر رقم 2006/3/29.

بيروت في 29/3/2006

برح هنبيان
رئيس المجلس
Appendix 3: Terms and condition of the contract for the maintenance of municipal green spaces and Profile of all municipal green areas

Terms and condition of the contract for the maintenance of municipal green spaces
(ref. Municipality of Saida)

The following items are extracted from the terms and conditions of the bidding process, these items were found relevant to the issues related to management, maintenance and supervision of the works done by the contractor:

#1: the contractor has to be a specialist

Ref: Conditions are required for participating in the bed: (item 3)

- Being an agriculture engineer/ or a company with experience in the domain of maintenance and agriculture that execute the works through an Agriculture engineer and an specialized team in this field

#2: Duties of the contractor related to the presentation in issues related to maintenance and excision works

- To present all the needed machines to execute the works and to be responsible on maintaining it and fuel consumption and to insure them at specialized companies ad to present a approved record and register it in the municipality
- The working team has to wear a distinct uniform that can be recognized and identified to the passing cars during the working hours
- The contractor has to present all the chemicals and organic fertilizers and pesticides in case the plant infection after the approval of a specialist appointed by the municipality that will supervise the quantity and quality
- To present all the needed tools and materials needed to maintenance works and irrigation
- Maintenance of all the irrigation system and network in specific locations
- Insure his workers against any injury during working times

#3: Tasks

- To refer to list 1: Appendix of all existing species and locations that forms the scope of works and to be responsible for the execution of all specified works of maintenance and irrigation respective to each site including works of replacing decaying plants with new ones.
- Present a time line that specifies monthly working plan covering the contact period done in coordination with the responsible appointed by the municipality and to start the works according to the plan after the approval of the responsible appointed from the municipality in charge of supervising the works
- The team has to clean all waste resulting of plant maintenance works and to clean all the tools and waste resulting of agricultural works in roundabouts and street medians as part of the plant maintenance contract. All works related to removal of plant material on side walks and streets are excluded form the scope of work of the contractor as they are part of the contractor responsible for the sweeping streets and
sidewalks and garbage collection as they have to insure the transportation of waste to the waste collection site (determined by the municipality) using specialized trucks.

**List 1: Classification of maintenance works:**
This list indicated all the pruning and fertilizing works needed per quantity and time and per specie and location. It is set by the municipality for the contractor.

**Class A:**
- Irrigation of all the plants in a schedule of 2 times a week except the lawn 3 times a week from first of April till the end of November and according to the need during the rest of the year under the condition that the time laps doesn’t exceed 10 days. The irrigation occurs using the irrigation system if available or using soft water using truck and water tanks in the other case.
- Lawn mowing in locations according to need under the condition that the lawn height doesn’t exceed 8 to 10 cm and removal of all the debris resulting of the mowing activities and transporting it to the allocated places specified by municipality on the contractor expense.
- The following works are required each month
  1. Pruning of trees, plants and hedges according to location with keeping on the general tree appearance / shape. The pruning need to remove all yellow leaves and to remove them to the allocated places specified by municipality on the contractor expense.
  2. Stacking of trees and plant of week plants
  3. Weeding of herbs and undesired plants around trees and removal of all derbies
- The following works each 2 month
  Pruning of Washingtonia and all fern/ palm plants that are located at roundabouts and squares and removal of al derbies
- Fertilizing:
  - Primary fertilizers (Nitrogen –Phosphate) 3 times a year in a rate of 1 kg/ du
  - Chemical fertilizers Nitrogen: 3 times a year in a rate of 25 to kg/du
  - Organic sterilized fertilizers: in a year in a rate of 40 to 60 kg/ du in roundabouts and 1000 g to 2000g in street medians
- insure and spray any plants in case of any infection in any disease
- washing of plants in a rate of once a month in summer (between June and September) excluding lawns
- replanting of new shoots/ plants in case od decaying plants and buying the new shoot on the expense of the contractor
- spraying plant in a cyclical manner with a minimum rate of 4 times to prevent from insect or pathogenic infection and in times needed
- all these works needs to be scheduled by the contractor in a written document that will be presented to the engineering department in the municipality to be reviewed by the specialist appointed by the municipality.
Class B:
- Irrigation of all the plants in a schedule of 2 times a week from first of April till the end of November and according to the need during the rest of the year. The irrigation occurs using the irrigation system if available or using soft water using truck and water tanks in the other case.
- The following works 4 times a year (except for Alti roundabout and Hussam Eddine al Hariri square 5 times a year):
  1. Pruning of trees, plants and hedges according to location with keeping on the general tree appearance / shape.
  2. Stacking of trees and plant of week plants
  3. Weeding of herbs and undesired plants around trees and removal of all derbies

- Fertilizing distribution:
  o Primary fertilizers (Nitrogen –Phosphate) 3 times a year in a rate of 1/4 kg/ tree or plant each time
  o Organic fertilizers: 3 times a year in a rate of 1/4kg per tree each time
- Provide spraying pesticide in case of infection in any agricultural pest
- Provide washing of the plant periodically in a rate of twice in summer
- Replace decaying plants and plant dead zones of lawn
- Spraying of plants in a periodic manner in a minimum rate of 4 times (April to October) in case of protection of from disease and pests and when it is needed. And if fall was delayed an additional fifth spray is requested from the contractor by the end of November

Class C:
- Irrigation of all the plants in a schedule of once a week from first of April till the end of November and according to the need during the rest of the year. The irrigation occurs using the irrigation system if available or using soft water using truck and water tanks in the other case.
- Works requested once a month
  1. Pruning of trees, Washigtonia and fern plants and removal of all derbies in all squares and roundabouts in the city
  2. Stacking of trees and plant of week plants
  3. Weeding of herbs and undesired plants around trees and removal of all derbies
  4. Provide spraying pesticide in case of infection in any agricultural pest
  5. Fertilizer distribution
     o Primary fertilizers (Nitrogen –Phosphate) 3 times a year in a rate of 1/4 kg/ tree or plant each time
     o Organic fertilizers: 3 times a year in a rate of 1/4kg per tree each time
- Provide washing of the plant periodically in a rate of twice in summer
- Replace decaying plants and plant dead zones of lawn
- Spraying of plants in a periodic manner in a minimum rate of 4 times (April to October) in case of protection of from disease and pests and when it is needed.
Class D:
Works to be done twice a year:
- Prune the trees in a designed shaped
- Staking of weak trees and plants
- Weeding of undesired herbs and removal of all debris resulting of weeding from lawn as it is requested from the contractor to plow shallowly the street medians once when the organic fertilizers are applied in February and first of March
- Provide washing of the plant periodically in a rate of twice in summer
- Provide spraying pesticide in case of infection in any agricultural pest
- Replace decaying plants and plant dead zones of lawn
- Spraying of tree trunks with lime and Copper Oxhexlor mixed with bordeau
- Spraying of plants in a periodic manner in a minimum rate of 4 times (April to October) in case of protection of from disease and pests and when it is needed.

List 2: required machines:
- mobile water tank / truck with a pumping machine
- pick up or truck that fold
- collection of pesticides and fertilizers
- bucket truck for pruning palm and Washingtonia

List 3: Working Team
- Agriculture engineer with a practicing permits from any of the engineering syndicate in Lebanon
- 2 supervisors for workers
- Min of 18 agriculture workers over the year

General Guidelines
- irrigation of lawn areas once a day in the morning or afternoon from May to October
- Add sterilized organic fertilizers (free of herbs seeds and fungus) once every 45days during irrigation and all along the year
- Add the primary chemical fertilizers (Nitrogen, Potassium, Phosphate) in an average of once a month all along the year directly before irrigation, preferably NPK 17, 17,17 of any source
- Spraying trees, plants and especially lawn with preventive pesticides once every 3 month, and in case of infection it has to be treated completely with pesticides in a specified monthly schedule that should be reported immediately to the appointed specialist of the municipality
- For any decaying plant resulting from plant drought or carelessness or pest infection (insect or pathogen) without being treated, the contractor is in charge of replacing and replanting it on his expense and under the condition that it needs to be the same size as the previous one
- The removal of all the debris resulting of works to allocated spots by the municipality
- The water used for irrigation has to apply to the specs (no salts)
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<th>Class</th>
<th>Location</th>
<th>Details</th>
<th>Number</th>
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<th>Area</th>
<th>Plant cover</th>
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<td>2</td>
<td>Plaza’s and 4 triangles on east side</td>
<td>2974</td>
<td>Turf grass, Palm, Pittosporum Hedge</td>
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<td>ساحة الشهداء</td>
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<td>بوليفيار فواد شهاب</td>
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<td>بوليفيار فواد شهاب</td>
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<td>تريانجلز امام شهاب</td>
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Profile of all municipal green areas (Ref. Municipality of Saida)
## Profile of all municipal green areas (Ref. Municipality of Saida)

<table>
<thead>
<tr>
<th>Code</th>
<th>Location</th>
<th>Description</th>
<th>Trees/Plants Description</th>
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<td>في الوضة والأرضية ومن بين وبين بار البوليفار +</td>
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</tbody>
</table>
Appendix 4: Templates of Green Open Spaces
**Municipal Green Areas**

**Saida’s Municipal Garden, Wastani**

- **Area:** 2 ha
- **Description:** Formal garden
- **Softscape:** None
- **Hardscape:** None
- **Status:** Not implemented
- **Ownership:** Municipal

**Other:**

**Map of Green Open Spaces**

**Proposed Master Plan (ref. Abd Al-Wahed Shehab)**

**View of the site**

**Landscape Character**

- Natural
- Agricultural
- Periurban
- Urban

**Landscape Potential**

- Ecological corridor
- Urban Periphery Definition
- Natural Heritage Value
- Cultural Heritage Value
- Amenity
**Landscape Character**
- Natural
- Agricultural
- Periurban
- Urban

**Landscape potential**
- Ecological corridor
- Urban Periphery Definition
- Natural Heritage Value
- Cultural Heritage Value
- Amenity

**Landscape Character**
- Natural
- Agricultural
- Periurban
- Urban

**Landscape potential**
- Ecological corridor
- Urban Periphery Definition
- Natural Heritage Value
- Cultural Heritage Value
- Amenity

**Al-Shohada Square, Dekerman**

**Ta’mir Garden, Dekerman, Ain El Helwi**

**Area:** 2,974 m²
**Description:** eastern square is fenced cemetery, the western square is a garden
**Softscape:** Turfgrass, Phoenix dactilifera & Pittosporum hedge
**Hardscape:** Fence, lightpoles
**Status:** Managed
**Ownership:** Municipal
**Accessibility:** Garden Accessible

**Area:** 1255 m²
**Description:** Small Formal Garden
**Softscape:** Ficus, Phoenix dactilifera & Pittosporum hedge
**Hardscape:** Fence, lightpoles, benches, garbage bins, pavement
**Status:** Managed
**Ownership:** Municipal
**Accessibility:** Accessible

**Al-Shohada Cemetery**
**Garden Furniture**
**Panoramic View**
**Panoramic of the Garden**

**Map of Green Open Spaces**

**Municipal Green Areas**

**Map of Green Open Spaces**

**Municipal Green Areas**
**Area:** 4,000 m²
**Description:** Boulevard median, designed as garden but lacks furniture
**Softscape:** Grass, Washingtonia robusta & Crataegus monogyna
**Hardscape:** Drip irrigation
**Status:** Managed
**Ownership:** Municipal
**Accessibility:** Accessible

**Water Resources**
- **Al-Awali River**
  - **Drainage area:** 295 km²
  - **Average annual flow rate:** 320 mm³/year

**Traffic Related Open Spaces**
- **Abou Rouh Garden, Dekerman, Waterfront**
  - **Area:** 4,000 m²
  - **Description:** Boulevard median, designed as garden but lacks furniture
  - **Softscape:** Grass, Washingtonia robusta & Crataegus monogyna
  - **Hardscape:** Drip irrigation
  - **Status:** Managed
  - **Ownership:** Municipal
  - **Accessibility:** Accessible

**Landscape Character**
- Natural
- Agricultural
- Periurban
- Urban

**Landscape potential**
- Ecological corridor
- Urban Periphery Definition
- Natural Heritage Value
- Cultural Heritage Value
- Amenity

**Landscape Character**
- Natural
- Agricultural
- Periurban
- Urban

**Landscape potential**
- Ecological corridor
- Urban Periphery Definition
- Natural Heritage Value
- Cultural Heritage Value
- Amenity
**WATER RESOURCES**

**Sayniq River**

- **Drainage area:** 140 km²
- **Average annual flow rate:** 12 mm³/year

**Al-Qamleh watercourse, Wastani**

- **Drainage area:** 4.78 km²
- **Average annual flow rate:** 0.58 mm³/year

---

**Map of water resources**

**Sayniq River Course**

**Aerial Image**

**Al-Qamleh Course**

**Map of water resources**

**Al-Qamleh Flow (February 2013)**

**Cafe on river Banks**

**View over the site**

**Al-Qamleh Culvert**

**Al-Qamleh Inlet**

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**Landscape Character**

- Natural
- Agricultural
- Periurban
- Urban

**Landscape potential**

- Ecological corridor
- Urban Periphery Definition
- Natural Heritage Value
- Cultural Heritage Value
- Amenity

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**WATER RESOURCES**

**Sayniq River**

- **Drainage area:** 140 km²
- **Average annual flow rate:** 12 mm³/year

**Map of water resources**

**Sayniq River Course**

**Aerial Image**

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**WATER RESOURCES**

**Al-Qamleh watercourse, Wastani**

- **Drainage area:** 4.78 km²
- **Average annual flow rate:** 0.58 mm³/year

**Map of water resources**

**Al-Qamleh Flow (February 2013)**

**Cafe on river Banks**

**View over the site**

**Al-Qamleh Culvert**

**Al-Qamleh Inlet**

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**SPORTS**

**Saida's Municipal Stadium**

- **Area:** 60,000 m²
- **Description:** Hosts 3 games/week for national teams
- **Softscape:** Bermudagrass
- **Status:** Managed following international standard, 1st in Lebanon in terms of quality
- **Ownership:** Municipal
- **Accessibility:** Not accessible

**CEMETERIES**

**Al-Jabbaneh, Old City periphery**

- **Area:** 1800 m²
- **Description:** Old Sunni Cemetery, reached full capacity - closed
- **Softscape:** Cupressus sempervirens, Bougainvillea spp. & other
- **Hardscape:** Paved pathway
- **Status:** Managed
- **Ownership:** Awqaf
- **Accessibility:** Accessible

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