

AMERICAN UNIVERSITY OF BEIRUT

RETHINKING MASTER PLANNING:
THE BINT-JBEIL REGION AS CASE STUDY

By

ALI TAMER ZEINEDDINE

A thesis
submitted in partial fulfillment of the requirements
for the degree of Master in Urban Design
to the Department of Architecture and Design
of the Faculty of Engineering and Architecture
at the American University of Beirut

Beirut, Lebanon
May 2014

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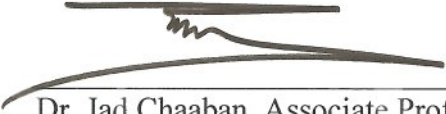
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ACKNOWLEDGEMENT

First and foremost, I would like to thank Allah (swt) for the power to believe in my passion and to pursue my dreams. I could never have done this without the faith I have in Allah (swt).

I wish to express my most sincere gratitude to my advisor Dr. Mona Fawaz for the continuous support of my Masters' study and research, for her patience, motivation, enthusiasm, and immense knowledge. Her guidance helped me in all the time of research and writing of this thesis. I could not have imagined having a better advisor to successfully complete the work in the smoothest possible way throughout the entire process from proposal to thesis.

I also would like to express my appreciation to my committee members, Dr. Jad Chaaban and Dr. Marwan Ghandour for their valuable comments and assistance.

My deepest and absolute gratitude and admiration goes to all my family and friends for their endless love and support, which crowned my efforts and brightened my vision.

AN ABSTRACT OF THE THESIS OF

Ali Tamer Zeineddine for Master of Urban Design
Major: Urban Design

Title: Rethinking Master Planning: The Bint-Jbeil Region as Case Study

The sustainable development of human settlements in Lebanon has been undermined by a number of challenges such as unequal growth, rampant sprawl, land speculation, social exclusion, environmental degradation, and the unsustainable management of natural resources. Urban and regional planning strategies have to date failed in responding to these challenges in the way they address the organization of the territories.

This thesis aims to explore an innovative planning and design approach that combines a two tier analysis looking at the intersections between on the one hand, ecological continuities (Makhzoumi and Pungetti, 1999) and on the other, the logic of the production of the built environment. Building on a case study of the agricultural fields connecting seven villages in the area of Bint-Jbeil (South Lebanon), the analysis identifies “conflict zones” and zooms in on one of these zones in order to propose an integrated set of planning incentives (taxation) and design (land use regulation/building regulations) interventions that work to reframe the organization of the natural and built environments in the area.

The thesis concludes on the necessity to revise existing planning tools by conceiving (considering) of development areas and scales of interventions beyond the currently used logics of concentric zoning and administrative units. It also demonstrates the possibility of introducing property taxation systems that work in the form of incentives to facilitate the implementation of land use planning.

The thesis is based on a detailed analysis of maps and aerial photographs, records of formal and informal building processes obtained from one of the local municipalities, as well as interviews with property owners in the investigated area.

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Chapter I

INTRODUCTION

European countries have devised rural planning policies with the goal of maintaining agricultural lands and the countryside as well as protecting these areas from urbanization (Alexander, 2006). Such forms of planning policies are described as ‘productivist regimes’ (Marsden et al., 1993). Rural planning policies have frequently been deplored (or condemned) by the professional planning community because they were perceived as ‘static’ or unable to adapt to change (Berke et al., 2006). Such schemes identify rural landscapes as ‘agricultural’ and accordingly ascribe to them specific, pre-determined land uses.

In Lebanon, rural planning was approached with a similarly conservative scheme despite the absence of any clearly defined policy targeting rural development. Instead, and in the absence of a functional rural economy for decades, attempts were made to zone lands as “agricultural”. In an effort to constrain and direct urban sprawl, the Master Plan assigns land usages and controls building densities so as to organize physical development. Every piece of land falling in a planned zone is mandated to abide by constraints on building height, type, size and percent of land to be built on. This plan goes further to delineate land for agricultural, residential, industrial, commercial, and special purpose usage.

In the Lebanese countryside, however, this process contradicts severely the landscape and economic reality of the zoned areas, which is strictly tied to urban

economies at the national and international scales, and where new building investments frequently take the form of secondary week-end or summer homes. In such a context, building processes happen frequently haphazardly, trespassing over agricultural lands and disregarding the ecological wealth. Thus, much of Lebanon's rural areas are pray to sprawling developments. Studies¹ show that urban sprawl will account for 250-300km² of Lebanon's area, with a growth of 42-50% (as compared with the year 2005) (Fig. 1).

The static nature of the master plan is however not the only challenge to control sprawl and protect ecological wealth. There are first challenges that arise from the economic value of land in a context where the building potentials of an individual property largely determine its financial value. In a context like Lebanon, land use zoning efforts fall prey to individual agendas and overall corruption (e.g. bribery, private interests). As a result, the goals set by the master plan are seldom achieved and the dictated zoning and planning regulations fail to protect ecological areas, reflecting instead the relative power of the property owners and their ability to challenge zoning regulations or not.

¹ Studies such as the "National Planning Master Plan of the Lebanese territory (NPMPLT). The Lebanese government appointed the Council for Development and Reconstruction (CDR) responsible for expanding on frameworks of previously set urban planning policies, and the development of a master plan that will serve as the base for future urban planning policies in the country. In May of 2009, such a plan was issued, and subsequently approved by the Council of Ministers of Lebanon.

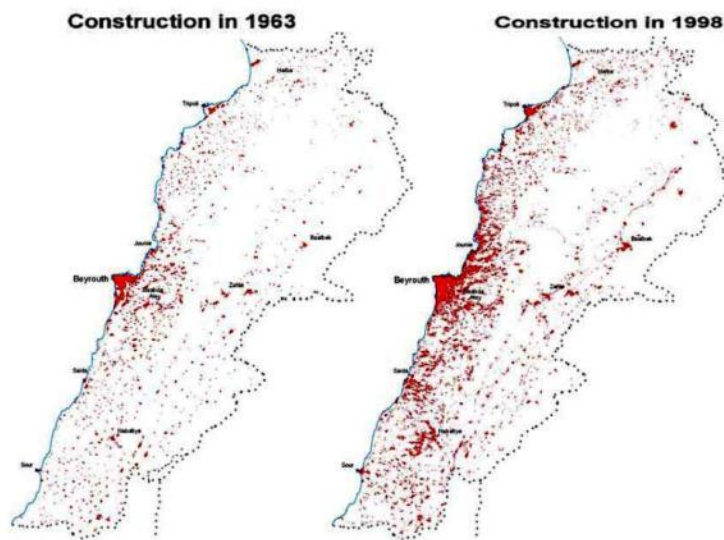


Fig. 1: The urban pressure

Source: National Physical Master Plan of the Lebanese Territory, Final report, 2005

Another limitation of master plans is *design weaknesses* whereby these regulations are typically based on the assumption of ‘clear zones’: people generally live in a central settlement and commute daily to and from their farmlands located in the peripheries. As a result, master plans typically follow a ‘concentric’ model where expansion occurs around a central core, typically the old village and/or town, in loops where building ratios are gradually reduced. Owing, then, to the patterns of land prices that is closely pegged in Lebanon to building ratios, these concentric circles typically also reflect land price hierarchies and are generally perceived as favoring the interests of certain property owners over others.

A third challenge to land use regulations stems from the wide disrespect of regulations in Lebanon. Indeed, communities are increasingly coming to the conclusion that land-use planning in Lebanon is hectic and disorganized. This results in landowners disregarding any planning regulations whilst municipalities provide [informal] pursuits.

A fourth challenge stems from the scale at which planning and decentralized government actually happens is today on the agenda of policymakers in Lebanon more than ever. Today, questions about decentralization, the competence of local authorities, and the scale at which local administration and hence planning should occur are at the heart of public policymaking (Harb and Atallah, 2014). In relation to planning, studies indicate that the municipal administrative scale has been inadequate in organizing planning: it interrupts agricultural fields between towns and villages and addresses rural areas individually despite the fact that they are closely tied to regional and national – particularly urban capital.

As a result of these challenges, new tools for the management of land uses that protect agricultural areas and reconcile tensions between green and built areas are needed. This thesis seeks to work towards that goal by reaching to a multidisciplinary planning/design framework that incorporates the tools of land use management/landscaping with those of design and property management. More specifically, the thesis aims at revising the current ways in which master plans are developed in at least three ways:

1. Rather than using administrative jurisdictions as the boundaries of the plan, the thesis will begin by identifying an area of ecological continuity as a zone to protect/plan;
2. Rather than approaching the problem from the perspective of land use/building management of ecological management, the thesis will confront these two approaches;

3. Rather than simply zoning the entire area, the thesis will look for incentives and regulations that support the needed protection/regulations.

A. Thesis Questions and Main Argument

This thesis will tackle the following two questions,

- How can we propose a new form of (land use) organization, which reconciles a holistic understanding of the ecology, social continuities, and the logic of production of the built environment in order to guide future growth in rural regions?
- What kind of incentives should be used for both urban planning and urban design?

In order to respond to these questions, the thesis proposes an innovative methodology for the analysis of the built environment that applies the ecological landscape associations proposed by Makhzoumi and Pungetti (1999) in relation to the logic of the production of the built environment. This methodology relies on overlapping the ELA analysis with a detailed analysis of the determinants of the production of space that enables, then, land use planners, to address areas where the two logics of ecological continuity and building production are in tension.

My main argument is that by following the above methodology, it is possible to reconcile the current logic of building with the natural ecology through a set of land use guidelines if appropriate incentives (regulatory and tax based) are introduced. In the conclusion of the thesis, I propose a set of recommendations.

B. Thesis Significance

This research proposes a new approach to articulating master planning schemes that seeks to protect the natural landscape and limit the encroachments of urban sprawl. This research is important particularly because land use *master planning* is the main planning tool used in Lebanon to organize territories and land uses. In doing so, the thesis upholds as one of its main premises the importance of preserving ecological/green and agricultural zones for the long term sustainability of the area which accounts notably for concerns about food security that are increasingly raised in the Middle East and elsewhere.

C. Thesis Methodology

In order to investigate the layers of ecological/urban developments and formulate strategies that can channel building processes while protecting agricultural lands, the thesis has incrementally outlined a multi-step methodology.

The starting point of the thesis was two separate planning exercises. The first exercise was conducted within the Planning and Design Workshop that was conducted at the MUPP/MUD program at AUB in Fall 2011/12.² The workshop tackled planning and design issues at multiple scales in the area, pointing to the limitations of the current planning regulations in relation to the current logic of the built environment. The thesis builds specifically on the conclusion of this planning exercise: namely that current land use planning is not only ineffective, but also harmful... and that there is a need to channel building activities by thinking of their relation to the built environment. The

² Al-Harithy and Fawaz, American University of Beirut, Fall 2011/12

second planning exercise that precedes this thesis is the work produced in an earlier thesis by Rami Harajli³, 2013 that showed through surveying one of the villages in South Lebanon that despite planning regulations, much of the agricultural commons of the village he investigated were still used for such purposes, particularly in subsistence form.

Methodologically, those two documents or exercises provide the thesis with the basic assumptions and justification to move forward with its analysis. To this end, the thesis began by selecting for a case study a zone located within the Qada' of Bint Jbeil. The premise is based on analyzing an agricultural/ecological field located between seven villages⁴. To propose an alternate master plan in this area, this thesis studies existing building models and land management schemes, relating them to social and ecological continuities. This new methodology shall answer to the integration of social, ecological planning, and building development.

The thesis adopts the methodology of Makhzoumi and Pungetti (1999), namely Ecological Landscape Associations (ELA), in order to analyze the ecological layers of the area. It adapts the *ecological landscape design paradigm*, so as to maintain the ecology's continuity and connectivity and avoid its fragmentation in Lebanon. Such a methodology draws on the logic behind the region's built environment, social customs, and ecological manners to maintain the integrity of the landscape, sustainable designs, ecological continuity and connectivity, and enhance the 'spirit of place'. This paradigm helps look passed the orthodox views that have been the core of Lebanon's master

³ Can the Process of Master Planning Become a Tool to Rally for Sustainable Development? Tebnin (South Lebanon) as a Case Study.

⁴ Haris, Tebnine, Safad El Batikh, Chaqra, Baraachit, Aaita Ez Zott, and Hadatha

planning strategies. Such orthodox views have prevented the proper protection of Lebanon's ecological connectivity and continuation. The full methodology is outlined on page 20.

The thesis also investigated the logic of building development at the area, through the analysis of urban sprawl and directions in the area, based on aerial photography and maps between 1963 and 2014, building permits (formal and informal) and interviews with dwellers' area.

The thesis confronts the two above logics in order to derive the clear areas of conflict, zones where the logic of building production clearly contradicts ecological continuities. The thesis then selects one of these zones of conflict in order to survey building production and interview comprehensively builders (old and new) to outline better their locational choices. The selection of the zone was based on multiple criteria such ecological continuity and building processes. The selection criteria are detailed in chapter VI.

Based on this analysis, the thesis articulates recommendations for possible planning and design tracks and suggests strategies to be tested for improving the planning process. These are outlined in chapter VII.

In conducting this research, data collection and analysis will be conducted on several fronts:

Mapping Ecological Layers:

The thesis' first step was an investigation, analysis of a mapping of the various ecological layers in the area in order to formulate what Makhzoumi call ELA. To this

end, the thesis builds on the GIS database developed for the 2009 master plan of Lebanon by the CDR⁵. The GIS database provides a rich source of information which was then selectively used and organized in order to obtain the analytical maps produced in my research.

The following criteria using GIS software where needed:

- **Ecological systems/layers:** natural waterways (rivers, rainwater steams, etc.), topography, land cover, fertile lands, Climate and infrastructural elements, etc.
- **Ecological connectivity/continuity:** *Ecological networks and greenways* mapped so as to the areas changes in landscape and fragmentation. Core areas, corridors, and buffer zones are ecological components and are considered greenways/ecological networks.
- **Physical built environments:** These serve as records of fragmentation associated with urban growth and production. Such are roads and villages. A map of the region, based on analysis of historical maps, locating where the settlements are distributed and where building constructions are taking place.
- **Land-Use Systems:** How are spaces used, and whether they are abiding by the law or not. Existing models of buildings and lands in the area examined.

Formal interviews and Direct Observation:

- Discussions and interviews with the region's flora and ecology experts, and residents. Furthermore, direct observation of building activities is conducted. This

⁵ Council for Development and Reconstruction

data collection garners in depth understandings of the logic of the built environment, its production, and development

- Municipalities of the Caza were interviewed in an effort to evaluate the construction permits, informal permits, as well as their location, number and dates
- Local brokers were interviewed whilst examining the price of properties following the existing planning schemes and conditions. Another evaluation of property pricing will be conducted after implanting the suggested taxation and legal techniques.
- Interview the local property owners. Such interviews would target those owning properties in areas labeled as ‘non-agricultural’. These properties are considered to have high exploitation ratios. The interviews will also target those owning lands considered to be agricultural. These lands, on the other hand, are considered to have a lower exploitation ratio. These interviews should allow us to better understand how landowners view the ideas of equity, and the idea of a taxation system.

D. Thesis Structure

Thesis structure is divided in the following way: in Chapter 2, I developed the Case Study Profile and the Problem Statement of the thesis. In Chapter 3, I developed the literature review, outlining the ways in which planning scholars have addressed the main assumptions adopted by the thesis, namely (i) the analysis of the logic of production of the built environment, and (ii) the Ecological Landscape Design Paradigm. Chapter 4 reviews the logic of the built environment in the area under study. Chapter 5 analyzes the landscape of the area based on the methodology of Ecological Landscape Association (ELA) proposed by Makhzoumi. Chapter 6 superposes the two

previous analyses, namely the logic of the built environment and the Ecological Landscape Associations in order to understand their intersections and identify points of conflict. Finally, a recommendation and conclusion chapter would elaborate on possible solutions after assessing the research findings.

Chapter II

CASE STUDY PROFILE AND PROBLEM STATEMENT

A. Location of the Area under Study

The question here is; how can one, whilst accounting for the region's continuity and the logic behind the existing built environments, define the boundaries of the area under study? Such a problem is resolved by first investigating a large area where no administrative zones/village borders are defined. These parameters are defined once the maps are studied, and understanding of the logic behind the ecological and social structure, the built environments and the region's production and connectivity is grasped.

The area being studied is roughly 106km away from Lebanon's capital, Beirut, and roughly 22km from the Palestinian border. It is part of the Caza of Bint Jbeil, which is in the Nabatieh District situated in the South of Lebanon, 650-750m above sea level. This area is a spacious (7km²) agricultural valley between seven different villages.

The area's agricultural valley is considered an ecological continuity that is part of several municipal districts. Furthermore, the area is a historical commons: the surrounding villages intensively farmed the valley throughout the course of history and relied on it for subsistence, food security, and other commercial purposes (Fig.2, Fig.3, and Fig. 4)

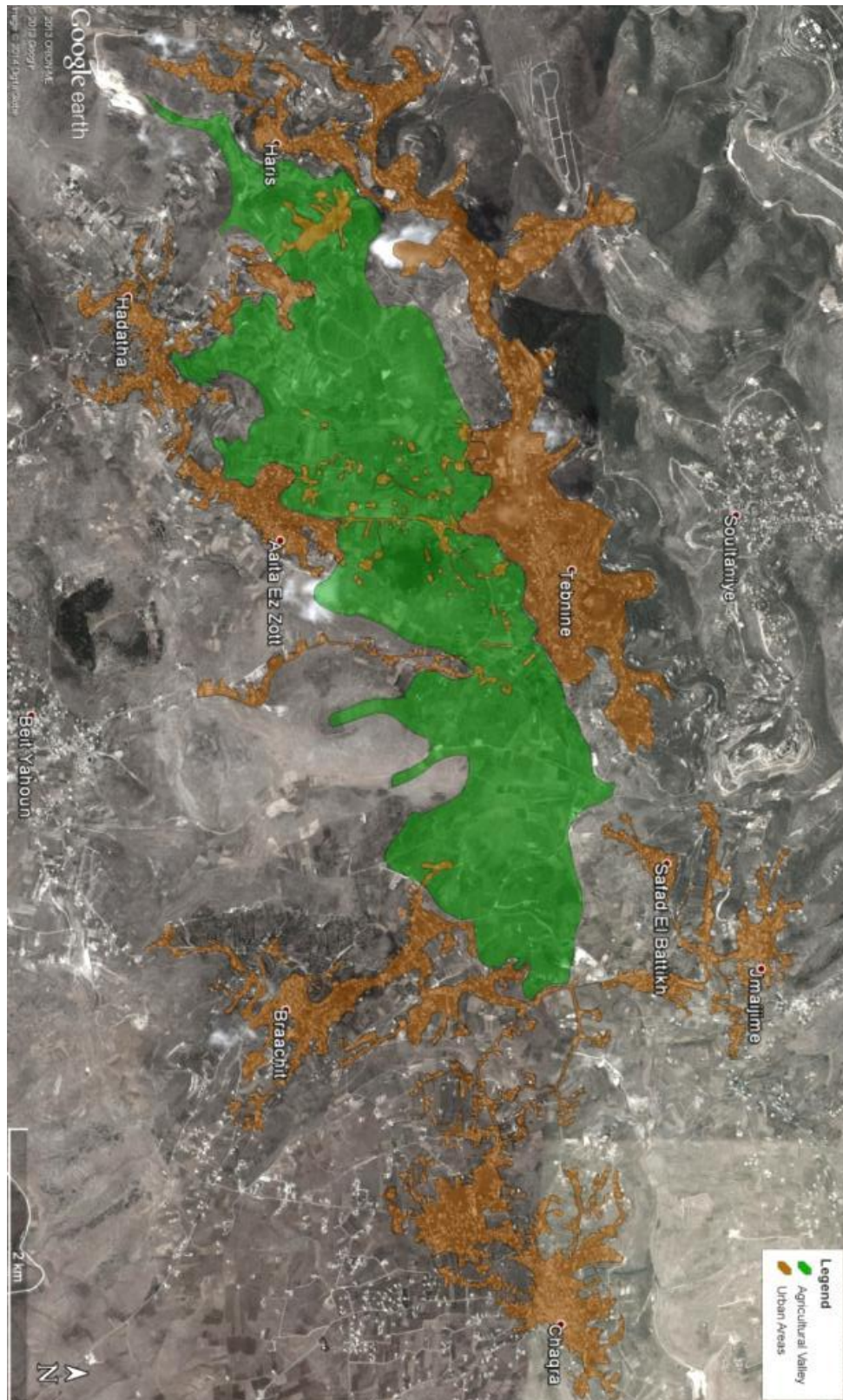


Fig. 2: The continuity of the agricultural valley between different villages
Information based on Google Earth. Analysis by Zeineddine, A. 2014



Fig. 3: The agricultural valley of the area, 2014



Fig. 4: The agricultural valley of the area and its continuity between villages

Source: www.bintjbeil.org

B. Memories and Amenities of the Valley

When local residents were interviewed, it was found that the agricultural valley is appreciated for its position as a ‘shared space’ and its reminder of the Sahel’s history. In addition to its value in agriculture, the valley has a sentimental value for its residents, and provides a sense of belonging. This agricultural valley reminisces the “Estiskaa

Pray” of Sayyed Muhsen Al Amin in the year 1924. Some consider the agricultural valley to be a social network during the tobacco season, others relate to the landscape’s natural heritage (seasonal river that previously crossed the valley) whilst others still are drawn to the valley’s eastern and western springs.

The interviews illustrated the agricultural valley’s further usefulness. Interviewees appreciated the environmental and producing benefits the valley has to offer.

The agricultural valley provides agricultural lands, wildlife, scenery, open space, recreational opportunities and public green spaces. Nowadays, the valley is considered an appealing ‘green escape’.

C. Historical and Current Use of the Valley

In the 1940s, the valley produced tobacco and olive since those two crops were the most profitable. Farmers developed a trend of producing tobacco instead of fruits and vegetables, the more obvious it became where the financial gain was. Despite being a profitable business, its production decreased in the 1970s. Such production decrease is due to the increased production cost. As a result of this, farmers, especially tobacco farmers moved to cities to seek employment in other sectors, notably in service and industry.

Residents of low income now depend on agriculture in the valley as a supplement to their main sources of income. Such production includes olives, apples citrus, considering the variation in agricultural products from the valley, it could be concluded that this valley could serve to ensure future food security, for at least residents of the area. (Fig 5)



Fig. 5: Agriculture as main source of income for residents, 2014

D. Challenges facing the Agricultural Valley

This agricultural valley is presently having its sustainability at risk. It exhibits water shortages, and planning schemes are weakening the valley's agriculture and its ecological significance. (Fawaz 2014)

The 2005 Master Plan for Tebnine failed to prevent urban sprawling and the invasion of the built environment into agricultural areas. The area classified most zones that are agricultural as mixed-use zones, allowing the construction of buildings in these areas. Rather than sheer incompetence, this zoning is the outcome of private interferences by individual property owners who saw in the assignment of low building exploitation factors a threat to their property values. In fact, these interests lead to the reduction of areas earmarked as agricultural, including the Sahel, and hence placed it under the pressure of urban sprawl that ushers its destruction as an ecological and agricultural commons (Fig.6 & Fig.7).



Fig. 6: Pressure of urban sprawl into the Sahel, 2014



Fig. 7: Pressure of urban sprawl into the Sahel, 2014

The successive road opening projects through the agricultural valley further threatened this ecological continuity as it attracted building activities on road sides, as is typical in Lebanon. Figure 8, shows the proposed paths of various roads in the location.

On a much larger scale, the climate has exhibited many changes that have taken a toll on the water supply in the area, as well flora and fauna. The effects of global warming on the short term can be devastating to the valley. This is exemplified by the increased frequency of droughts. Droughts mean less water, which would mean that farmers would have a hard time making a living from agriculture.

All in all, these various changes create a situation where building activities severely threaten the historical ecological continuity which is dangerously losing its meaning, despite the fact that it remains used for subsistence economies for many people in the area (Harajli, 2013).

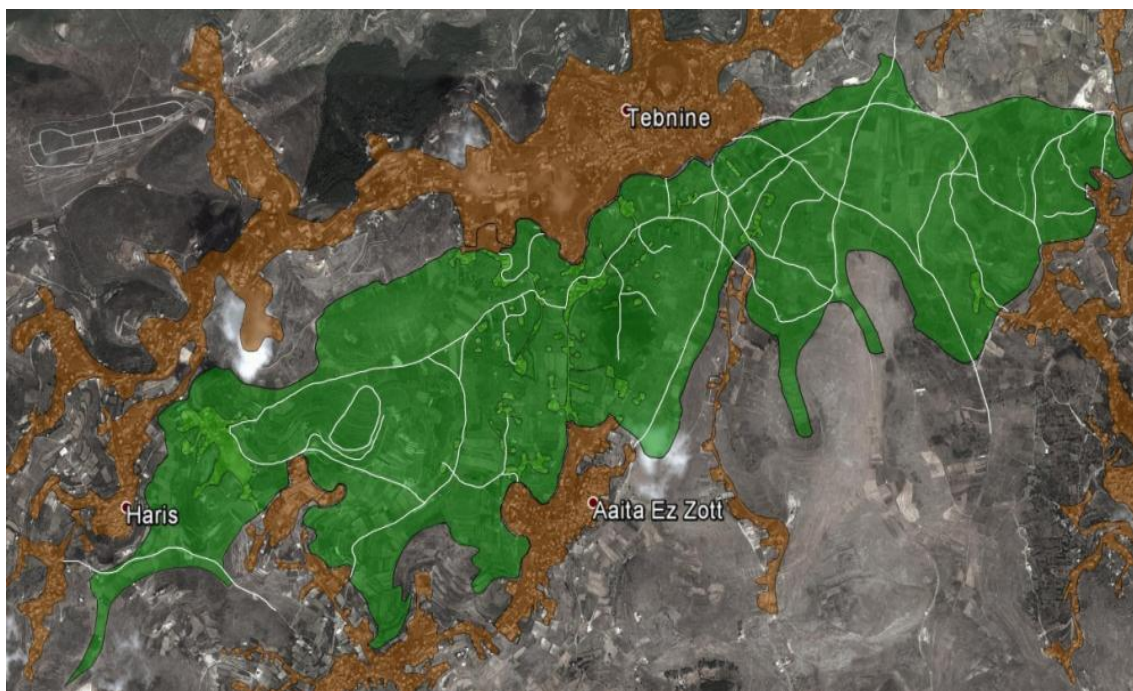


Fig. 8: Local and agricultural roads in the agricultural valley.
Source: Information based on Google Earth. Analysis by Zeineddine, A 2014

Chapter III

LITERATURE REVIEW

This literature review outlines the empirical findings and theoretical conclusions listed in the planning and design literature about the two key assumptions underlining the thesis: (1) the Analysis of the logic of the built environment in the area, and (2) the analysis of the different ecological associations in the area. In the last section, the chapter summarizes the main conclusions and their relevance to the case study at hand.

A. Analysis of the Logic of the Built Environment

How has the scientific and academic community investigated the logic behind the built environment production? Literature reviews indicates that scholars have analyzed the actions of the authorities such as legislation, localized decisions, and provision of infrastructures and facilities in the region. Such measures affect urbanization by causing concentrations, or scatterings: (population densities, harmonious aspects, threat on sensitive areas (natural, agricultural, flood prone area, etc.).

David Harvey (1997) highlighted and reviewed the separation that environmentalists make between urban areas and natural environments. Furthermore, he argues that since these two develop together, their study should also be intertwined.

Urban development trends, such as green urbanism, designs with nature, all aim to balance between built settings, and the natural environment. According to Harvey, one must realize a “process” and a “thing”. The analogy goes, according to Harvey, that

processes dominate things. Such a relationship is rather complicated because once things have been produced; they would inevitably affect the processes that make them (Jeson and MacGregor, 1997).

In the Bint-Jbeil case study, research was built according to this analogy; where an understanding between the built environment, natural setting, and development was attempted.

B. Ecological Landscape Design Paradigm

Makhzoumi and Pungetti (1999) have implied the necessity of a framework that is specific to the Middle East's landscape. Furthermore, Makhzoumi (1999) elaborates on a design paradigm where landscape design is taken in using a conceptual understanding. So, ecological landscape designs consider factors of the area's ecology as well as the design itself. Such considerations prove a new methodological approach that is complementary to both the ecology and the built environment (Makhzoumi and Pungetti, 1999).

Ecological landscape designs follow a holistic understanding of the landscape in question. It is holistic because it takes into consideration the past, present as well as the landscape patterns and processes in the area and the region the area is located in. The approach follows through because it is responsive, and is a result of realizing both the constraints and the opportunities of the project in terms of nature, culture, or both. Such design approaches follow: landscape maintenance, landscape integrity, and the reinforcement of the area's natural and cultural values (Makhzoumi and Pungetti, 1999).

The methodology of Ecological Landscape Association is used for the achievement of the goals an ecological landscape design would have. The methodology is “a framework for understanding the landscape and a tool for designing it” (Makhzoumi and Pungetti, p.214). The methodology allows the designer a holistic understanding of the landscape. Such an understanding is achieved by studying what it is that binds aspects of a landscape together and forms associations (topography, geology...) (Makhzoumi and Pungetti, 1999). This discussed framework would also test the validity of such associations. The validated associations will then become the fundamental basis of the design.

Designers can, thus, further integrate investigated and validated associations into their designs, the methodology’s spontaneous and intuitive approach places the landscape’s integrity and sustainability at the top of the goals list .

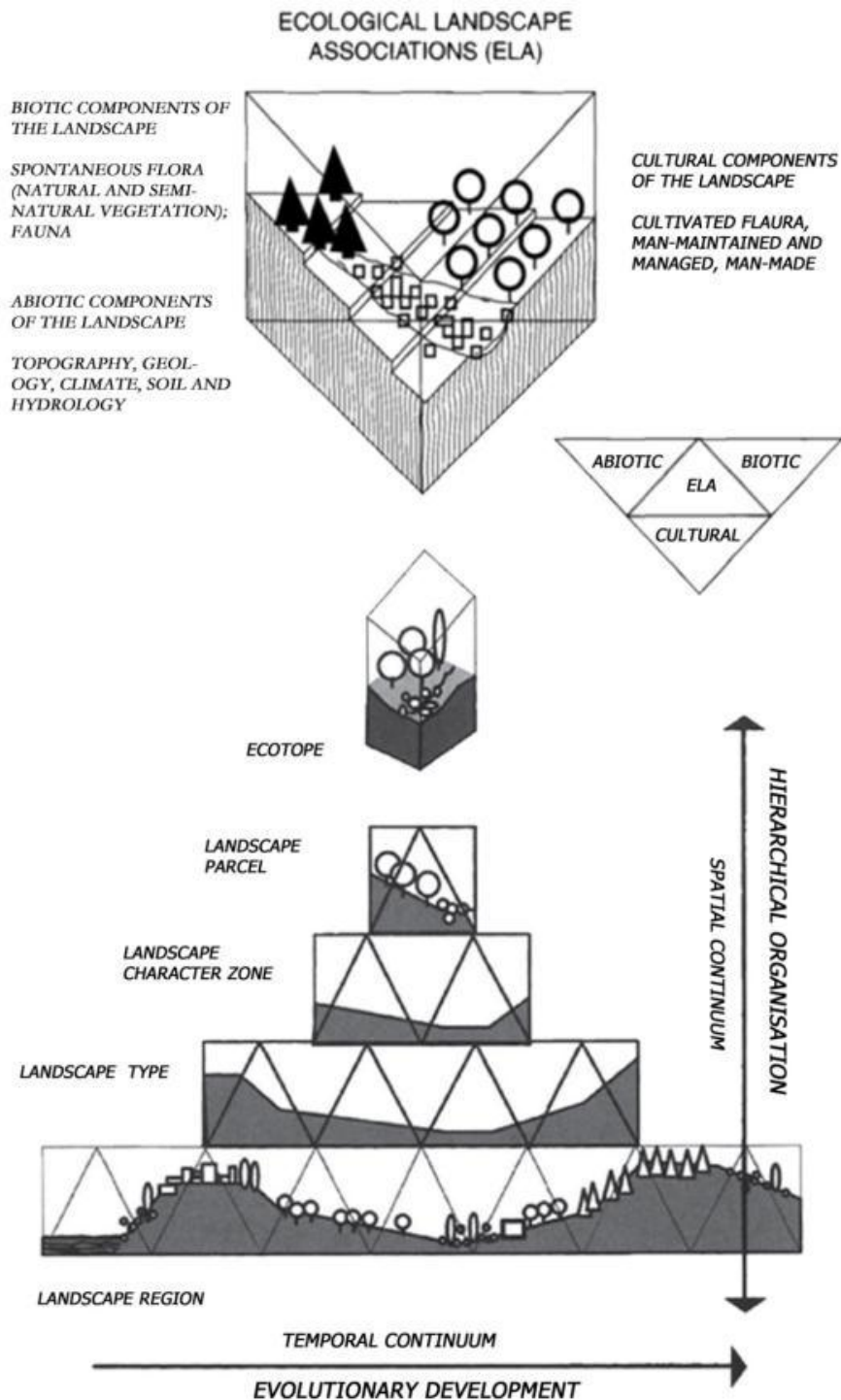


Fig. 9: Schematic illustration of the Ecological Landscape Association methodology; The temporal/evolutionary and spatial/hierarchical understandings of landscape are central to the holistic framework of ecological landscape design. Source: Makhzoumi and Pungetti, 1999

Malta Case Study

Fig.10 visualizes the case study in Bahrija conducted in Malta's western region; this case study is an example of how the ELA methodology and the ecological approach to landscape design are applied. These applications provided a means to comprehensively study and understand the area's landscape, which would allow the formulation of a master plan that considers the best interest of both the ecology and the urban setting to be. The case study's significance is mostly in the master plan that was developed. The plan relies on ecological studies and continuities that provided an alternate framework of the traditional plans presented.

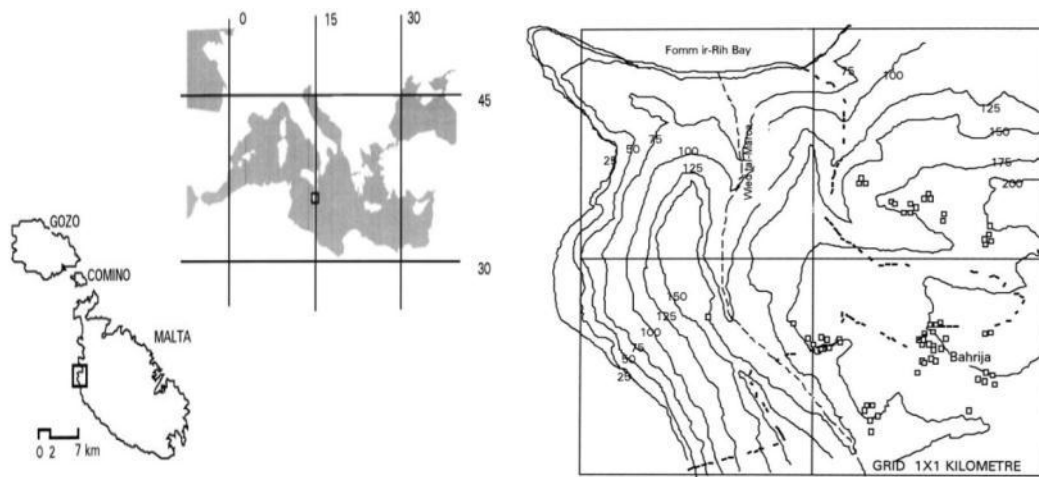


Fig. 10: Location maps of the Maltese Archipelago and the Bahrija site.

Source: Makhzoumi, 2000

ELA methodology was used so as to understand the landscape of the Bahrija site. ELA methodologies were also used to identify associations in the site that would allow the development of ELA plans. Such plans would then form the basics of landscape design for the area. ELA methodologies were referenced in studying the landscape. The use of digital topography maps, scaled at 1:2500, literature, flora

ecology expert interviews, observations, allowed the development of five distinct ELAs (fig 11): Garigue/Lower Coralline Limestone/coastal cliffs; Maquis/Blue Clay scarp edges; The Wied tal-Marca; Walled terraces/Upper Coralline Limestone/outcrops; and Walled terraces/Globigerina Limestone/coastal belt.

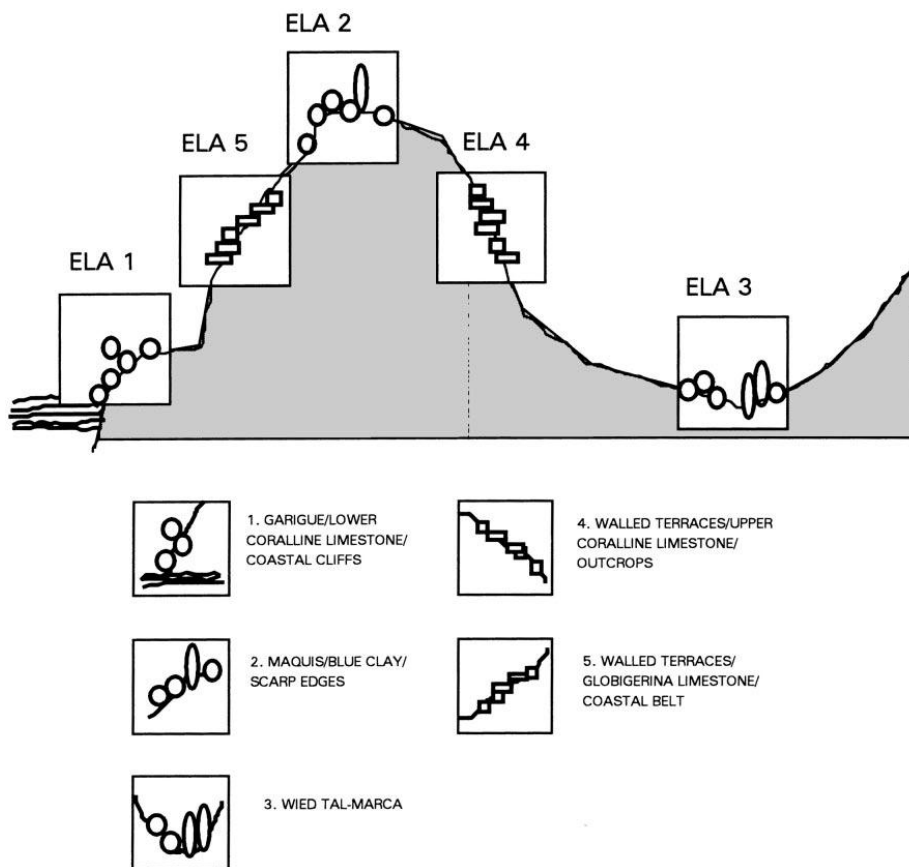


Fig. 11:The five Ecological Landscape Associations (ELA) discerned at the Bahrija site
Source: Makhzoumi, 2000

A preliminary landscape master plan was designed to show the owners and planning authorities the potential of designs based on the landscape's ecology, to create a meeting middle point between arising conflicts. The master plan aims to minimize any harm that may come to the landscape's integrity and sustainability. However, the master plan should not be viewed as the final plan. It is a plan that illustrates the patterns that

are going on in the landscape in question. Furthermore, it should be considered as a framework to abide by. The preliminary landscape master plan consists of eight main zones (Fig. 12).

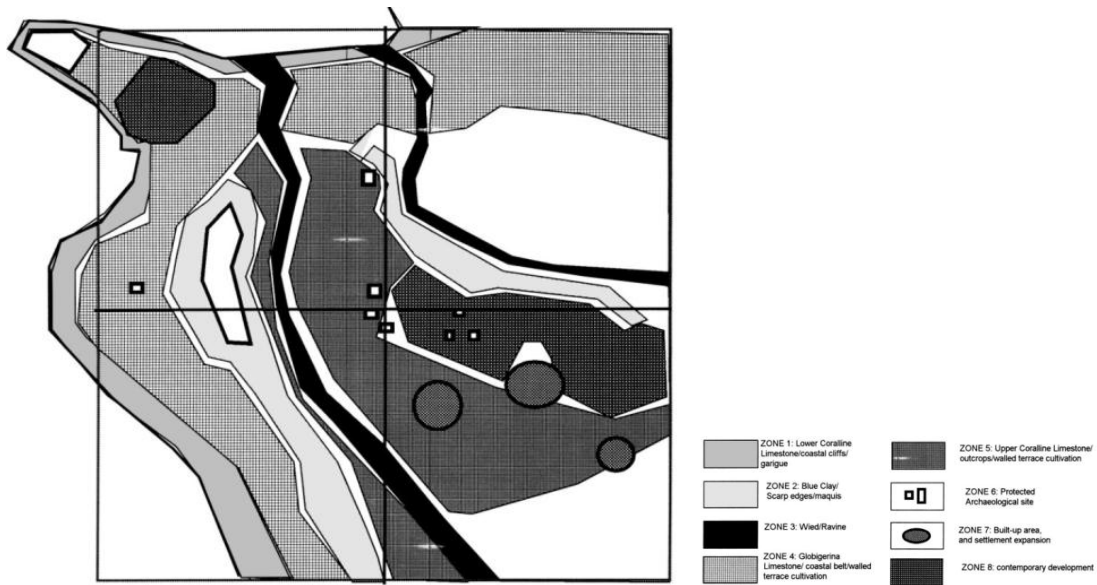


Fig. 12: The preliminary landscape master plan for the Bahrija Project. Zones 3 and 4 have been extended beyond the site boundaries.
Source: Makhzoumi, 2000

Back to the case study investigated in this thesis, the literature review in this section confirms the main assumptions made by the thesis. It confirms that by adopting the methodology of ELA proposed by Makhzoumi and Pungetti (1999), the thesis can determine new boundaries and scale of intervention that spans several municipal districts and boundaries, and that is based on ecological and landscape continuities. The literature review further helps to determine and analyze the logic behind the built environment in the area under study. These will be used in the following chapters as frameworks of analysis.

Chapter III

REVIEWING THE LOGIC OF BUILT ENVIRONMENT

A pre-requisite to channeling building development will be to understand the logic of its production in order to act on it in ways that can reduce the negative externalities of building activities. In this chapter, I attempt to follow through this goal by relying on a series of aerial photographs which were overlapped in order to analyze and highlight on the sprawl, as well as understanding of its directions.

A. Analysis of maps/aerial photographs

To understand the process of space and built environments in the area and its development throughout time, I relied on a series of aerial photographs which were overlapped in order to analyze and highlight on the sprawl that the area is witnessing between 1962 and 2014. The findings of this analysis indicated that urban growth predominantly occurred around the historic cores of the villages surrounding the study area as well as along the main village roads.

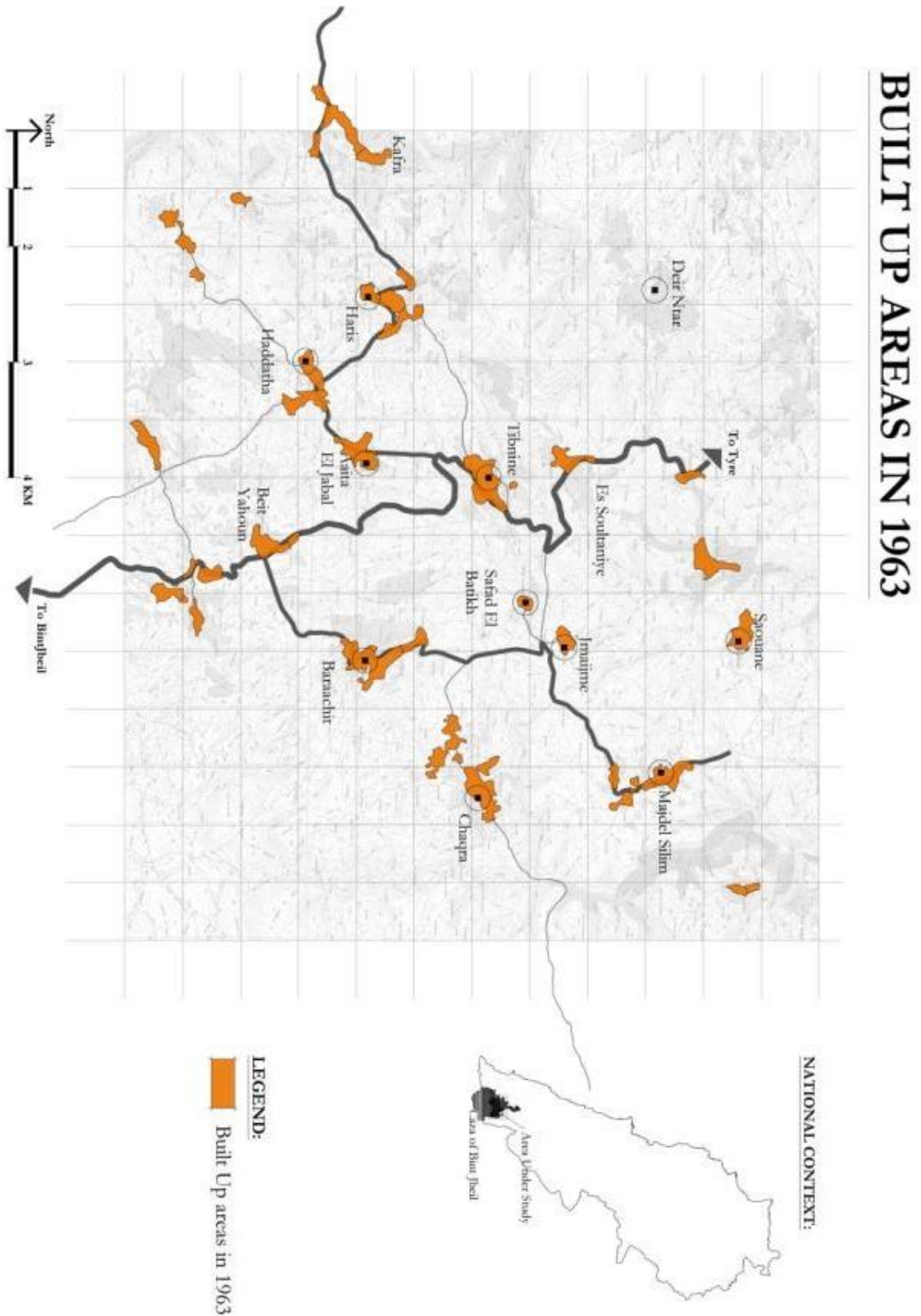
Visually surveying the main roads within the area of study provided a better understanding of built patterns and the sprawling that accompanied them. Land along the roads was mainly dominated by two main categories: mixed-use buildings and single-use residential buildings. Residential buildings were located at a short distance from the road. Mixed-use buildings, which were the dominating form of buildings along the road, were located right along the road and parking spaces were on the road itself. On the ground floors, these buildings consisted of shops, snack restaurants, and gas

stations, whilst residential apartments (for single families) were found on subsequent higher floors.

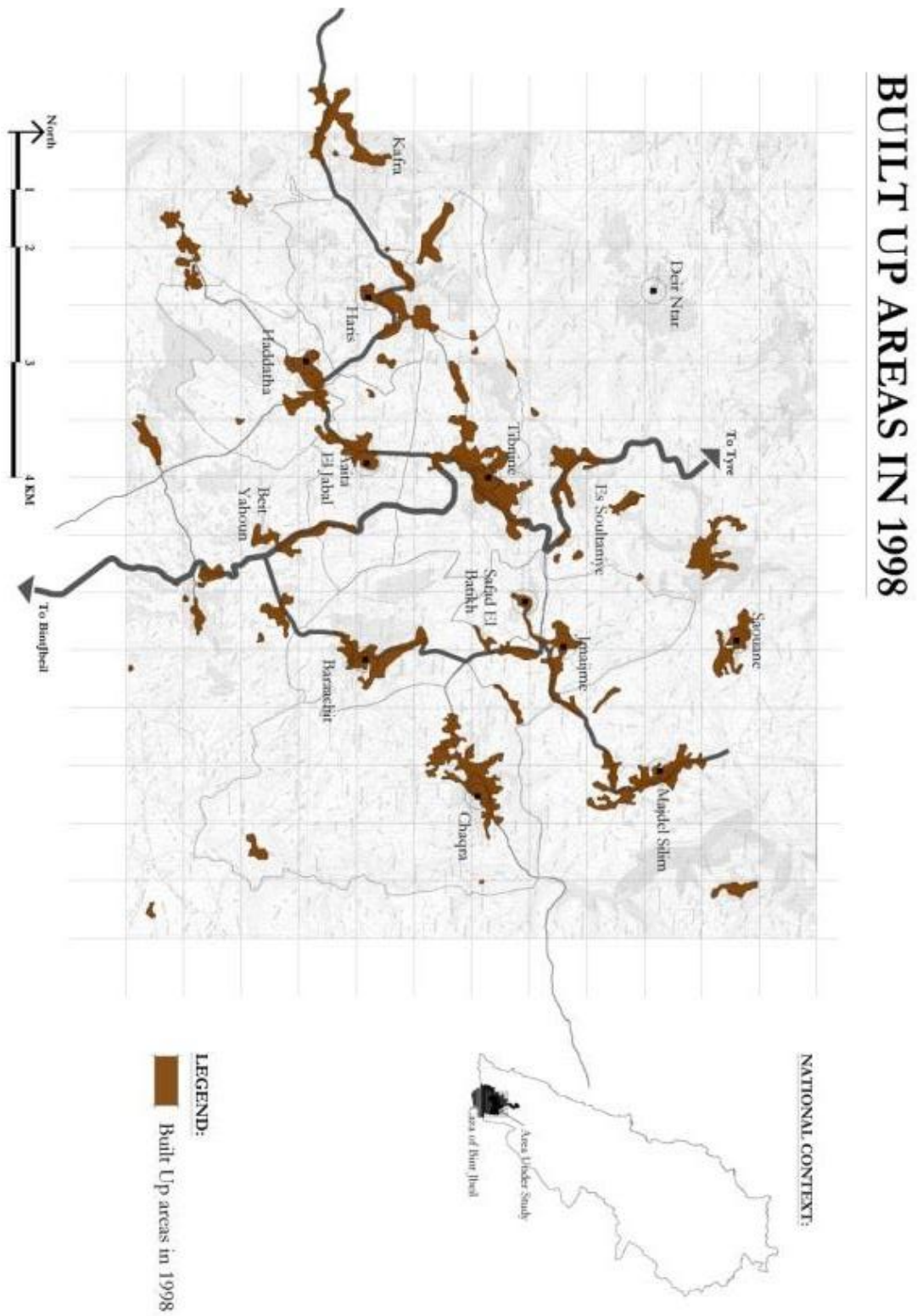
Such a layout (along the roads) suggests a shortage of land that is already serviced with infrastructure, roads, and other utilities. This is the ‘process’ according to Harvey. Furthermore, this same layout shows local resident’s eagerness for commercial investment along sides of the [main] roads. This is why the growth of villages’ historical old core and the linear extensions are often noticed between villages that end up joining with each other (sprawl).

These same maps (between 1962 and 2014) showed that villagers and local residents are more than eager to leave village cores and spread out into more open spaces once infrastructure and utility services have been extended to these areas.

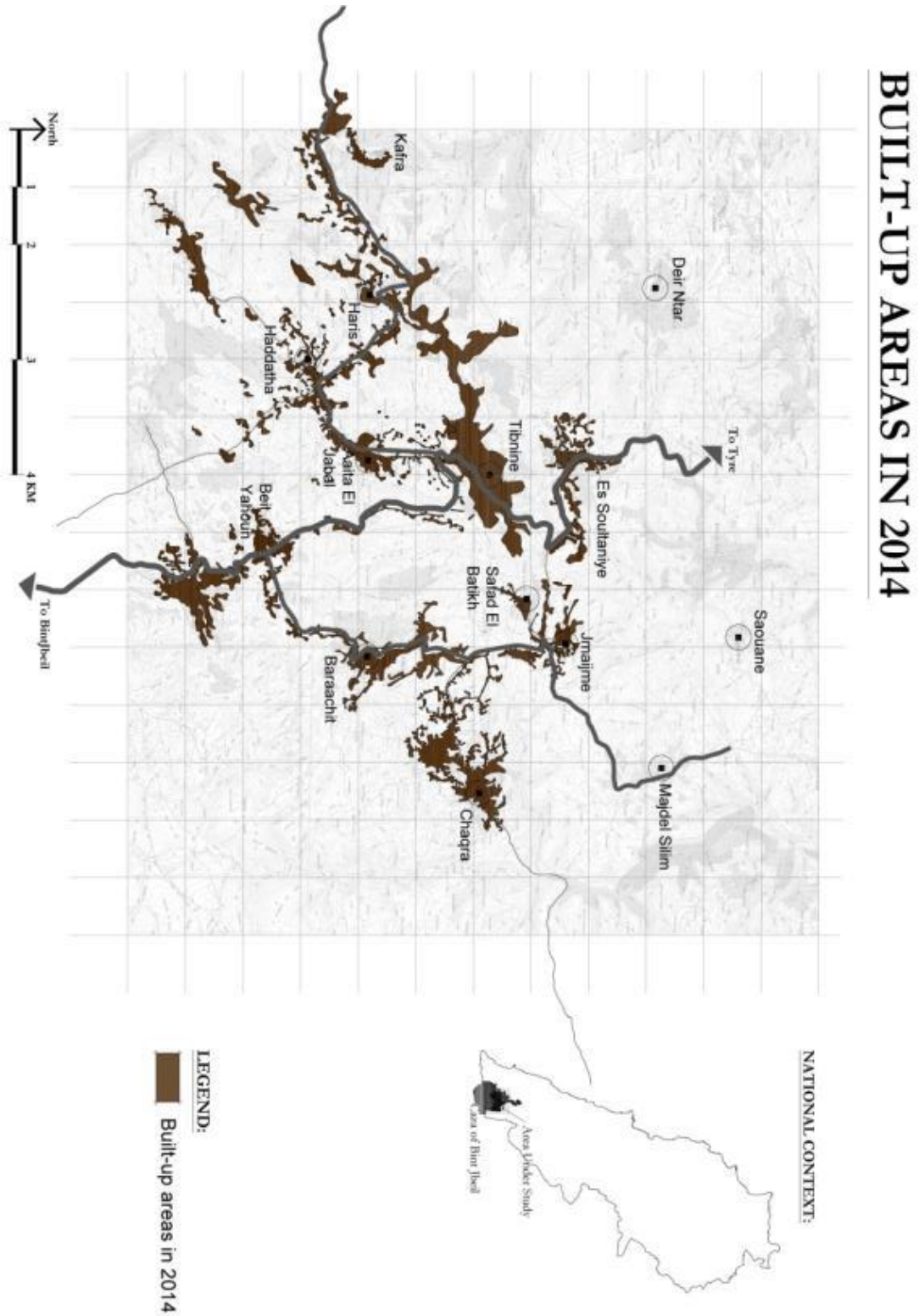
According to such observations, and considering what has been understood of the logic behind built environments in the area being studied, it seems most fitting to reconsider road development in the area in an effort to control the natural urge of built environment sprawl “things” that have a causal effect on “process”.



Map.13: Information based on GIS developed for the 2009 master plan of Lebanon, Analysis by Zeineddine, A. 2014



Map.14: Information based on GIS database developed for the 2009 master plan of Lebanon
Analysis by Zeineddine, A. 2014



Map.15: Information based on GIS developed for the 2009 master plan of Lebanon
 Analysis by Zeineddine, A. 2014

B. Expectation of Growth

After analyzing and reading the logic of the built environment in the area, it is now possible to predict the direction of urban growth in the area under study. Main and local roads direct the expansion of the villages, leading to a linear extension of urban areas along the main road accesses that connect towns and villages. Map 16 predicts the expected scenario of building development in the area under study, if the production of the built environment continues to follow the existing roads in the area. This map (map 16) can illustrate the direction, volume and impact of the expected sprawl.

In conclusion, the chapter has revealed local resident's eagerness for commercial investment along sides of the [main] roads, and that villagers and local residents are more than eager to leave village cores and spread out into more open spaces and into places with open views.

Chapter V

REVIEWING THE LANDSCAPE OF THE AREA

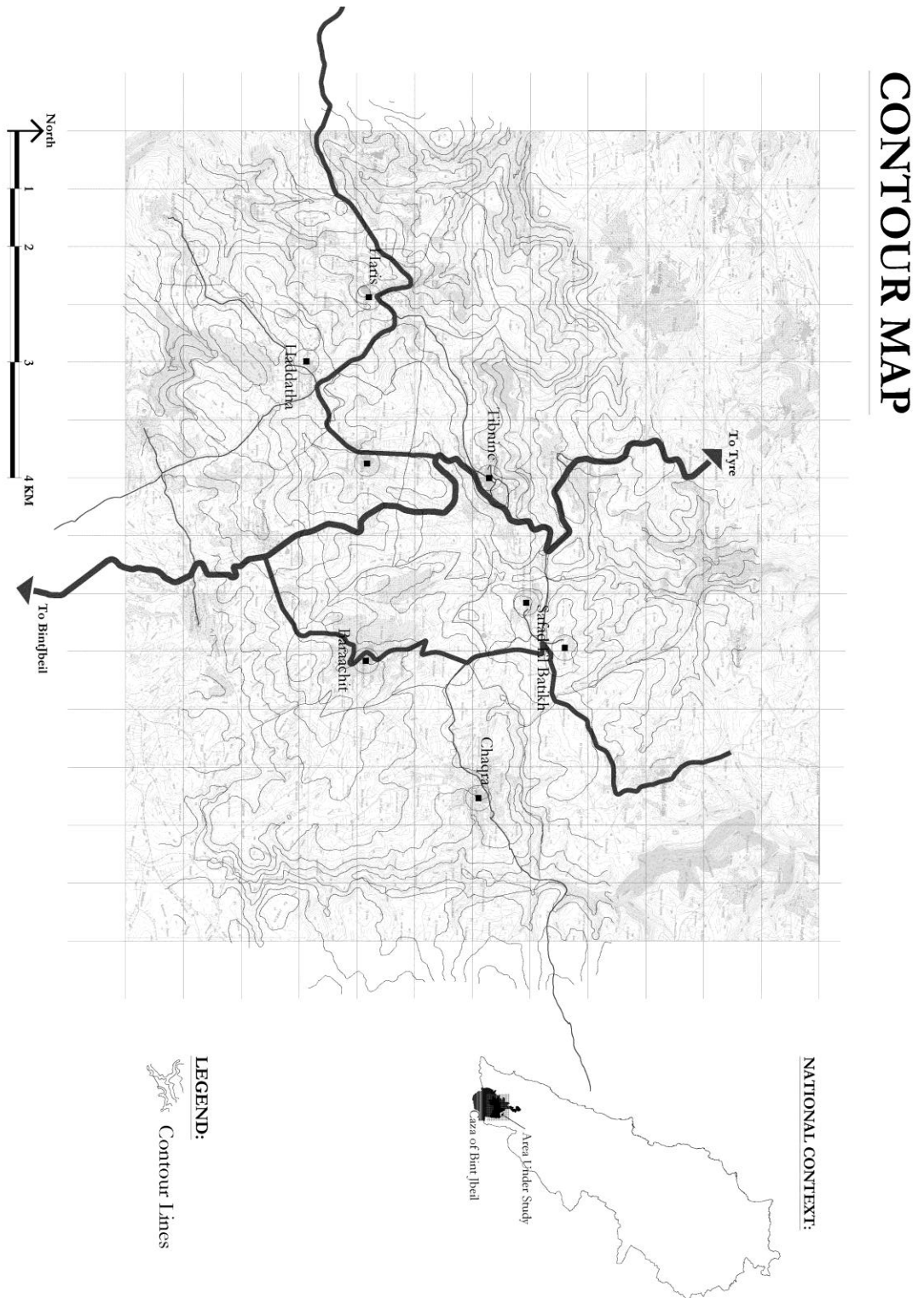
As a framework that provides in-depth, holistic, dynamic and ecological understanding of systems (natural, semi-natural, rural cultural, and urban cultural), I will employ Ecological Landscape Associations (ELA) in this part of the research to read the landscape of the area through its abiotic, biotic and cultural components.

A. The Abiotic Components of the Landscape of the area under study

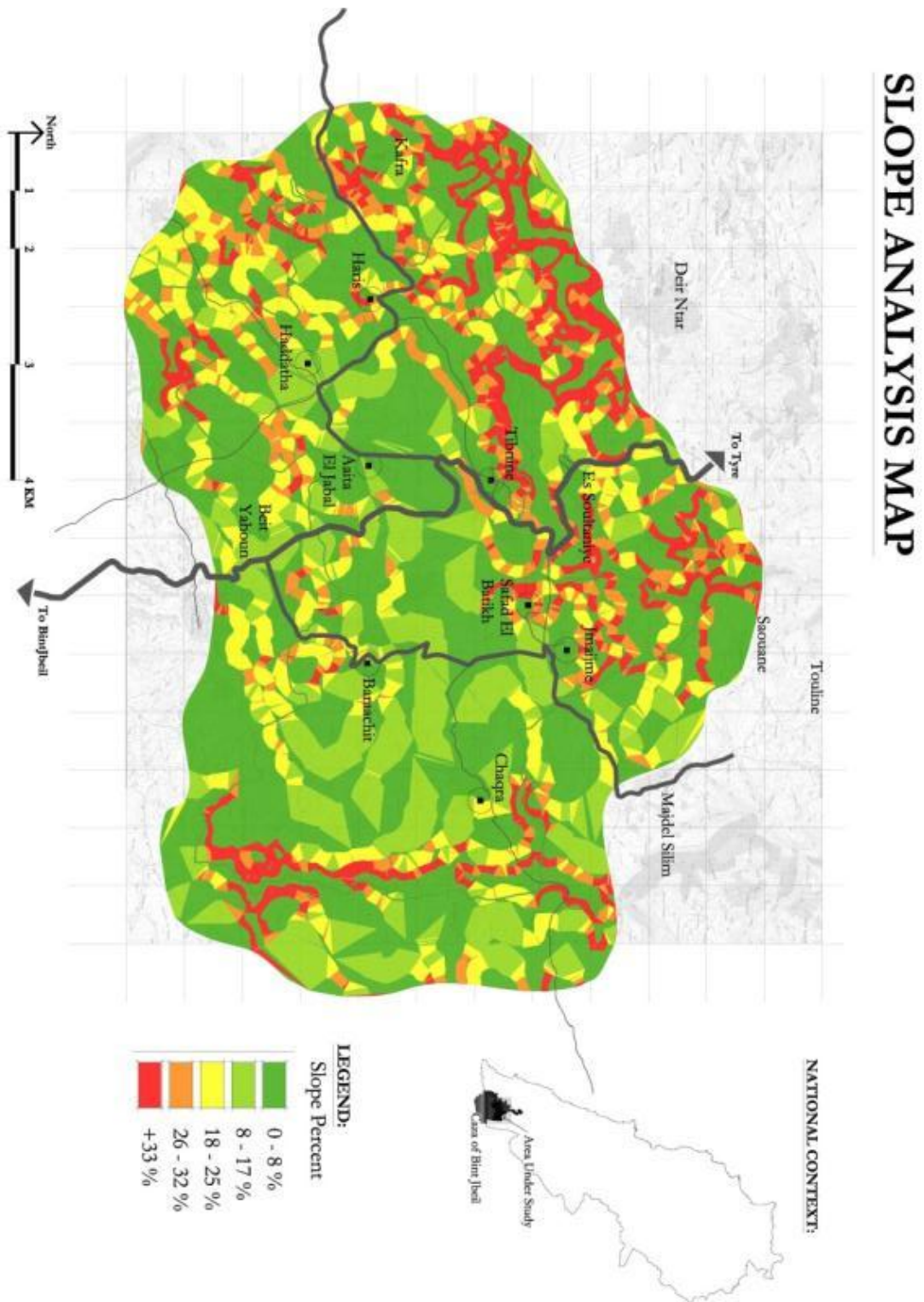
1. Topography

Topography is an unavoidable, distinguished and at the same time restricting feature of Lebanon. In the area under study, Topography had always played a decisive role in the history of settlements in the region and still doing to date. It generates more or less steep slopes where constructions rarely set up on slopes higher than 30%, and practically never on slopes higher than 40%. Therefore -and besides to the historical location of agricultural lands at the peripheries of the mountains- most of the urban areas are located on the hilltop of its mountains, splitting the area into geomorphological regions separated by valleys and mountains with great scenes of landscape. Topography plays a determining role for the biodiversity and the different Ecological Landscape Associations (ELAs)⁶ that characterize the area under study and create different associations as per characteristics and potentials. (Map 17 – Map 18).

⁶ As presented earlier in chapter III, ELA is at once a framework for understanding the landscape and a tool for designing it.



Map 17: Information based on GIS developed for the 2009 master plan of Lebanon
Analysis by Zeineddine, A. 2014



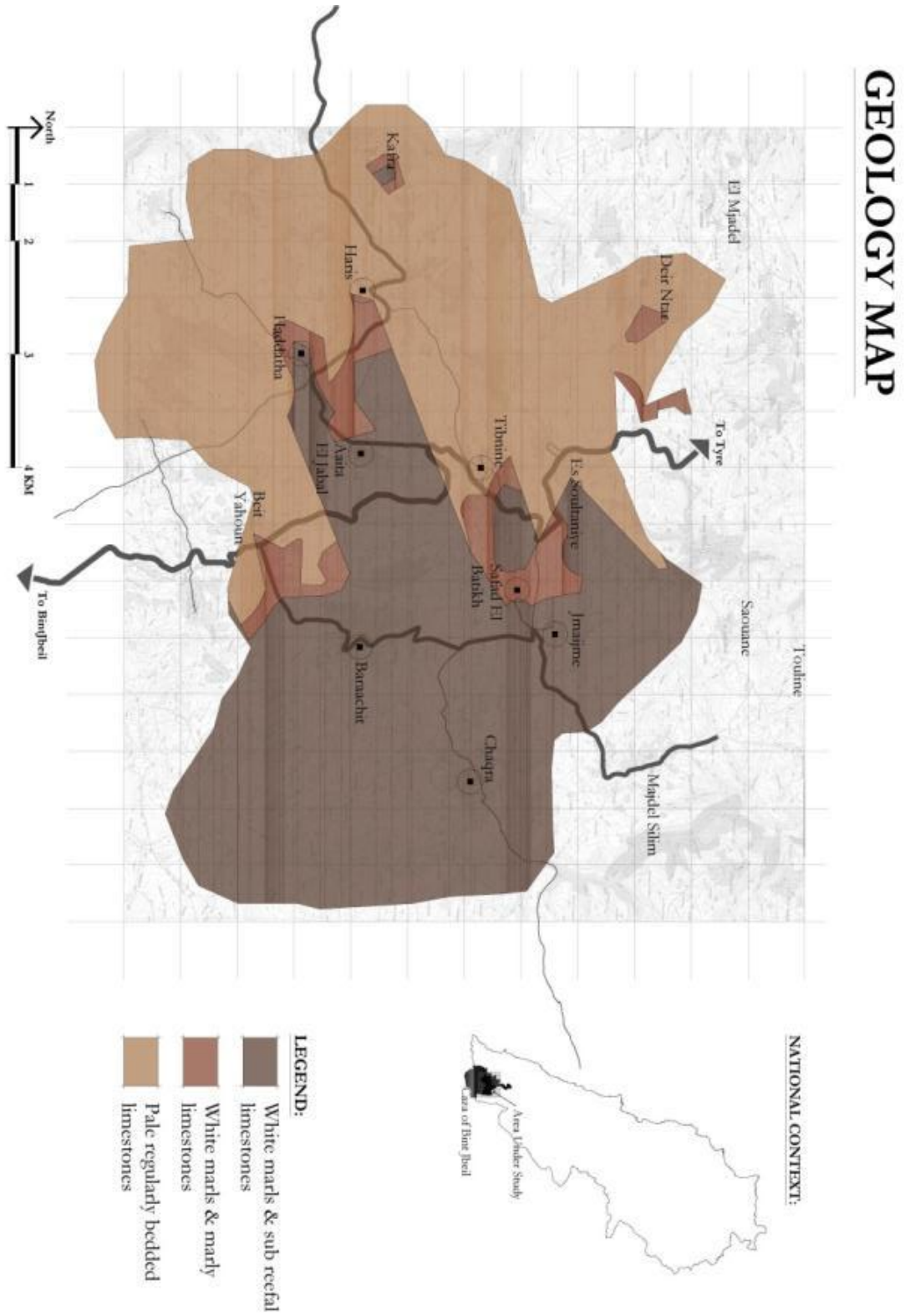
Map 18: Information based on GIS developed for the 2009 master plan of Lebanon Analysis by Zeineddine, A. 2014

2. Geology

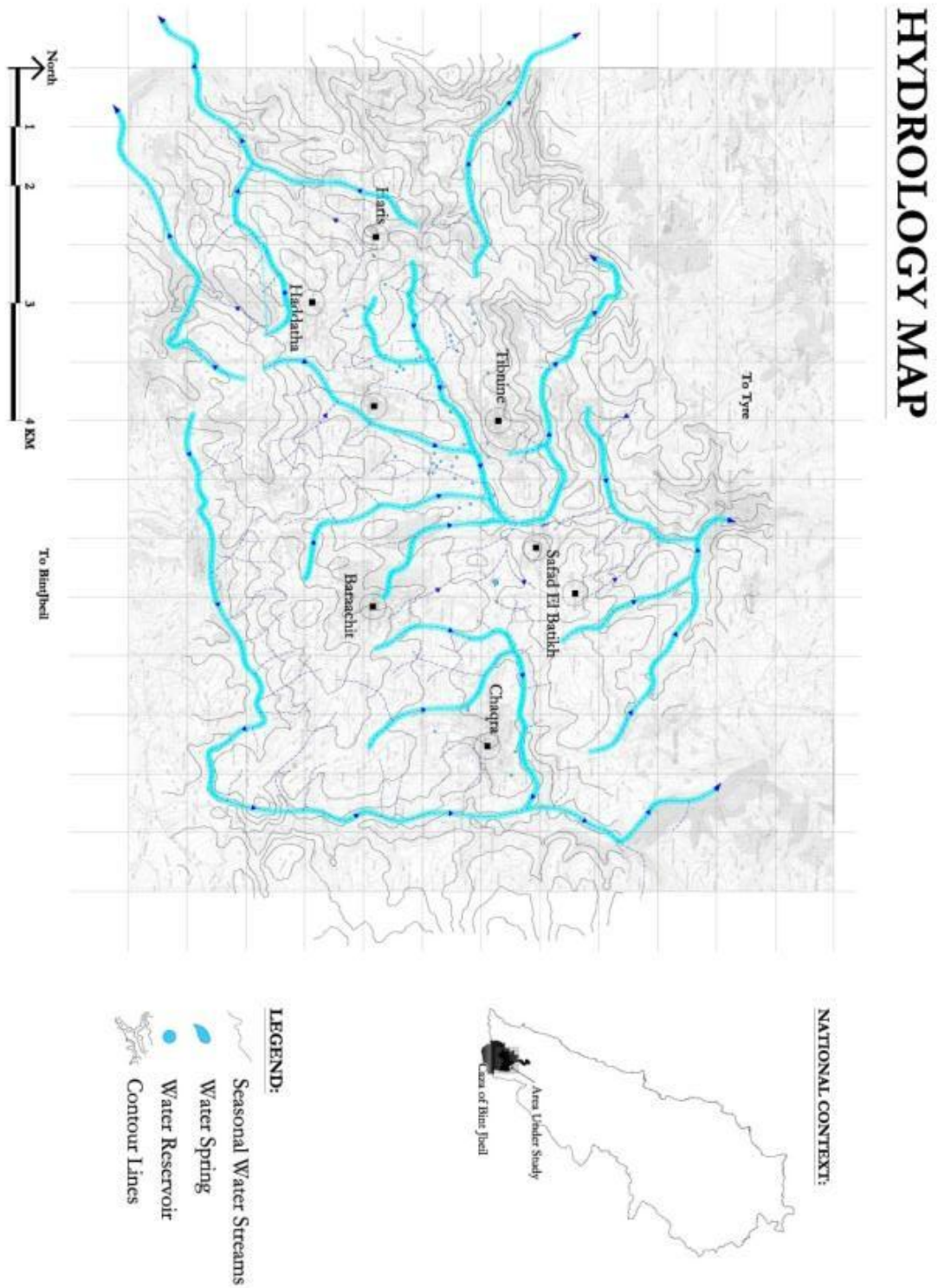
The geological formation of these topographical components consists mainly of *White Marls and Sub Reefal Limestones*, as the basis of the region stretching almost at the eastern side of the area under study. The north and west side of the area under study are formed mainly of *Pale Regularly Bedded Limestones*. A third type of geology is located at the middle of the area under study that is *White Marls and Marly Limestones* (Map 19)

3. Hydrology

Historically, the area under study contained a significant watercourse network crossing between the mountains and urban settlements. Water is an important natural resource in the area where it was historically stored in natural-ground and human-made reservoirs, creating an important resource for the agricultural valley extended between the villages in the area when agriculture was prosperous. The rainy and snowy winter season results in many temporary watercourses in winter and throughout spring. One major network of the watershed that crosses in the middle of the area under study flows from the south side, from the hilltop of the villages of Haddatha and Baraachit, down by the historical agricultural valley and continues into Deir Ntar to the north. Today the increasing urbanization and excessive usage of natural resources, water within the area under study is scarce, and the network of watercourses had become *dry watercourses*. Nevertheless, the current, temporary, winter watercourses are of significant value for the ecological corridors and ecological networks for the movement of flora and fauna in the area. (Map 20)



Map 19: Information based on GIS developed for the 2009 master plan of Lebanon
Analysis by Zeineddine, A. 2014



Map 20: Information based on GIS developed for the 2009 master plan of Lebanon
 Analysis by Zeineddine, A. 2014

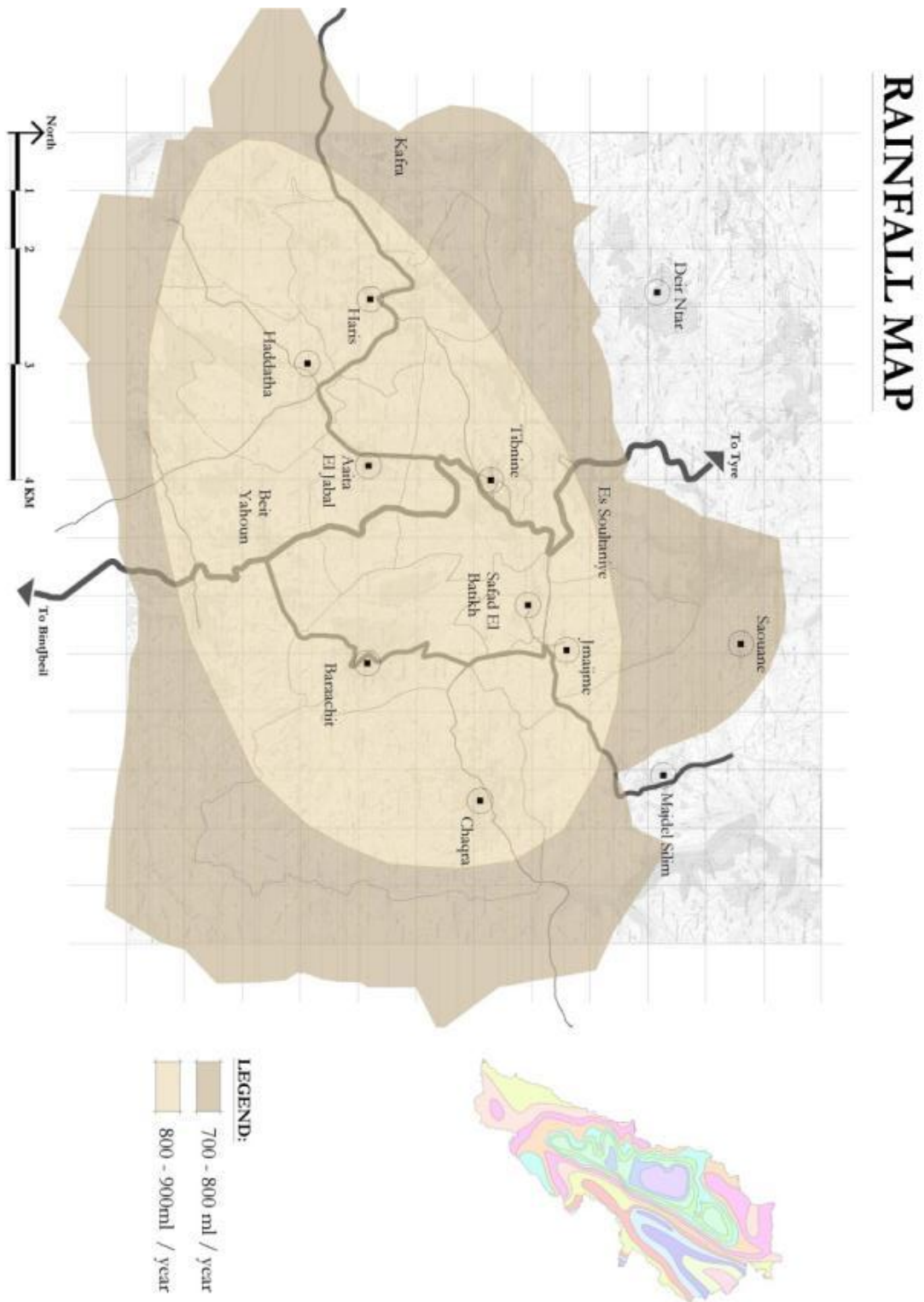
4. *Rainfall and Climate*

The rainfall season in the area under study is –as most Lebanon- extended over 5 months per year, against 5 months of dry season and 2 months of limited rainfall.

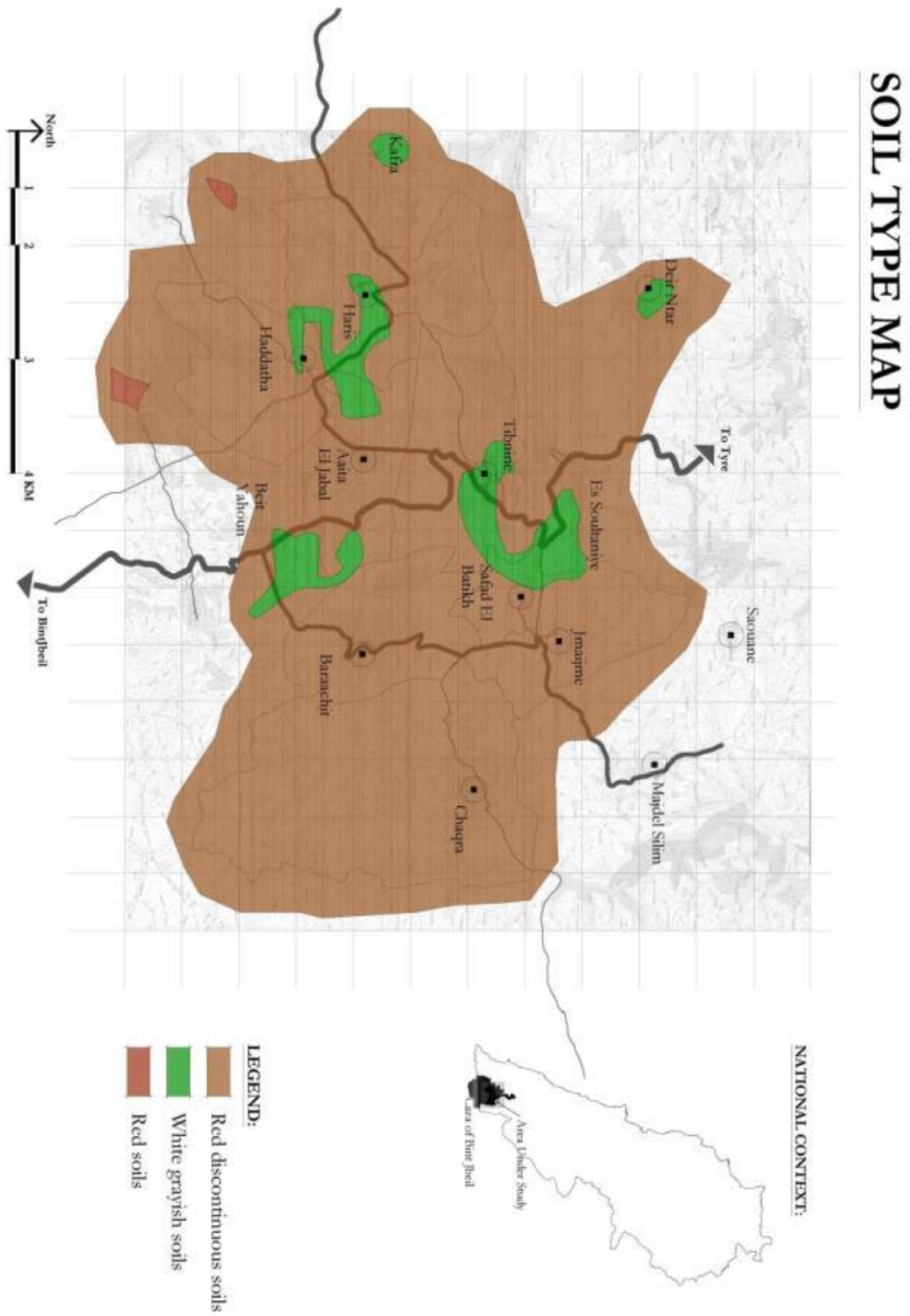
During winter, the area under study has a common average of precipitation that is 800 - 900ml / year with average temperatures as low as 8 degrees. On the other hand, the summer season in the area under study stretches from June until September with an average temperature of 23 degrees. (Map 21)

5. *Soil Type*

The soil analysis of the area under study demonstrates that it is dominated by a main soil type known as the *Red Discontinuous Soil*, which is a fertile type of soil. The profile of this type being “well drained, moderate in organic matter content, and non-saline and calcareous” may have been a reason to the prosperity of the agriculture type of Olive intercropped, deciduous fruit trees and choosing the locations of the first settlers (urban and rural) houses. (Map 22)



Map 21: Information based on GIS developed for the 2009 master plan of Lebanon
 Analysis by Zeineddine, A. 2014



Map 22: Information based on GIS developed for the 2009 master plan of Lebanon
Analysis by Zeineddine, A. 2014

B. The Biotic Components of the Landscape of the area under study

1. Land Cover

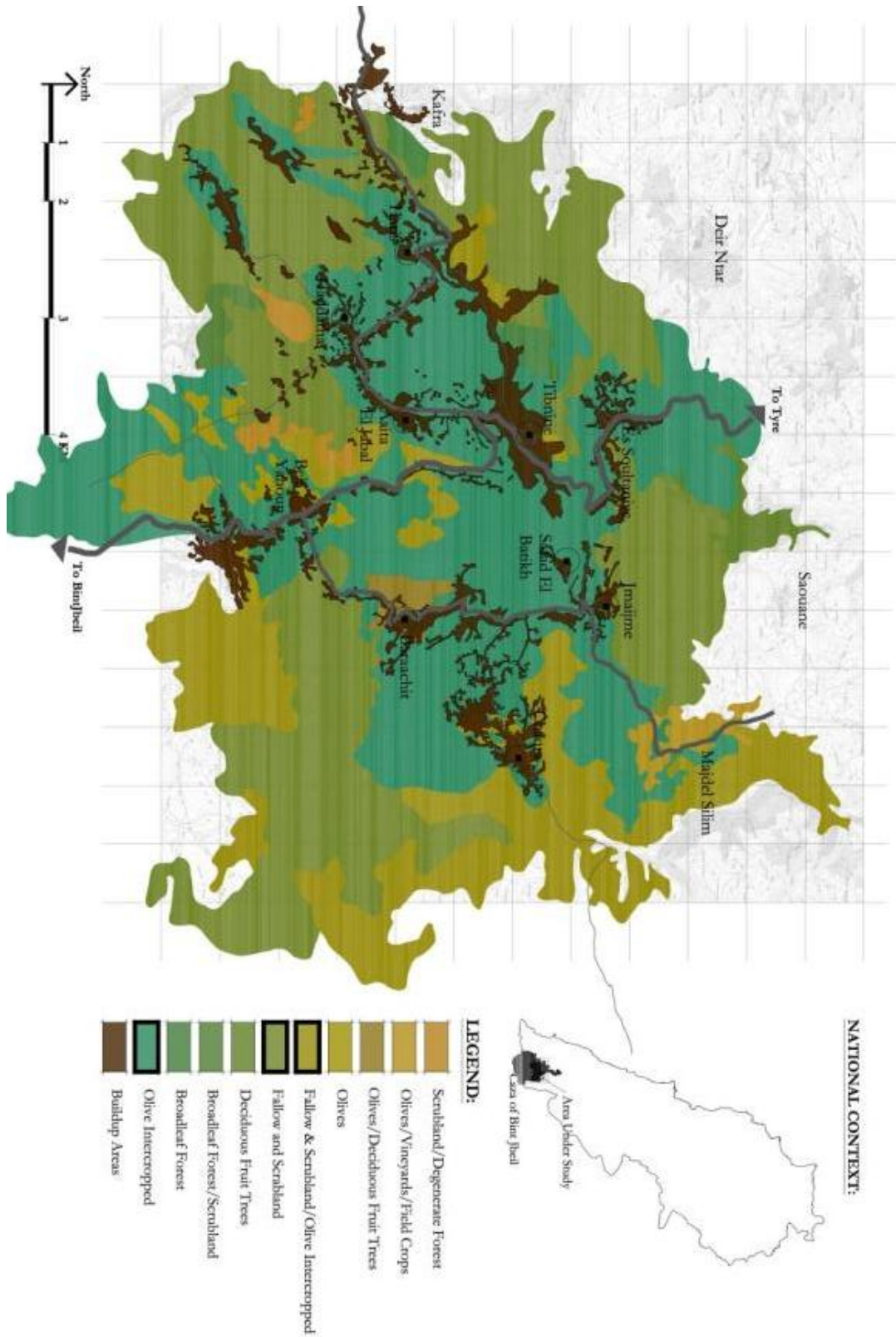
Three types of vegetation coexist in the area under study: natural, semi-natural and agricultural. The landscape of the area is originally part of regional scrubland, with some types of plants and flowers that endure the dry summer season. The southern and western hillsides of the area are historically part of a larger fallow and scrublands. The middle and northern parts of the area under study are historically part of a larger agricultural area. These agricultural lands originally belong to surrounding villages, where local farmers planted olives and tobacco that are responsive to the climate and soil of the area and that need minimum irrigation, usually provided by winter rain. While on the hilltop of the mountains in the area are located the built up urban areas forming an urban landscape connectivity among the region. (Map 23)

C. The Cultural Components of the Landscape of the area under study

1. The Rural Cultural Landscape

The area is defined by agriculture, stone wall terraces, and orchard. The agricultural practices in the area are considered to be sustainable, and considerate of the area's cultural norms and values. The terraces are not unique to the area, but rather signify an agricultural practice common to the entire country and the region. These terraces are new, old, functioning, or long since abandoned. In addition to being culturally significant, terraces are considered to hold important aspects of biodiversity, and prevent soil erosion. (Pic 24 and Pic 25)

LAND COVER MAP



Map 23: Information based on GIS developed for the 2009 master plan of Lebanon
Analysis by Zeineddine, A. 2014



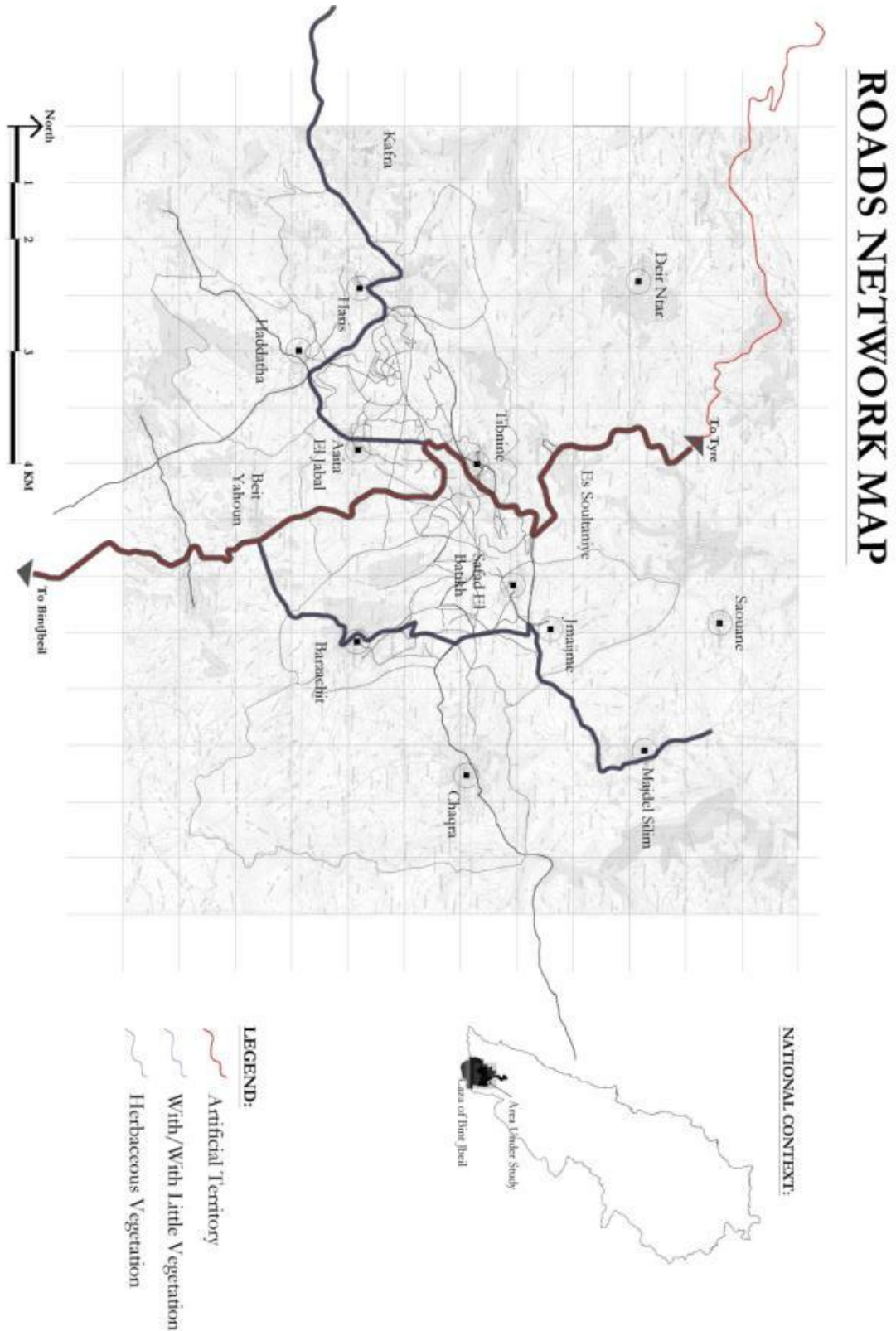
Fig. 24: Old terraces in the area under study



Fig. 25: New terraces in the area under study

2. The Transportation Landscape

Transportation means and methods played an important role in shaping the built environment in the area. A primary road connects Bint Jbeil to Tyre, a city along the coast. This road, along with its secondary additions, serviced the entire area. The World Bank, after the liberation of the south, funded the local municipalities. The municipalities in turn, to build new roads that reached the agricultural areas. These new roads led to transformation that broke the continuity of the ecological areas. (Map 26)



Map 26: Information based on GIS developed for the 2009 master plan of Lebanon Analysis by Zeineddine, A 2014

D. Ecological Landscape Associations (ELA) in the area under study

The above excerpt was to familiarize the reader with the area before moving onto an in depth study of it. The nature and residents in the area are studied, and processes and associations are identified. ELA methodology is applied onto the area's various components so as to understand its ecology and processes, as well as patterns and relationships.

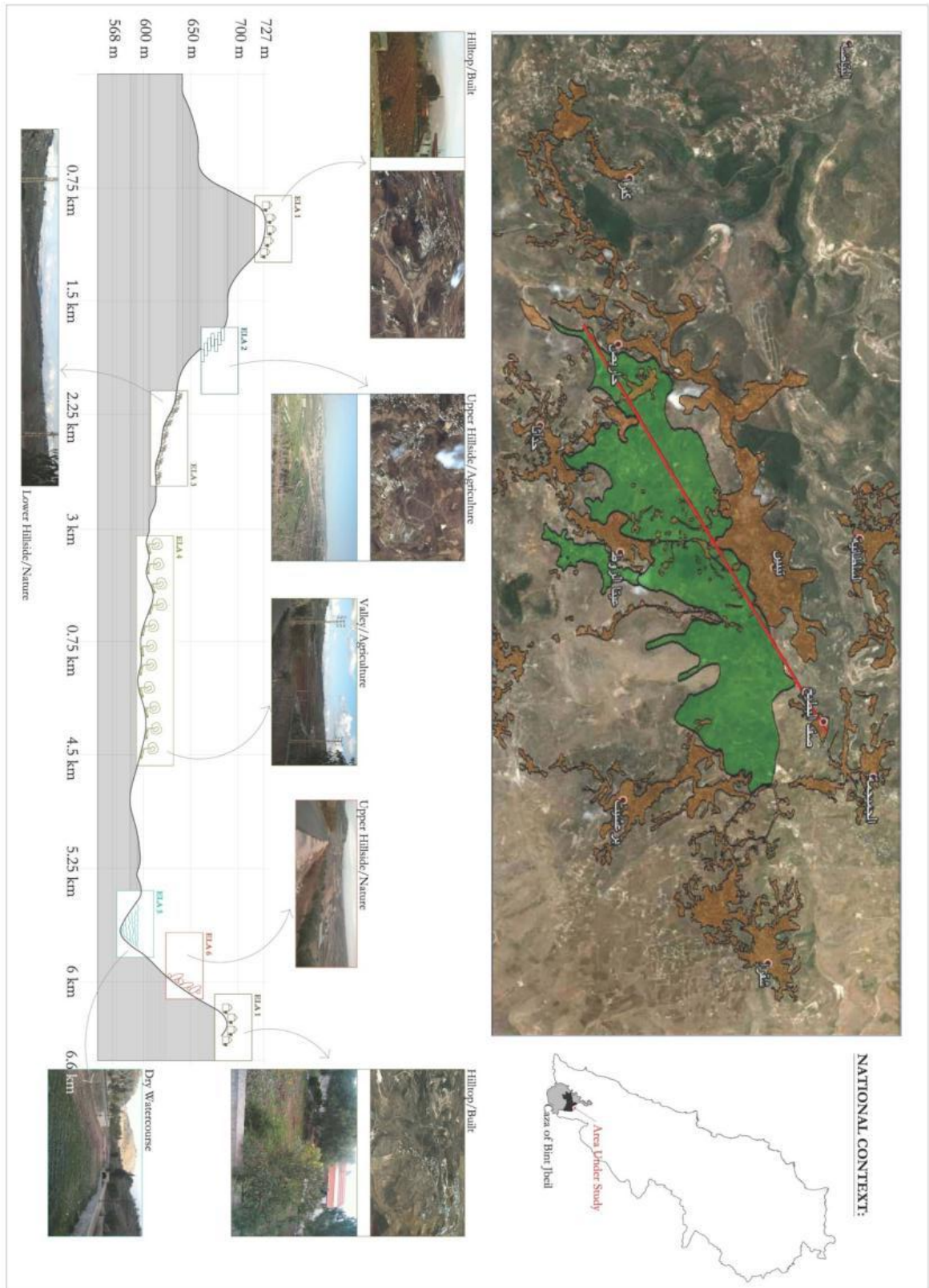


Fig 27: Section and the Six ELA discerned at the Area under Study
Analysis by Zeineddine, A. 2014

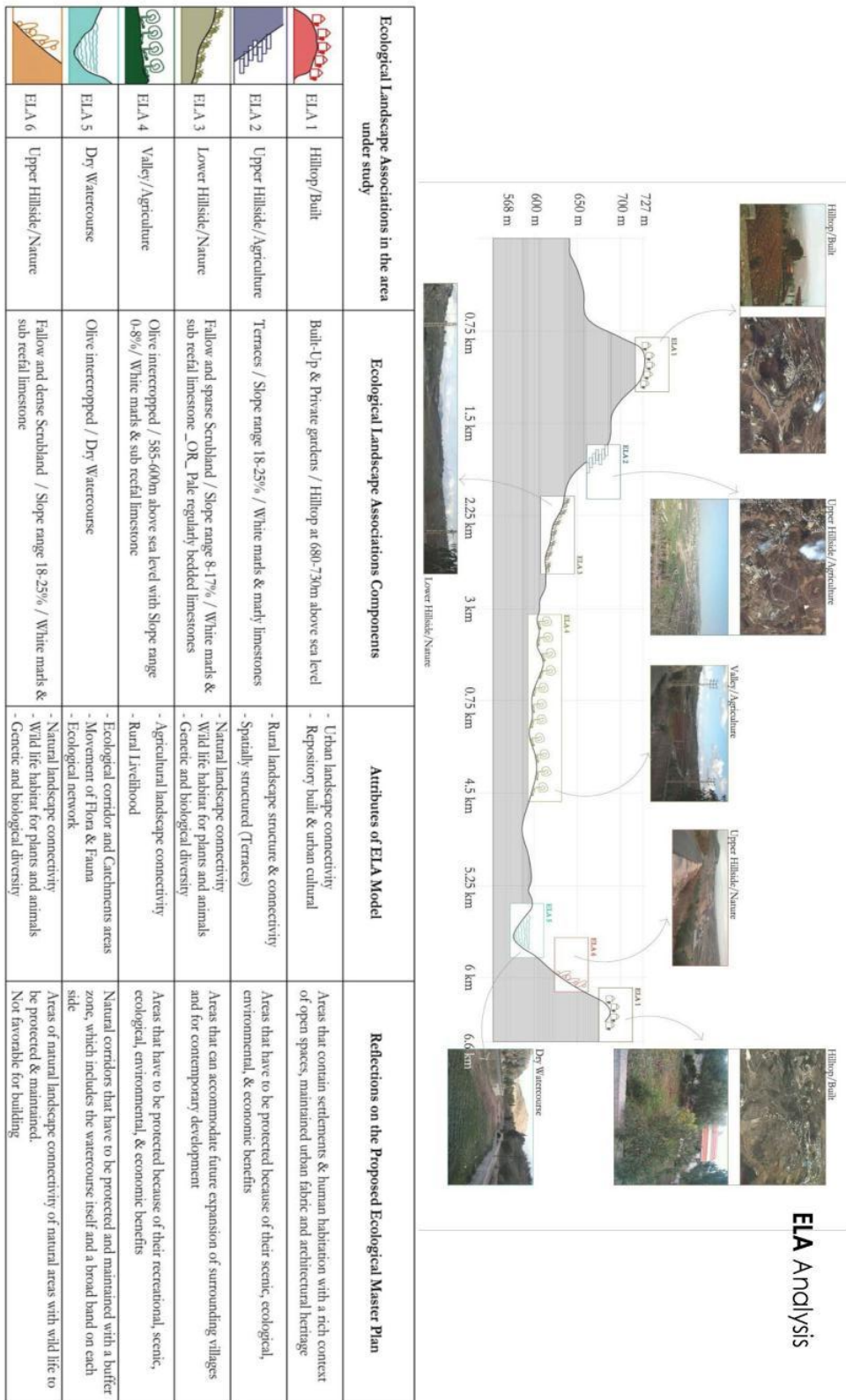


Fig 28: Characteristics of the Six EIA discerned at the Area under Study Analysis by Zeineddine, A. 2014

EIA ZONES

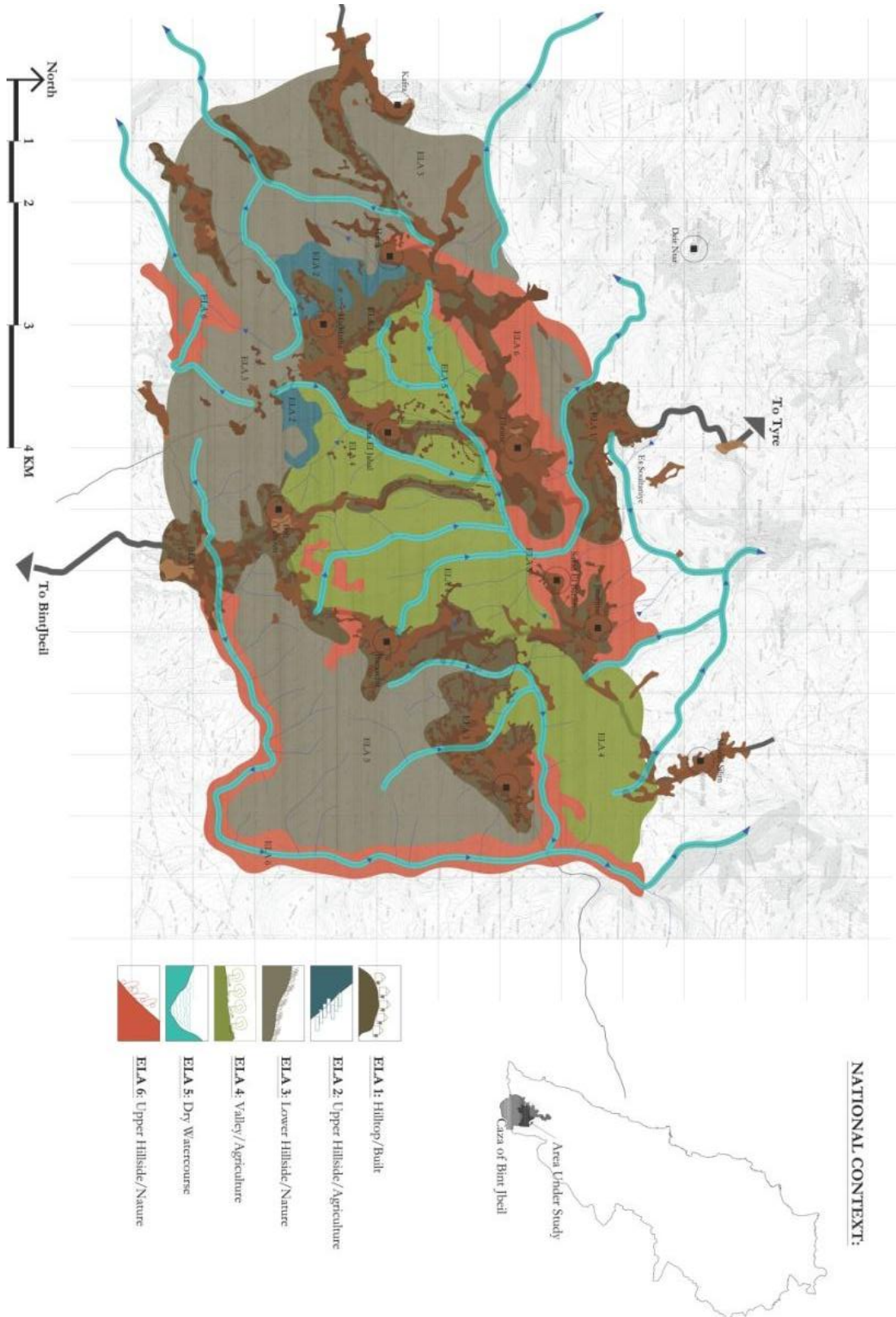


Fig 29: Preliminary Landscape Master Plan of the Area under Study
 Analysis by Zeineddine, A. 2014

1. Components of the Natural and Rural Cultural Landscape

The **Hilltop/Built** ELA was the first association to be studied. At an average altitude of 680-730 m.a.s.l, this association is representative of urban landscapes that cover the hilltop and have a low to medium population density. This ELA encompasses human settlements that have a good, wide range of open spaces, and that have preserved their architectural heritage. Also, this ELA characteristically has private gardens that compose the area's urban setting.

The second association studied was the **Upper hilltop/Agriculture** ELA. This association has a slope range of 18-25%. It is organized with continuity with the neighboring villages following the agricultural concept of terracing. These terraces must be protected for their ecological and environmental significances as well as their scenic and cultural value.

Third, the **Lower Hilltop/Nature** ELA, the dominant in the landscape, was studied. With a slope range of 8-17%, this association is very diverse biologically and genetically. With its fallow lands and shrub cover, it serves as a migratory route for fauna and flora. Attributing to its slope, this association is ideal for construction and village expansion.

The **valley/Agriculture** ELA is fourth to be studied. At an altitude of 585-600 m.a.s.l., it has a slope ranging between 0-8%. Being located predominantly in the middle of the area, it serves as a continuity (both in terms of landscape and agriculture) for villages (olives coupled with intercropping). The association is considered a migratory route for flora and fauna, a connector of the landscape, and has major

ecological value. This association is the second dominant type of association in the area, and should be preserved as well, for its scenic, economic, and ecological value.

The fifth area to be studied is the **Dry water Course** ELA. Serving as a catchment area, it supports a good diversity of fauna and flora. It is characterized by a number of dried up water courses passing through it. It could be considered an ecological corridor. Furthermore, this association also serves as a route of movement for flora and fauna, as well as a connector of landscape. Preserving this association should include a buffer zone that has a watercourse and an area of 50m on all surrounding sides.

The **Lower hilltop/Nature** ELA is the third association in the area under study. It is characterized by a slope range between 18-25% with White Masrls and Sub Reefal Limestone. It represents an important habitat for biological and genetic diversity. It is characterized with fallow lands and dense scrubs cover. While it represents an unfavorable slope (18-25%) for construction, it characterizes a natural landscape connector and a major migratory route of local plants and animals. Consequently, areas of this ELA must be protected and maintained.

It is essential to comprehensively understand, critically assess and realistically build on these patterns of heterogeneity, interaction and responsiveness of the landscape of the area under study. It is essential to build on these determined ecological associations in order to tackle current and future challenges in the area. These intrinsic values and assets of the landscape are rich and significant potentials to sustain the continuity of the ecology and the landscape of the area under study. The preliminary

landscape master plan derived in the area helps to determine vulnerable agricultural lands and waterways that must be protected, and helps to determine and propose new areas that are more suitable for development and are ideal for new construction and expansion.

Chapter VI

LOGIC OF BUILT ENVIRONMENT VS. ELA

Studying the logic behind the built environment, and being able to read the valley's rural and urban landscapes in its ELA divisions, it is possible to recognize and identify points of conflict where interventions need to be targeted. These problems can be visualized by superimposing the built environment's logic over the ELA in figure 30

As the analytical figure 30 shows, there are at least four areas (Areas A, B, C and D) where the logic of spatial production conflicts with the logic of the natural environment. These occur mainly in the areas surrounding the main historic cores of the villages and along the recently paved roads particularly in the areas where they intersect with the Valley/Agriculture ELA (ELA 4) and the Dry Watercourse on site (ELA 5), which represent agricultural and rural landscape continuity, ecological corridors and network, a major rural livelihood for local residents, ecological and environmental significant components of the landscape of the area, a natural landscape connector, and a major migratory route of local plants and animals that must be conserved and protected. This conflict in areas A, B, C and D is expected to lead into an ecological fragmentation of ELA4 and ELA5, and deterioration of the historical agricultural valley in the area under study.

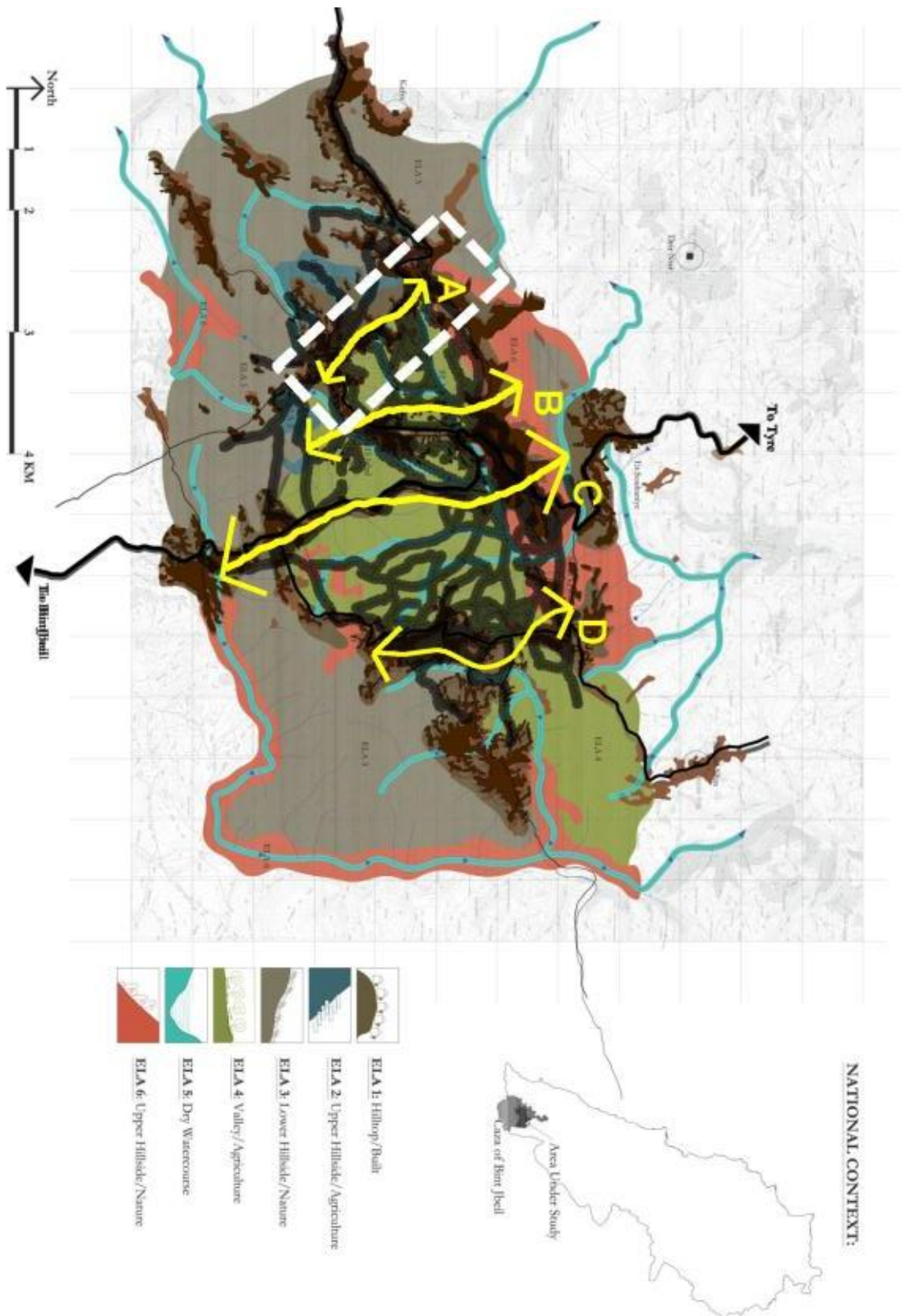


Fig 30: Areas of Conflict between ELA and B.E. in the Area under Study
Analysis by Zeineddine, A. 2014

Given time limitations, it was impossible for the thesis to derive all the areas of conflicts in the area. Instead, the thesis zooms in on one of these zones (zone A) in order to propose an integrated set of planning incentives and design (land use regulation/building regulations) interventions that work to reframe the organization of the natural and built environments in the area. The selection of Area A is based on the fact that this area includes a major intersection and conflict zone between the watercourse in this area and building sprawl. The area witnessed the oldest sprawl of buildings in the late 1970s⁷ between the two villages: Aita El Jabal and Tebnine.

Studying the conflict arising in Area A, the building logic can be further understood, and addressed. The survey and the interviews were conducted in the area in spring 2014 and covered approximately twenty respondents/buildings in the area. Analysis of the built environment in “area of conflict A”, interviewing local residents and property owners, investigating the reason behind owners’ locational choice, and date of construction helped identify the reasons behind such building growth in the area. The findings of the analysis and the survey are represented in the following:

⁷ Based on conducted interviews with old people in this area.

A. Area of Conflicts A:

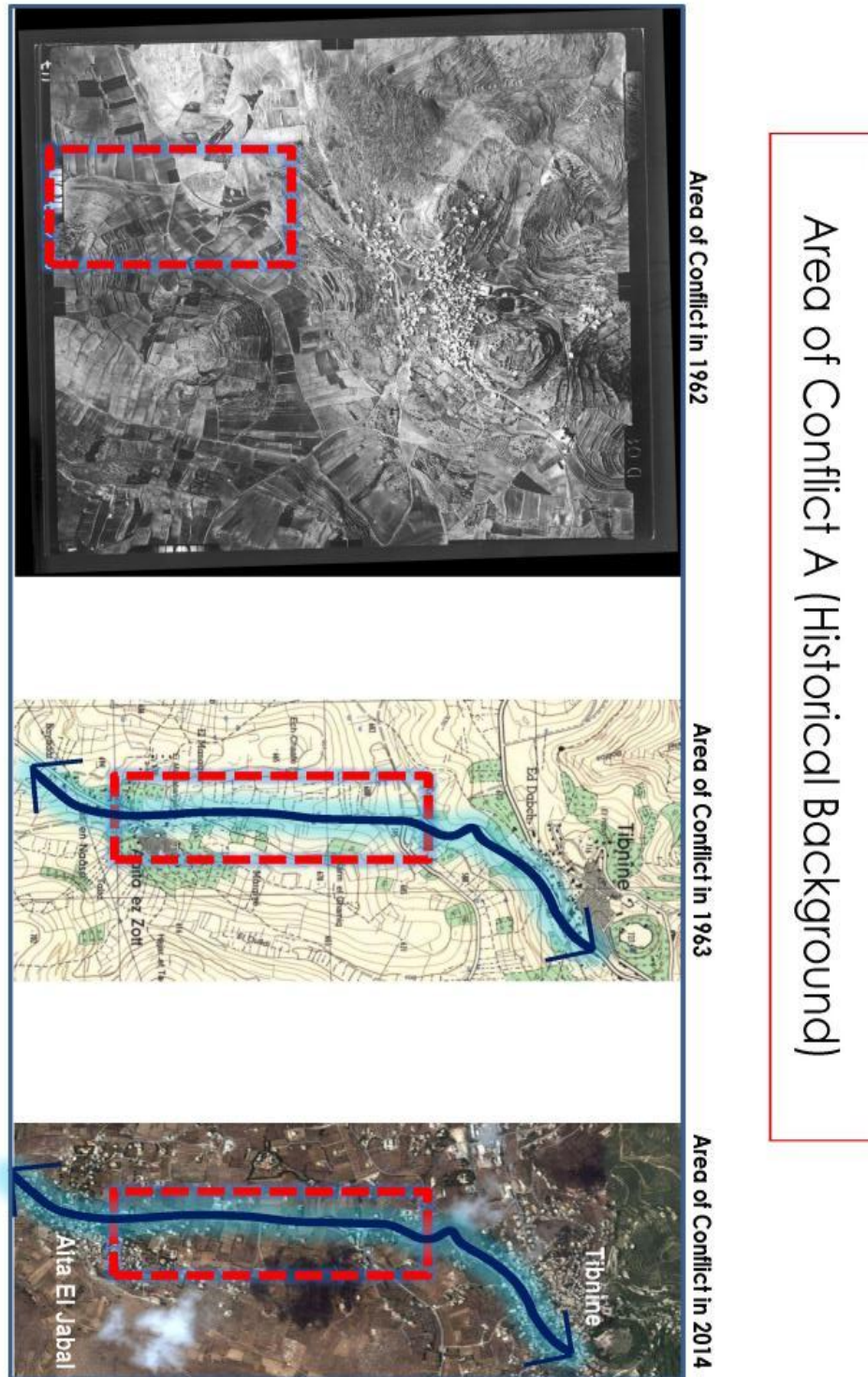


Fig 31: Historical Analysis of the “Area of Conflict A”
Analysis by Zeineddine, A. 2014

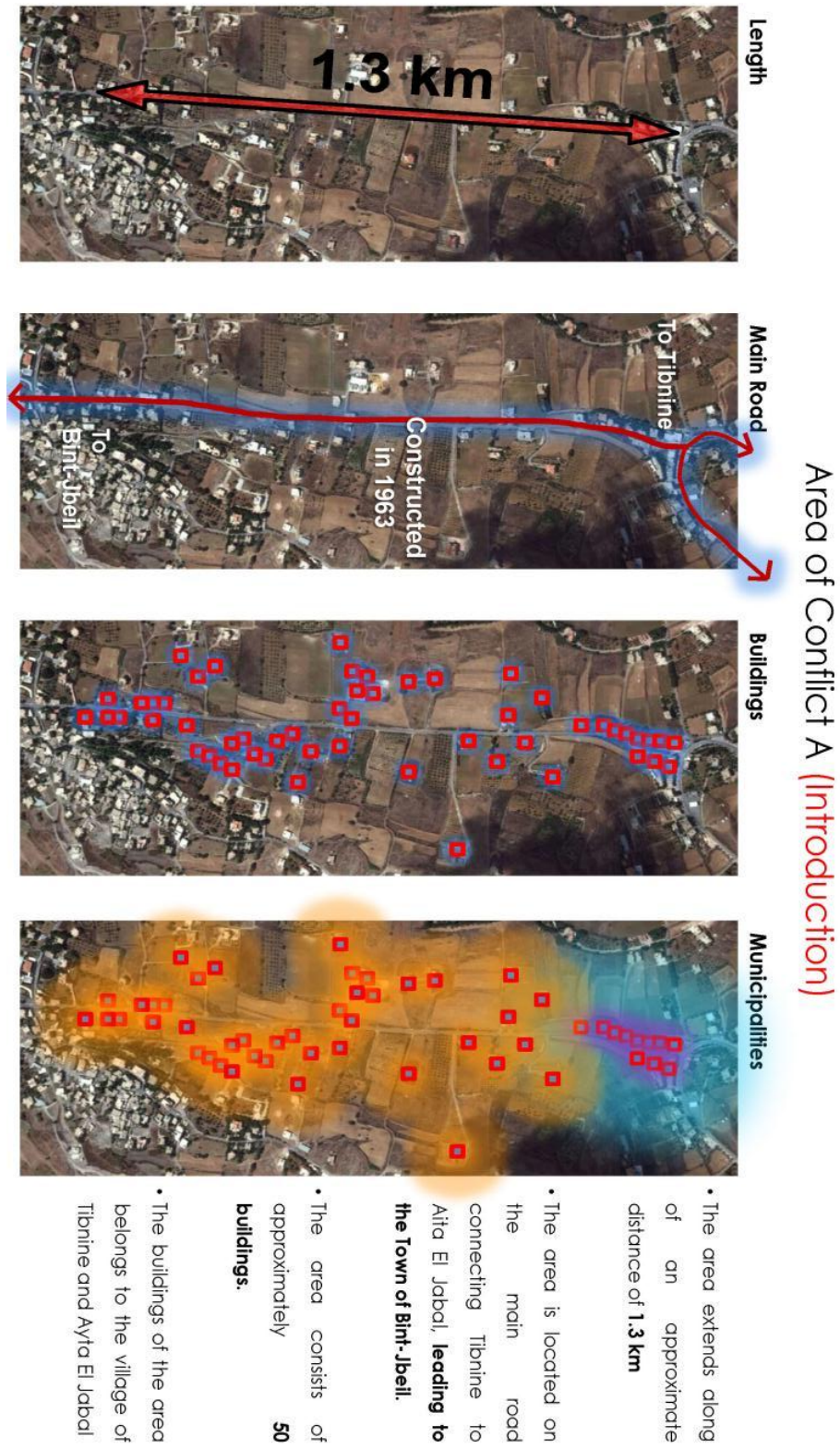


Fig 32: Introduction for the “Area of Conflict A”
 Analysis by Zeineddine, A. 2014

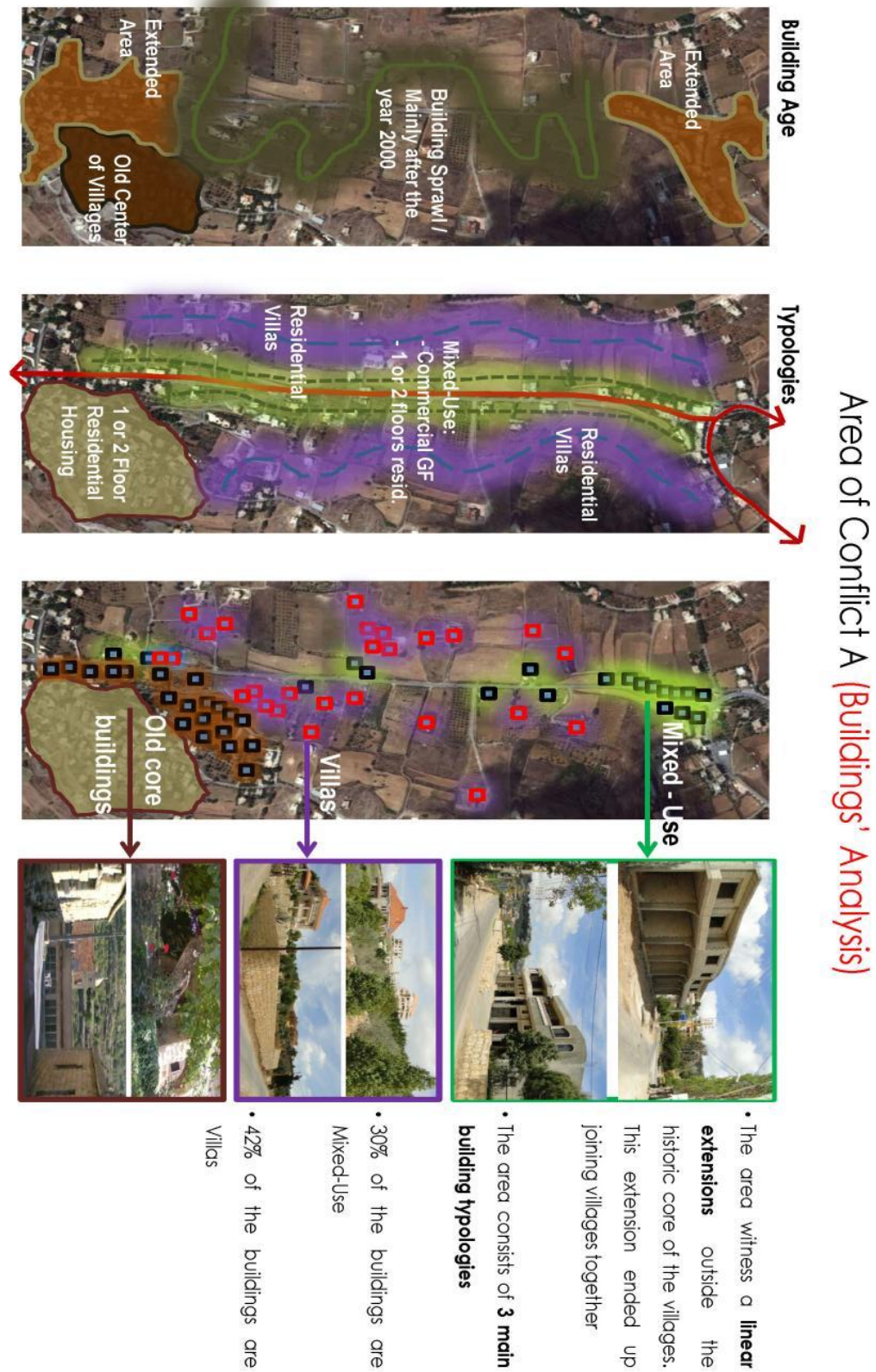


Fig 33: Building Analysis for the “Area of Conflict A”
Analysis by Zeineddine, A. 2014

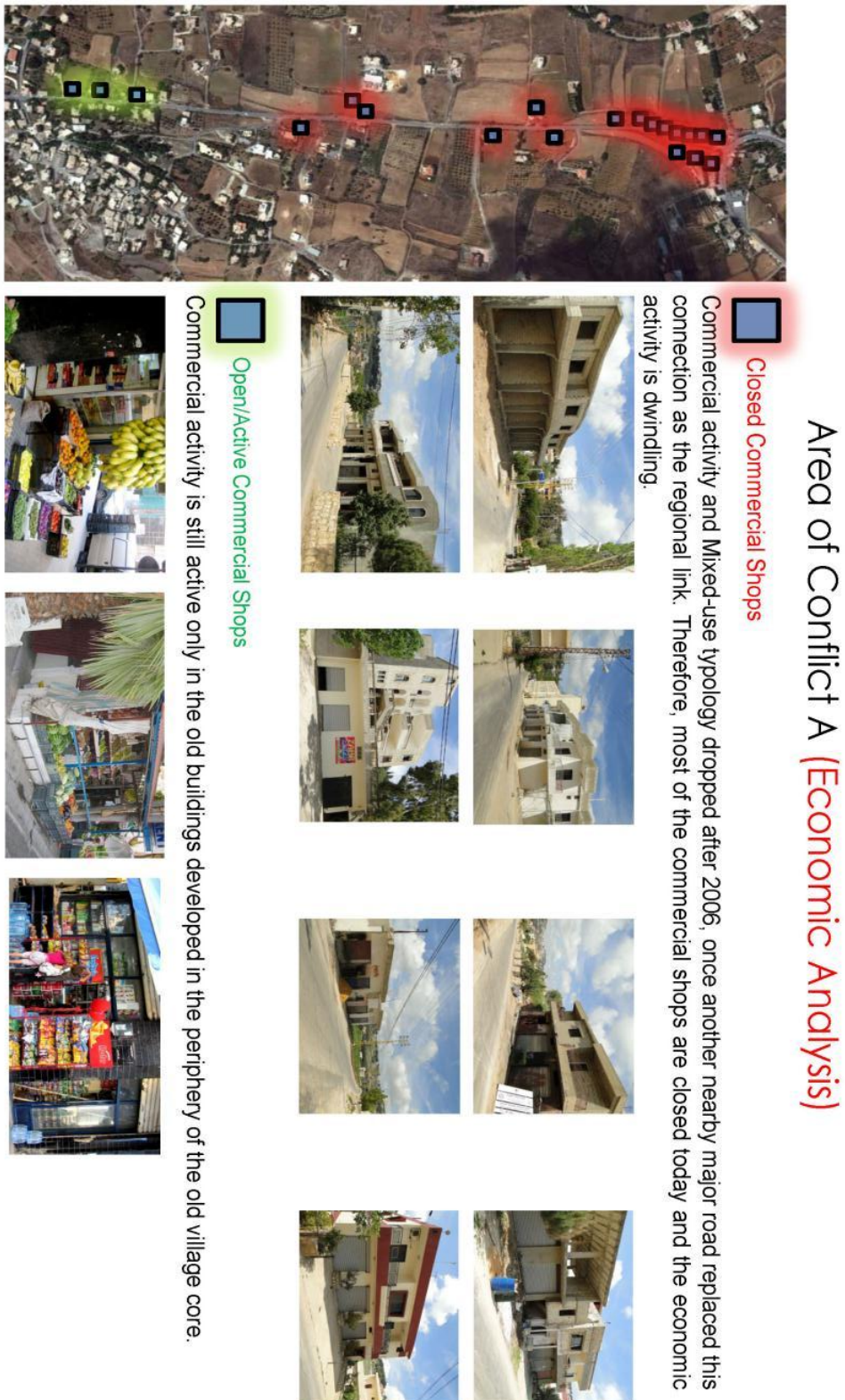


Fig 34: Economic Analysis for the “Area of Conflict A”
Analysis by Zeineddine, A. 2014

Survey and Analysis Results:

When interviewing local residents and property owners, investigating the reason behind their locational choice, the survey showed the following results, summarized in the following tables:

Survey & Interviews, Spring 2014 (Distribution of Answers)			
Reasons behind Owners' Locational Choice	Villas	Mixed-use	Housing essentially residential
Adjacent to the main road/Old village		XX	XX
Open view in the area	XXX		
Centrality of location / Proximate to services in Tebnine	X	XX	
Pleasant climate	XX		
Opportunity of Mixed-Use typology		XX	
Absence of alternative location			XX

Table 1: Distribution of Survey & Interviews' Answers

Survey & Interviews, Spring 2014 (% of Answers)		
Reasons behind Owners' Locational Choice	Nb. of answers	% of the Nb. of answers
Adjacent to the main road/Old Village	12	25%
Open view in the area	10	20%
Centrality of location / Proximate to services in Tebnine	9	19%
Pleasant climate	6	12%
Opportunity of Mixed-Use typology	6	12%
Absence of alternative location	6	12%
		100%

Table 2: Percentages Distribution of Survey & Interviews' Answers

1. *Building Processes*

Sprawl in this area coincides with the enlargement of the agricultural road in the late 1960s and its transformation as a main regional connector. Building activities boomed in the early 2000, in sync with the rest of the region and following the liberation of the South. These results match with the logic of sprawl that is previously demonstrated in chapter IV.

2. ***Building Typologies***

It is possible to distinguish between the following typologies:

- Old buildings developed in the periphery of the old village core are essentially residential
- New buildings developed along the main road are mainly mixed-use, commercial/residential activities
- New buildings built away from the road are mostly residential villas.

These results suggest that any planning/building regulation will have to account for the variety of building typologies, and to respond through various regulations/incentives.

3. ***Property owners/ builders***

Landowners are mainly expatriates or families living in Beirut. Most of their buildings are secondary houses. They typically use these houses either a few weeks in the summer or during week-ends, particularly in the summer. Therefore, area's properties are predominantly vacant throughout the year. The main drive behind the locational choice is the view as well as a pleasant climate in the summer.

These trends suggest that taxing the view, as well as proposing incentives to shift the construction into elsewhere will be possible since one's location within a family quarter is for example not a locational choice.

4. ***Economic Condition***

Commercial activity was very active in the area under study at an earlier stage, while it dropped after 2006, once another nearby major road replaces this connection as the

regional link. Therefore, most of the commercial shops are closed today and the economic activity is dwindling (fig. 35). These trends suggest the possibility to limit current building developments in the area, mainly the mixed-use typology.

- School was constructed, commercial activity along what now could be considered the old road declined, and many shops eventually for closed.
- It should be noted that most of the area's property is predominantly vacant throughout the year because it is owned by people having an exterior source of income (Beirut, Africa, Australia).

As seen in this chapter (chapter of the Logic of Built Environment and the survey conducted in the “area of conflict”), the current logic behind the production of the BE contradicts with the ELA analysis and threatens to undermine the ecological integrity of the agricultural fields. The survey conducted along “conflict area A” as well as interviews in the area indicated important findings, particularly the dwindling economy on the main street and the predominance of the villas typology among new buildings (42% of the total number of buildings). These two indications suggest the possibility to put a halt on new constructions in the area and instead encourage agricultural activities in line with the ELA analysis presented in Chapter V.

Chapter VII

THESIS FINDINGS AND MAIN RECOMMENDATIONS

This thesis aimed to explore an innovative planning and design approach that combines a two tier analysis looking at the intersections between on the one hand, ecological continuities (Makhzoumi and Pungetti, 1999) and on the other, the logic of the production of the built environment. Building on a case study of the agricultural fields connecting seven villages in the area of Bint-Jbeil (South Lebanon), the analysis identified “conflict zones” and zoomed in on one of these zones in order to propose an integrated set of planning incentives and design interventions that worked to reframe the organization of the natural and built environments in the area.

A. Thesis Findings

This thesis investigated the possibility of reorganizing land use planning outside the current framework of master planning at the administrative level by studying the logics of the ecological and building processes at work in one geographic area and introducing an integrated strategy that includes, next to a proposed land use zoning, different incentives that work within the unraveled logics. The main findings of the thesis showed the following:

- When applying the ELA methodology, which is based on the holistic reading of continuities and connectivity of ecology, geography, built environment, social activities and practices, or infrastructure, the thesis determined new boundaries and scale of intervention that spans several municipal districts and boundaries. The

thesis presented a scale-alternating process that helped to understand the area under study and its context in the perspective of all affecting dynamics rather than scaling it down to its administrative boundaries.

- The survey conducted along “conflict area A” as well as interviews in the area indicated important findings, particularly the dwindling economy on the main street and the predominance of the villas typology among new buildings (42% of the total number of buildings). These two indications suggest the possibility to put a halt on new constructions in the area and instead encourage agricultural activities in line with the ELA analysis presented in Chapter V.
- The thesis was able to understand and to read the logic behind the built environment. It was able to analyze the main reasons behind the urban sprawl taking place in the area under study, namely opening of new roads, scenic views, plots’ accessibility, mixed-use typology (commercial/housing) on the roads, absence of alternative plots, and the search for pleasing amenities outside the main village cores whenever infrastructure and facilities are provided.
- A better grasp of the logic behind the built environment provided a good prediction of the direction in which urban sprawl might assume in the future.
- The areas where conflict between urban sprawl and the area’s ecology were predicted. The consequences of such conflicts were studied.

B. Recommendations

Building on the above findings, the thesis recommends a revision of the current used tools of planning used to guide future growth in rural regions. It recommends a revision for the adopted methodology that is static, fragmentary and classified as an ill-suited to

the dynamic attributes of living systems. It recommends adopting a new environmental design paradigm in urban areas that emphasizes on a holistic design approach that addressed both people and environment. (Makhzoumi, 1995)

Furthermore, the thesis recognizes that complementary steps must be taken to encourage the protection of agricultural lands and waterways, and to shift agricultural practices from vulnerable agricultural lands into the proposed areas, which are more suitable for building activities. The thesis proposes an integrated set of planning incentives and design (land use regulation/building regulations) interventions that work to reframe the organization of the natural and built environments in the area and re-orient building activities. The following incentives could be used to encourage landowners to elect agricultural production over building development:

1. Property Tax Incentives

Property tax incentives are a traditional method of protecting agricultural lands. The general idea is to impose a lighter tax burden on agricultural property compared to other types of property. My fieldwork indicated that among the main actors fuelling the production of the built environment in these areas are expatriates and other families residing in Beirut who develop secondary homes where they use these green areas as “views” to enhance the quality of their private residence. Responding to that rationale as a possible strategy to protect the ecological area through the introduction of market-based planning incentives (rather than regulations that are commonly violated), this thesis proposes to introduce a “tax on the view”, a common taxation mechanism where property owners are taxed on their private benefits of shared goods. More specifically,

the thesis proposes to introduce a “tax” on the view, which is levied from property owners whose houses overlook the field. The tax’s aims are two-fold, on the one hand, the tax creates a disincentive for people to build in the fields, as they will be paying much higher taxes. On the other hand, the money levied by the tax is reinvested to restore historic waterways, facilitate the access to water, support agricultural programs and trainings, fund local farmers, etc.

In order to investigate the applicability of this method, I ran a pilot limited sample questionnaire with 15 respondents from all the adjacent villages and 20 respondents from the “area of conflict A” in spring 2014. Questions were raised about the community’s attitude toward the agricultural valley neighboring their homes, detecting their motivation for protecting its environmental aspect, detecting their adequacy to move into the new proposed areas of development, and testing their willingness to pay annual taxes to conserve the rural view of the valley. Local residents were asked to evaluate the valley surrounding their houses, the view over it, and their feelings toward it.

While 100% of the respondents showed appreciation for the scenery of the valley in their area, the results of the survey show disparities in the viewpoints. Upper income households confirmed their appreciation of the proximity of farmland neighborhood and their readiness to pay annual taxes to preserve the agricultural aspect of the agricultural valley, while poor households -although they showed appreciation for the scenery of the valley- raised severe concerns about their ability to pay, refusing any additional taxes.

2. Land Acquisitions or Development Rights Acquisition

A survey conducted by Harajli in 2013 for his thesis work show that “over 70% of the farmers are agents while 30% are landowners. Our survey shows that most agents engaged in commercial agriculture tend to rent land from temporary landowners such as expats and from permanent landowners who usually own several lots in the village” (Harajli, 2013). Responding to that foundation, local municipalities either directly acquire, or regulate and facilitate the third-party acquisition of conservation easements or development rights to protect agricultural land. Under this approach, the landowner receives financial compensation while retaining title to the land and the right to continue farming. The terms vary, but generally restrict the agent operators’ ability to develop the property for non-agricultural purposes.

3. Agricultural Support Programs

Agricultural support programs seek to make agricultural production more economically viable by increasing the demand for locally produced foods and providing needed services and infrastructure to agricultural operators. Models for support programs can be found in both the local government and non-profit sectors. Some of the common features included in support programs is the establishment of a *Farmers’ Market Space*. Such a market can play an essential role to market fresh produce and other local foods. Farmers’ markets provide a direct means of connecting producers and consumers of local agricultural products, including value-added products. In order to ensure that consumers have adequate access to farmers’ markets, municipalities in the

area should consider whether to facilitate markets on multiple days of the week, and in different locations.

4. **Sufficient Water for Agricultural Uses**

Adequate water supply for the protected agricultural lands is a significant issue in the region. Its absence may be a serious issue in protecting the agricultural lands that can be productively used. Therefore, local municipalities can sponsor or grants to pay for the establishment of artificial reservoirs, which are ecologically and environment friendly, to contain running water and rainwater.

5. **Transfer of Development Rights (TDR)**

Transfer of Development Rights is a tool that can allow landowners to realize equity in their land while continuing their agricultural operation. While the use of TDRs ultimately results in development, that development is shifted away from vulnerable agricultural lands and waterways in “areas of conflict” into the proposed areas that are more suitable for development as classified by the ELA analysis. Development restrictions in conflict areas can create development rights for additional density, square footage, or height allowances in the alternative areas. Those alternative areas are for example the third ELA, the **Lower Hilltop/Nature** ELA, with a slope range of 8-17%. This association is ideal for construction and village expansion.

6. Development incentives in alternative areas

Local governments can use a variety of incentives to encourage landowners in the “area of conflict” to shift into the proposed areas for new developments to protect agricultural lands and waterways. Some possibilities include:

- **Building Fee Exemptions:** Under this incentive, projects have reduced or waived construction fees. Local municipalities can offer incentives to housing projects that are shifted from the “area of conflict”.
- **Free services:** local municipalities can offer free consulting services for projects shifted from “areas of conflict”.
- **Expedited Review and Permitting Processing:** Shifted projects can receive a higher priority in application processing, agency commenting, and decision making by the local governing body. Municipalities of the area can offer priority review of building applications when is shifted.
- **Off-site Improvement Assistance:** Shifted projects can apply for municipal-sponsored grants to pay for off-site infrastructure improvements that may be needed, such as sewer or water lines, power lines, telephone and internet lines, local roads, etc.

Building Regulations

On the other hand, **building regulations** will be applied as a **disincentive** to build in the “area on conflict” in order to contain new possible constructions or sprawl. With these disincentives, new projects in the “area of conflict” are restricted to minimum lot sizes, front setback requirements from the main road in order to exclude the mixed-use

typology typically generated by the road, such as limits on building heights strict side and rear setback requirements for buildings, limited buildings' footprint, reduced exploitation factors, fifty meters setback from existing waterways in the area, etc.

CONCLUSION

Each of these regulations will need to be further analyzed and refined. Further research is needed in order to test them, articulate and nuance them in ways that can make them responsive to the local cultural, social, and economic imperatives. They however provide the grounds for a new strategy of thinking about urban planning and design at the regional scale.

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