HUNGARIAN UNIVERSITY OF AGRICULTURE AND LIFE SCIENCES

EXPLORING SPATIAL TRANSFORMATION AND EFFECTIVENESS OF MASTER PLAN IN THE SYRIAN COASTAL REGION

Ph.D. DISSERTATION

DOI: 10.54598/004860

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Budapest

2024

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INTRODUCTION

"*Urbanization is a complex socio-economic process that transforms the built environment, converting formerly rural areas into urban settlements and shifting the spatial distribution of populations from rural to urban areas*" (UN, 2018). This transformation is primarily driven by migration from rural regions to urban centers, leading to the expansion of urban populations and territories. As a result, urbanization brings about changes in land use patterns, economic activities, and cultural dynamics, leading to significant societal and economic transformations (UN, 2018).

Particularly in developing countries, there is a notable increase in urban populations, resulting from both natural population growth and sustained rural-to-urban migration. This demographic transition presents various challenges, such as escalating land prices, housing shortages, inadequate infrastructure, insufficient green spaces, and unplanned urban expansion, which encroaches upon surrounding natural environments. Urban areas, in an effort to accommodate the growing demand for services, often expand at the expense of rural and green spaces.

Since the mid-20th century, the global pace of urbanization has accelerated significantly. Notably, in 2007, the urban population globally exceeded the rural population for the first time, marking a historic demographic milestone. Projections indicate that by 2030, about 60% of the world's population will be living in urban areas, a figure expected to rise to approximately 68% by 2050. This rapid urbanization underscores the urgency of addressing the complex challenges it presents (UN, 2018). Figure (1) shows the world Urban and Rural population within the time.

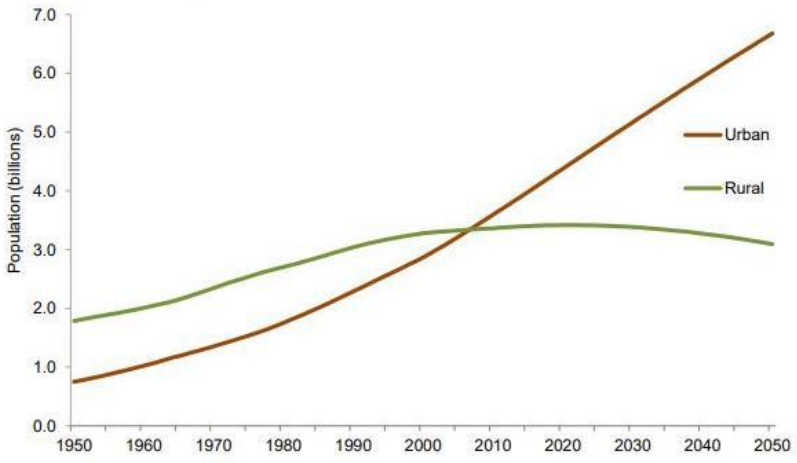

Figure 1: urban and rural pupulation , Source : (UN, 2018).

In Syria, urban landscapes are experiencing dramatic transformations. Agricultural lands are increasingly succumbing to urban expansion as cities undergo rapid and often unmanaged expansion. This expansion, characterized by spontaneous growth in peri-urban areas, poses multiple challenges for both residents and authorities. Driven by factors such as population growth, economic aspirations, and changing land-use patterns, this unregulated expansion occurs without the benefit of proper planning or regulations. Consequently, urban areas extend in a disorganized manner, threatening valuable agricultural land and creating new challenges for local authorities.

The responsibility for infrastructure provision heavily burdens these authorities, who struggle to keep pace with the demands of growing populations. Issues such as sanitation, water supply, and waste management are exacerbated, straining existing systems and potentially compromising public health. Moreover, the unplanned nature of this growth can disrupt social and community structures, leading to disenfranchisement and marginalization among residents.

In light of the uncontrolled urban expansion characterizing Syrian cities, the imperative for structured regulatory oversight and strategic urban planning has become increasingly evident. Master plans emerge as critical tools in navigating the complexities of urban growth, advocating for the implementation of comprehensive planning policies and the enforcement of effective regulations. These plans are pivotal in directing urban development along a sustainable trajectory, ensuring the conservation of valuable natural and agricultural resources, promoting inclusivity, and facilitating the creation of resilient and thriving urban landscapes. The success of these master plans, however, hinges on their ability to remain flexible and responsive to evolving urban dynamics, drawing lessons from both past achievements and shortcomings. Through detailed analysis and the proposition of innovative solutions, this research seeks to arm policymakers with the insights necessary to refine and optimize these strategic planning instruments. The goal is to ensure that they effectively steer urban growth towards outcomes that are both sustainable and equitable, securing a prosperous future for Syrian cities and their inhabitants (UN, 2018)

1.1.Importance of study

The rapid expansion of urban areas often disrupts the social fabric within cities. This investigation highlights socio-economic disparities resulting from such growth and offers guidance for policies to mitigate issues like displacement, inequitable access to opportunities, and resource scarcity. The

goal is to advocate for inclusive and equitable urban expansion, creating accessible and beneficial communities for all.

Beyond identifying challenges, this research evaluates the efficacy of existing urban master plans strategic documents for managing urban growth. Through critical analysis, it aims to equip policymakers with insights to formulate development strategies that promote economic prosperity, environmental sustainability, and social equity.

Additionally, the research explores successful international examples of urban development to extract valuable lessons and best practices. This knowledge transfer will support the creation of sustainable urban paradigms.

In essence, this research proposes a strategic pathway towards urban expansion that avoids environmental degradation and social inequities. By examining the impacts of urban growth, assessing current planning tools, and learning from global successes, the study advocates for urban environments characterized by livability, resilience, and social equity. This comprehensive approach aims for urban expansion that contributes positively to a sustainable and flourishing future for all inhabitants.

1.2.Research problems and objectives

Uncontrolled and poorly planned urban expansion poses a significant threat to the Syrian Coastal Region, casting a long shadow over its delicate ecological, social, and economic fabric. This research delves into the complex interplay between unmanaged urban expansion and its multifaceted consequences, paving the way for a more sustainable future for the region.

Key drivers of this research problem include:

- Disregard for Natural Environment: The current approach to urban expansion in the Syrian Coastal Region often ignores the surrounding natural landscapes, disrupting the ecological balance and undermining the region's environmental integrity.
- Inadequate Control Mechanisms: Existing urban planning and regulatory mechanisms lack the capacity to effectively manage and guide growth. This results in haphazard expansion, inefficient land-use patterns, and the encroachment of urban areas into ecologically sensitive zones.
- Neglect of Sustainable Development Principles: Urban expansion efforts frequently overlook the principles of sustainable development, including the need for balanced growth

that harmonizes environmental preservation with socio-economic development. This neglect exacerbates resource depletion and environmental degradation.

- Socio-Economic Disparities: Rapid urban expansion has exacerbated socio-economic disparities, leading to uneven development, inadequate infrastructure, and strained public services in both urban and rural areas.

In light of these challenges, this research aims to:

This research aims to critically analyze the spatial transformations in both rural and urban areas of the Syrian Coastal Region, with a particular focus on the dynamics of urban expansion. By examining Latakia Master Plan as a case study for the Syrian coastal cities, this study will assess the plan's effectiveness in managing urban growth and its impact on the region's ecological, social, and economic landscapes.

Beyond city limits, the research will analyze how urbanization impacts the delicate relationship between urban and rural areas, assessing its influence on lifestyle, land use, and social dynamics. Additionally, the research will compare Latakia's urban planning approaches with successful international examples to identify strengths, weaknesses, and potential areas for improvement. The ultimate objective is to provide evidence-based insights to guide policymakers in refining urban planning strategies, ensuring they are more adaptive, sustainable, and capable of addressing the unique challenges faced by the Syrian Coastal Region. This analysis seeks to inform decision-makers of critical areas where modifications could enhance the master plan's effectiveness, fostering a balanced and resilient development trajectory for the region.

Based on that the research rise 4 main research questions:

1. What are the spatial changes occurring in rural and urban areas due to urban expansion, and how can these changes be observed in the context of Latakia governorate?
2. How does urban expansion influence land use changes in the rural areas of the Syrian Coastal Region?
3. How effective is the current Latakia Master Plan in addressing the challenges of rapid urban growth, and what specific areas of the plan require improvement for better management of urban expansion?
4. What urban development strategies can enhance development and improve the quality of life in the Syrian Coastal Region?

The study will draw upon extensive literature reviews to explore concepts related to urban expansion and transformation, enriching the understanding of the subject matter.

1.3.Hypotheses

Uncontrolled urban expansion in the Syrian Coastal Region, particularly in Latakia, prioritizes short-term economic gains while neglecting environmental sustainability and social equity. Existing control mechanisms, including the Latakia master plan, are ineffective in managing this expansion, leading to negative consequences for both urban and rural areas. By learning from successful international examples of urban development and implementing clear principles for responsible urban expansion, the Syrian Coastal Region can achieve a more balanced approach that fosters economic growth, environmental preservation, and improved quality of life for all residents.

1.4.Research methodology and dissertation structure

To achieve the research goals, the methodology is structured into four main chapters, with a fifth chapter dedicated to presenting the new scientific achievements.

The research began with a comprehensive literature review (chapter1) focusing on theories related to urban expansion and its implications. This review encompassed a wide range of studies on urban development, land use planning, and the social dynamics within cities. Key theoretical frameworks were examined to provide a foundational understanding of how urban expansion affects landscapes and communities. The objective was to establish a theoretical framework that informed subsequent analyses of urban expansion impacts and master plan effectiveness. This included reviewing seminal works and recent advancements in urban planning theories, sustainability practices, and the socio-economic impacts of urban growth.

The second chapter of the research involved analyzing four international case studies of master plans: the Alexandria city master plan in Egypt, the Abu Dhabi city master plan in the UAE, the Barcelona city master plan in Spain, and the Montpellier city master plan in France. These case studies were selected to represent a diverse set of urban planning approaches in different cultural and geographic contexts. The analysis focused on the urban development strategies employed in these master plans, examining how these strategies had been implemented, the challenges faced, and the outcomes achieved. By comparing these different approaches, the research aimed to gain insights into effective strategies for managing urban expansion. Each case study was scrutinized

through documents, reports, and interviews with urban planners and officials involved in the planning process.

The third chapter of the research investigated the correlation between urban and rural areas in the Syrian coastal region. This practical study aimed to explore the impact of this correlation on various aspects such as lifestyle changes, housing types, and community dynamics. Figure (2) shows the different relations between rural and urban areas.

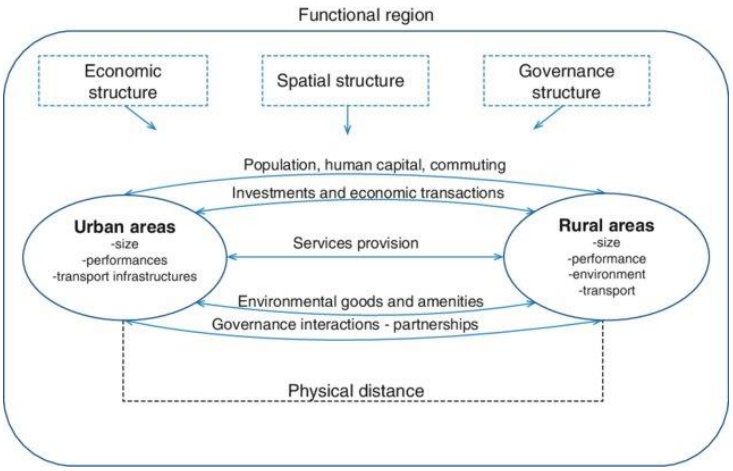

Figure 2: Linkages between rural and urban regions, Source: (OECD, 2013)

Data collection methods included surveys and field observations. Specifically, questionnaires were distributed to people living in modern housing units and people living in traditional housing units. The questionnaires covered aspects such as changes in housing design, community interaction, access to services, and perceptions of urban expansion. Statistical analysis was conducted to identify trends and correlations in the data, providing empirical evidence of the impacts of urban expansion on rural-urban dynamics.

The fourth chapter of the research assessed the effectiveness of the Latakia master plan, with a particular emphasis on the 2008 version. This began with a historical review of city expansions and previous master plans in Latakia, tracing the evolution of urban planning in the city. This historical context provided a backdrop for analyzing the main urban development strategies employed in the 2008 master plan. The research evaluated how effectively these strategies addressed urban expansion challenges and their impact on the landscape and community dynamics in Latakia. This evaluation was conducted through a combination of qualitative methods, such as content analysis of planning documents, and quantitative methods, such as spatial data analysis and statistical trends.

Additionally, a comparative table was created to compare Latakia master plan with both Arabic and European master planning experiences. This included a detailed comparison between the Latakia master plan and the master plans of Alexandria and Abu Dhabi, as well as comparisons with the Montpellier and Barcelona master plans. These comparisons aimed to identify similarities, differences, and potential lessons learned that could inform future urban planning efforts in Latakia. The analysis included a regional analysis focusing on Latakia and the Arabic cities of Alexandria and Abu Dhabi, and a cross-regional analysis comparing Latakia with the European cities of Montpellier and Barcelona. Figure (3) shows the cross relation between the master plan, urban expansion and the city structure.

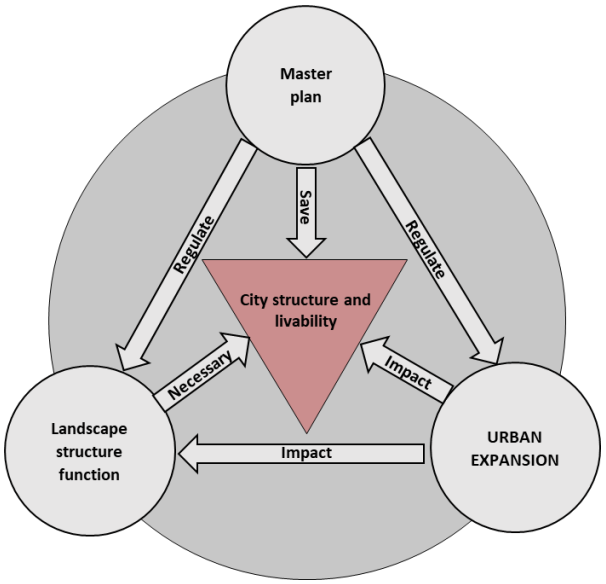

Figure 3: Cross relation between master plan, Urban expansion and city structure, Source: Author

Latakia governorate was chosen as a case study for this research because it exemplifies the planning and urban expansion challenges faced by cities in the Syrian Coastal Region. With its significant population and rapid urban growth, Latakia provides a valuable context for analyzing urban expansion dynamics. As one of the most densely populated areas in the region, it serves as a representative model for understanding and addressing similar issues in other coastal cities, offering insights that can guide sustainable urban planning efforts across the region.

The fifth chapter showcased the new scientific achievements, and the recommendations derived from the research findings. Figure (4) shows the Thesis structure.

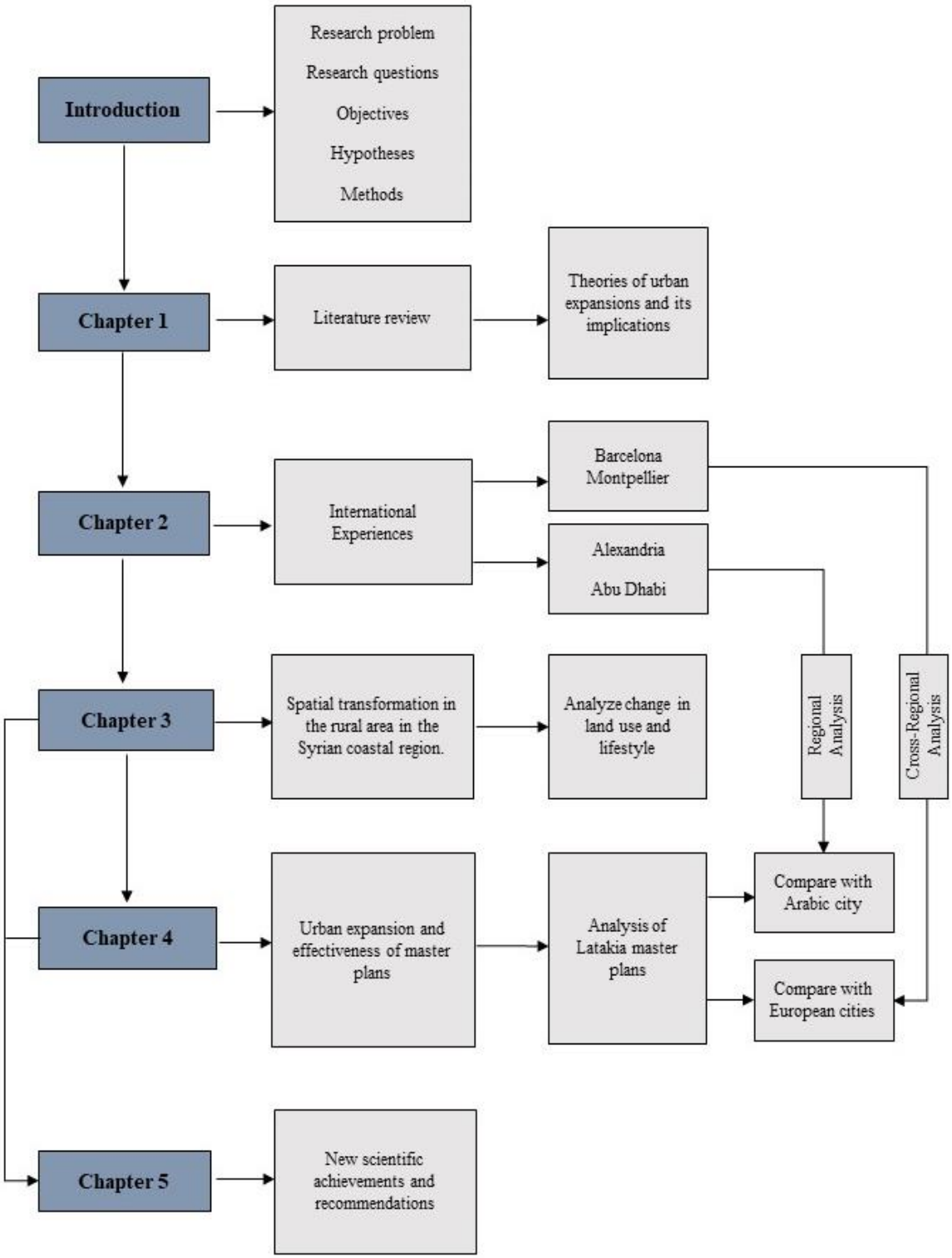

Figure 4:Thesis Structure, Source : Author

1.5.Literature background and data collection

This research draws upon a comprehensive review of scholarly sources from diverse disciplines related to urban development. Sources on urban expansion explore its causes, consequences, and management challenges, highlighting the crucial role of urban planning in mitigating adverse impacts. Additional sources address city planning, focusing on land use, transportation, housing, and policies for sustainable development, with particular emphasis on the integration of natural elements within cities and their benefits for air quality, and resident well-being. Importantly, the research also delves into the rural environment and its relationship with urban expansion, through references exploring the impact of city growth on surrounding areas, including land use changes, livelihood transformations, and environmental considerations.

Furthermore, sources on urban plan evaluation explore methodologies and criteria to assess plan effectiveness, emphasizing both quantitative and qualitative methods and stakeholder feedback.

In terms of data collecting, the research is mostly based on a variety of studies that chronicle the historical growth of Latakia city and offer an evaluation of the city's spatial organization, land uses, and the effects of urban expansion on city structure. These studies form the theoretical basis for this research. Moreover, the research collects information from official reports provided by Latakia City Council and the General Company for Engineering Studies and Technical Consultations, which contain critical information about the Master Plan 2008, the development strategies employed, and the criteria used to select the preferred alternative.

CHAPTER 1- Literature review

1.1 Urban Expansion and Its Dimensions

Urban expansion, a pivotal facet in urban studies, refers to the physical enlargement of a city's spatial footprint, typically involving the conversion of previously undeveloped or rural areas into urbanized zones (Angel et al., 2011). This process encompasses the extension of built-up areas, the establishment of new infrastructure networks, and the construction of housing units to accommodate a growing population (Ratcliffe, Stubbs, & Keeping, 2007). It often leads to heightened population density within the city's confines and substantial alterations in land use patterns (Duranton & Puga, 2014). Urban expansion is fundamentally driven by demographic shifts, economic development, and the demand for housing and services (United Nations, 2019). This phenomenon is closely linked to economic prosperity, as cities expand to become centers of economic activity, attracting businesses and fostering innovation (Florida, 2002). The economic dimension of urban expansion is contingent on factors such as access to a skilled labor force and a favorable business environment (Duranton & Puga, 2014). Additionally, urban expansion necessitates substantial investments in infrastructure, including transportation networks, utilities, and public amenities, essential for ensuring the livability and functionality of expanding cities (World Bank, 2019). This expansion, however, is not without challenges, including increased traffic congestion and pressure on public services (Ratcliffe, Stubbs, & Keeping, 2007). Hence, urban expansion represents a complex interplay of demographic, economic, and infrastructural factors, warranting comprehensive investigation for informed urban planning and sustainable development.

1.2. Dimensions of Urban Expansion

This section delves into various dimensions of urban expansion, exploring its spatial, demographic, economic, infrastructural, and social aspects. Each dimension plays a crucial role in shaping the trajectory of urban growth and development.

1.2.1. Spatial Expansion

Spatial expansion constitutes as a fundamental pillar of urban growth, encompassing the physical enlargement of urban areas through various means such as the extension of built-up areas, the expansion of infrastructure networks, and the conversion of rural land into urbanized zones. This

expansion stimulates heightened demand for housing and services, consequently catalyzing the proliferation of transportation networks to accommodate the burgeoning urban population.

"Urban expansion alters the physical fabric of cities, impacting everything from land use to transportation networks and environmental ecosystems" (Angel et al., 2011; Gottdiener, 2001).

The ramifications of spatial expansion extend far beyond mere physical changes, encompassing transformative shifts in the landscape of cities. Previously undeveloped greenfield areas may undergo conversion into residential or commercial zones, inducing alterations in land use patterns and modifications to the natural environment. Moreover, the concept of vertical growth has emerged as a prominent strategy in numerous global cities, wherein buildings ascend skyward to optimize land use efficiency and accommodate denser populations. This trend towards vertical expansion introduces distinctive challenges and opportunities within the domains of urban planning and design.

In response to spatial expansion, urban planners must adopt comprehensive strategies to mitigate its impacts and leverage its potential benefits effectively. This entails implementing measures to regulate urban expansion and promote compact, sustainable development patterns that optimize land use while minimizing environmental degradation. Additionally, the integration of green infrastructure and open spaces into urban expansion plans can help preserve ecological balance and enhance the overall livability of cities.

Furthermore, the phenomenon of vertical expansion presents a paradigm shift in urban development strategies, necessitating innovative approaches to infrastructure design and management. This includes the implementation of high-density zoning regulations, the provision of adequate amenities and services for vertical communities, and the adoption of sustainable building practices to mitigate the ecological footprint of tall structures.

1.2.2. Population Growth

The growth of urban areas is intrinsically linked to population expansion. The influx of people into urban areas is a driving force behind the demand for additional housing, services, and infrastructure. This population growth not only impacts the requirement for physical space but also exerts significant influence on the socio-cultural dynamics within the city. The rate of population

growth in urban areas can have significant implications for housing markets, transportation systems, and social services" (United Nations, 2019; Breheny, 1992).

Rapid population growth often brings with it a host of challenges, such as heightened traffic congestion, housing shortages, and increased pressure on public services. To ensure the sustainable development of expanding cities, urban planners must proactively anticipate and address these challenges. Furthermore, demographic shifts, including aging populations and shifts in household composition, introduce new complexities into the realm of urban expansion planning. These factors necessitate adjustments in housing designs, transportation systems, and healthcare services to cater to the evolving needs of urban residents.

In response to rapid population growth, urban planners must implement comprehensive strategies to mitigate its adverse effects on cities. This may involve the development of innovative housing solutions, such as mixed-use developments and high-density residential complexes, to address housing shortages while maximizing land use efficiency. Additionally, investments in robust transportation systems, including public transit networks and infrastructure for non-motorized modes of transportation, are imperative to alleviate traffic congestion and enhance mobility within urban areas.

Furthermore, demographic shifts, such as an aging population, require targeted interventions to accommodate the specific needs of different demographic groups. This may include the provision of age-friendly infrastructure and amenities, as well as healthcare services tailored to the healthcare needs of older adults. Similarly, changes in household composition, such as an increase in single-person households or multi-generational families, necessitate flexible housing options and supportive community services to meet diverse living arrangements.

1.2.3. Economic Development

Economic growth in urban areas is closely tied to the presence of a skilled workforce, accessibility to markets, and a supportive policy environment"(Duranton & Puga, 2014; Florida, 2002). Urban expansion often goes hand in hand with economic prosperity. As cities expand, they become focal points of economic activity, attracting businesses, creating jobs, and fostering innovation. This economic vitality is fueled by factors such as access to a skilled labor force, proximity to markets, and a conducive business environment.

The economic dimension of urban expansion is of paramount importance for long-term sustainability. Balancing growth with economic stability requires strategic planning that promotes a diverse and resilient economic base, thereby minimizing vulnerability to economic shocks. Furthermore, economic diversification within expanding cities plays a pivotal role in ensuring stability and resilience in the face of economic downturns. A mix of industries, including knowledge-based sectors, manufacturing, and service industries, can contribute to a balanced and dynamic urban economy.

1.2.4. Infrastructure Development

Infrastructure development is a cornerstone of urban expansion, providing the backbone for economic activities and the enhancement of the quality of life in cities (World Bank, 2019; Giffinger et al., 2007).

The expansion of urban areas necessitates significant investment in infrastructure. This encompasses the development of transportation networks, roads, water supply systems, sewage facilities, and public amenities. Adequate infrastructure is indispensable for ensuring the livability and functionality of expanding cities.

Effective urban planning must incorporate strategies for infrastructure development that are not only aligned with projected growth patterns but also prioritize resource efficiency and environmental sustainability. Moreover, the integration of technology, often in the form of smart city initiatives, has become an integral component of urban expansion strategies. These digital advancements facilitate improved service delivery, resource management, and enhance the overall quality of life for urban residents.

1.2.5. Social Dynamics

Urban expansion exerts profound implications on social structures and dynamics within a city. As cities grow, they emerge as melting pots of diversity, bringing together individuals from various backgrounds, cultures, and socio-economic statuses. This diversity, while fostering a rich tapestry of ideas, perspectives, and opportunities, also presents challenges related to social equity, inclusivity, and community cohesion.

Inclusive urban planning is essential for creating cities that accommodate the needs and aspirations of diverse populations (UN-Habitat, 2016; Carmona et al., 2008). Urban planners must prioritize initiatives that promote social well-being, including policies aimed at ensuring affordable housing,

access to education, healthcare, and the creation of inclusive public spaces. In the digital age, the rise of technology and social media platforms is reshaping how communities interact and engage with urban spaces. This digital transformation introduces new avenues for civic participation, enabling residents to have a more direct role in shaping the future of their expanding cities.

1.3. Models of Urban Structure

To analyze the structure of expanding urban areas, various theoretical models have been proposed, offering valuable frameworks for understanding the complex dynamics of urban growth and development. These models serve as conceptual tools to decipher the intricate interplay of factors shaping the spatial organization, socio-economic dynamics, and environmental footprint of cities. In the following section, we present main urban models, aiming to provide a comprehensive overview of the diverse approaches used to conceptualize and analyze urban form and function.

1.3.1 Concentric Zone Model

Burgess's concentric zone model posits a theoretical framework for urban spatial organization. This model conceptualizes a city as a series of concentric rings emanating outward from a central business district (CBD). As the city undergoes expansion, new development zones emerge, each characterized by distinct land-use patterns and socioeconomic demographics(Burgess, 1925).

The model offers valuable insights into the historical evolution of urban areas. It highlights the dynamics of land-use change over time, with the CBD acting as a central hub attracting commercial activity and high-density development. Subsequent zones outward display a gradient of land uses, often transitioning from commercial to residential and potentially industrial areas at the periphery. Despite its seminal influence on urban studies, the concentric zone model has been subject to critiques for its oversimplification of urban complexities. Critics point out its limitations in capturing the nuanced and dynamic character of contemporary cities. The growing influence of

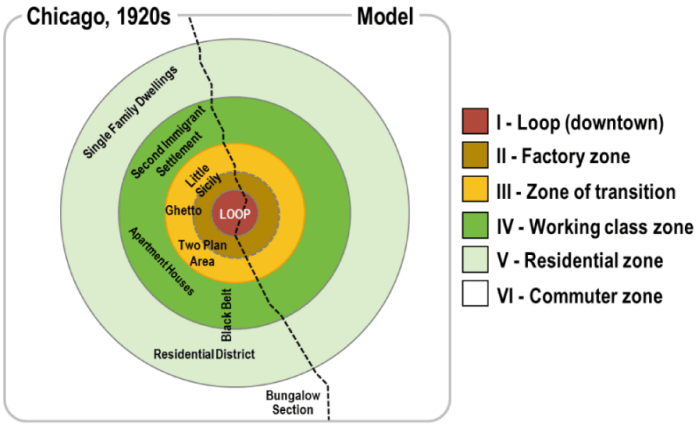

Figure 5: Concentrate zones , Source: (Adulla , 2022)

globalization and rapid technological advancements present additional challenges to the model's universal applicability. Figure (5) shows concentrate zones theory.

However, the concentric zone model retains its significance as a foundational framework for understanding urban development and the spatial distribution of land uses within cities (Park & Burgess, 1925; Knox & Pinch, 2000). Its enduring value lies in providing a point of reference for further research and the development of more nuanced models that account for the complexities of modern urban landscapes.

1.3.2. Sector Model

Building upon the foundational concepts of Burgess's concentric zone model, Hoyt's sector model proposes a distinct theoretical framework for urban spatial organization. This model departs from the notion of concentric rings and instead conceptualizes urban growth as occurring along radiating sectors extending outward from the central business district (CBD). Each sector within the Hoyt model is characterized by specific and dominant land uses, such as residential, commercial, or industrial zones (Hoyt, 1939). This emphasis on sectoral differentiation highlights the influence of transportation networks and accessibility on urban development patterns.The core strength of Hoyt's sector model lies in its acknowledgement of the crucial role that transportation infrastructure plays in shaping the spatial organization of expanding cities. By acknowledging the importance of accessibility and connectivity, the model provides a more nuanced understanding of how urban development unfolds. Figure (6) shows Sector Model theory.

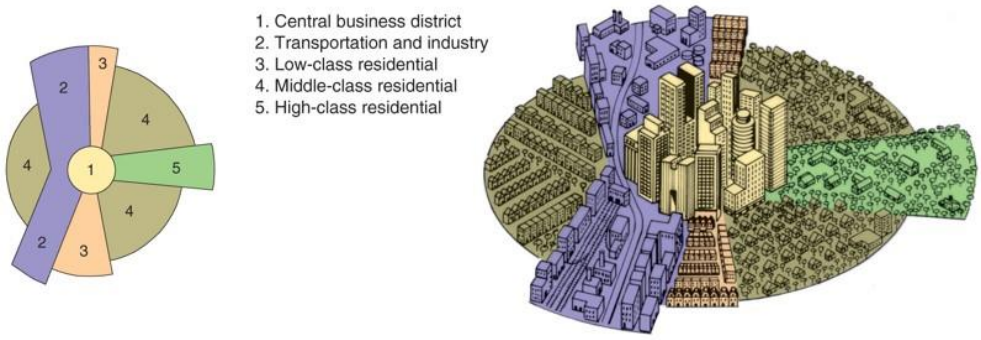

Figure 6: Sector Model, Source: (Adulla , 2022)

In conclusion, Hoyt's sector model represents a significant advancement over Burgess's work. It emphasizes the critical role of transportation routes in shaping urban form, offering a more

comprehensive framework for analyzing urban spatial organization (Hoyt, 1939; Knox & McCarthy, 2012).

1.3.3. Multiple Nuclei Model

This model challenges the notion of a single central nucleus and argues that cities have multiple centers of activity, each with its own characteristics and functions figure (7). These nuclei can include business districts, industrial zones, residential clusters, and cultural hubs. This model provides a more nuanced understanding of urban complexity (Harris and Ullman, 1945).

The multiple nuclei model highlights the diverse functions and nodes of activity within a city, recognizing that urban areas are not homogenous entities. It is particularly relevant in the context of modern cities with multiple specialized districts and a mix of land uses.

The multiple nuclei model acknowledges the complexity and diversity of urban areas, offering a more nuanced understanding of urban structure (Harris & Ullman, 1945; Hall & Pfeiffer, 2000).

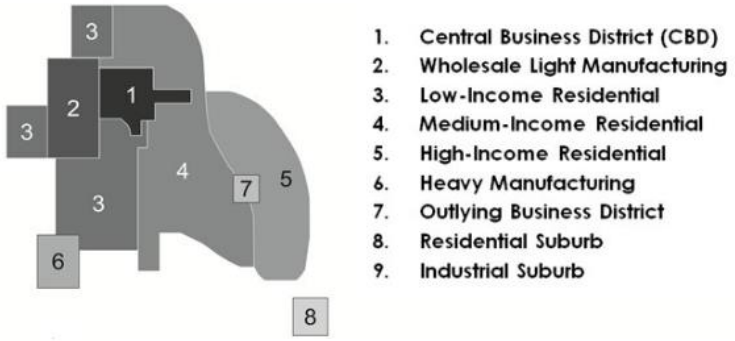

Figure 7: Multiple Nuclei Theory, Source : (Armin ,2022)

1.3.4. Urban Realms Model

The Urban Realms Model emerged in the latter half of the 20th century as a response to the expansion and development of metropolitan areas, particularly in the United States (Lang, 2003). It suggests that a metropolitan area consists of several distinct "urban realms," each functioning as a semi-independent city with its own downtown or commercial center. These realms are typically linked by transportation networks.

The model reflects the decentralization of commercial, industrial, and residential zones, recognizing the diminishing importance of a single city center. This model is particularly applicable to large, expansioning urban areas where suburban regions have developed strong

economic and social identities independent from the central city. Figure (8) shows the urban realm model.

Figure 8: urban relam , Source : (Alshawabkeh et al., 2019) modified by author.

1.3.5. Edge City Model

Developed by Joel Garreau in the 1990s, the Edge City model identifies the emergence of significant economic centers at the periphery of traditional downtown areas (Garreau, 1991). These edge cities are characterized by extensive office and retail spaces and often develop in suburban locations that have experienced significant growth. They challenge traditional notions of the urban core as the primary center of economic activity, highlighting the decentralization of urban functions and the growing importance of suburban areas in urban economies. Figure (9) shows an example of a post-industrial city.

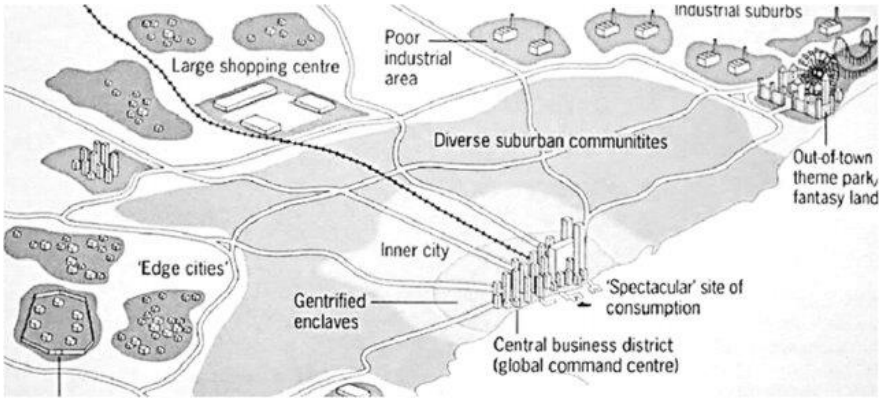

Figure 9 : example of post-industrial city, Source : (Simboli et al., 2019)

1.3.6. Evolution and Critique

While these models provide frameworks for understanding urban structure, they are not without limitations. Urban development is influenced by a wide range of factors, including economic shifts, technological advancements, policy decisions, and social dynamics. The global trend towards urbanization, coupled with the impact of globalization and digital technology, has introduced new complexities that these models may not fully capture (Hall & Pfeiffer, 2000).

For example, the rise of telecommuting and digital workspaces challenges the traditional emphasis on physical proximity to work centers. Furthermore, issues such as gentrification, sustainability, and social equity are increasingly important in urban planning discussions, requiring a more holistic approach that considers the socioeconomic and environmental aspects of urban development.

1.3.7. Future Directions

As urban areas continue to evolve, there is a need for dynamic and flexible models that can adapt to the changing landscape of cities worldwide. This includes integrating concepts of sustainability, resilience, and inclusivity into urban planning frameworks. Future models must also consider the impact of climate change on urban development, incorporating strategies for mitigation and adaptation (Harris & Ullman, 1945).

In conclusion, while classical models of urban structure provide valuable insights into the patterns of urban development and land use, the complexity of contemporary urbanization requires a multifaceted approach that addresses the diverse challenges and opportunities of urban living. As urban planners and researchers continue to explore new theories and models, the goal remains to create livable, sustainable, and equitable urban environments for all.

1.4. Dynamics of Urban Expansion: A Comparative Perspective

Urban expansion reflects the outward growth of cities and metropolitan areas. This phenomenon is deeply influenced by the socioeconomic, environmental, and political contexts within which it occurs, and it manifests differently in developing and developed countries. The differences between these contexts are profound, encompassing rates of urban growth, the forces driving expansion, the challenges faced, and the strategies employed to manage growth. This chapter delves into these distinctions, offering a comprehensive analysis of urban expansion across diverse global landscapes.

1.4.1. Urban Expansion in Developing Countries

Urban expansion in developing countries is predominantly rapid and unplanned, driven by high population growth and the influx of rural-to-urban migrants seeking better opportunities. This often leads to the emergence of informal settlements, where access to basic services like clean water, sanitation, and secure housing is limited. The rapid urbanization challenges the capacity of cities to accommodate this growth sustainably, frequently resulting in environmental degradation and increased vulnerability to climate change.

1.4.1.1. Challenges

The challenges faced by developing countries in managing urban expansion are multifaceted. Limited financial resources, governance issues, and the lack of comprehensive urban planning are significant hurdles. Additionally, the environmental impact, including the loss of agricultural lands and increased exposure to climate change effects, poses severe risks to sustainable development (UN-Habitat, 2016).

1.4.1.2. Strategies

Addressing these challenges requires a multifaceted approach. Strategies often include enhancing governance, investing in essential infrastructure, and enacting policies that encourage sustainable growth. Implementing slum upgrading programs, promoting affordable housing, and expanding public transportation networks are critical steps towards managing urban expansion effectively (World Bank, 2019).

1.4.2. Urban Expansion in Developed Countries

In contrast, urban expansion in developed countries tends to be slower, characterized by more strategic planning and management. Despite lower population growth rates, urban areas continue to expand, driven by economic development, lifestyle changes, and the decentralization of cities. This controlled expansion, however, does not come without its challenges.

1.4.2.1. Challenges

Even with more resources and advanced planning techniques, developed countries face their own set of challenges related to urban expansion. Issues such as urban expansion, increased energy consumption, and the environmental impacts of low-density development are prevalent. Balancing

the need for infrastructure and services with the preservation of green spaces and minimizing environmental footprints remains a critical challenge (Seto et al., 2011).

1.4.2.2. Strategies

Developed countries employ various strategies to mitigate the negative impacts of urban expansion. These include land-use planning, zoning laws, and policies promoting densification and sustainable development. Investments in public transportation and green infrastructure, along with efforts to revitalize urban centers, are pivotal in combating the adverse effects of urban expansion (United Nations, 2018).

The comparison between urban expansion in developing and developed countries underscores the global complexity of urbanization. While the pace and nature of growth may differ, the underlying goal in both contexts is to achieve a balance between growth and sustainability, ensuring equity and resilience. This comparison highlights the importance of addressing the broader socioeconomic and environmental factors influencing urban development. It calls for comprehensive, adaptable strategies that consider the unique challenges and opportunities presented by urbanization in different contexts.

In essence, the dynamics of urban expansion reveal a pressing need for innovative, integrated approaches to urban planning and development. As cities around the world continue to grow and evolve, the focus must remain on creating sustainable, livable urban environments that can adapt to future challenges.

1.5. Urban Planning in the Middle East

Urban planning in the Middle East presents unique challenges and opportunities, shaped by the region's diverse socio-economic contexts, rapid urbanization, and geopolitical dynamics. This subchapter examines the distinct approaches and issues in Middle Eastern urban planning, with a focus on the interplay between tradition and modernity.

1.5.1 Historical Context and Modernization

The Middle Eastern urban landscape is characterized by a rich historical heritage juxtaposed with modern development pressures. Key aspects include:

- Preservation of Cultural Heritage: Efforts to conserve historical sites and architectural heritage amidst urban expansion. Examples include the restoration of ancient cities and the integration of traditional architectural elements into new developments (Bianca, 2000).
- Modernization Initiatives: Large-scale urban development projects aimed at modernizing infrastructure and diversifying economies. Notable examples are the ambitious city-building projects in the Gulf states, such as the creation of smart cities like Masdar City in Abu Dhabi (Elgendy, 2011).

1.5.2 Socio-Economic and Political Influences

Urban planning in the Middle East is heavily influenced by socio-economic and political factors, including:

- Economic Diversification: Shifts from oil-dependent economies to more diversified economic structures, driving urban development and infrastructural investments. Cities like Dubai have become global hubs for finance, tourism, and trade (Davidson, 2008).
- Political Instability: Impact of conflicts and political instability on urban development, leading to challenges such as displacement, reconstruction, and uneven development. The Syrian conflict, for instance, has severely affected urban planning and development in cities like Aleppo and Homs (Al-Hallaq, 2015).

1.5.3 Environmental and Climatic Considerations

Environmental sustainability is becoming an increasingly important aspect of urban planning in the Middle East, given the region's harsh climatic conditions and limited natural resources. Strategies include:

- Water Management: Implementation of advanced water conservation and recycling techniques to address water scarcity. Desalination plants and wastewater treatment facilities are critical components of urban infrastructure (Gleick, 2014).
- Climate-Responsive Design: Architectural and urban designs that mitigate the effects of extreme heat and promote energy efficiency. Use of traditional cooling methods, such as wind towers and courtyards, combined with modern technologies (Taleb, 2014).

1.6. Governance and Urban Expansion

Governance plays a pivotal role in shaping the trajectory of urban expansion. Effective governance involves the coordination of various stakeholders, including government agencies, community organizations, and private sector entities, to ensure that urban growth is planned, regulated, and managed in a sustainable and inclusive manner.

1.6.1. Urban Planning and Policy Frameworks

Sound governance requires robust urban planning and policy frameworks. This involves the development of comprehensive master plans that guide land use, zoning regulations, and infrastructure investments. It also entails the establishment of clear guidelines for sustainable development, including provisions for green spaces, affordable housing, and efficient transportation networks.

"Urban planning and policy frameworks are essential for guiding sustainable urban expansion" (Healey, 2006; Allmendinger & Tewdwr-Jones, 2009).

1.6.2. Stakeholder Engagement and Participation

Inclusive governance involves active engagement with the community and stakeholders. This includes participatory planning processes that solicit input from residents, businesses, and civil society organizations. Engaging the public in decision-making ensures that the needs and aspirations of diverse urban populations are considered in the expansion process.

"Active stakeholder engagement is crucial for ensuring that urban expansion aligns with the needs and aspirations of the community" (Innes & Booher, 2010; Watson, 2009).

1.6.3. Regulatory Measures and Land Use Controls

Governance mechanisms must include effective regulatory measures and land use controls. This includes zoning ordinances, building codes, and environmental regulations that guide the allocation of land for various purposes. Regulatory frameworks help maintain the integrity of urban spaces, protect natural resources, and ensure the safety of residents.

"Effective regulatory measures are essential for guiding urban expansion and ensuring the well-being of urban residents" (Flyvbjerg et al., 2003; Sanyal, 2005).

1.6.4. Transparency and Accountability

Transparent governance is essential for building trust and accountability within urban communities. This involves open and accessible decision-making processes, clear communication

of policies and plans, and mechanisms for public scrutiny. Additionally, transparent fiscal management ensures that resources are allocated efficiently and equitably.

"Transparency and accountability are fundamental principles of effective urban governance" (Gruenewald & Smith, 2014; Hajer & Wagenaar, 2003).

1.6.5. Collaboration and Coordination

Urban expansion often transcends municipal boundaries, necessitating inter-governmental collaboration. Effective governance involves coordination between neighboring jurisdictions, regional authorities, and national agencies. Collaborative efforts are crucial for addressing cross-cutting issues such as transportation networks, environmental conservation, and regional economic development.

"Collaboration and coordination are essential for managing urban expansion in a holistic and sustainable manner" (Hambleton, 2014; Betsill & Bulkeley, 2006).

1.6.6. Adaptive and Resilient Planning

Adaptive and resilient planning is essential for ensuring that urban expansion remains sustainable in the face of dynamic challenges (Innes, 1996; Satterthwaite, 2007).

Governance frameworks should be adaptable to changing circumstances and resilient to shocks and stresses. This requires the capacity to monitor urban trends, evaluate policy outcomes, and make adjustments as needed. Resilient governance ensures that expanding cities can respond effectively to emerging challenges, including those posed by climate change and rapid technological advancements.

1.7. Contemporary Urban Planning Methods

Contemporary urban planning methods have evolved significantly to address the multifaceted challenges posed by rapid urbanization, environmental concerns, and socio-economic disparities. These methods prioritize sustainability, inclusivity, and resilience to create more livable and adaptable urban environments.

1.7.1 Sustainable Urban Planning

Sustainable urban planning focuses on creating communities that are environmentally responsible, economically viable, and socially equitable. Key strategies include:

- Green Infrastructure: Incorporation of green spaces, green roofs, and urban forests to improve air quality, reduce urban heat islands, and enhance biodiversity (Benedict & McMahon, 2006).
- Transit-Oriented Development (TOD): Design of urban areas around public transportation hubs to reduce dependency on cars, lower carbon emissions, and promote walkability (Calthorpe, 1993).
- Energy-Efficient Buildings: Promotion of energy-saving technologies and renewable energy sources in building designs to minimize environmental impact (Fisk, 2000).

1.7.2 Smart City Initiatives

Smart city initiatives leverage digital technologies to improve urban management and enhance the quality of life for residents. These initiatives include:

- Internet of Things (IoT): Deployment of sensors and connected devices to monitor and manage urban infrastructure, such as water supply, waste management, and transportation systems (Kitchin, 2014).
- Data-Driven Decision Making: Use of big data analytics to inform urban planning decisions, optimize resource allocation, and predict future urban trends (Batty, 2013).
- Citizen Engagement Platforms: Implementation of digital platforms to facilitate public participation in urban planning processes and improve government transparency (Caragliu, Del Bo, & Nijkamp, 2011).

1.7.3 Resilient Urban Design

Resilient urban design aims to enhance the ability of cities to withstand and recover from various shocks and stresses, including natural disasters, economic crises, and social upheavals. Core principles include:

- Flexible Land Use: Development of multi-functional spaces that can adapt to changing needs and conditions (Ahern, 2011).
- Disaster-Resilient Infrastructure: Construction of buildings and infrastructure that can withstand extreme weather events and seismic activities (Godschalk, 2003).
- Community-Based Approaches: Engagement of local communities in resilience planning to ensure that strategies are context-specific and inclusive (Vale & Campanella, 2005).

1.8. Spatial Transformation Types and Effects

Spatial transformation encompasses the myriad changes in the spatial organization of landscapes, driven by urbanization, economic development, technological advancements, and social dynamics. This chapter explores various types of spatial transformations, their underlying causes, and their profound effects on environmental, social, and economic systems.

1.8.1. Types of Spatial Transformation

- Urbanization: The transition from rural to urban life, as cities expand, and populations move in search of better opportunities (Hall & Pfeiffer, 2000). This fundamental shift alters land use from agricultural and natural states to urban and suburban configurations.
- Suburbanization: Characterized by the outward spread of urban areas, leading to the development of low-density residential zones, commercial areas, and road networks. This trend is facilitated by the availability of automobiles and the desire for larger living spaces outside dense urban cores (Hall & Pfeiffer, 2000).
- Gentrification: The process whereby lower-income neighborhoods are transformed by the influx of more affluent residents, altering the area's social character and economic landscape. This often results in the displacement of original residents and a shift in neighborhood identity (Sassen, 2001).
- Industrialization: The expansion of industrial activities in and around urban areas, driven by economic growth and the demand for manufactured goods. While fostering economic development, this transformation also impacts the environment and local communities (Sassen, 2001).
- Rural Depopulation: The movement of people from rural areas to cities, often resulting in the decline of rural communities. This shift affects agricultural practices, land use, and the economic viability of rural areas (Beatley, 2000).
- Green Urbanism: A movement towards integrating green spaces and sustainable practices into urban planning to create eco-friendly and livable cities. This approach aims to address environmental concerns and improve the quality of urban life (Beatley, 2000).

1.8.2. Effects of Spatial Transformation

Urban expansion, while a driver of economic growth and societal change, has far-reaching consequences across environmental, socio-economic, and cultural spheres. This section delves into the interconnected impacts listed below:

- Environmental Impact: Spatial transformations significantly impact the environment, leading to habitat destruction, biodiversity loss, and pollution. Urbanization and industrialization contribute to these issues by altering land use and increasing greenhouse gas emissions (Beatley, 2000).
- Socio-economic Changes: These transformations can drive economic development in some areas while leading to decline and poverty in others. Gentrification and suburbanization may exacerbate socio-economic disparities, affecting community cohesion and access to resources (Sassen, 2001).
- Cultural Shifts: The changing spatial organization can dilute or transform local cultures and traditions. Urbanization, in particular, may introduce new cultural dynamics, influencing the social fabric of communities (Sassen, 2001).
- Infrastructure and Services: The evolution of spatial landscapes necessitates the adaptation of infrastructure and services. Rapid urban growth, for example, requires significant investments in housing, transportation, and utilities to meet the needs of expanding populations (Hall & Pfeiffer, 2000).
- Mobility and Accessibility: Changes in land use and urban structure affect how people access services, employment, and recreational activities. The spread of suburban areas often leads to increased reliance on automobiles, impacting mobility patterns (Hall & Pfeiffer, 2000).

1.8.3. Mitigation and Adaptation Strategies

Effective management of spatial transformation requires:

- Sustainable Urban Planning: Balancing development with environmental conservation and social equity is crucial for fostering sustainable cities (Beatley, 2000).

- Infrastructure Investment: Upgrading and expanding infrastructure to accommodate changing spatial dynamics, emphasizing sustainability and resilience (Hall & Pfeiffer, 2000).
- Community Engagement: Involving communities in the planning process ensures that developments are equitable and reflect local needs and aspirations (Sassen, 2001).
- In Conclusion Spatial transformations reshape the environmental, social, and economic landscapes, presenting both challenges and opportunities. Understanding these dynamics is essential for crafting policies and strategies that promote sustainable development, equitable growth, and enhanced quality of life.

1.9. Conclusion of chapter 1

This literature review traverses an interdisciplinary landscape to illuminate the multifaceted phenomenon of urban expansion. It dissects the dynamic interplay between demographic shifts, economic dynamics, and infrastructural development that underlie urban growth while navigating the challenges and strategies inherent to managing such expansion sustainably. By juxtaposing the urban experiences of developing and developed countries, this study elucidates the universal and context-specific challenges of urbanization, ranging from the proliferation of informal settlements in rapidly growing cities to the environmental and social repercussions of urban expansion in more established urban contexts.

Through the analytical lens of various urban models, including Burgess's concentric rings and Garreau's edge cities, this investigation underscores the evolution of urban thought and planning strategies. It emphasizes the necessity for adaptive and resilient planning approaches capable of navigating the complexities of contemporary urban expansion. This requires integration of technology, robust public participation mechanisms, and international cooperation to forge sustainable, inclusive, and livable urban futures. Moreover, the study underscores the pivotal role of governance in orchestrating coordinated efforts aligned with sustainable development goals. This involves ensuring equitable access to resources and fostering community resilience against socio-economic and environmental pressures.

CHAPTER 2- International Experiences

2.1. Methodology and aim of analyzing the international experiences

This chapter delves into a rigorous examination of urban development strategies implemented by four distinct coastal cities: Montpellier and Barcelona in Europe, and Alexandria and Abu Dhabi in the Arab region. The primary objective is to conduct a meticulous evaluation of the effectiveness of their respective master plans in managing urban expansion and mitigating its environmental impact on the surrounding landscape. This in-depth analysis will serve as a foundational framework for subsequent comparison and contrast with the case study of Latakia.

The selection of these cities was undertaken with a deliberate purpose. It aims to capture a comprehensive spectrum of urban planning approaches while simultaneously identifying common challenges shared with Latakia. A critical shared characteristic lies in their coastal location, predisposing them to similar issues such as rapid urbanization, land-use conflicts, and environmental degradation. By scrutinizing how these cities address these challenges through their master plans, we can extract valuable insights into potential strategies that may be transferable to Latakia's urban development efforts.

However, beneath these overarching similarities lie subtle distinctions shaped by historical, cultural, and socioeconomic factors. Montpellier and Barcelona, as established European metropolises, boast rich cultural heritages and are governed by distinct regulatory frameworks compared to their counterparts in the Arab region. Conversely, Alexandria and Abu Dhabi function within different socio-political landscapes, influenced by their unique historical trajectories and demographic compositions. These contextual variations offer invaluable data points for understanding the adaptability and contextualization of urban development strategies across diverse settings. Furthermore, each city's urban development trajectory is characterized by its distinct response to specific challenges and opportunities. For instance, Montpellier has grappled with the complex task of balancing the preservation of its historical heritage with the demands of modern urban expansion. In contrast, Barcelona has pioneered innovative approaches to sustainable urban development. Meanwhile, Alexandria and Abu Dhabi have navigated the complexities of rapid urbanization amidst shifting geopolitical dynamics and burgeoning

economic aspirations. Understanding these distinct trajectories provides a nuanced perspective on the inherent complexities of urban planning and its varied approaches across different contexts. Through this comprehensive analysis, this chapter seeks to elucidate key insights into the effectiveness of urban development strategies in diverse coastal city contexts. By synthesizing the lessons learned from these diverse urban environments, we can inform and enhance the urban development plans for Latakia, ensuring their relevance and efficacy in addressing the city's unique challenges and aspirations.

2.2. The case of Barcelona

Barcelona is the most densely populated city in the state of Catalonia in Spain, with a 1.6 million inhabitants According to the 2010 census, and it extends over an area of about 102.2 km2, with a density of about 15 thousand people/km2 (Maya, 2014). It is located on the shore of the Mediterranean on the northern coast. Barcelona city belongs to the Barcelona metropolitan area (Área Metropolitana de Barcelona AMB), which consists of 36 municipalities with a population of 3.2 million people according to the 2010 census.

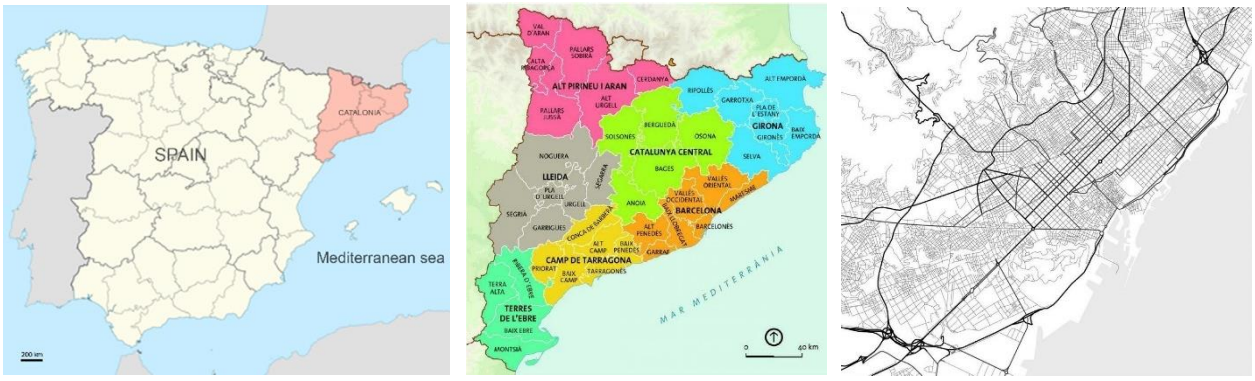

Figure 10: Barcelona map, source : (Maps Barcelona, 2024) modified by author.

2.2.1. Historical review

Barcelona's modernization began with the preparations for the 1992 Olympics. Planners devised a comprehensive strategy and utilized the Games as a tool for city-wide improvements. The Olympic facilities were distributed throughout four neglected metropolitan districts. The Olympic Village, built on abandoned industrial property along the shore, was the most well-known feature of the time (Barcelona Field Studies Center, 2022). The most significant consequence has been the development of six artificial beaches on either side of the Olympic Port, and for the first time in

its history, Barcelona faced the sea (Barcelona Field Studies Center, 2022). Figure (11) shows Barcelona urban growth from 1990 until the post Olympics period.

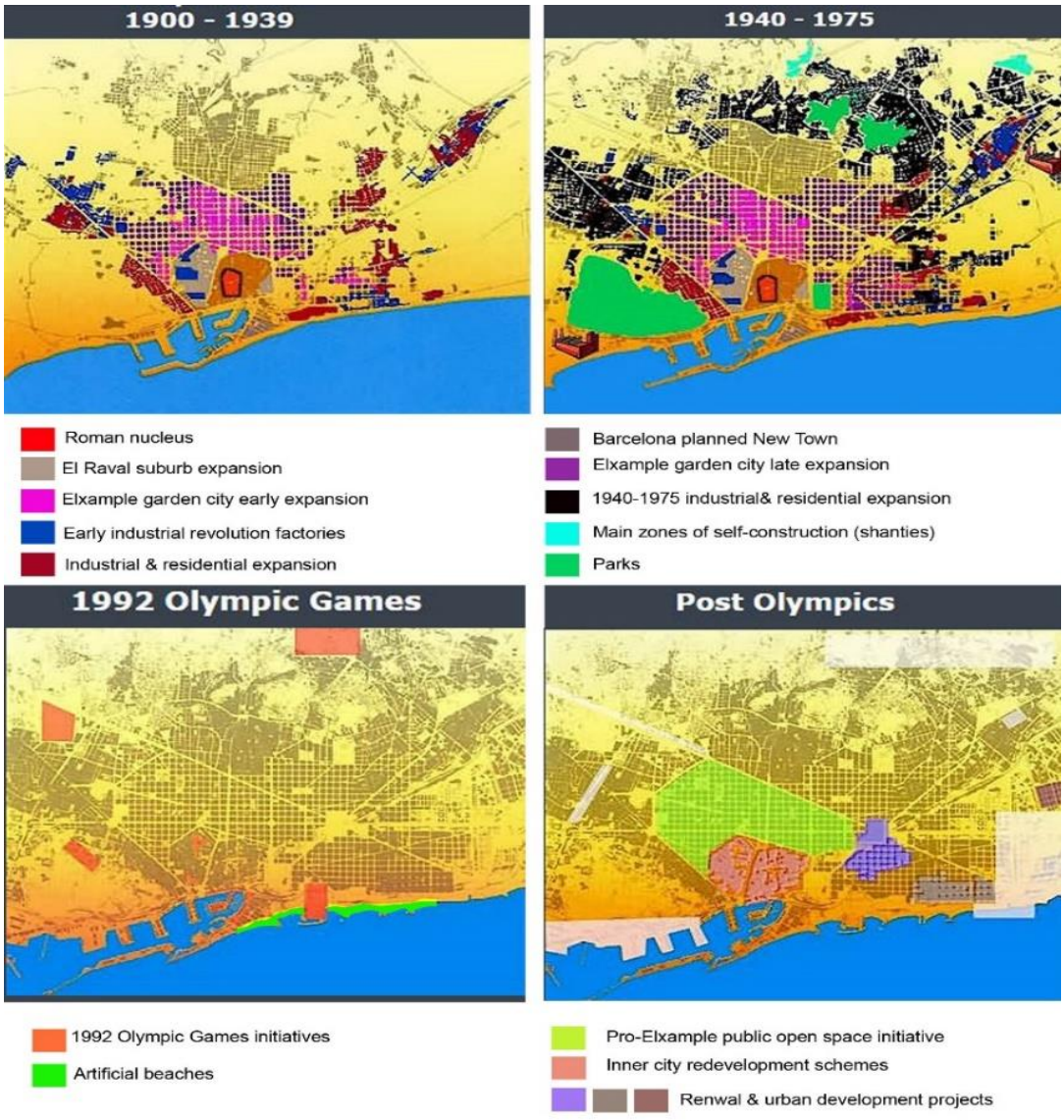

Figure 11: The growth and city development stages of Barcelona: Source: (Barcelona Field Studies Center. 2022) modified by author.

In 2003 the metropolitan strategic plan (PEMB) was approved which came as a result of the development of the three economic and social strategic plans of Barcelona (BCN1-BCN2-BCN3) (Maya, 2014), it defined as an integrated scheme that included classifications of land uses (urban, agricultural, and land for development), It was designed with a short and long-term vision in mind, with the goal of managing the region's economic and social development, political reform, and development as one of Europe's developed regions until 2020.

Work continued in accordance with the principles of the first strategic plan 2003 until 2010, When the 2nd Metropolitan Strategic Plan of Barcelona- Barcelona vision 2020 was authorized, the goals were to make the Barcelona metropolitan region a hub of innovation and creativity, attracting talent, enterprises, suitable infrastructure, and social harmony.

2.2.2. Barcelona Vision 2020

Barcelona 2020 vision approved on 2 November 2010, was formulated by the Regional Government, the Province of Catalonia, and the Barcelona City Council in cooperation with the private sector, it considers as a comprehensive and ambitious strategic plan that has the potential to make a significant impact on the city.

The main objective of Barcelona Vision 2020 is to make Barcelona a more attractive and influential European region for innovative talent, with a quality model for social integration and cohesion.

To address these issues, the Plan established five transformation levels that would serve as structural axes for overcoming the challenges (Ajuntament de Barcelona, 2010).

- A strong educational and university system

- A business-friendly administration that is quick and dependable.

- Governance that emphasizes public-private co-responsibility in strategic project management and provides novel criteria in project management.

- Broad language expertise that supports internationalization, talent attraction, and complete integration into global markets. The Barcelona brand and an international airport.

- Future values that complement and enhance the foundation of present and historic values, giving the city and its citizens a new personality.

Table 1 shows main Master plans in Barcelona.

Table 1: The main Master plans in Barcelona: Source : (Barcelona City Council, 1990) modified by author.

Strategy	Date/Year	Scope
Barcelona Strategic Economic and Social Plan 2000 (BCN1)	(1990-1994)	Support the city's transformation ahead of the Olympic Games and to define a shared future vision to achieve by the year 2000.
2nd Barcelona Strategic Economic and Social Plan 2000 (BCN2)	(1994-1998)	Consolidate the city's international presence once the immediate benefits had been obtained after successfully holding the Olympic Games.
3rd Barcelona Strategic Economic and Social Plan (BCN3)	(1999-2005)	Position the city internationally within an incipient context of inter-city networking and included a vision of Barcelona as an open and knowledgeable city respectful of its local surroundings.
1ST metropolitan strategic plan	2003	Managing the region's economic and social development, political reform, and development as one of Europe's developed regions until 2020
2ND Metropolitan Strategic Plan of Barcelona	2010	to make the metropolis more attractive to attain a new economic boost. suitable infrastructure, and social harmony

2.2.3. Main Urban Development Strategies in Barcelona

2.2.3.1. Housing Development Strategy

Since the middle of the twentieth century, as a result of unplanned urbanization, it has been difficult to stop low-income immigrants from building slums in unregulated lands. These agglomerations have been constructed without respect for the fundamental urban infrastructure that has emerged in the city's peripheral slopes. The inadequacy of preparations to handle the city's urban growth

resulted in its expansion at the expense of agricultural fields to accept the influx since 1929 (Sotoca & García, 2011).

In 2009, a uniform approach, "Strategic Plan for Neighborhoods on Slope" was devised as a housing idea for unregulated peripheric residential areas (Sotoca & García, 2011), with a focus on social justice and adherence to the principle of mixed-use development to ensure easy access and integration with the urban network. The initial idea for the revitalization was to replace old buildings with a new eco-district, which focuses on promoting green spaces, pedestrian-friendly areas, sustainable transportation, and energy-efficient buildings. Several urban renewal initiatives were launched in the first periphery of Barcelona, which is characterized by a blend of industrial and residential areas and is inhabited by numerous working-class and immigrant communities. The promotion of social housing was a key feature of these renewal projects, as it can enhance the residents' standard of living, promote social inclusion, and stimulate economic growth.

Participation of residents was considered throughout planning and execution. A set of conditions, such as minimal energy use, water recycling systems, and the utilization of renewable energies, were agreed upon by representatives from the neighbors and the government (Sotoca & García, 2011). Figure (12) shows two urban renewal projects in Peri Trinitat Nova and Peri Vivendes Del located in Nou Barris district, which are designed to address specific needs and challenges within the Nou Barris district, contributing to its overall improvement and the well-being of its residents.

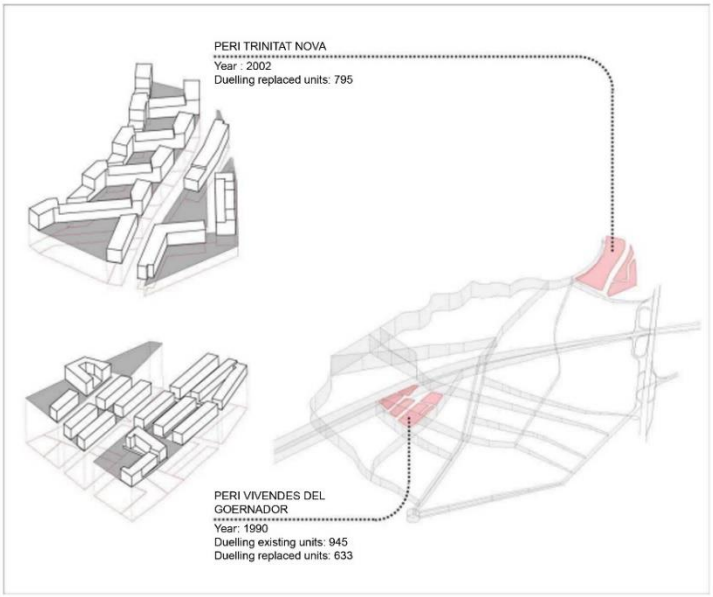

Figure 12: Urban renewal punctual interventions in Nou Barris district in Barcelona, Source : (Sotoca & García, 2011)

Furthermore, Barcelona metropolitan strategic plan has implemented various urban renewal projects that aim to improve the quality of life for residents through the enhancement of housing, public spaces, and sustainable development. For instance, the 22@ and La Segrada urban renewal projects are examples of such initiatives that have transformed old industrial areas into new urban centers, taking into consideration sustainable urban development, with a focus on improving the well-being of its citizens through the creation of high-quality public spaces and environmentally friendly features.

2.2.3.2. Urban Mobility Plan (PMU)

Barcelona has the (2013–2018) Urban Mobility Plan (PMU), a planning instrument used to outline the courses of action that will control urban mobility in the following years. It has been designated as a strategic horizon for progress toward a more sustainable, efficient, safer, healthier, and equitable collective mobility paradigm. The plan lays out the goals and actions that must be taken to ensure that different modes of transportation and the people who use them can coexist on public highways, that pedestrians and cyclists are prioritized and protected, that public transportation is promoted, that the use of private vehicles is reduced, that commercial and tourist mobility is regulated, and that the overall efficiency of the mobility network is ensured (The Mobility Master Plan of the Barcelona Metropolitan Region MMP 2013–2018, 2010).

The plan comprises the following primary courses of action:

- Organization of the city's urban pattern in superblocks and other calming measures.
- Implementation of the new orthogonal bus network and maintain the current level of traffic service.
- Total development of cycling network.
- Promotion and positive discrimination measures of high occupancy vehicles.
- Compliance with regulatory environmental quality parameters
- Revision of parking regulations on- and off-road.
- Improving loading and unloading efficiency.

Following the implementation of the mobility urban plan, Barcelona has seen extraordinary achievements, including a 67 percent rise in cycling, a 21 percent drop in the use of private automobiles, and a 3.5 percent increase in the use of public transportation (The Mobility Master Plan of the Barcelona Metropolitan Region MMP 2013–2018, 2010).

The “superblock” (superilla in Catalan) is a concept that originated in Barcelona and involves grouping several conventional city blocks together and reconfiguring the streets within them to create a large, pedestrian-friendly block with reduced traffic and more green space.

Under the superblock plan, streets within the block are narrowed, speed limits are lowered, and priority is given to pedestrians and cyclists. Cars are allowed to enter the block only to access parking, and through traffic is rerouted around the outside of the superblock. This creates a calmer, more livable environment with less noise and air pollution, and encourages active transportation, such as walking and cycling. Figure (13) shows the superblocks model distribution and modal distribution in Barcelona.

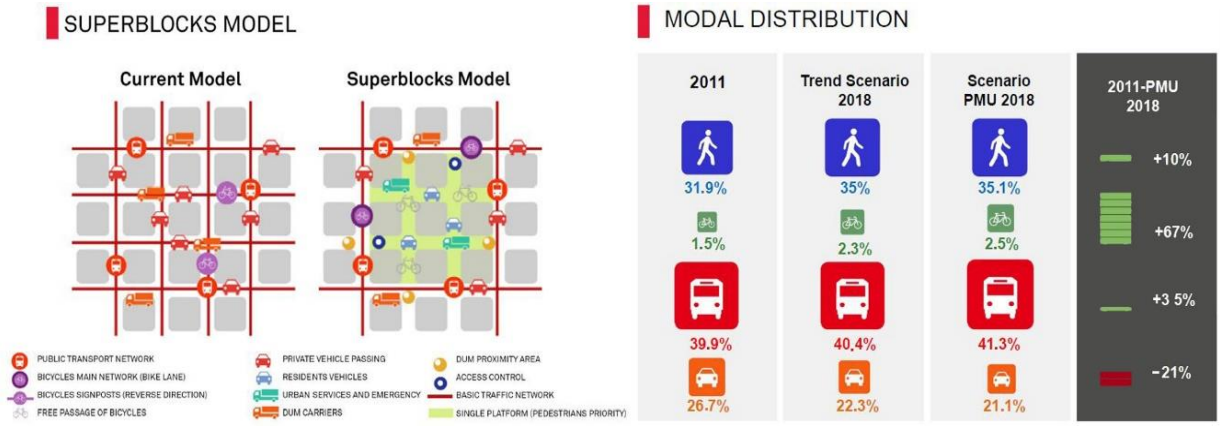

Figure 13: Superblocks model and modal distribution of (PMU) in Barcelona. Source: (The Mobility Master Plan of the Barcelona Metropolitan Region MMP 2013–2018, 2010).

2.2.3.3. Sustainable Planning for the Natural Areas and Biodiversity of Barcelona

Barcelona’s policy of protecting natural areas and green spaces evolved from the compressed city policy to provide green and public spaces within the city. It adopted the policy of continuously producing urban public sites (Pellitero et al, 2009), based on the self-sustaining urban agricultural ecosystem that was implemented in Barcelona to address the problems it faced due to its shrinkage beginning in the 1980s, its population orientation towards the city periphery, and the emergence of a new urban agricultural ecosystem.

Urban agriculture policies, which have been considered since the first metropolitan master plan, have been instrumental in improving the availability of parks, particularly in residential areas. The strategy (sustainable tourism, leisure, employment, and trade) supports the idea of creating development corridors for the population, whether in terms of providing sustainable transportation that minimizes negative environmental impacts or of opportunities for sustainable urban

development that considers the social, economic, and environmental impacts of urban growth; such opportunities might include the establishment of an urban farming system and pedestrian and bicycle paths, and the creation of an interconnection between green areas, urban agriculture, and residential areas.

Figure (14) shows urban agriculture system proposed in the strategic planning for the Tres Turons hills.

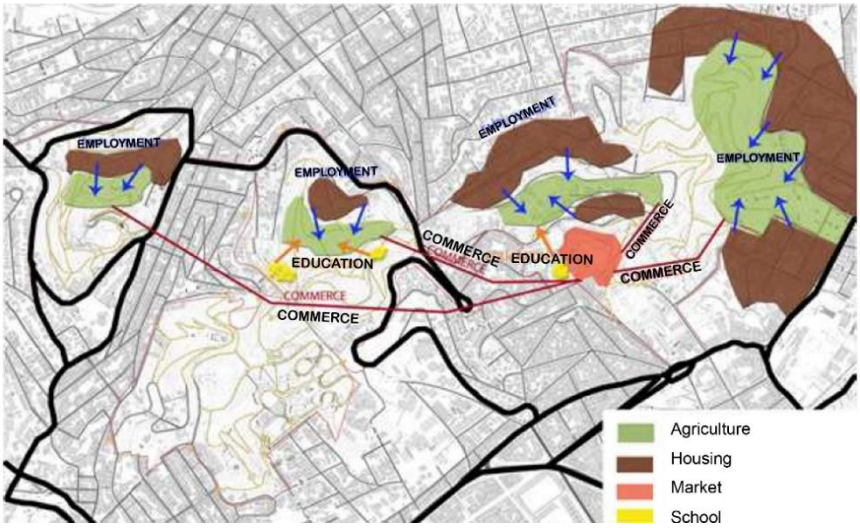

Figure 14:Urban agriculture system in Tres Turons hills in Barcelona. Source: (Pellitero et al., 2009).

Thérèse-Toros Park, which is located in the northern part of Barcelona, is considered a significant example of the use of urban agriculture strategy. The park incorporates a communication network of corridors, nodes, and loops, as well as sustainable transport and an urban farming system, all designed to promote ecological and social sustainability.

The inclusion of urban agriculture within the park's design is particularly significant, as it not only provides a source of fresh produce for local residents but also contributes to the park's overall ecological sustainability by promoting biodiversity and connecting different natural areas within the park. Additionally, the park's multifunctional design, which includes recreational areas, spaces for urban agriculture, and interconnections between green areas and residential areas, creates opportunities for social interaction and community engagement while also promoting physical activity and healthy living. Overall, the Thérèse-Toros Park serves as an example of how the integration of urban agriculture into a larger master plan for sustainable development can enhance green spaces and promote both ecological and social sustainability in urban areas.

2.3. The case of Montpellier

Montpellier is the capital of the Hérault department and the second largest city in the of southern France, with a city center (12 km) from the Mediterranean coast. Montpellier is the Occitanie region's administrative and commercial capital. The city location is on a fertile plain, and the city has built up around its historic districts, which are now surrounded by boulevards on the original city wall locations. It is known for the Promenade du Peyrou, a terraced 17th- and 18th-century promenade with views of the Mediterranean Sea. Figure (15) shows Montpellier agglomeration location

Figure 15:Montpeller agglomoration location , Source: (SCOT, 2006) modified by author.

2.3.1. Historical review

Montpellier was a grape center in the early twentieth century with little urban transformation and population expansion. During this time, Montpellier's service sector (universities, high schools) was strengthened, and some new infrastructure was developed (monumental places, theatre, museums, etc.). Following World War I, the first low-cost housing was built, as well as some public services (more schools, university equipment, a big hospital). Simultaneously, army territory was converted to civil usage, resulting in an increase in built-up areas (Buyck et al., 2008).

In 1956, Montpellier was upgraded to become the capital of Languedoc-Roussillon, and the 1960s were years of demographic, economic, and spatial growth: public and private investments, new highways, and new periphery districts. Montpellier grew from 120,000 people in 1962 to 200,000 people in 1982 (Buyck et al., 2008). Montpellier was opened up to a massive economic field during this time, with the establishment of "new economy" actors (such as IBM in 1965), tourism infrastructure in the area (new seaside sites), and transportation equipment. With more economic expansion, social evolution, and urban development initiatives, the Montpellier area became a site

defined by a young population (students, young people working in new industries), a large demographic boom, and a high demand for housing, which was met by expanding the urban area. As of 1999, the urban area of Montpellier accommodated a population of 460,000 residents (Buyck et al., 2008).

During the 35 years from 1968 to 2004, more than 15,000 hectares have been used, approximately half of this area corresponding to residential occupation and the rest to the other diverse occupations of space to which urban practices lead: (infrastructure), amenities and leisure facilities, commercial activities, education and culture (community facilities), and work (activity areas). It is considered that each additional inhabitant has led, in the past, to the additional use of approximately 800 m²: 400 m² for residential use and 400 m² for other uses (SCOT, 2006). Figure (16) shows the urban expansion in Montpellier between 1952-1999.

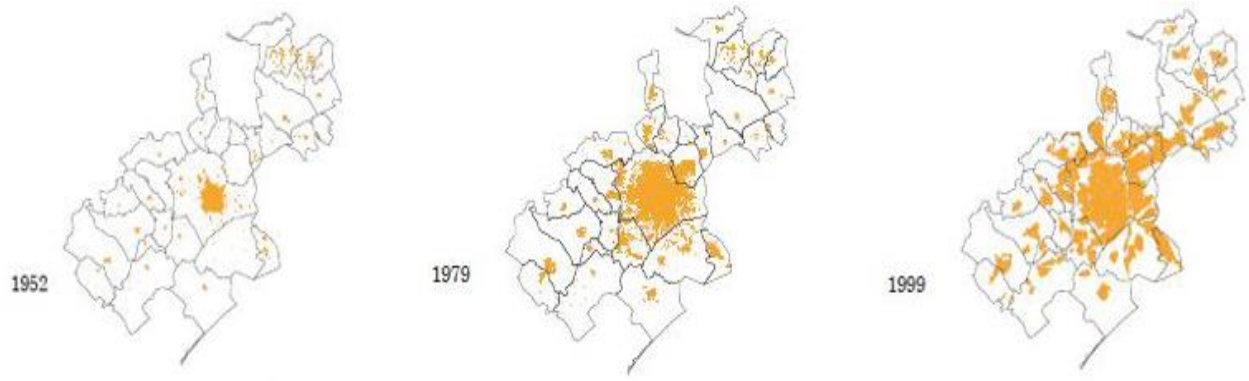

Figure 16: urban expansion in Monpolite between 1952-1999, Source: (SCOT, 2006) modifid by author.

2.3.2. Main Urban Development Strategies

Montpellier's SCOT (Scheme of Territorial Coherence) is a planning tool used for urban and rural contexts, including the urban fringe. The SCOT imposes spatial planning at the inter-communal level with the scheme of territorial coherence and sets the main planning orientations in the Montpellier Agglomeration for the next 10 years (Buyck et al., 2008).

The basic idea of the Montpellier city plan SCOT (which was approved by the Community council in February 2006) as endorsed by the report on the "Local Plan for Urban Development of Montpellier (PLU)" and the report on the Project Management and Sustainable Development (PADD), is based on the integration of three main axes (environment-, economic-, and urban development) that ultimately aim at integration in the development of the Montpellier region, and at the same time the development of sustainability for all sectors (PADD-2010).

2.3.2.1. Economic development

The economic development strategy of the SCOT scheme in Montpellier master plan aims to promote a diversified and resilient local economy that is less dependent on any one industry or sector. This involves supporting small and medium-sized enterprises, as well as promoting innovation and entrepreneurship. Additionally, the scheme recognizes the significance of tourism to the local economy and strives to encourage sustainable tourism practices that respect the region's natural and cultural heritage, including eco-tourism and cultural tourism. To further facilitate economic growth, the SCOT scheme also emphasizes the importance of investing in infrastructure and public services, such as transportation infrastructure, education, healthcare, and public transit. Furthermore, the scheme acknowledges that effective economic development requires collaboration and partnership between government, business, and civil society stakeholders. Thus, the scheme aims to foster partnerships and collaboration to promote sustainable economic growth and development in the region.

2.3.2.2. Urban development

The urban development strategy employed by the SCOT scheme in Montpellier master plan aims to create a sustainable, livable, and connected urban environment by:

-Reducing urban expansion and finding solutions to accommodate the expected population growth of the city, such as available vacant lands and lands suitable for development and encouraging growth in low-density areas.

- Establishment of socially diverse housing projects (respecting the principle of social mixing and avoiding segregation areas for medium and popular housing).

- Working with the principle of mixed uses, which is the diversity of uses in the same area between (commercial and economic activities and housing).

- Strengthening the communication between the neighborhoods of the same city, as well as between the cities of the region between them and each other through the work of highways and paved roads, as well as the work of internal tram lines, which contributed very significantly to strengthening communication between parts of the entire region, as well as the ease of access from any part of the region. For the province to the beach areas.

- Reducing the use of cars within the city and providing easy and non-polluting means for the environment, such as cycling paths.

Figure (17) shows the tram lines services range, and the suggested development directions within the city, and shows the hotspots points which refer to areas that have been identified as having high potential for development. The SCOT scheme prioritizes investment in these areas to stimulate economic growth, improve public spaces and amenities, and promote sustainable urban development.

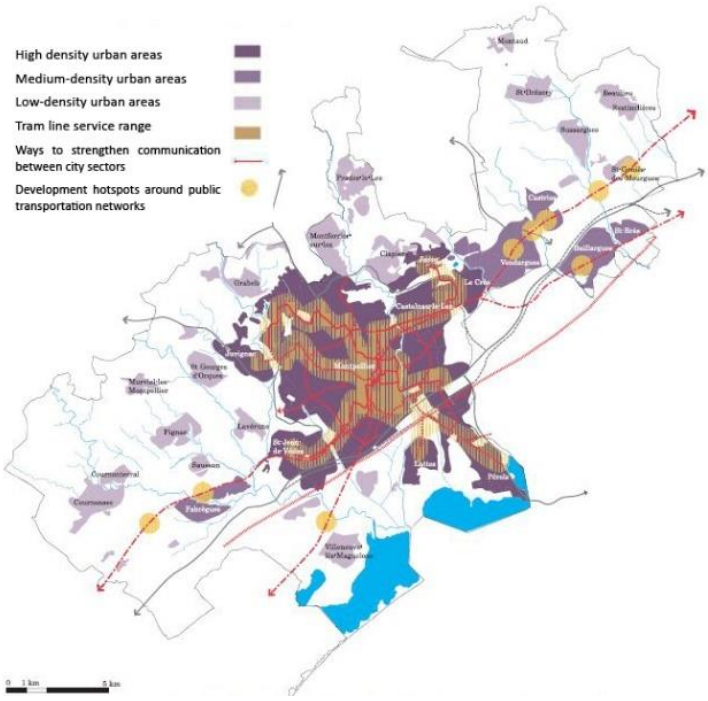

Figure 17: The dynamics of urban development around the public transport network in Montpellier, Source: (PADD-2010).

2.3.2.3. Sustainable environmental development

The SCOT scheme in Montpellier master plan prioritizes the preservation and enhancement of natural resources, such as wetlands, rivers, and forests, and aims to establish a green network that interconnects these natural areas to promote wildlife movement and ecological resilience. The green network is also designed to facilitate recreational activities, including hiking, cycling, and birdwatching, thereby promoting physical activity and improving residents' quality of life.

Furthermore, the green network serves as a natural filter that can absorb pollutants and mitigate the negative impacts of urbanization on air and water quality in Montpellier. Figure (18) shows the employed green network techniques within Montpellier's environmental development strategy.

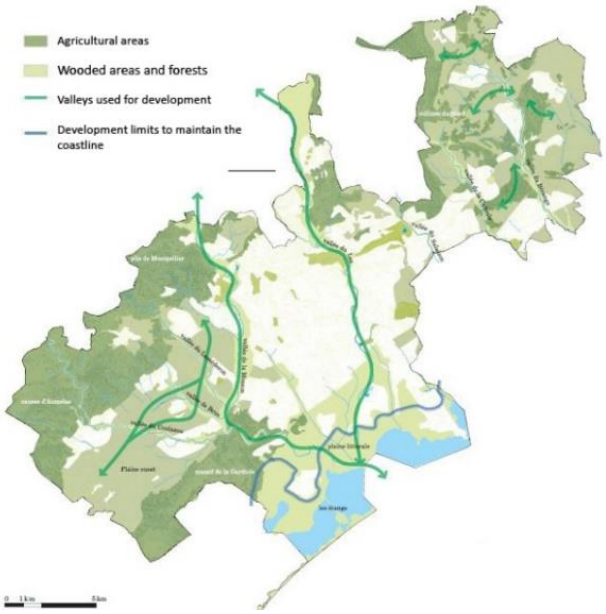

Figure 18: Environmental development of the Montpellier agglomeration, Source: (Buyck et al., 2008).

2.3.2.4. Housing policy

Montpellier's housing policy aims to meet the different housing needs while respecting the principle of social and urban diversity to avoid any segregation in the urban space. The Local Housing Program (P.L.H) is the local application of the SCoT in terms of housing. It allows detailing SCoT objectives at a local scale, and it is part of the strategy developed at the level of the Agglomeration which is formalized in the inter-municipal.

In this area, the policy of the City of Montpellier is based on three main orientations:

- diversify the production of housing in new urban areas,

- act on the housing stock of existing districts,

- respond to categorical housing needs that are not satisfied by the mechanisms of the market.

In order to achieve diversified housing production in future urbanization areas, the city relied on the approach of diversifying housing production to meet all needs by avoiding excessive residential

specialization (residential complexes) and allowing all neighborhoods to provide the greatest diversity in housing, especially social rental housing, in addition to supporting and a preference for building collective housing, to reduce urban expansion.

The urban development plan of the city passed a law stipulating that 25% to 30% of housing built in new neighborhoods must be social rental housing. The city's social housing stock is estimated at 28,858 in 2012, which represents 21.74% of the number of main housing units (PADD-2010). However, the rapid growth of the population and the high demand for housing make it necessary to maintain this trend, therefore, the municipality of Montpellier has included in its PLU (Plan Local d'Urbanisme) a provision that makes it mandatory in all sectors for residential use to build social housing subsidized by the state. This provision applies to any project with an area of more than 1200 square meters, with the exception of tourist housing, and gradually according to the size of the project (PADD-2010). Figure (19) shows proportion of social housing within the general planning process in Montpellier

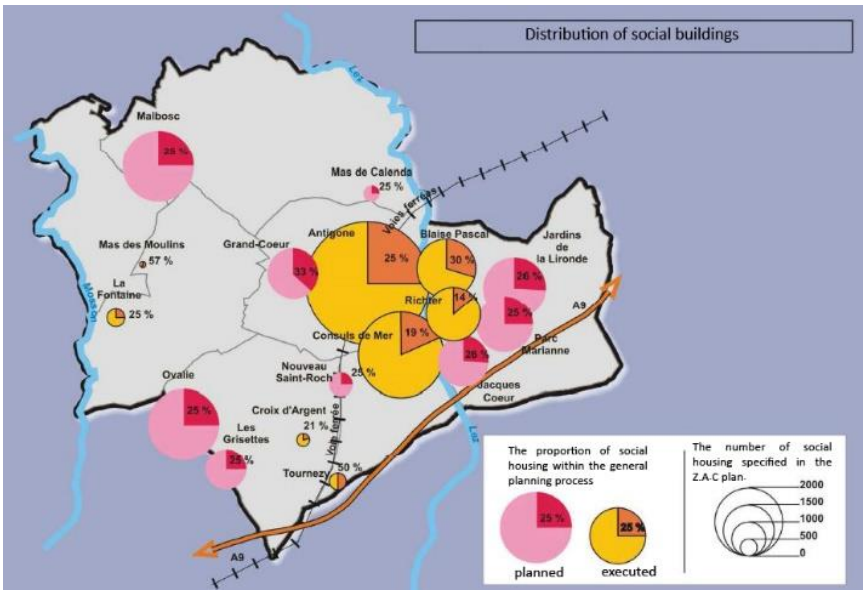

Figure 19: Proportion of social housing within the general planning process in Montpellier, Source: (PADD-2010).

2.3.2.5. Urban Mobility

The city's objective is to mitigate the use of private vehicles between the outskirts and the city center by promoting public transportation and non-motorized modes of travel, particularly cycling, as potential alternatives to cars. The development of an efficient public transportation system is deemed necessary to manage the growing volume of commuting between residential and work areas. The adoption of a tram system as a solution allows for the reorganization of urban spaces,

as it is accompanied by the revitalization of public areas along its route. Therefore, the tram system is considered a viable alternative to private cars for urban mobility (PADD-2010). With regard to motorized travel, four orientations have been presented in the PDU (Plan of Urban Mobility) which is a planning document consider as the specific SCoT part for mobility, and transportation (Buyck et al., 2008).and the four orientations are:

- develop the public transport network,

- organize car traffic on a hierarchical network of roads favoring bypasses, belts, and connections between districts without passing through the city center,

- continue the parking policy by favoring free parking for residents near the city center and by creating relay parks on the outskirts to access the tramway.

- encourage companies and public authorities to draw up a mobility plan for their staff (the Company Travel Plans).

To reduce the impact of transportation in the city and maintain the landscape connection within the city, priority is given to soft circulations that prioritizes non-motorized modes of transportation, such as walking and cycling, at both the local and agglomeration levels. These circulations provide a genuine connection between the various landscape typologies and keep green paths going continuously through the city areas (Buyck et al., 2008). Figure (20) shows the soft circulation strategy in Montpellier

Figure 20: Continous landscape (Soft circulation method) Montpellier agglomeration, Source: (Buyck et al., 2008).

2.4. The case of Alexandria

Alexandria is the second-largest city in Egypt and used to be its ancient capital. Situated on the coast of the Mediterranean Sea. Alexandaria city is divided into 7 main Districts (Montaza, East, Middle, Gomrok, West, Amraia, Borg ELArab) extending approximately 93.5along the Mediterranean Sea from the north sideAlexandria covers an area of 2679 km2 farmland covers around 163 km 2 or 5.66 percent of the overall area of the city (Mohamed, 2023). Figure (21) shows Alexandria city location.

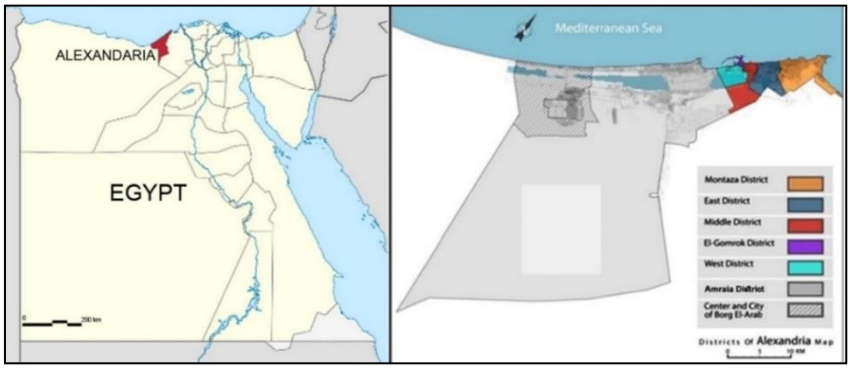

Figure 21:Alexandria city location, source : (Mohamed,2023) modified by author.

Alexandria, with its strategic location overlooking the Mediterranean Sea, became a hub of commerce, culture, and learning. It was home to the iconic Library of Alexandria, a symbol of knowledge that attracted scholars from across the ancient world. Throughout its history, Alexandria witnessed the convergence of diverse cultures, blending Egyptian, Greek, Roman, and later Arab influences.

Alexandria's population has grown steadily over time, mirroring the city's urban expansion. From its early days as a thriving Hellenistic metropolis to its modern-day status as a commercial hub, Alexandria has attracted residents from all corners of Egypt and beyond. The city's current population is estimated to be around 5.5 million, making it the second-most populous city in Egypt.

2.4.1. Historical Review

technological, and land use changes (Soliman & Soliman, 2022). The Greek era saw Alexandria thrive as a commerce and cultural hub, with significant urban infrastructure. The Roman period marked the first major urban expansion with Nicopolis. During the Islamic era, the city faced challenges due to new trade routes and rival cities, leading to a cultural decline (Aisen & Jose,

2013). The Ottoman period saw further decline with reduced industrial and commercial prominence (Soliman & Soliman, 2022).

The 19th century brought revival through infrastructural projects like the Mahmoudeya Canal and the Cairo railway, attracting new inhabitants (Arimah, 2016). Early 20th-century urban planning by Scottish engineer William H. McLean introduced public spaces and new suburban areas (Pallini & Scaccabarozzi, 2016). The wars of 1967 and 1973 disrupted development, leading to informal settlements. Recent plans like the Comprehensive Plans of 2005 and 2017 aimed to control uncontrolled expansion, leading to the development of the General Strategic Plan of Alexandria 2032.

2.4.1.1. Alexandria Master plans

Post-World War II, Alexandria saw the rise of informal settlements at its urban fringes, accommodating rural migrants and low-income individuals (Elbanna, 2015). This led to congestion in residential areas and straining of essential services. Despite recommendations from McLean's 1921 planning, rapid urban expansion continued.

In 1956, Alexandria's Municipality established a planning authority, resulting in the 1958 Master Plan to address developmental challenges figure (22). The plan aimed to transform Alexandria into a contemporary metropolis with expansive boulevards and a comprehensive transportation infrastructure. However, unplanned growth persisted due to insufficient funding.

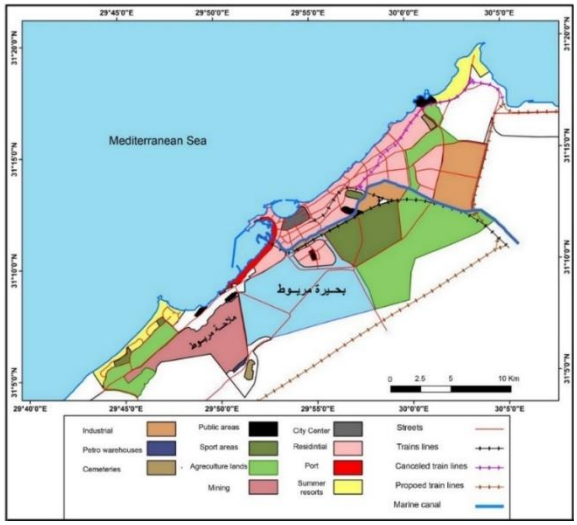

Figure 22: Alexandria master plan 1958, Source: (Elbanna, 2015) modified by author.

The 1984 Urban Development Plan (UDP) aimed to control urban expansion until 2005 (Dixon et al., 2014). The 2005 Master Plan aimed to guide urban expansion along designated axes, prioritize areas with existing infrastructure, and revitalize historic neighborhoods figure (23). Despite its comprehensive vision, the plan faced challenges in implementation due to limited resources and complexities of urban planning.

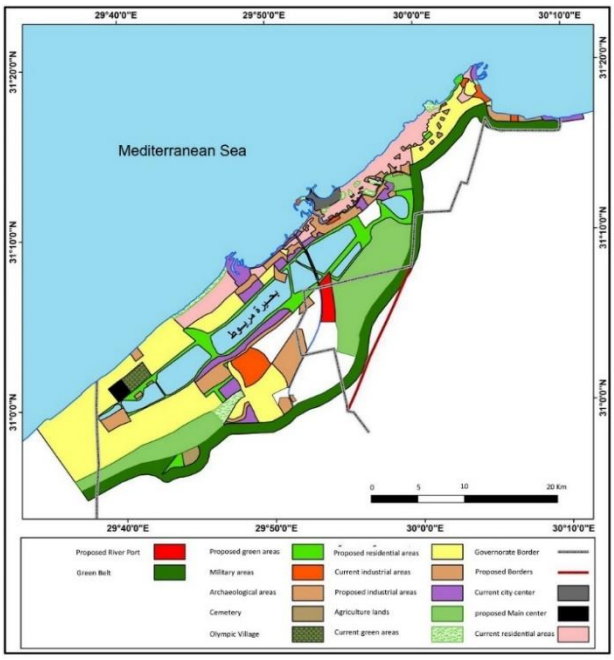

Figure 23: Alexandria master plan 2005, Source: (Elbanna, 2015) modified by author.

The "General Plan 2017," formulated in 1997, focused on southern urban development, population redistribution, stringent urban regulations, informal settlement development, historical site preservation, improved transportation connectivity, and agricultural land conservation. However, the plan had drawbacks, including environmental pollution and inaccurate population growth predictions.

2.4.2. Alexandria General Strategic Urban Plan 2032

In 2010, the Ministry of Housing and Urban Communities, represented by the General Organization for Physical Planning and the Regional Planning Center in Alexandria, developed the new strategic plan for Alexandria 2032. The plan included the following:

- Increasing the urban area of the city to 122,000 acres.
- Increasing the population density of the city by adding approximately 2.4 million new residents.

- Creating more than 760,000 new jobs.
- Achieving several key objectives, including Supporting the decentralization of new urban communities, improving the efficiency of the city's transportation system, improving the quality of life and the environment, promoting economic and social development, supporting cultural and architectural heritage, and supporting the implementation of state planning policies.

The new strategic plan for Alexandria 2032 aims to transform the city into a vibrant metropolis that can accommodate the expected population and economic growth in the future.

2.4.3. Urban development strategies in Alexandria General Strategic Urban Plan 2032

2.4.4.1. Integrated Urban Expansion and Sustainable Land Use Framework

The Alexandria 2032 Strategic Plan aims to address the city's urban challenges through a comprehensive approach to expanding the urban area and implementing a sustainable land-use framework. With approximately 46.5% of Alexandria's population residing in unplanned areas characterized by high building densities and inadequate infrastructure, the plan proposes an expansion strategy to accommodate growth effectively. This includes allocating 18,932 acres (approx. 79.3 square kilometers) for regional services and investment projects, 2,298 acres (approx. 9.6 square kilometers) for public services, and 14,776 acres (approx. 61.8 square kilometers) for residential projects. Additionally, the plan designates 23,818 acres (approx. 99.6 square kilometers) for existing regional services, 20,661 acres (approx. 86.4 square kilometers) as water bodies and reserves 41,841 acres (approx. 175 square kilometers) for the current urban block as shown in Figure (24).

Figure 24: Proposed urban area scheme in Alexandria strategic plan 2032, Source: (General organization for physical planning, 2020) modified by author.

Furthermore, the Alexandria 2032 plan introduces a transformative land-use framework across all districts. This framework establishes clear guidelines for building density, function (residential, commercial, etc.), and architectural aesthetics, aiming to minimize environmental impact while enhancing public spaces. By fostering sustainable growth and infrastructure development, the plan seeks to create vibrant and livable communities. The success of these initiatives will rely on active public engagement, capacity building for local authorities, and ongoing monitoring and evaluation to ensure the plan's effectiveness in meeting Alexandria's future urban needs. Figure (25) shows Building conditions and land use in Al Montazah district.

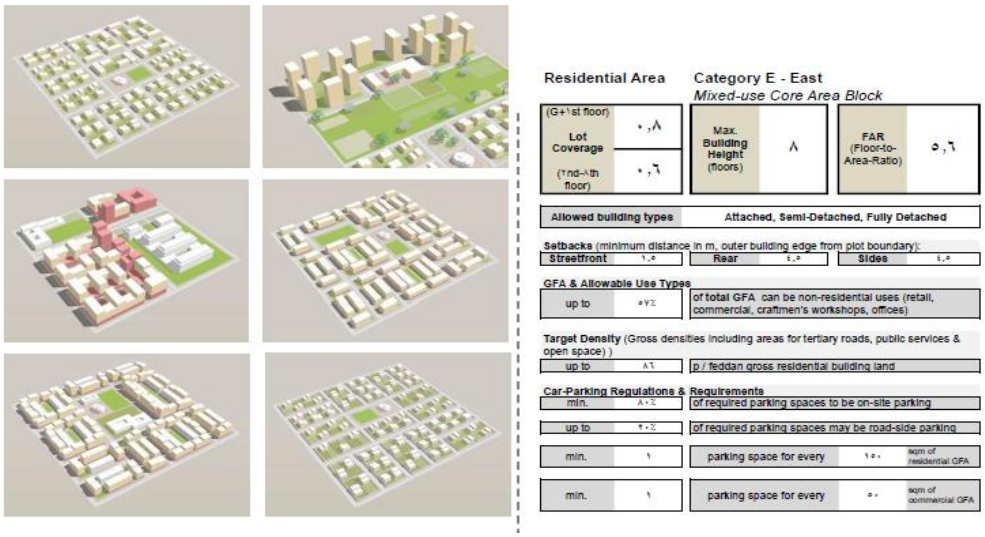

Figure 25 :Building conditions and land use in Al Montazah district as example for the land use and building conditions in Alexandria master plan 2032, Source: (General organization for physical planning, 2020).

2.4.3.3. Urban Mobility

Alexandria's Strategic Urban Plan 2032 outlines a comprehensive vision for sustainable transportation development, aiming to transform the city into a more livable and sustainable metropolis. The plan emphasizes the development of a multimodal transportation system that prioritizes public transportation, cycling, and walking, while also enhancing the efficiency and sustainability of the city's road network.

To achieve its vision, the plan calls for expanding the bus network, introducing a tram system, constructing light rail systems, improving pedestrian and cycling infrastructure, implementing intelligent traffic management systems, integrating public transportation with the road network, integrating public transportation with cycling and walking infrastructure, and developing real-time information systems and integrated ticketing systems.

Specific projects highlighted within the plan include the construction of the Abu Qir Metro line, spanning 22.1 km, and the Abu Qir Tram line of equal length, which are anticipated to significantly bolster the public transport infrastructure. The rehabilitation of the Raml Tram line, extending 7 km, is set to improve service reliability and comfort for users. Additionally, the introduction of a fast bus line along the Corniche, covering 18 km, and another alongside the Mahmoudiya Canal, extending 14.5 km, will further enhance the city's transit network, providing rapid and efficient transport options for residents and visitors alike. Figure (26) shows Alexandria Transportation system plan.

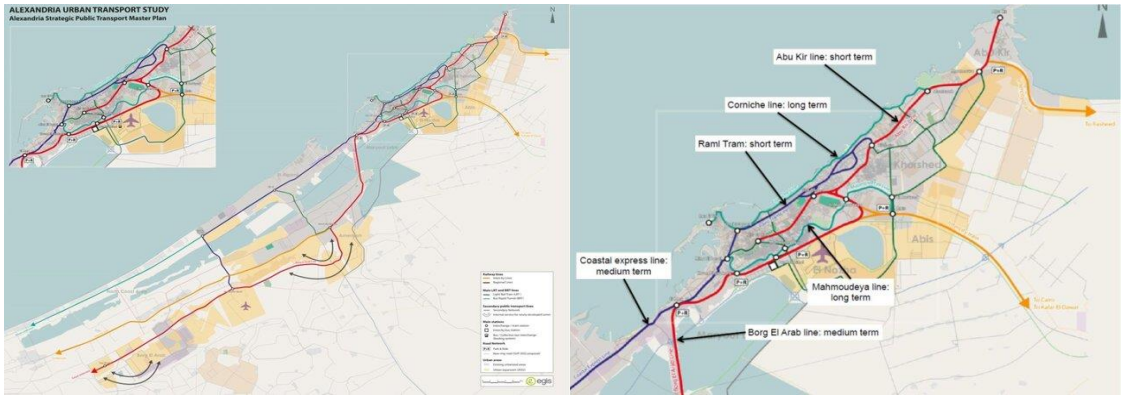

Figure 26: Alexandria Transportation system plan, Source: (Hassan,2018).

2.4.3.4. Sustainable Urban Infrastructure

Alexandria's Strategic Urban Plan 2032 emphasizes the necessity of a sustainable urban infrastructure through environmental consciousness in land use planning, investment in eco-friendly services, and shifting public awareness towards environmentally responsible behaviors. A comprehensive plan has been developed for water and sewage supplies, energy provisions, and waste management strategies. To manage rainwater, the introduction of green corridors has been proposed, where 82% of the newly established pathways in the Montazah district will serve multiple functions such as utilities and ventilation.

These pathways are designed to improve the local climate, reduce air pollution, and provide spaces for the infrastructure network, decentralized utility stations, and rainwater management. The corridors will adhere to specific standards, being free from any significant structural barriers, dedicated to public benefit, and acquired through municipal authorities. They will traverse residential areas, acting as conduits for industrial runoff to facilitate rainwater drainage, and will

include designated areas for infrastructure facilities. Figure (27) shows Sustainable Urban plan in Alexandria strategic plan 2032.

Figure 27: Sustainable Urban plan in Alexandria strategic plan 2032, Source: (General organization for physical planning, 2020).

In conclusion, Alexandria's master plans showcase a commendable commitment to long-term, comprehensive urban development. While past efforts have faced hurdles like funding constraints and outdated elements, the city's focus on sustainability, public transportation, and adaptability in recent plans positions it in a promising future. Moving forward, prioritizing public engagement, data-driven decision making, and securing financial resources will be crucial for translating these plans into reality. By embracing continuous improvement and incorporating best practices, Alexandria can ensure its master plans pave the way for a vibrant, livable, and sustainable city.

2.5. The case of Abu Dhabi

Abu Dhabi City is the capital of both the Emirate of Abu Dhabi and the United Arab Emirates (UAE), a country made up of seven emirates on the Arabian Gulf. It is the largest city in the Emirate of Abu Dhabi and the center of the federal government. The city was first settled in the mid-18th century for hunting and pearling. Its importance grew with the discovery of oil in the mid-20th century and the formation of the UAE in 1971 (Abu Dhabi Urban Planning Council, 2007). Since then, Abu Dhabi has grown steadily into a pleasant and well-organized city with over half a million residents. Recently, the introduction of limited private land ownership and increased

international interest in the UAE as a safe and welcoming place to invest has created the potential for rapid growth. While this new growth is needed to support the government's broader goals, it is crucial to manage it in a planned and sustainable way. Figure (28) shows Abu Dhabi City Location.

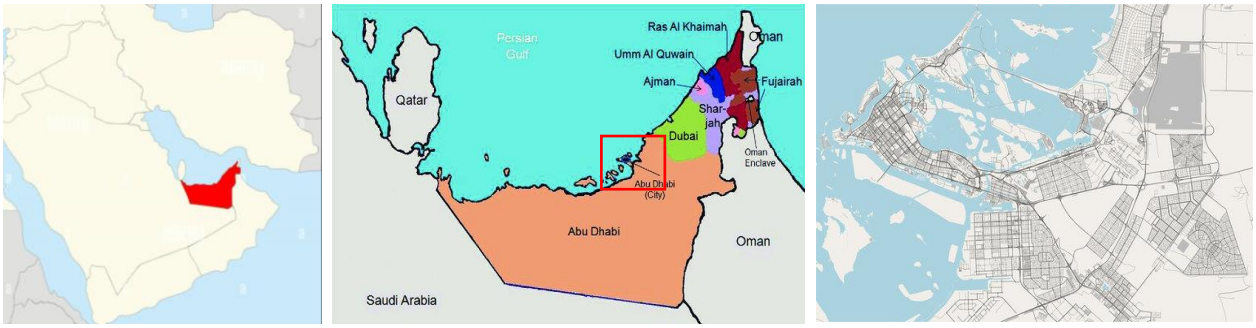

Figure 28: Abu Dhabi City Location, Source (Stefanopoulou et al., 2014) modified by author.

2.5.1. Historical Review

The former general plan for the city of Abu Dhabi, prepared in the late 1980s, has served the city well during a time of measured growth (Abu Dhabi Urban Planning Council, 2007). Its conceptual limits have now been reached and it does not have the scope to further shape the type and intensity of development that can benefit the city moving forward.

Recently, with the introduction of limited private ownership of land and an increasing world focus of attention on the UAE as a safe, hospitable investment area, the potential for rapid, even explosive, growth has risen dramatically. While new growth is essential to support the broader ambitions of the Government of Abu Dhabi, it is important that this growth is managed in a coordinated and sustainable way.

The Abu Dhabi 2030 Urban Structure Framework Plan, also known as Plan Abu Dhabi 2030, is a visionary initiative launched by the Abu Dhabi Urban Planning Council (UPC) to guide the emirate's development towards a sustainable and well-structured urban future. The plan was introduced in 2007 as a response to the rapid growth and urbanization that Abu Dhabi was experiencing. It aims to create a comprehensive framework for the physical development of Abu Dhabi, ensuring that the growth is managed in a balanced, sustainable, and efficient manner. The Plan is targeted to the year 2030 and an expected population of over 3 million people. It is conceived so that it can continue to grow in a compatible way to 5 million people or even more.

The vision behind Plan Abu Dhabi 2030 is to transform Abu Dhabi into a global capital city, renowned for its high quality of life, robust infrastructure, and sustainable development practices. The plan emphasizes the importance of maintaining the cultural heritage and environmental integrity of the region while accommodating future growth and development. By 2030, Abu Dhabi is envisioned to be a thriving metropolis that seamlessly integrates residential, commercial, and recreational spaces, all while preserving the natural environment and promoting social well-being.

2.5.2. Main urban development strategies in Plan Abu Dhabi 2030

2.5.2.1. Urban development and Land Use Planning

Integrated land use planning is a critical strategy in Plan Abu Dhabi 2030, aimed at creating a cohesive urban fabric that balances residential, commercial, and industrial uses. The plan encourages mixed-use developments that combine residential, commercial, and recreational facilities within the same area to reduce the need for long commutes and enhance community interaction. Implementing zoning regulations defines specific areas for different types of development, ensuring a well-organized urban layout that supports efficient land use. Transit-oriented development (TOD) is promoted around public transportation hubs to increase accessibility, reduce traffic congestion, and encourage the use of public transit systems. Urban density is strategically managed to prevent urban sprawl and optimize the use of existing infrastructure, with high-density zones developed in central areas and medium to low-density zones in peripheral areas. Figure (29) shows Abu Dhabi Land use framework.

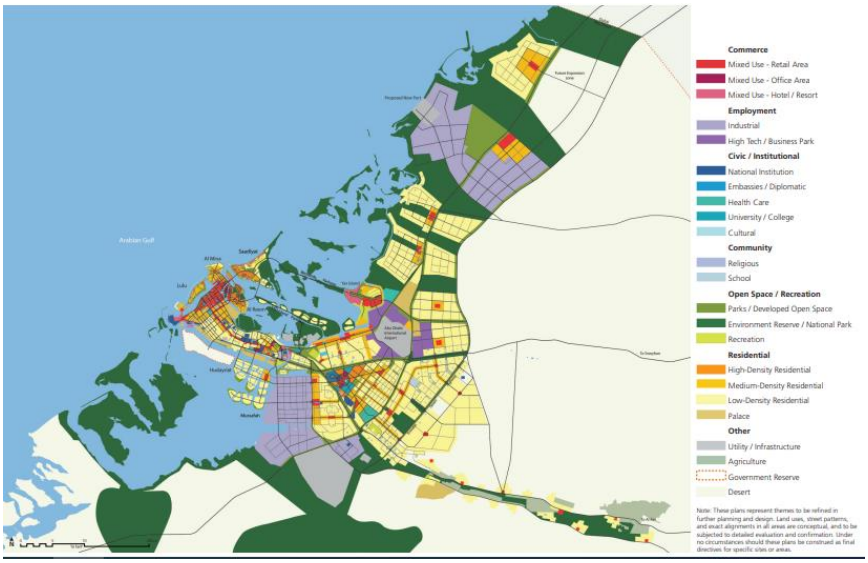

Figure29: Abu Dhadi Landuse framework ,Source: (Abu Dhabi Urban Planning Council, 2007).

2.5.2.2. Sustainable Development and Environmental Stewardship

One of the cornerstone strategies of Plan Abu Dhabi 2030 is the emphasis on sustainable development and environmental stewardship. This strategy involves prioritizing the protection of Abu Dhabi's natural landscapes, including coastal areas, mangroves, and desert ecosystems. It promotes the sustainable use of resources to ensure long-term ecological balance. Green building standards are adopted in construction projects to reduce the environmental footprint, involving energy-efficient designs, the use of renewable energy sources, and sustainable materials. Additionally, mandatory environmental impact assessments (EIAs) are conducted for all major development projects to ensure potential adverse effects on the environment are identified and mitigated. The creation of parks, green belts, and recreational areas enhances urban livability and provides residents with access to nature, thereby promoting physical and mental well-being.

2.5.2.3. Urban Mobility

The transportation strategy for Abu Dhabi as part of the Plan Abu Dhabi 2030 emphasizes the critical link between land use planning and efficient traffic management. By evenly distributing traffic through a well-designed grid of boulevards and avoiding the congestion pitfalls of large freeways, the plan aims to create a smoothly functioning roadway system. The strategy prioritizes connectivity and walkability, ensuring that every journey starts and ends comfortably on foot. For example, the proposed Central Business District (CBD) on Al Suwwah Island will be integrated with the city through multiple bridges, enhancing traffic flow and pedestrian comfort. Figure (30) shows Abu Dhabi public transportation framework.

Figure 30: Abu Dhabi public transportation framework, Source: (Abu Dhabi Urban Planning Council, 2007).

While freeways are included, they are limited to essential routes, such as connecting Saadiyat Island to the airport and providing alternate entry points to reduce pressure on main streets. These routes will be designed as parkways with extensive landscaping to maintain aesthetic and environmental quality.

Public transit is a cornerstone of the plan, aiming to facilitate a shift from car usage to public transportation. This includes high-speed rail linking the city center with the Capital District, the airport, and Dubai, as well as a freight rail line connecting key industrial areas. Two high-capacity metro lines will traverse the city, complemented by a network of light rail, streetcars, and buses ensuring no resident is more than a five-minute walk from public transit.

Improving pedestrian infrastructure is also a priority, with plans to widen sidewalks, add shade trees, and enhance the overall streetscape to ensure safety and comfort. This comprehensive approach seeks to manage Abu Dhabi's growth sustainably, creating a well-connected, efficient, and pleasant urban environment for its residents and visitors.

2.5.2.4. Public Open Space framework

The Public Open Space Framework Plan for Abu Dhabi, part of Plan Abu Dhabi 2030, establishes a hierarchical system of open spaces. At the macro level, a protective ring of undeveloped land surrounds the city, preserving ecological assets and preventing urban sprawl. This ring is defined by the Sand Belt to the east and the National Park System to the northeast.

Three major city parks—Mangrove Park, the Corniche, and Lulu Island—serve the entire city, offering unique features such as urban wilderness, public waterfronts, and recreational spaces. A network of community parks and recreational spaces ensures green areas are accessible throughout the city, creating a garden-like atmosphere and safe play areas for children. Figure (31) shows Abu Dhabi Open spaces framework

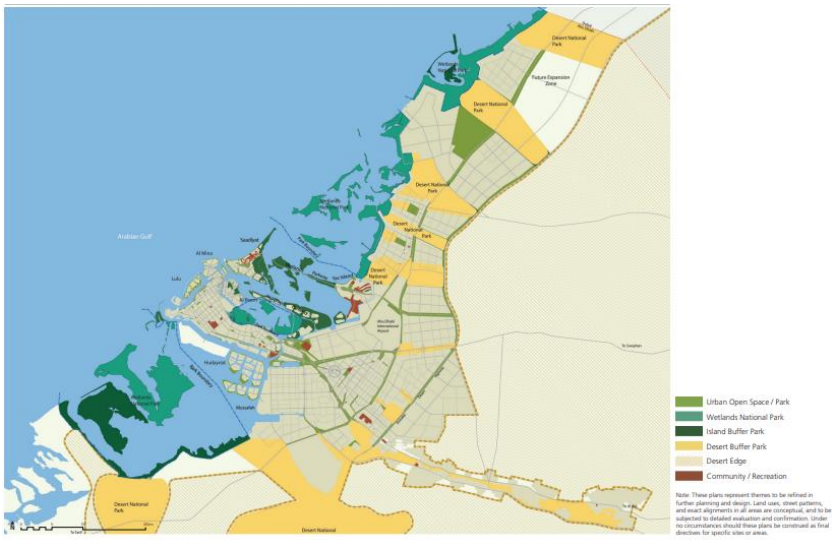

Figure 31: Abu Dhabi Open spaces framework, Source : (Abu Dhabi Urban Planning Council, 2007).

Planted boulevards and byways connect these parks, allowing for shaded travel and reinforcing the city's garden vision. Important public buildings will have landscaped open spaces to enhance their significance

and create cool microclimates. Golf courses, although not mapped, are included in large residential developments outside business districts. This comprehensive approach aims to enhance ecological preservation, provide recreational opportunities, and improve the quality of life in Abu Dhabi, reinforcing its character as a garden city on the Gulf.

2.5.2.5. Social and Cultural Integration

The Plan Abu Dhabi 2030 emphasizes social and cultural integration to create a cohesive urban environment. Affordable housing options prevent socio-economic segregation, fostering a diverse community. The plan includes community facilities like schools, healthcare centers, sports complexes, and cultural institutions to meet residents' needs and enhance quality of life. Preserving Abu Dhabi's cultural heritage involves protecting historic sites, developing cultural districts, and supporting traditional arts. Public participation in the planning process is encouraged through community consultations and workshops.

To ensure long-term prosperity, the plan promotes economic diversification and innovation. It aims to attract investment in high-tech industries, research, and knowledge-based sectors by establishing innovation hubs, technology parks, and startup incubators. Developing world-class tourist attractions and cultural experiences positions Abu Dhabi as a premier tourist destination. Investments in education and training create a skilled workforce, with partnerships with leading universities and vocational centers. Special economic zones (SEZs) offer incentives for businesses, boosting economic activity and job creation.

In conclusion, Plan Abu Dhabi 2030 is a comprehensive and forward-thinking urban development framework that addresses the multifaceted challenges of rapid urbanization. By incorporating strategies for sustainable development, integrated land use planning, advanced infrastructure, social and cultural integration, and economic diversification, the plan aims to transform Abu Dhabi into a global capital city that exemplifies high quality of life and environmental stewardship. The successful implementation of these strategies will not only enhance the livability of Abu Dhabi but also serve as a model for other cities in the region and beyond.

2.6. Conclusion of Chapter 2

From the visionary approaches of Barcelona and Montpellier to the budding ambitions of Alexandria, and the forward-thinking strategies of Abu Dhabi, a fascinating narrative unfolds regarding the complexities of urban development. Barcelona and Montpellier stand as beacons of successful planning, achieving a remarkable balance between environmental responsibility, economic prosperity, and social well-being. These cities prioritize sustainability through extensive green spaces, efficient public transportation, and a focus on walkability. Their commitment to

mixed-use development ensures vibrant communities where historic preservation meets modern innovation, catering to diverse needs while safeguarding cultural heritage.

Alexandria, though facing challenges, reveals the potential for transformation. Past implementation hurdles haven't deterred its renewed commitment to urban planning. The 2032 Master Plan marks a turning point, outlining a comprehensive strategy to tackle pressing issues. From improved transportation infrastructure to enhanced green spaces and economic revitalization, Alexandria seeks to redefine itself as a city that prioritizes both growth and environmental responsibility. By leveraging its unique cultural heritage and natural assets, the city aspires to create a resilient and inclusive urban landscape, ensuring a high quality of life for its residents while safeguarding the environment for future generations.

Similarly, Plan Abu Dhabi 2030 is a comprehensive and forward-thinking urban development framework that addresses the multifaceted challenges of rapid urbanization. By incorporating strategies for sustainable development, integrated land use planning, advanced infrastructure, social and cultural integration, and economic diversification, the plan aims to transform Abu Dhabi into a global capital city that exemplifies high quality of life and environmental stewardship. The successful implementation of these strategies will not only enhance the livability of Abu Dhabi but also serve as a model for other cities in the region and beyond.

This analysis underscores the importance of tailored urban development strategies. While Barcelona and Montpellier offer valuable lessons in achieving sustainability and equity, Alexandria and Abu Dhabi demonstrate the potential for transformative change through well-defined master plans and a commitment to long-term environmental and social well-being.

Chapter 3: Spatial transformation in the rural area in the Syrian coastal region

This Chapter delves into the rural areas situated in the coastal region, examining the spatial transformations that have influenced the fabric of social life. These transformations encompass the rapid population growth, urban expansion, and emergent developments, all of which have significantly altered the dynamics and scale of the house, garden, and landscape relationship. The research scrutinizes the evolution of the rural housing model within the coastal region and its intricate interplay with the surrounding landscape.

3.1. Introduction

All human settlements, whether urban or rural, grow and expand in different ways in order to accommodate the volume, functional and population increase (Marah, 2019), and therefore the process of urban expansion comes as a result of several factors that differ from one place to another, however, three main factors can be found in most cases:

- The natural increase of urban populations results from an excess of births over deaths in urban areas. An assessment of the components of urban growth 1961-2001 found that the share of urban growth associated with urban natural increase ranged from 51% to about 65% during this period. (UNFPA,2007)

- Migration to cities from rural areas or from abroad contributes to urban growth whenever the number of in-migrants exceeds the number of out-migrants. (UN,2018)
- Reclassification contributes to urban growth by enlarging the size of urban areas. When cities grow in an area, they incorporate neighboring settlements and their populations, which were formerly classified as rural.

The growth and expansion of cities and the complexity of life in them led to the emergence of many overlapping problems for this growth in various fields and led to results on all social, economic, and environmental levels.

Syria is one of the developing countries that is witnessing a high rate of urbanization (Figure 32). The urban areas have increased from 40 % in 1970 to 50 % in 2007 (Maya, 2014), and according to UN-Habitat report, the Urbanization in Syria has increased to 76% by the end of 2014 affected

by the Syrian crises, and 40% of IDPs (internally displaced people) in Syria are being hosted in cities. (UN-Habitat, 2014)

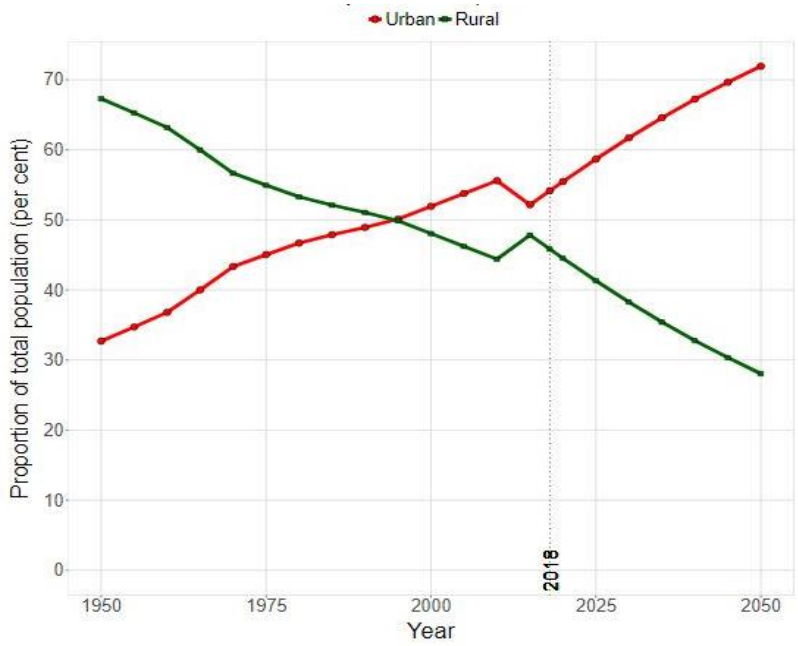

Figure32: Percentage of population in Urban and rural areas in Syria, Source: (UN, 2018).

The urbanization in Syria is due to the policies that control this process, as the urban distribution in the centers of governorates and cities is primarily related to the development services available in them and job opportunities without the rural areas and through the focus of development efforts in these centers (Marah, 2019).

A general change at the national level began in Syria after 1970 and accelerated further after 1990. With the stabilization of the political situation in the country, economic recovery appeared in all Syrian cities. Many factories and trading companies were established in addition to the revival of tourism and import and export operations through the seaport (Sofi, 1950). These conditions encouraged the urbanization in the Syrian cities because most of the development projects were located in the city's outskirts, which motivated people to leave the countryside and approach new job opportunities, which led to urban expansion without compatible long-term urban development plans.

The Syrian coast is located on the western coastal front of the Syrian state, between the Mediterranean Sea (as the western boundary) and the coastal mountain range that stretches along the coast from the eastern side. The coast extends to a length of 330 km and a width of 30–50 km (Fadel, 2017). and includes two governorates: Latakia in the north and Tartous in the south.

As mentioned before, Latakia governate has chosen as a case because it exemplifies the planning and urban expansion challenges faced by cities in the Syrian Coastal Region. It located on the northern part of the Syrian coast, with an area of 244,000 hectares, which constitutes 1.2 % of the total area of Syria (Maya, 2014). Figure (33) shows the study area.

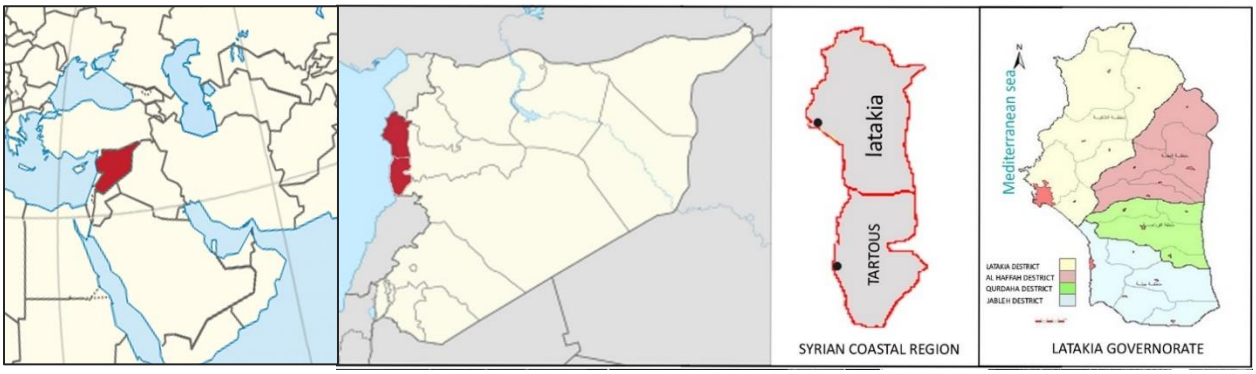

Figure 33: Study area, photo source: Author based on map (Latakia governorate) from the ministry of tourism in Syria

Latakia Governorate is divided into four administrative districts (Latakia - Jableh – Al Qurdaha - Al Haffah), and each of these administrative districts has a number of sub-districts, villages and towns,

(Table 2) shows the administrative division for Latakia governorate.

Population in 2011	Administrative divisions				AREA km2	Latakia Governerate
1008000	Villages	Towns	sub- destricts	Cities		
	438	-	24	4		
	14	-	-	1	950	City Center
603800	118	24	7	-		Latakia Destrict
224500	123	27	7	1	530	Jableh Destrict
93000	128	19	5	1	400	Al Haffah Destrict
86200	94	23	5	1	320	Al Qurdaha Destrict

Latakia Governorate on the Syrian coast holds strategic significance for the nation due to a confluence of geographical and economic advantages. Its prime location establishes Latakia as Syria's gateway to the Mediterranean Sea, fostering diverse economic activities with regional and international reach. The presence of the Latakia seaport, Jableh International Airport, and Tishreen University (one of Syria's top five public universities) underscores the region's economic and educational importance (Khadour et al., 2021).

Furthermore, Latakia boasts significant tourism potential due to its unique geographical features. These factors have synergistically spurred a surge in tourism, industrial, and commercial activities.

The seaport plays a pivotal role, facilitating import and export movements, which in turn has necessitated the development of a robust transportation network connecting the coastal region to the hinterland (Khadour et al., 2021). This connectivity has further fueled economic dynamism.

Latakia's attractiveness extends beyond economic opportunities. The city has gradually evolved into a magnet for migration, drawing residents from surrounding rural areas and other urban centers. This influx of population significantly impacts the spatial landscape of Latakia Governorate, driving urban expansion and necessitating the adaptation of infrastructure and services to accommodate the growing population.

The landscape along the Syrian coast is remarkably diverse, featuring a range from fertile plains extending westward from the sea to mountainous regions in the east, with a width spanning between 15 and 20 kilometers. This region hosts a mix of urban and semi-rural settlements, benefiting from fertile agricultural land. The highest point in the Coastal Mountain Range, which runs parallel to the coast, is Nabi Yunis, reaching 1575 meters near Latakia (Collelo, 1988). Figure (34) shows the Geography of the Syrian coastal region.

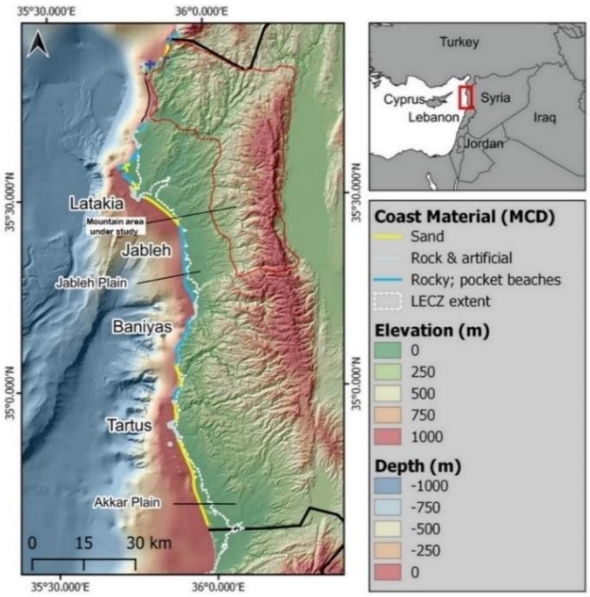

Figure 34: Geography of syrian coastal region , Source :(Westley et al., 2022) modified by Author

The western slopes, exposed to moisture-laden winds from the Mediterranean Sea, are more fertile and densely populated compared to the eastern slopes. This area enjoys a mild Mediterranean climate, characterized by dry summers with an average temperature of 25.8°C (June–August) and cooler winters averaging 12.8°C (December–February) (Latakia Climate, 2017). These climatic

conditions, coupled with fertile soil, have historically made the coastal region a productive agricultural zone, supporting various crops and traditional farming practices.

3.2. Urbanization and Transformation of Rural Landscapes

Urbanization and counter-urbanization processes, driven by demographic, social, and economic factors, have significantly reshaped rural communities in Syria. Over the past century, fundamental political and economic changes have led to rapid population growth and urban expansion, encroaching on rural areas and transforming the rural landscape through infrastructure development and new highways.

Historically, agriculture was the dominant activity in rural areas, with villages characterized by farmstead buildings of varying densities and arrangements (Banski et al., 2010). These rural areas were predominantly agricultural, and the architectural layout reflected this lifestyle. Villages were composed of closely-knit communities where social life revolved around agricultural activities. The dominance of farmsteads created a landscape where the built environment was harmoniously integrated with the natural surroundings.

However, as urbanization intensified, rural areas became equipped with better social and technical infrastructure, shifting the focus from agricultural to non-agricultural activities. Many farmers transitioned to commercial activities, diversifying land use and leading to new morphogenetic structures of rural settlements (Banski & Weslowsk, 2010; Sevenant & Antrop, 2007; Unvin & Nash, 1992). This shift was driven by a variety of factors, including the need for improved living standards, better employment opportunities, and enhanced connectivity with urban centers.

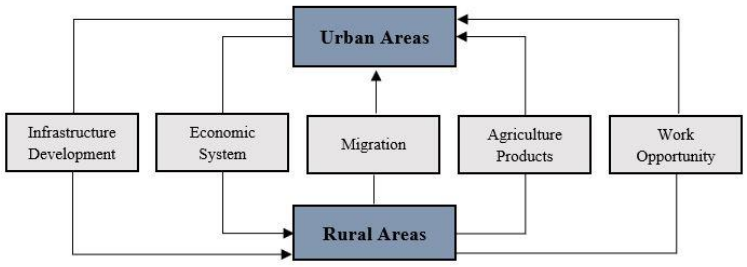

Figure 35: Rural -Urban relation in the syrian coastal region, Source :Author

The urban population in Latakia constituted 51% of the total population, while the rural population accounted for 49% (The Regional Planning Commission in Latakia, 2008). This close

demographic split underscores the dynamic interaction between urban and rural areas. Over time, migration from rural to urban areas has increased, driven by the search for better economic opportunities and living conditions. This migration has further intertwined the urban and rural systems, making them interdependent and significantly impacting each other's development. Given this interconnectedness, it is crucial to study the transformations occurring in both rural and urban areas. Understanding the changes and influences between these regions can provide insights into sustainable development and planning strategies that benefit both urban and rural communities. The ongoing migration trends and the evolving land use patterns highlight the importance of integrated approaches to manage the urban-rural nexus effectively.

3.3. Overview of the housing types in the Syrian coastal region

In accordance with the major changes (in politics, economy, transport, society etc.) affecting the rural development of the region (Weulersse, 1940; Zakkar & Alwaraa, 2013), three main phases of transformation of the coastal landscape are possible to identify. As a consequence, three main types of relationships between the residential building and the surrounding land and of indoor and outdoor functional layouts are possible to distinguish:

3.3.1. Until 1970: The Traditional Residential Unit in The First Phase

The traditional residential unit is a reflection of the feudal system, from the time when most of the people lived in poverty and had very limited capabilities, while the power and large estates were in the hands of a few feudal lords (Weulersse, 1940). These traditional houses were built before the 1950s; the design was simple and functional, reflecting the rural lifestyle of the period. The houses had a related strongly to the surrounding land, where most of the inhabitants practiced agricultural activities as the main source of their income. The unit consisted of two parts: the inner space of the house itself that served mainly for sleeping, including a separate space to shelter and protect the domestic animals at night, and the outer space adjacent to the house, where most of the daily activities of the inhabitants occurred. This outer area resembled the living room of the house; people were very accustomed to spending their time and practicing their daily activities, such as social encounters, cooking, eating, and relaxing, in the outer space, with the exception of extreme weather situations, therefore, this area was the core of the traditional unit and allowed a strong relationship between the inhabitants and the land (Khadour et al., 2021). The people used the surrounding land intensively as a source of food and a space for living without increasing the built area in the village as shown in Figure (36).

(a) (b)

Figure 36. A traditional residential unit in the first phase, Jableh countryside. (a) The house; (b) the layout Source: Photo and figure by author.

The residential units were built by the inhabitants themselves, with traditional methods and using only materials that existed in the surrounding nature (stone, wood, and clay), which gives these units a great ecological value, as they are able to provide a comfortable atmosphere during extreme weather conditions (Zakkar & Alwaraa, 2013).

The layout of the village developed as a combination of large properties of agricultural land that belonged to the feudal lords and much smaller properties of those traditional residential units, where locals lived and owned only the space that they live in while working for the feudal lords on the bigger plots (Yaseen, 1979). The distribution of these traditional units was also controlled by the feudal lords. The village lacked public services and had a poor connection to the city. Its economic system relied mainly on agriculture and animal products.

The feudal and bourgeois system continued in Syria until the new law of agrarian reform was announced in 1958 (Act 161 of Land Reform, 1958). The law mandated the formation of a farmer's cooperative association to support farmers who reclaimed their lands. From a social point of view, the law aimed to reduce inequality in the distribution of land among social groups in rural areas, and to reduce the severity of social injustice and the poor distribution of income caused by poor distribution of agricultural property. From an economic point of view, the law aimed to direct rich groups to invest in other non-agricultural service sectors in order to create additional job opportunities and strengthen the national economy in general.

However, no significant change happened in the few years following the announcement of the law. It took around ten years for the results of the law start appearing clearly in the countryside in terms of transforming the social life and economic situation for the rural population. With this new

development of the economic and social conditions in the countryside, a new change of the housing units and the village layout started to appear (Khadour et al., 2021).

3.3.2. 1970–1990: The Traditional Residential Unit in the Second Phase

This period can be described as a transitional period between the feudal system and the communist system. It lasted for about thirty years and witnessed some simple but very essential changes regarding the rural lifestyle. After 1970, as a reflection of the improvement of the economic situation (Deep, 2011), the rural housing unit developed. The buildings became larger, and the animal space was separated from the inner space of the house, which reflected an improvement of the economic state of the community and their lifestyle. The outer area in front of each house remained an important part of the unit, as it still accommodates most daily activities, emphasizing the strong connection between the inhabitants and their land. This type of building has replaced the first type and dominated the rural housing scenery until the third type appears at the beginning of the 2000s.

New building materials started to appear, so while the walls of houses were still constructed of natural stone, concrete started to appear in the construction of the roofs, which led to the opportunity to create an additional floor, especially since the number of family members was increasing by marriage of the youth (Barut, 2007), as shown in Figure (37).

(a) (b)

Figure 37. A traditional residential unit in the second phase, Jableh countryside. (a) The house; (b) the layout Source: Photo and figure by author.

Although the improvement of the economic situation of the villagers had its effects on the rural lifestyle, the social ties, and in particular the kinship ties, remained very strong. In particular, all the inhabitants shared agricultural work as a common source of income, which provided them with a sense of unity and affinity.

The layout of the village has simply changed in the coastal region in this period, according to several factors, including.

- Economic factors: the abolition of the feudal system and the distribution of large properties to the villagers, providing farmers the right to own the land on which they worked. As a result, the countryside is composed of agricultural land and rural houses, which were built randomly on the farms.
- Social factors: the increase of public services, such as schools and hospitals, as a result of the government's cultural and social service development plan for the countryside.
- Transportation/connectivity: the connectivity between the countryside and the cities has increased dramatically because of new developments in the road system, and this led to the migration of some of the rural population to the cities, in order to access new job opportunities other than agriculture.

The general changes that started in Syria after 1970 at the national level, accelerating even more after 1990. With the stability of the political situation in the country, the economic revival was clearly apparent in all Syrian cities. Many factories and commercial companies were established, in addition to the recovery of tourism and import and export operations (Khadour et al., 2021).

This atmosphere initiated the urbanization process of Syrian cities, because most of the development projects were located in the outskirts, encouraging people to leave the countryside and move closer to those new job opportunities, leading to urban expansion without compatible urban development plans for the long term.

In this sense, the urbanization process in the coastal region was also initiated. Commercial activities were closely linked to the presence of seaports in the cities of Tartus and Latakia (Sofi, 1968), which were considered Syria's gateways to the world, and most of the goods that entered Syria were arriving through these ports. This led to the development of a new transportation network to connect the coast with the inner part of the country, and to facilitate the process of distributing the goods and materials from the ports to the rest of the country.

The new roads constructed had an impact on the character of the areas which they passed through, and led to significant changes of the land uses alongside. In general, most of these roads crossed rural areas, and this led to the creation of new activities and new land uses that did not exist before.

Consequently, commercial and industrial activities increased at the expense of agricultural activity in the countryside, and more urban activities started appearing in rural areas.

3.3.3. After 2000: The Contemporary Residential Unit

In addition to all the above-mentioned changes and their accelerated effects during this period, population growth increased rapidly (with a population growth estimate of Gr 17.5 per thousand between 2000 and 2005 alone, (Barut, 2007)), which resulted in raised demands on housing units. The most important change in this sense was the change in the type of housing, where traditional rural houses were disappearing and being replaced with modern concrete buildings, which brought also great changes in the social and rural lifestyle. Consequently, the landscape has changed radically.

The new housing unit was transformed into a multi-story building (mostly 3–4 story's), constructed mainly from concrete, while the use of traditional materials has disappeared. With a more urbanized lifestyle, and less dependence on cattle breeding, there has been no more need for spaces assigned for animals within or adjacent to the house, and the agricultural land that surrounded each unit was neglected as the new housing model weakened the relationship between the inhabitants and the surrounding landscape as shown in Figure (38).

(a) **(b)**

Figure 38. A contemporary residential unit Jableh countryside. (a) The unit; (b) the layout
Source: Photo and figure author.

The structure of the village has changed drastically (especially after 2011, as the Syrian crisis resulted in families migrating from conflict areas and settling in the coastal region, which was considered as a safe area, thus inducing additional housing demands). The multi-story, concrete buildings dominated the views and the scenery of the village, introducing an urban way of living into the countryside, which was reflected in many aspects. The social ties and relationships of the

inhabitants started to weaken as the new model of houses lost the outer open area, which was the core of the rural social life. The more enclosed type of the housing unit encourages independent life, creates boundaries, and decreases the chances of daily encounters and communication, which was a main and celebrated attribute of rural living. Furthermore, as the economic system continued developing, people started finding new investment opportunities to answer the needs of a new lifestyle, and new commercial and service activities started to replace the agricultural ones as they provided easier and faster income. As a result, the cultivated land around the villages became fragmented and abandoned. The Regional Planning Commission in 2005 (Syrian Regional Planning Commission, 2020) established that the percentage of workers in the agricultural sector in the coastal region decreased from 35% in 1990 to 11% in 2005, while 60% of the workers are in the services sector and 20% work in commercial activities. This indicates a very serious transformation in the overall status of the coastal region, as it is shifting from being an agriculturally productive region to a consumer region. As a consequence, the balance of the region in social, ecological, and economical fields is being compromised (Khadour et al., 2021).

As shown in Figure (39), there is a clear relationship between the layout of the residential units and their distribution and the character of the landscape. In the first phase, the landscape is the dominant feature of the rural landscape, where housing units are small in number and allocated

Figure 39. Evolution of the general layouts of the village types, source: photos and drawings by author.

randomly, giving priority to preserving the agricultural land. In the second phase, we can observe the appearance of a more organized pattern, with an increasing number of houses around a center, which makes the agricultural land relatively peripheral but still retaining its important role in rural life. As the influence of urbanization grows, the third phase brings an increasing number of roads and a higher density of the built area on account of the agricultural land, which becomes fragmented, losing its dominance over the built area.

3.4. Approach and Materials

The general analysis focuses on the mountain area of the coastal region; however, a deeper comparative analysis was conducted on four villages (Bet Yashot, Hellet Ara, Helbako, and Almnaizlah) that are located along a main highway axis connecting the coastal region with the middle region, each with a different height and distance from the city (Jableh) as shown in Figure (40). The reason why those villages were chosen is related to their location in the mountain area, within the western part of the ridge, because the changes in the landscape were stronger and more spectacular here than the changes in the plains. The latter are further away from the urbanized areas, and thus have been less developed and have kept their vernacular traditions and system for a longer period of time.

Figure 40. Illustrative diagram of the study area ,source :Author based on: Google earth.

The four villages are located sequentially on an axis related to the city center of Jableh, which gives them particular attributes regarding their relationship to a highway connecting the coastal region to the middle region, which was constructed between 1985–1989.

This part of the research proceeds with an analytical study of the housing models in the study area, in order to have a clear understanding of the morphological change of each model and its impacts on the social life and the interaction between man and nature. Furthermore, the comparative study on the four villages in the study area is conducted by the use of a questionnaire, in order to get feedback from the inhabitants of those villages and be able to evaluate the performance of each model in the end. Depending on the results. The analytical study of the four villages will rely on the data collected by the questionnaire, which was a "random sample" distributed to 200 people from the village inhabitants. The portion was close to 1.5% of the population in 2004 per village (Regional planning commission,2004). For the distribution of the questionnaires, an important consideration was that half of the participants were living in traditional houses and the other half were living in contemporary houses.

The questionnaire was distributed in different proportions to suit the population numbers of each village, as shown in Table 3.

Table 3. The questionnaire distribution numbers in the surveyed villages.

Village Name	Population (Regional planning commission,2004)	Total Number of Questionnaires Distributed in the Village	Number of Questionnaires for Traditional Houses Group	Number of Questionnaires for Contemporary Houses Group
Bet Yashot	6115	90	45	45
Hellet Ara	3155	50	25	25
Helbako	1949	30	15	15
Almnaizlah	1633	30	15	15

The results of the questionnaire were divided into four parts: Part 1: General characteristics of the participating groups and their lifestyles. Part 2: Transportation system. Part 3: Social life. Part 4: Ecological aspect. Each part includes a group of factors that are related and provides specific indicators for the assessment of the questionnaire results.

3.5. Data Analysis and Interpretation

3.5.1. General Characteristics of the Participating Groups and Their Lifestyles

Table 4. Questionnaire results related to the characteristics of the participating groups and their lifestyles.

	Traditional Houses 100 Participants, 100%				New Houses 100 Participants, 100%			
Age average (σ = stander deviation)	50 Years (σ = 15.2)				39 Years (σ = 11.5)			
Professions	Employees	Farmers	Craftsman	Other	Employees	Farmers	Craftsman	Other
	15%	64%	11%	10%	72%	12%	7%	9%
Where do you prefer to live?	In the village		In the city		In the village		In the city	
	78%		22%		51%		49%	
Which type of houses do you prefer to live in?	In a traditional house		In a modern house		In a traditional house		In a modern house	
	69%		31%		48%		52%	
Do you feel that your house fits the surrounding landscape?	Yes		No		Yes		No	
	98%		2%		66%		34%	
Do you own agricultural land in the village?	98%		2%		35%		65%	
If yes, do you do any agricultural activities on this land?	78%		22%		42%		58%	
Any of your family members help with these activities?	55%		45%		25%		75%	
Do you feel that you belong to the place that you live in?	94%		6%		68%		32%	

By analyzing the results of the first part of the questionnaire displayed in the summary table, we notice that the average age of the inhabitants living in traditional houses is higher than the average of those living in contemporary houses, and this comes as a logical result after the rapid growth of population during the last three decades, which has increased the demands on constructing more houses in a short time scale. Therefore, the younger generations moved to live in these newly constructed houses, as they are more capable of adapting to a new lifestyle than the older-aged groups, who can be much more attached to their inherited customs, traditions, and lifestyle.

Most of the residents of traditional houses own agricultural land, and most of the family members are engaged in agricultural activities. A significant difference can be observed in the second group, where the majority of the residents of new houses are employees in the service sector, and most of them do not own agricultural land (only 35% do). However, most of those who own agricultural land do not engage in any agricultural activity.

These data reflect the change of the concept of agricultural work among residents. For the residents of traditional housing, farmland is still considered as the main pillar of their lives, and agricultural income still counts as essential in their economic system. Therefore, they have stronger connection to their land, and they pay more attention to agricultural activities, because the design and the structure of their houses facilitate this connection to the farms and the surrounding landscape. In contrast, the lifestyle of the residents of new houses has changed. Agricultural work is no longer a priority, as it is no longer considered the primary source of income and a basis of their economic system. Instead, they started heading to government and private jobs that provide a stable income, unlike the agricultural income, which is very much dependent on the weather (Khadour et al., 2021).

Figure (41) represents the land use changes in the coastal region in general between 2010–2020 (Mohamed, 2021). We can see the increase in the bare and uncultivated lands, especially in the mountainous area of the Syrian coast region, with an increase in the proportion of urban areas, while the plains region is still witnessing agricultural activities, due to the availability of favorable conditions for agriculture, such as fertile land, availability of equipment, and ease of transportation.

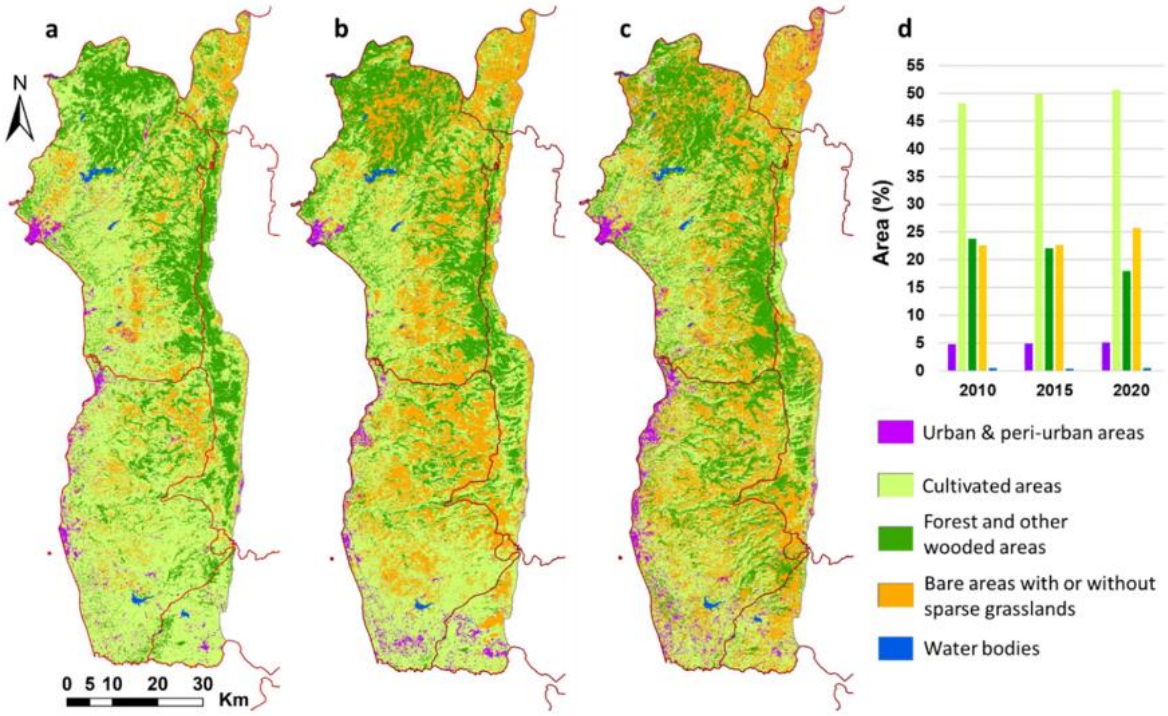

Figure 41. Land use and land cover in the Syrian coastal region between 2010–2020, Source: (Mohamed, 2021)

Another factor that has fostered changes in the way of living is the increasing interest in education in rural areas. For educated people, the pursuit of specialized work suited to their education is more common than going into agricultural work that depends on acquired experience and physical effort. That is why we can see that the design of contemporary houses does not focus on the connection with surrounding nature; hence, the residents of these houses lost that feature, and have been relatively distanced from practicing the agricultural activities specific to this area, and even from small-scale manifestations like gardening. They also lost a certain form of social interaction and traditional gatherings, which were essential for achieving a sense of unity and closeness between the rural residents.

On the other hand, the fact that the residents of traditional houses have participated in the process of building their homes with their hands, and that the building materials are natural materials, provides this group with feelings of belonging to the rural environment, which cannot be said about the other group, whose houses came as a response to the increased demand on housing, without respecting the historical legacy of their environment.

To sum up, the relationship that links the residents of traditional houses with their environment and homeland is much more significant than for those living in contemporary houses. This can be explained by the different reality and conditions they are facing, as members of the latter group are in daily contact with the city, since most of them work there. They will have different needs and develop a different mental image of their life routine related to the practical and artificial lifestyle of the city.

3.5.2. Transportation System

One of the statements on the questionnaire was "Please give an evaluation of the public transportation system in your village".

Through the results of the questionnaire were related to the effectiveness of the public transportation system in the studied villages, as shown in Figure (42), we can see that the evaluation of the transportation means by the inhabitants of the villages seems to be more positive and rated as effective in the villages closer to the city.

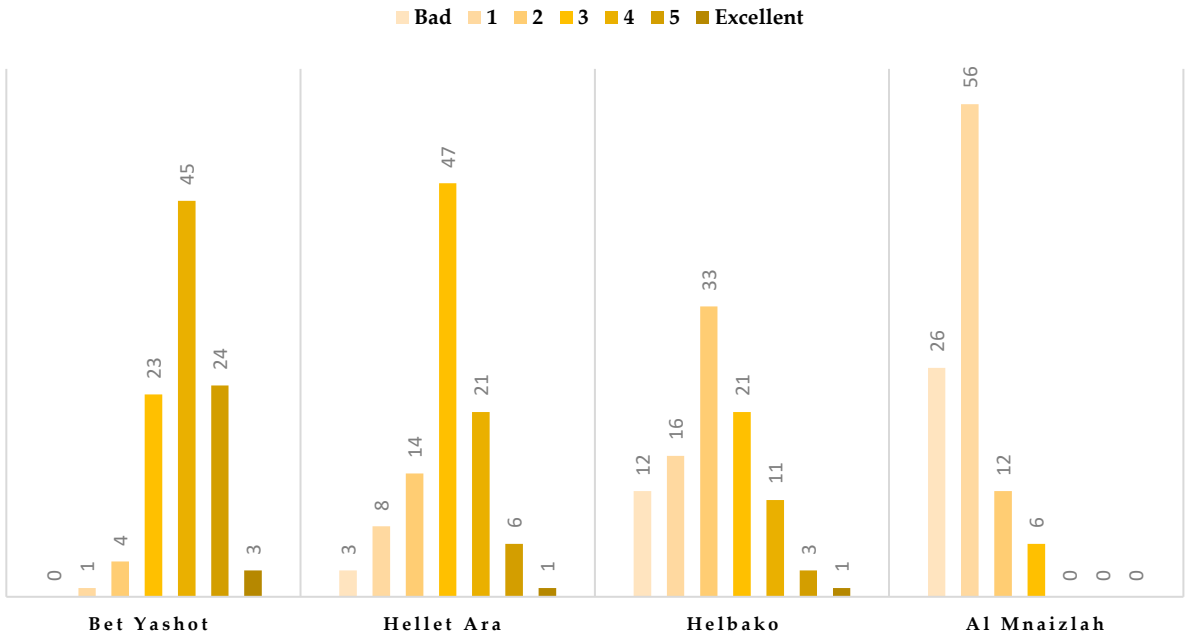

Figure 42: Questionnaire results related to the transportation system, Source: Author.

Comparing these results to the statistics issued by the Regional Planning Commission in Latakia in 2008, related to the proportions of workers in the agricultural sector shown in Table 3 and the proportion of contemporary and traditional housing in the study villages shown in Figure (42), we

note that the ratio of workers in the agricultural industry decrease gradually in the villages that are closer to the urban center. At the same time, the amount of contemporary housing is increasing progressively by getting closer to this urban center, while the numbers of traditional houses are greater in the villages that are farther from the center of Jableh.

Table 5. Percentage of workers in the agriculture sector and other sectors in the studied villages, from the Regional Planning Commission in Latakia (2008).

Village Name	Distance from the City	Agriculture	Industry	Real Estates	Constructions	Restaurants Hotels	Transportation	Service Sector
Bet Yashot	20 Km	4.5%	3.0%	0.5%	4.7%	2.5%	2.7%	81.5%
Hellet Ara	25 Km	12.0%	2.5%	3.5%	5.0%	5.0%	4.5%	67.5%
Helbako	30 Km	22.0%	1.5%	3.0%	4.5%	4.0%	4.0%	61.0%
Al Mnaizlah	35 Km	35.0%	3.0%	2.5%	3.0%	2.5%	3.0%	51.0%

Similarly, we can see a clear relationship between the effectiveness of the transportation system and the increasing impact of urban areas on the surrounding rural environment, and the decisive factor appears to be the proximity of the new housing to the urban center.

This is largely related to the overlap of economic systems between cities and the surrounding rural centers, which has increased by facilitating connectivity through the transportation system. At the same time, rural areas farther from the urban center, with less effective transportation systems, seem to have preserved the traditional way of living—that is, the villages that are difficult to reach have more independent economic systems, and their built and natural environments kept the traditional character. Figure (43) shows The ratio of modern and traditional houses in the four villages.

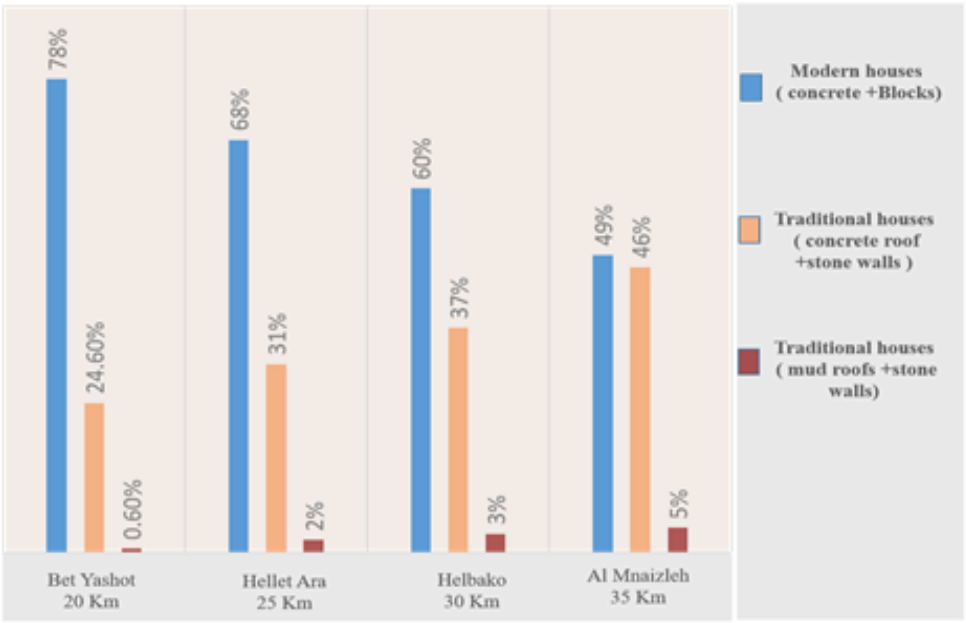

Figure 43: The ratio of modern and traditional houses in the four villages. Source: (The Regional Planning Commission in Latakia, 2008).

3.5.3. Social Life

Table 6. Questionnaire results related to social life

	Traditional Houses: 100 Participants, 100%					New Houses: 100 Participants, 100%				
Do you do any activities in the nature around you?	No	Picnic	Sports	Farming	Other	No	Picnic	Sports	Farming	Other
	8%	14%	61%	84%	22%	24 %	34 %	53%	22%	24%
Do you have good relations with the neighbors?	Yes		Medium	No		Yes		Medium	No	
	76%		16%	8%		33%		49%	18%	
Do you share your house with another family (are the different generations live together)?	Yes		No			Yes		No		
	68%		32%			19%		81%		

The third section of the questionnaire includes questions related to social life in the Syrian coastal countryside. Based on the results, it is clear that social relationships and ties have changed for the residents of the new and traditional houses, which has affected social life in the countryside in general.

The social relationships and ties that link the residents of traditional houses together are stronger and more durable, and this is due to several reasons; most important among them is the layout of the traditional residential units, which were open towards the outside, allowing a physical connection to the surrounding environment. This allowed visual connection to other houses, encouraging more social interaction and weakening boundaries. The rural society with traditional houses was considered to be an integral unit, where people coexisted in very harsh conditions in terms of political and economic organizational aspects. In particular, when the feudal system was dominant over the entire countryside of the coast, it was very important for the inhabitants to stand beside each other and strengthen their relationships.

On the other hand, a significant characteristic of the traditional residential unit was that it occupied a relatively large area and accommodated more than one family, as a result of difficult economic conditions that the Syrian coastal countryside witnessed in recent decades, so it was useful to increase the number of family members for a better life, as it was seen as an increase in the workforce in agriculture, and thus an increase in the financial income of the family. Due to this state of family unity and economic difficulties, when a family member wanted to get married and form his or her own family, a new room was constructed attached to the original house as a solution to avoid wasting agricultural land and money.

The changes in the rural economic system during the past three decades, along with increased connections to the nearby urban areas by the transportation system and the move of large number of rural residents to live or work in the city, have led to clear changes in social life in the countryside. The influence of urbanization has started to appear in every aspect of the rural inhabitant's daily life, and a tendency toward increased privacy and emphasis on territorial boundaries has started to develop. This process was reflected in the spatial structure of the village with the increase of multi-story buildings similar to those in the city, due to the profit they provide to the owner, since they can accommodate multiple families, with each having an independent home and life (Khadour et al., 2021).

3.5.4. Ecological Aspect

According to the results displayed in Table 7, there has been a clear shift in the perception toward the land and how it can be used. Instead of the old traditional gardening and agricultural activities that were meant to provide the daily needs of inhabitants, people have started to allocate all of the land to grow more profitable crops that provide more and stable income, such as olive trees and tobacco. Figure (44) shows Tobacco cultivation in Bet Yashou Village.

Figure 44. Tobacco cultivation in Bet Yashout, Source: Author.

It is clear that both new and traditional houses suffer from some functional problems, but the nature and quality of these problems differ between the two types.

Traditional houses have challenges in adopting innovations, such as the ability to allow electrical installations, since most of them need electrical connections to be installed inside the walls built of stone. In contrast, the contemporary houses were built taking into account requirements like electrical appliances and their extensions, as well as advanced sewage systems. On the other hand, most of the problems that the residents of contemporary houses suffer from are related to the special environmental and climatic conditions in this rural mountain area, which is characterized

by cold, rainy winters and mild summer weather. Most of the residents suffer from moisture inside their homes and difficulties with thermal insulation, especially in the winter. The traditional houses are more adaptable to the environment in that sense; they are more efficient from an ecological aspect, because they are built with local natural materials and inherited traditional methods, which give these types of houses more ecological value. For example, the natural stone used in construction constitutes significant thermal insulation and maintains a moderate temperature inside the house in summer and winter; in addition, the rainwater from the winter was stored in tanks built from stone adjacent to the house, to be used later in the summer. The ecological superiority of the traditional housing units is very clear compared to the incompetence of the contemporary ones, which were designed and built with no other consideration than a quick solution to accommodate the increasing population.

Table 7. Questionnaire results related to the ecological aspect for the houses in the studied villages.

	Traditional Houses: 100 Participants, 100%					New Houses: 100 Participants, 100%				
If you live in a new house: Do you have any connection with the surrounding landscape?	-	-	-			Yes, I have a garden and I use it	Yes, I have a garden, but I do not use it	No, I do not have any connection		
	-	-	-			21%	23%	56%		
Do you have any problems with your house?	Yes	No				Yes	No			
	53%	47%				62%	38%			
If yes, which kind of problems do you have?	Thermal insulation	Moisture problems	Sanitation problems	Electrical Problems	Water problems	Thermal insulation	Moisture problems	Sanitation problems	Electrical Problems	Water problems
	7%	14%	43%	62%	14%	63%	71%	5%	11%	54%

3.6. Conclusions of Chapter 3

The major changes that occurred in the Syrian coastal region during the last century in political, social, and economic terms have led to fundamental changes in the planning of the coastal cities and fostered their economic growth, which has transformed them into polarization centers (Al Zaied, 2016). This has encouraged migration from rural areas towards the urban centers, because they provided more work opportunities. This has initiated the process of urbanization and counter-urbanization in the region.

The effects of urbanization have reached some remote villages of the Syrian coast, and this was facilitated by the development of the transportation system, which led to a significant change in the land use in these villages, especially in those with direct connection to the main transportation routes. The income provided by commercial and industrial functions developed along these routes has presented a more stable and reliable source of living than agricultural income, which is subject to weather. However, the construction of regional roads, such as the highway connecting the coastal region with the middle region in the study area, brings radical changes and development to the surrounding areas, and in some cases, it can be a threat to losing heritage values. That is why a comprehensive plan should address these aspects, and make sure that the impact of this construction is controlled and preplanned.

Over the last three decades, the impact of these changes has increased to include most rural areas on the Syrian coast, but in varying degrees, depending on its position relative to the urban centers.

Changes in land use in rural areas have been accompanied by changes in housing models. The recent residential development model represents a new style, with a greater resemblance to the urban modern residential units, and thus has abandoned some attributes and values to learn from architectural ingenuity in adapting to the close environment and the tangible evidence reflecting the inhabitants' traditions and strong connection with nature. Furthermore, the old traditional house was constructed of natural materials, and presents an ecological housing model that is compatible with the environment of the region, while the recent model has lost this advantage due to the use of concrete and artificial materials. The diversification and change of activities in the areas adjacent to the rural houses has had a great impact on the nature of interaction between the village residents and nature. The horticultural activities have deteriorated, and residents no longer rely on the land to provide their daily needs for food and supplements, as these were easy to access from

newly found commercial businesses. Agricultural activities are now limited to producing crops for commercial purposes, especially tobacco and olive fruits.

The case study reflects the variety of impacts of urbanization and counter-urbanization processes, which appear clearly in every detail of the lifestyle of the community; however, the developments that are related to the change in the use of lands, which have a direct impact on houses and the new way of interaction between the dwellers and the surroundings of their houses, is very crucial. The questionnaire results indicate a loss of connection and change in the recognition of nature for the dwellers of the new housing model, which can create difficulties for future development plans, especially ones that aim to restore the values and characteristics of the coastal region, as it can be harder to motivate people to engage in the process without the appreciation of their values.

New technologies and materials in housing result in ecological disadvantages, as well as negative consequences for living conditions (poor heat isolation, dampness problems, connection to nature lost). The answers to questionnaires clearly reflected that ties to the local landscape are much stronger for those living in rural areas than for those residing in crowded contemporary urban housing. The economic dependency in agriculture and direct connection to nature result in a greater awareness towards the landscape among the inhabitants living in rural places, with lifestyle contributing to the preservation of the landscape character and identity.

Although the development projects for the region were planned to improve the quality of life of the rural areas and provide more services to these areas, they had also an impact on the identity and the cultural heritage of the countryside in the region, and made it take an undesirable direction. It gave the villages the characteristics of the city with no regards to the important assets of the natural environment and its contribution to the social life and spatial identity of the countryside.

Housing and rural development policies must focus on the importance of the cultural and social dimensions of rural society, which preserve the essence of the relationship between man and nature and prevent the transformation of rural housing into a consumer unit that forms a barrier between the inhabitant and the natural environment.

CHAPTER 4. URBAN EXPANSION AND EFFICTIVNESS OF MASTER PLANS

The Syrian cities suffer from major urban problems, as a result of the inadequacy of the organizational plans and the inefficiency of the master plan used in developing the city and determining the directions of its future growth, because these plans did not depend on clear planning standards, but rather were in another way just plans for organizing land uses formulated according to standards determined by the legislative decree Nomber / 1 / for the year 1982 (Abdin et al. 2013), which are traditional quantitative standards in the first place for building densities, population and transportation.

As mentioned previously, Latakia Governorate divided into four administrative districts (Latakia - Jableh – Al Qurdaha - Al Haffah), Latakia district, positioned as the central and principal administrative hub within the governorate, commands a substantial demographic influence, constituting 51% of the entire governorate population. With a district populace of 603,831, it assumes a pivotal role in relation to the overall governorate population of 1,080,000 (Maya, 2014).

4.1. Latakia city urban structure

Latakia district is divided into 20 neighborhoods, each has a distinctive population, density, and area. The highest population density is in the western neighborhoods of the city, which are accompanied by both commercial and residential activities (UN-Habitat, 2014).

- Area 1 (11 neighborhoods): represents the modern part of the city, which took the place of the Old City during the 1980s and 1990s period of significant urban transformation. The majority of the city's marketplaces and logistical infrastructure are located in this highly populated neighborhood.

- Area 2 (5 neighborhoods): The area had business, residential, and agricultural activities. Low density informal housing was created when the rich agricultural fields were progressively urbanized.

- Area 3 (4 secondary settlements): Previously held by tiny secondary communities (initial population didn't exceed 13,000 in 2010 estimates), which developed in Latakia's perimeter and attracted urban growth. Recently this area has been incorporated to the city municipal authority.

Together, Areas 1 and 2 make up the majority of Latakia's urban area (8,300 ha). It also has significant logistical transportation facilities, including a port, two duty-free zones, and complex rail and road systems. Figure (45) shows Latakia city urban composition and population density.

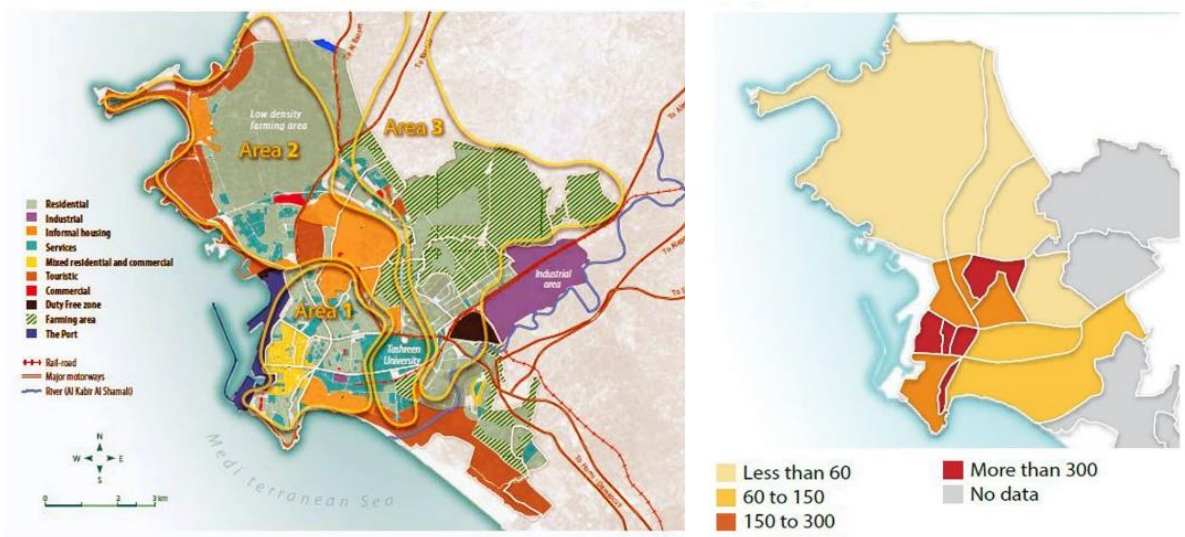

Figure 45: Latakia city urban composition & population density,(people/ha), Source (UN-Habitat, 2014).

Latakia City is recognized as one of the cities experiencing fast urban expansion, it has expanded along with other cities as a result of both organized and disorganized urban expansion, and its built-up areas have evolved in a variety of ways to meet the growth that is occurring there. These changes undoubtedly contributed to the city's development and brought about adjustments that led to demands and issues that must be considered while creating new urban development plans.

4.2. Latakia Urban Master Plans

The first Master plan for the city was prepared in 1951, the area of the city at that time was estimated at 200 hectares (Maya, 2014). In 1964, the plan was developed to accommodate 250,000 people. The municipality issued laws for the expansion and extension of the city and set administrative boundaries for it. In 1976, a new master plan was drawn up for the city By the Arab Consulting Engineers Group on the basis of analytical studies for the future of the city, as the inhabited residential area at that time included 217,533 people with a built-up area of 656 hectares (Maghrakona, 2019). The plan also estimated the possibility of doubling the city’s population and the built-up area until the year 2000, and solutions were developed for potential problems in increasing the number of automated means of transportation in the neighborhoods of the modern city and large villages, which are expected to become suburbs attached to the spatial structure of

the city. In addition, this plan was taken into account the topographical situation of the city (which was missing from the previous plan) and the general economic situation (agricultural, industrial, tourism), especially land uses.

In 1984, the new master plan for the city was ratified with an area of 3,190 hectares. The new master plan focused on finding areas for the future expansion of the city to accommodate 500,000 people. Organizational plans were drawn up for the future residential communities surrounding the city. After that, the city began to spread to the north and east until it extended over an area of 4,348 hectares in 1991 (Maya, 2014). Figure (46) shows Latakia urban growth.

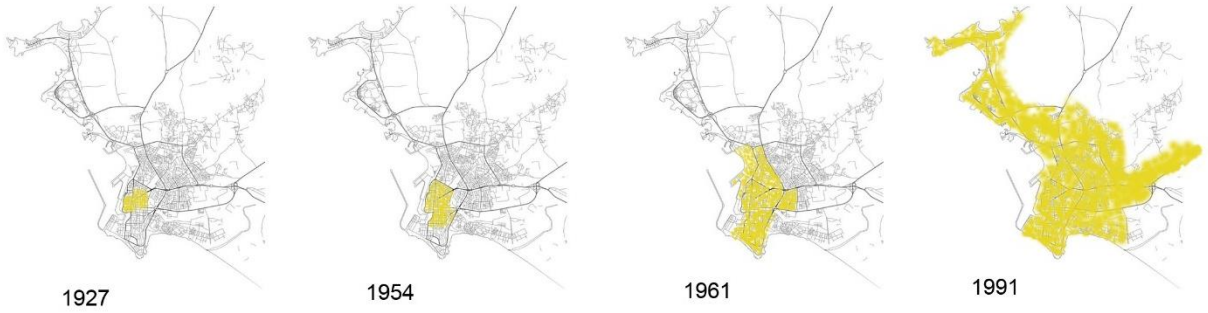

Figure 46: Latakai city urban growth, Source: Author based on (Maya, 2014)

Despite the fact that the new master plan attempted to outline the areas where the city would expand in the future, slums began to appear and spread haphazardly between the city limits and planned residential neighborhoods. That was an inevitable result of the plan's inability to absorb the growing demand for housing as a result of the increase in immigration from rural areas to the city, due to the lack of services in rural areas and the concentration of most of them in the city. These slums spread over an area estimated at 21% of the area of the full scheme, and its population was estimated at 180,000 people (Maya, 2014). The expansion came at the expense of open spaces, green areas, and agricultural lands surrounding the city, which caused an increase in population density and a decline in the quality of life in these settlements.

1984 Master plan was based on a study of the city's growth absorption by defining areas for expansion in the general plan on three assumptions for the expected population increase, and the strongest theory was that the growth factor would be 48.1 per thousand for the period between 1975-1990 and 44.1 per thousand for the period 1990-2000.

However, due to the city's declining yearly population growth factor, the predicted density was higher than reality, particularly in the second stage (Maya, 2014). Additionally, there were differences in density between the earlier phases, which is a natural phenomenon often imposed by urban expansion. The proposed expansion areas served as the foundation for the 1984 master plan, and it should be highlighted that this strategy left a significant gap between securing the services of these expansion areas and organized residential communities located on the outskirts of the city. Thus, increasing the consumption of agricultural land, road lengths, and travel time. In 1987, Latakia's hosting of the Mediterranean Games marked Syria's debut in organizing major international sporting events, involving 18 countries. The occasion spurred profound urban development, creating expansion of 156-hectare sports city that includes sports facilities with green public spaces. This versatile complex not only became a hub for athletic training and events but also evolved into a vibrant center for festivals and entertainment activities, enriching Latakia's cultural landscape. The Games spurred the construction of stadiums, training centers, and improved infrastructure, enhancing the city's overall urban planning and public services.

In 2001, the General Company for Engineering Studies and Technical Consultations got the permission from the city council to study and issue a new master plan for latakia city. The study is conducted in three phases with a duration of 36 months. The project was supposed to be completed in the year 2004, but the announcement of the master plan was postponed several times in order to keep pace with the urban development of the city until it was announced in 2008. The area of the city in the new plan amounted to 10,034 hectares, figure (47), with an area of 4,800 hectares more than the plan announced in 1984 (Latakia City Council,2013).

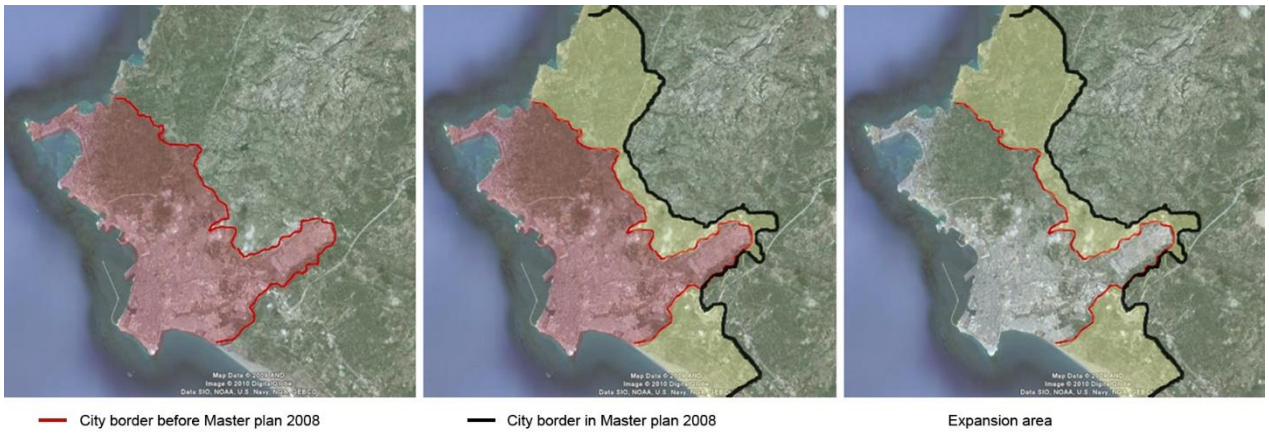

Figure 47: Latakia City boundries regarding 2008 Master Plan, Source; (Latakia City Council,2013) modifeid by author.

In order to develop the final Master plan for the city, five alternatives were proposed for urban development of the city. These alternatives were studied and evaluated according to several planning and design criteria.

Table (8) shows the 5 alternatives of the 2008 Master plan after the analysis phase as it presented by General Company for Engineering Studies and Technical Consultations in 2004.

Alternative	Objectives
1	Continuation of the previous general master plan approach, with city expansion, organization of agricultural areas, and road network adjustments
2	Defining the city boundaries with a highway, utilizing available land for housing, developing the Marj area, and ensuring good connectivity to public networks.
3	Organizing part of the agricultural area in Dumsarkho, improving surrounding main roads, and developing nearby population clusters.
4	Achieving a greater balance between the city and nearby population centers, utilizing them to create new suburbs and developing tourism along the coast.
5	Linear extension of the city from the northern and southern beaches towards Jableh, developing residential areas, and connecting them with a highway.

Finally, the approved alternative was a result for combining the alternatives number 4 and 5, which achieved the highest percentage of conformity to the proposed planning standards and the vision of the plan was introduced in main points (General Company for Engineering Studies and Consultations, 2004).

1- The adoption of the strip expansion of the city achieves the appropriate aesthetic goals for placing the city on the sea

2- Population and tourism development is achieved with the same strategic importance for the future.

3- It achieves the strategic and future regional goals in terms of creating a demographic balance

between the city and the surrounding and nearby population centers, thus reducing the burden on the city and promoting new urban centers.

4- Achieving these new urban gatherings around the city and in its territory in the future and in the long run works and contributes to curbing the flow of immigration to the city.
5- This alternative achieves long-term future orientations towards the integrated development of regional tourism, north and south.

6- The proposal of maritime passenger transport routes contributes to the revitalization of tourism development and contributes to alleviating the burden on public roads. Figure (48) shows the main development strategies in Latakia Master plan 2008.

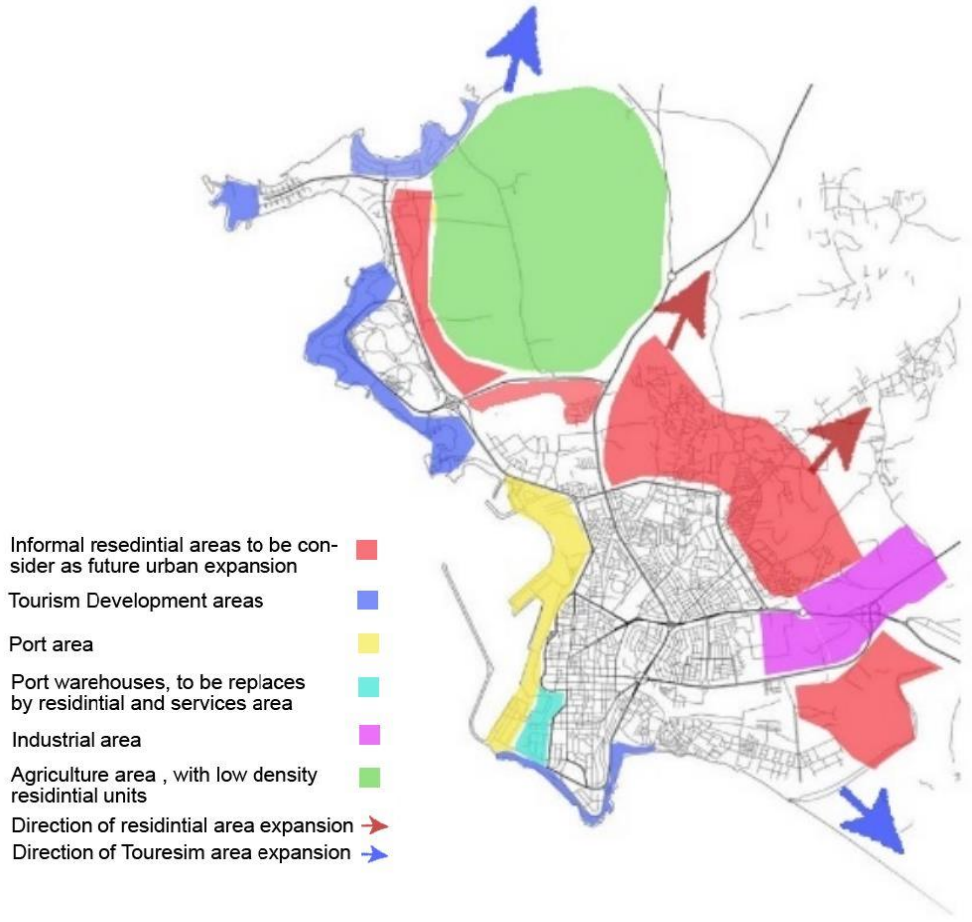

Figure 48: Development strategies in Latakia Master Plan 2008, Source: (Abdin et al. 2013) modified by author

4.3. Development strategies in the master plan

4.3.1. Urban expansion strategy

Depending on the population studies of the city, the population of the city was estimated at 831,000 people in 2025, according to the adoption of a population growth factor of 3 per thousand, divided as follows: 560,000 residents within the current spatial area of the city, and 270,000 residents in the expansion areas (General Company for Engineering Studies and Consultations, 2004). In order to accommodate this population, increase, two expansion approaches were presented:

The first approach was represented by external expansion outside the current urban structure limits, in this regard, eight zones of urban expansion were defined, figure (49). The area of these expansions was 1,226 hectares, five expansions areas were proposed to accommodate the population growth of the city during the first ten years, which was expected to reach 138000 residents, these five areas was estimated to accommodate 96,000 residents (Maghrakona,2019). Figure 48 shows the proposed zones for future urban expansions in Latakia 2008 Master plan.

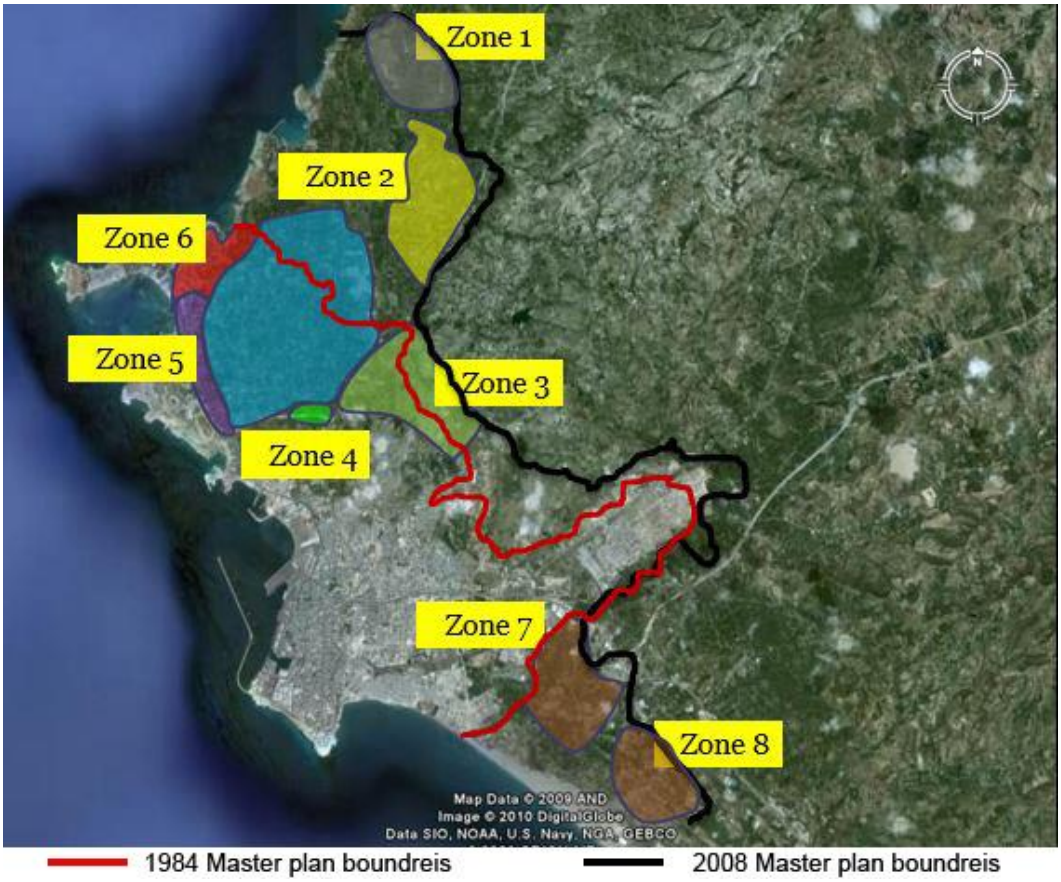

Figure 49: Proposed Expansion Zones, Source: (Latakia City Council,2013).

The second approach represents the internal expansion, figure (50), by filling the gaps, accommodating the empty spaces, and utilizing the potential for absorption of the irregular areas after including these areas to the limits of the new plan and reordering them.

Several informal residential areas appeared in the city, with an area of 655 hectares, or 21% of the city's built-up area. The population of these areas reached 187,000 people, with an average density of 390 people / hectare. Since these areas occupy important sites within the city boundaries and with the connection to the organized neighborhoods, it was necessary to develop a plan to reorganize these areas and link them with the organized plan and raise the quality of life in them. The plan included:

- Connecting these areas with each other on the one hand and with the neighborhood and the city in major ways on the other hand
- Determine zones for installation, maintenance, and restoration of the services in them Determine zones of urban developing intervention through:
- Taking advantage of the vacant lands that are not subject to the organized plan and proposing a new urban organization that allows the transfer of residents to these areas after the completion of their construction.
- Securing the necessary services (educational - health - commercial - ....) according to the possibilities available from vacant lands.
- Improving existing road sections as much as possible and securing connecting roads with the main transportation network.

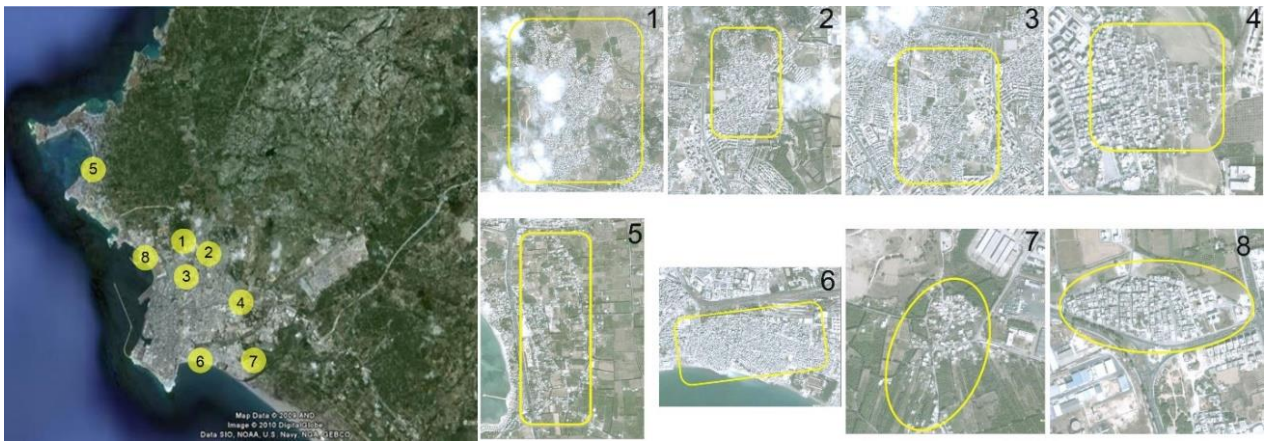

Figure 50: Informal residential areas to be organised in the 2008 Latakia Master plan, Source: (Latakia City Council,2013).

The proposed expansion strategy provided good suggestions for organizing random housing areas and determining areas for future growth, but these enhancements were only general suggestions that skipped over crucial information about the social structure of these areas, which are thought to be closer to the rural system and require an intervention mechanism that ensures maintaining the structure of these communities and integrating them into the urban framework. Furthermore, neither the environmental solutions that might be employed to meet the future needs of these places' infrastructure nor the process for developing it were discussed in this study which might cause serious challenges in the future (Khadour et al., 2023).

4.3.2. Housing development strategy

The housing shortage is regarded as one of the most serious issues facing Latakia governorate in general, and the city center in particular. Planners tried to provide some solutions to lease this issue in the new master plan. Therefore, in addition to structuring informal areas and improving their life conditions proposals, the housing strategy aimed to achieve a better balance between urban districts and the nearby semi-urban areas by include these areas in the newly structured plan and dispersing future population growth there.

The housing development strategy proposed:

- Involving some of the suburban settlements outside the city in the new planned strategy and investing in bare land by starting new housing projects.
- Putting the slums in order, enclosing them, and connecting them to the organized areas.
- Urban expansion will likely go in the direction of the north and north-east for housing, with a chance that it will also move south as a result of the port warehouses' transformation into an urban region.

Here, we find that the housing strategy relied on proposing new residential areas in the city without going deeper to find solutions to the current problems that this sector suffers from. Such as duplication problem with housing issue, as at the same time while housing demand is increasing, there are many vacant housing units, amounting to 20% of the governorate's housing units, which is 286,869 houses for the year 2010, including 140,245 houses in urban centers (Maya,2014), these vacant houses are mostly in the city center and belong to a small percentage of the owners, and their prices are very high, exceeding the purchasing power of those with limited income. which

drives many families to settle in irregular areas despite the poor services and poor conditions, as it suits their economic situation (Khadour et al., 2023).

4.3.3. Urban mobility and public transportation

Due to the concentration of the governorate's main government centers in Latakia city and the consequent increase in daily movement to and from the city, as well as the rise in the number of private cars that worsened traffic congestion and made moving around the city difficult, the demand for transportation in the city has increased significantly, placing a heavy burden on the public transportation system (Khadour et al., 2023).

Road networks are separated into main streets with heavy traffic connect the center with the main sections of the city, and secondary streets that cross them and go into residential neighborhoods. Secondary streets make up 69% of the overall road network's area while main streets make up 31% of it (Assaad & Salloum, 2020).

101 buses run on the nine lines that make up Latakia's public transportation system. 82% of the public transportation network is physically coherent with the major thoroughfares that serve as hubs for the everyday flow of people inside the city. While 18% of the public transport network agrees with secondary roads, which serve urban areas within the city (Assaad & Salloum, 2020). Figure (51) shows public transportation network in latakia.

Figure 51: Public transportation network in latakia city, Source: (Assaad & Salloum, 2020)modified by author

In order to relieve congestion in the city center, it was suggested to build a ring road that links the northern and southern urban areas, as well as a number of roads that connect the new expansion areas. However, no public transportation system was suggested; instead, plenty of parking spaces were allocated, which in turn encourages the use of private vehicles and has a negative impact on the city's traffic.

The master plan proposed to combine central and decentralized roads for the distribution of services, and this merger causes confusion between local and regional traffic, reduces the safety factor in the vicinity of the residential environment, and weakens social communication Maya,2014). Pedestrian paths and roads of their own have also been proposed, but at specific hours. In order to promote tourism, the plan suggested that maritime transportation lines be established connecting the coastal tourist spots along the shoreline (Khadour et al., 2023). Figure (52) shows transportation system proposal in latakia master plan 2008.

Figure 52: Transport system proposals, Source: (Abdin et al., 2013) modified by author.

The plan falls short in addressing critical aspects of urban mobility. It lacks a mechanism for improving existing road infrastructure within the city. Furthermore, the plan fails to prioritize non-motorized transportation by neglecting proposals for enhanced pedestrian walkways and cycling paths. A key omission is the absence of a network of car-free corridors, particularly in the city center, which would significantly improve accessibility and encourage residents to walk, cycle, or utilize public transportation (Khadour et al., 2023).

4.3.4. Green network and open spaces

Agriculture and horticulture have a significant role in the economy of the Latakia Governorate, which is shown in the fact that this industry contributes 22% of the total gross domestic product of the city (UN-Habitat, 2014). However, these activities face significant obstacles, such as the expansion of urban areas consuming farmland and the decline in agricultural profitability, which brought the percentage of persons employed in agriculture down to 11.5% in 2011. whereas in the past it had been at 22.5 % (Deep,2020).

Table 9: Land use and GDP in Latakia Governorate, Source: (Deep,2020), (UN-Habitat, 2014).

Current Land use: Source: Author based on (Deep,2020).		Latakia Governorate GDP by sector. Source: Author based on (UN-Habitat, 2014)	
Agriculture land	43.5 %	Agriculture land and Forestry	22 %
Open and Green spaces	4 %	Industry	17 %
Residential areas	21.49 %	Building and construction	2 %
Tourism	4.95 %	Hotel and Tourism	15 %
Public services	16.21 %	Transportation and Communications	15 %
Port area	3.34 %	Finance, Insurance and Real estate	5 %
Industrial areas	3.39 %	Public services	24 %
Vacant spaces	2.16 %		

The lack of green spaces, gardens, and open areas within the urban fabric of the city is notably conspicuous on the cartographic representation, particularly within the city center (Figure 20), where the highest population density is observed. Notably absent from the urban landscape is a public park, a crucial component integral to the local ecosystem. Furthermore, the city's primary coastal expanse is dominated by the presence of the port, impeding direct access to the shoreline. In response to these spatial limitations, Latakia Sports City, established in 1987 as the venue for the Mediterranean Sport Games, has emerged as a prominent refuge for urban residents, offering a convergence of sports facilities, expansive green spaces, and open areas. This enclave has garnered substantial popularity among city dwellers seeking respite from the pressures of urban Living. Figure (53) shows the green and build up area in latakia.

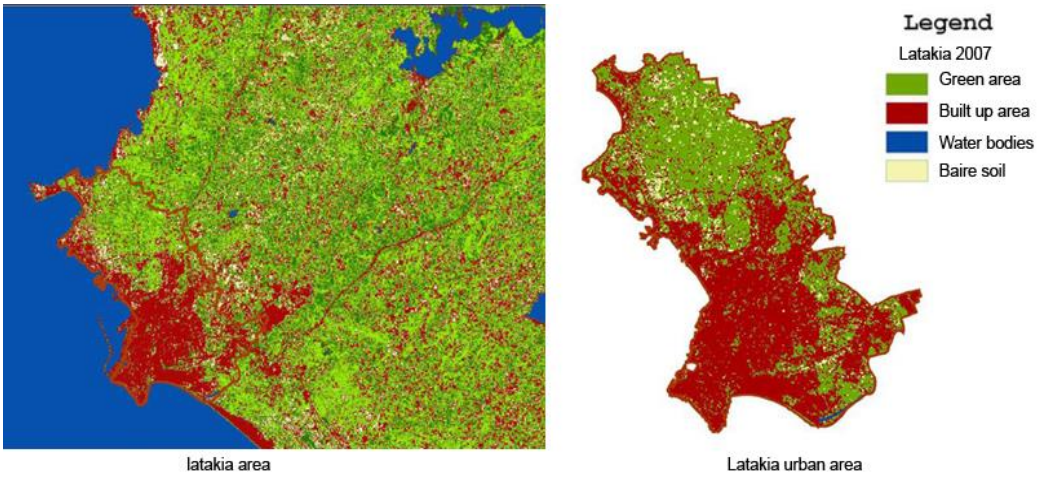

Figure 53: Green & build in areas in latakia, Source: (Maghrakona, 2019) modifid by author.

In recent years, Latakia city has seen significant climatic changes, including changes in precipitation rates, an increase in average temperatures, a drop in groundwater levels, and other significant climatic shifts that have an effect on the ecosystem (Salameh & Fallah, 2018; Abu Hammad, Salameh, & Fallah, 2022). The land use scheme that was suggested in the Master Plan did not give priority to expanding the effectiveness of the green network in the city, which plays an important role in responding to the effects of climate change. Instead, it made bigger areas available for residential and tourism-related purposes, some of which spread over large parts of the beach. In addition to this, it decreased the amount of land used for agriculture, which is regarded to be a fundamental component of the city's local economy. Figure (54) shows the Proposed land use scheme in Latakia Master Plan 2008.

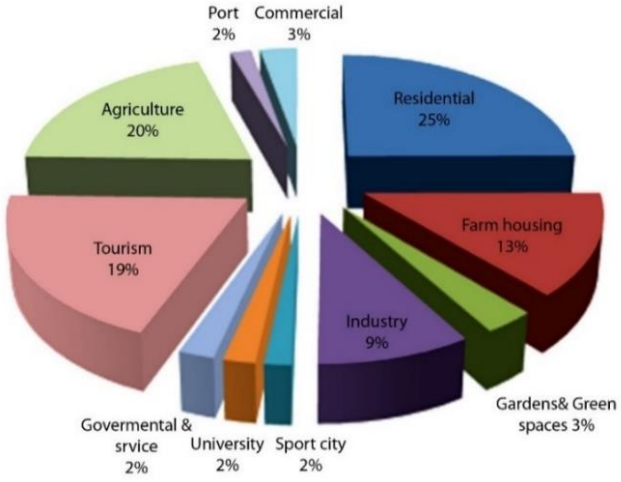

Figure 54: Proposed land use scheme in Latakia Master Plan 2008,Source: (Latakia City Council,2013)

4.4. Comparative Analysis

This study aims to conduct a comparative analysis of urban development strategies outlined in the Latakia master plan in relation to select Arabic and European cities. Specifically, the analysis will encompass two phases:

Phase 1: Regional Comparison, this stage of the analysis will focus on comparing the urban development strategies delineated in the Latakia master plan with those of Abu Dhabi and Alexandria, both representative of urban contexts within the Arab region. Through a systematic examination of key parameters such as infrastructure planning, environmental sustainability, and social development initiatives, this stage aims to elucidate commonalities and disparities among the selected cities, thereby providing insights into regional urban planning practices and challenges.

Phase 2: Cross-Regional Comparison, Subsequently, the analysis will transition to a cross-regional comparison, juxtaposing the urban development strategies of Latakia with those of Barcelona and Montpellier, two prominent European cities renowned for their innovative approaches to urban planning and sustainable development. By exploring divergent methodologies, policy frameworks, and implementation strategies across different geographical and cultural contexts, this stage seeks to identify transferable best practices and lessons learned that may inform and enrich urban planning endeavors in Latakia and beyond.

Through rigorous comparative analysis spanning both regional and cross-regional dimensions, this study endeavors to contribute to a deeper understanding of urban development dynamics and strategies across diverse cultural and geographical contexts. By elucidating shared challenges, innovative solutions, and opportunities for cross-pollination of ideas, the findings of this study aspire to inform evidence-based urban policy formulation and decision-making processes, ultimately fostering sustainable and inclusive urban development outcomes in Latakia and analogous urban settings worldwide.

4.4.1. Regional comparative

Table 10: Comparative Analysis of Urban Development Strategies in Latakia, Abu Dhabi, and Alexandria

Criteria	Abu Dhabi	Alexandria	Latakia
General vision	The plan focuses on **creating a globally competitive, diversified economy with a high quality of life for its residents**. It emphasizes sustainability, efficient infrastructure, and a resilient urban environment that can adapt to future needs.	The overarching goal is to **create a sustainable urban environment that accommodates population growth** and promotes economic development. Plans focus on addressing challenges such as unplanned urban expansion, population growth, and environmental degradation.	Latakia Master Plan had a **strong emphasis on promoting population growth, attracting tourists, and fostering economic development** in the city. Its vision was to position Latakia as a key economic and cultural hub in the region (General Company for Engineering Studies and Consultations, 2004).
Infrastructure and services	Abu Dhabi's master plan prioritizes the development of robust infrastructure to support anticipated economic and population growth. Key projects include the **expansion of transportation networks, water and energy supply systems**, and digital infrastructure. The plan also focuses on providing essential services such as education, and recreational facilities to ensure a comprehensive urban environment.	The plans advocate for a comprehensive infrastructure network encompassing **transportation, water supply, sanitation, and waste management.** The 2032 Strategic Plan introduces a data-driven approach to infrastructure development. The use of **green corridors** for **rainwater management** exemplifies this focus on environmentally conscious urban planning.	Latakia's infrastructure is less developed than the other two cities. The master plan has plans to improve infrastructure in recent years, **including upgrading the port and building new roads, and new maritime roads** but more needs to be done to improve access to basic services for residents (General Company for Engineering Studies and Consultations, 2004). The plan's provisions for green infrastructure were deemed poor
Urban mobility	includes extensive investments in public transportation to **reduce reliance on cars and improve connectivity**. The plan outlines a network of **regional rail, metro systems, street trams**, and buses to achieve a **40% modal split for public transport** by 2030. This transit-oriented development aims to enhance accessibility, reduce traffic congestion, and lower carbon emissions	Plans aim to enhance urban mobility by **promoting public transportation, cycling, and walking**. Strategies include expanding bus networks, introducing tram and light rail systems, improving pedestrian and cycling infrastructure, and implementing intelligent traffic management systems.	The city has a relatively limited public transportation system with bus networks. Master plan **recognized the need to improve transportation infrastructure and expand public transportation options**, but it **did not prioritize sustainable modes of transportation** like cycling or increasing pedestrian paths. Instead, the plan focused more on traditional modes of transportation, with more areas for parking (General Company for Engineering Studies and Consultations, 2004).

Criteria	Abu Dhabi	Alexandria	Latakia
Green and Open spaces	The master plan incorporates significant green and open spaces to enhance urban livability. These include public parks, waterfronts, and landscaped areas that provide recreational opportunities and improve environmental quality. The goal is to integrate natural elements within the urban fabric, promoting biodiversity and offering residents a connection to nature	Integration of green spaces like parks and green corridors for environmental benefits and recreation (2005 and 2032 Plans). 2032 Plan proposes rainwater management strategies using green infrastructure.	The Master Plan did not include a comprehensive strategy to improve the green network and open spaces. This is evidenced by the fact that the plan allocated more areas for urban expansion, without prioritizing the preservation or creation of green space.
Housing Strategy	Abu Dhabi's housing strategy focuses on **creating diverse and affordable housing options** to accommodate various income levels and family sizes. The plan includes the development of high-density residential areas near transit hubs, mixed-use developments, and community-focused neighborhoods. This strategy aims to ensure equitable access to housing and support a balanced socio-economic environment	Creation of new **suburban districts with modern housing units** (1958 Plan). Revitalization of historic neighborhoods (2005 Plan). 2032 Plan lacks a specific housing strategy detail but **focuses on land-use allocation for residential areas**.	Latakia master plan primarily focuses on the **introduction of new residential areas**, with relatively less emphasis on enhancing existing residential areas and providing social housing.
master plan updates and revisions.	The master **plan is designed to be adaptive and responsive to changing circumstances**. Regular updates and revisions are planned to address new challenges and opportunities, ensuring the plan remains relevant and effective.	Alexandria has a history of revisiting and updating its master plans, demonstrating adaptability. This allows for addressing changing needs and incorporating new concepts like sustainability. **Public engagement** in revisions has been limited in the past but **is stressed in future plans.**	The master plan in Latakia is characterized by infrequent updates, occurring approximately every 25-30 years. This extended interval between revisions means that the master plan may struggle to keep pace with the ongoing changes and developments in the city. making it less efficient compared to master plans that undergo more frequent updates.

4.4.2. Discussion of regional analysis

All three cities aim for economic development and improved quality of life amid population growth, but their approaches diverge significantly due to unique economic contexts, historical backgrounds, and topographical constraints. Latakia's plan lacks a long-term vision for sustainability and fails to address critical issues such as traffic congestion or green spaces. This absence of forward-thinking infrastructure and environmental planning could hinder the city's ability to adapt to future challenges and enhance residents' quality of life. Economic constraints with limited financial resources further exacerbate Latakia's planning deficiencies. The city's agricultural lands surrounding the urban area limit free space for expansion, presenting additional challenges. However, despite these limitations, Latakia's master plan is a good start toward a more comprehensive strategy that could include improved sustainability measures and enhanced quality of life for its residents in future iterations.

In contrast, Alexandria shows a stronger commitment to sustainability and inclusivity with its Plan 2032, although the effectiveness of its initiatives remains to be seen. The city's previous urban development plans were not very efficient, often falling short in implementation and impact. However, Plan 2032 includes more comprehensive elements of sustainable urban development, such as investment in public transport and the introduction of green spaces. Alexandria's relatively more robust economy allows for greater investment in such infrastructure projects. Nevertheless, Alexandria faces significant challenges in balancing modernization with the preservation of its extensive historical and cultural sites, complicating efforts to manage urban sprawl and development effectively.

Abu Dhabi takes the most ambitious approach among the three, prioritizing innovation and high living standards. The city's comprehensive plan includes a multimodal transport network, extensive green spaces, and diverse housing options. These measures aim to create a sustainable, high-quality urban environment that can support economic growth and enhance the well-being of its residents. Abu Dhabi's wealthy economic status, bolstered by significant oil revenues and diversified investments, enables it to fund and execute large-scale, cutting-edge urban development projects. Unlike Latakia and Alexandria, Abu Dhabi does not have extensive historical infrastructure to preserve, giving it more flexibility to implement its development strategy. Additionally, Abu Dhabi's newer city status allows for free expansion into desert lands,

providing more flexibility in choosing expansion dimensions compared to the constrained agricultural lands of Latakia.

Latakia prioritizes cars and lacks a comprehensive public transport plan, which could lead to increased traffic congestion and pollution over time. Limited financial resources constrain Latakia's ability to invest in public transport infrastructure. In contrast, Alexandria, under Plan 2032, invests in sustainable transport options such as light rail and dedicated bus lanes, aiming to reduce reliance on private vehicles and improve accessibility. Both Latakia and Alexandria face challenges related to their historical urban layouts, limiting the expansion and integration of modern transportation systems. Abu Dhabi implements a multimodal transport network, including light rail, buses, and cycling paths, promoting a more sustainable and integrated transportation system, made possible by its significant financial capacity and greater developmental flexibility.

Regarding green spaces, Latakia lacks a clear strategy, impacting urban livability and environmental health. Alexandria's Plan 2032 proposes the creation of new parks and recreational areas, aiming to enhance the urban environment and provide residents with accessible green spaces. Nonetheless, the preservation of historical sites in Alexandria can sometimes limit the availability of land for new green spaces. Abu Dhabi prioritizes green spaces and public amenities, ensuring they are integral to urban development. This approach supports environmental sustainability and improves the quality of life for its citizens, backed by substantial economic resources and fewer historical constraints.

Housing strategies vary as well. Latakia suggests new developments that could lead to urban sprawl, which may not address the need for affordable and accessible housing effectively. Alexandria's Plan 2032 aims for affordable and mixed-use housing options, promoting social inclusivity and reducing socioeconomic disparities, supported by a relatively stronger economic base. However, historical preservation complicates urban expansion and housing development. Abu Dhabi offers a diverse range of housing options catering to a broad population, from luxury apartments to affordable housing, ensuring balanced and inclusive urban development, funded by extensive economic wealth and benefiting from fewer historical constraints.

Latakia's plan appears outdated, with limited information on revisions or updates. This lack of regular updates, approximately every 20-25 years, can hinder the city's ability to respond to new challenges and opportunities. Similarly, Alexandria's plans are not regularly updated, also revised

approximately every 20-25 years, which can impede the city's responsiveness to emerging needs. In contrast, Abu Dhabi regularly updates its plans to reflect changing circumstances and emerging trends. Alexandria's commitment to revising its urban strategies under Plan 2032 marks a significant improvement over previous inefficiencies, while Abu Dhabi's economic strength supports its ability to frequently update and adapt its urban plans without significant historical constraints.

In summary, while Latakia's current approach lacks necessary elements for sustainable urban development, Alexandria and Abu Dhabi are making more substantial efforts toward creating sustainable and inclusive cities. Alexandria's Plan 2032, though promising, requires effective implementation and continuous evaluation to ensure success, especially in light of previous inefficiencies. Abu Dhabi's ambitious and comprehensive strategy, backed by significant economic resources and developmental flexibility, positions it as a leader in urban innovation and quality of life improvements, setting a benchmark for other cities aiming for sustainable growth. Despite its current limitations, Latakia's master plan is a good foundation that could evolve to include more strategies for sustainability and improved quality of life in future revisions.

4.4.3. Cross- regional comparative

In this comparative analysis, although Latakia is not explicitly included in the comparative table of Barcelona and Montpellier, its master plan is critically discussed in the narrative. The decision to exclude Latakia from the table is based on the comprehensive regional analysis already provided earlier in the chapter. This approach avoids repetition while still ensuring Latakia's urban planning challenges and initiatives are adequately addressed in the broader discussion.

Table 11: shows Barcelona and Montpellier cross analysis

Criteria	BARCELONA	MONTPELLER
General vision	Barcelona Master Plan seeks to **create a sustainable, inclusive, and livable city that works for everyone**. Its goals include promoting economic development, **improving mobility options, preserving cultural heritage**, and reducing greenhouse gas emissions (Barcelona Field Studies Center, 2022).	Montpellier Master Plan aims to create a vibrant, attractive, and competitive **city center that is economically and socially inclusive**. Its goals include attracting new businesses and industries, promoting social inclusion, **preserving natural habitats, and improving public transportation** (Projet D'aménagement et de Development Durable—PADD, 2010)

Criteria	BARCELONA	MONTPELLER
Infrastructure and services	The Master Plan aims to **improve the quality and availability of public services**, including health, education, and social services, as well as upgrading the city's infrastructure to meet the needs of its growing population (Barcelona Field Studies Center, 2022).	Comprehensive plan for the **development of infrastructure and services**, including the creation of new cultural and recreational facilities, as well (Projet D'aménagement et de Development Durable—PADD, 2010).
Urban mobility	The city has an **extensive public transportation system including metro, bus, tram, and bike-sharing networks.** The master plan implemented policies to reduce car usage and **promote sustainable mobility**, including low-emission zones and pedestrianization of city center areas (The Mobility Master Plan of the Barcelona Metropolitan Region, 2013–2018).	The city has a relatively small public transportation system with bus and tram networks. The master plans emphasize **improving existing transportation infrastructure** rather than expanding it. **It also implemented policies to promote sustainable mobility**, including bike-sharing programs and pedestrianization of city center areas (Buyck, Chéry, & Jarrige, 2008).
Green and Open spaces	Master Plan included a **comprehensive green infrastructure plan to improve the city's biodiversity** and ecological connectivity - Focuses on creating green corridors, parks, and public spaces to promote sustainable mobility and recreation - Has policies to encourage urban agriculture and green roofs.	Master Plan included a **green network plan to improve the city's ecological connectivity**, and it emphasizes **preserving and enhancing existing green spaces rather than creating new ones**. Furthermore, the master plan included policies to promote urban agriculture and green roofs. (Projet D'aménagement et de Development Durable [PADD], 2010)
Housing Strategy	Strong focus on **social and affordable housing**, with more specific and comprehensive strategy for achieving its goals in this area**, including a higher target for social housing and requirements for developers** to include social housing units in new developments	Strong focus on social and affordable housing with emphasizes **creating mixed-income neighborhoods** and has stronger policies for promoting sustainable building practice.
master plan updates and revisions.	The master plan undergoes **periodic revisions, approximately every 5-10 years,** and incorporates various planning documents, like **SMPB-BCN-PEMB-PMU**, which are subject to ongoing progress updates. This process ensures that the master plan remains up-to-date and responsive to the changing demands of the city.	The Master Plan revise **approximately every 10 years** and it is created through a series of planning documents such as **PLH, PLU, PADD**, up to date making the master plan responsive to the changing demands of the city.

4.4.4. Discussion of cross-regional analysis

Barcelona and Montpellier's master plans stand as exemplars of comprehensive urban development strategies, prioritizing sustainability, equity, and residents' quality of life. These visionary plans are underpinned by a range of strategic approaches, including the enhancement of green networks, expansion of public transportation systems, promotion of mixed-use development, rehabilitation of existing infrastructure, and the cultivation of social cohesion. Such multifaceted strategies contribute to an intricate urban fabric that harmonizes societal needs and environmental preservation.

Barcelona's Master Plan prioritizes sustainability, inclusive infrastructure, and reduced emissions, introducing innovative concepts like super blocks to curb car usage. This plan emphasizes comprehensive green infrastructure, including green corridors and urban agriculture solutions, promoting biodiversity and ecological connectivity. Additionally, Barcelona targets social and affordable housing with specific mandates for developers.

Conversely, Montpellier's focus lies on a vibrant city center, integrating social inclusion with sustainable development. Its plan emphasizes creating cultural hubs and promoting soft circulation and continuous landscapes to enhance urban aesthetics and accessibility. Furthermore, Montpellier adopts a housing strategy centered around mixed-income neighborhoods and sustainable building practices.

Both cities regularly update their plans to remain responsive to evolving urban challenges. Barcelona revises its plan every 5-10 years, while Montpellier does so approximately every decade. These updates reflect the cities' commitment to balancing economic growth with historical preservation, ensuring sustainable and inclusive urban development.

A critical divergence in the planning processes becomes apparent when considering the frameworks utilized in each city. Barcelona and Montpellier adopt a decentralized approach, leveraging a diverse array of planning instruments, such as BCN, PEMB, and PMU (Barcelona, Spain), and SCOT, PLU, and PADD (Montpellier, France). This inclusive methodology fosters a comprehensive vision of urban development, with each document centering on distinct aspects of urban life. On the contrary, the Latakia master plan reflects a more centralized process, driven by government influence and technical expertise. This approach, while efficient, lacks the community 1engagement necessary for a holistic and sustainable urban vision.

On the contrary, the Latakia master plan reflects a more centralized process, driven by government influence and technical expertise. This approach, while efficient, lacks the community engagement necessary for a holistic and sustainable urban vision.

Its centralization of vision and decision-making authority within the city council underscores a lack of substantial community involvement. This disparity is evident in the significant number of objections raised during the public submission phase (12,000 objections) [57], reflecting concerns about the plan's alignment with community aspirations. Therefore, the governorate council created a committee to investigate the complaints. The committee advocated various changes, including the cancellation of the ring road and several of the master plan's projected expansion areas.

4.5. Conclusion of Chapter 4

In conclusion, the comparative analysis of master plans for Barcelona, Montpellier, Alexandria, Abu Dhabi, and Latakia underscores the importance of tailored urban development strategies that balance diverse needs and aspirations. Barcelona and Montpellier's comprehensive approaches, underpinned by decentralized planning frameworks and frequent revisions, offer valuable insights into achieving sustainable, equitable, and vibrant urban environments. Alexandria and Abu Dhabi, with its ambitious approach, further exemplifies the benefits of substantial economic resources and flexibility in urban planning.

For Latakia, elevating the effectiveness of the master plan demands a shift toward sustainable development that harmonizes land use, environmental preservation, and holistic economic advancement. The pivotal agricultural sector can play a transformative role, driving economic prosperity and community well-being through strategic empowerment of farmers. Drawing inspiration from successful green networks and urban agriculture strategies can further enhance Latakia's ecological sustainability and overall quality of life.

Moreover, embracing diverse strategies such as urban renewal projects fosters balanced and equitable urban development, revitalizing underdeveloped areas and enhancing overall urban resilience. The incorporation of cooperative and social housing initiatives, mirroring successful approaches like those of Montpellier and Abu Dhabi, enhances inclusivity and addresses urban housing demands.

To bolster urban resilience against climate change, expanding green spaces and promoting non-motorized transportation modes emerge as vital strategies. These elements counteract heat effects, enhance air quality, and provide essential recreational spaces while mitigating carbon emissions and traffic congestion.

Finally, crafting a sophisticated master plan requires rigorous research, collaboration with experts across various fields, and data-driven decision-making. By incorporating best practices and international standards, a well-informed and comprehensive plan can effectively guide Latakia's urban development, creating a resilient, sustainable, and prosperous future for its residents. Abu Dhabi’s example demonstrates the importance of leveraging economic strength and flexibility, providing a model that Latakia can adapt to its unique context.

Integrating lessons from Barcelona, Montpellier, Alexandria, and Abu Dhabi, Latakia can enhance its master plan to better meet the evolving needs of its population, fostering a more sustainable and high-quality urban environment.

CHAPTER 5. NEW SCIENTIFIC ACHIEVEMENTS

5.1. New scientific achievements

Thesis 1: I have found that traditional housing in the rural areas of the Syrian coastal region, which utilizes local materials and maintains strong environmental connections, is significantly more sustainable than contemporary styles.

Through a comprehensive historical review and survey data analysis, my research identified a clear shift towards urban housing styles driven primarily by economic factors such as reduced construction costs, faster building timelines, and modern aesthetic preferences. Despite the environmental suitability of traditional houses, which are naturally adapted to the local climate and make use of passive cooling and natural ventilation, modern housing designs in the rural areas of the Syrian coastal region rely heavily on non-native materials, making these houses less resistant to climate challenges. This shift results in increased energy consumption and contributes to environmental degradation.

Thesis 2: I explored the socio-economic and physical landscape transformations resulting from the adoption of contemporary housing styles in rural area of the Syria coastal region and found that this shift has significantly reduced integration with nature and altered rural activities.

My research indicates a marked decline in agricultural productivity and crop diversity, particularly in areas that have shifted their economic focus toward cultivating high-commercial-value crops such as olives and tobacco. This transformation is associated with a decreased reliance on traditional agricultural income, which historically provided subsistence for rural populations. As rural communities move away from diverse agricultural practices, there is an observable impact on food security, and the sustainability of rural livelihoods.

Thesis 3: Through analyzing urbanization patterns and transportation development in Latakia Governorate, I found that the construction of regional highways and the expansion of transportation networks have significantly influenced rural transformation.

My research demonstrates that these transportation networks have not only physically linked rural areas with urban centers but have also facilitated the socio-economic integration of rural

populations into urban economies. Urban centers have emerged as pivotal hubs, attracting rural residents seeking improved job prospects and higher incomes. Villages in closer proximity to these urban centers are experiencing more pronounced spatial transformations, including shifts from agricultural land to commercial and residential use. While these changes bring economic opportunities, they also lead to the erosion of traditional rural lifestyles and cultural practices.

Thesis 4: I conducted an in-depth analysis of the Latakia Master Plan and found significant deficiencies in its urban development strategies, particularly in achieving sustainable urban growth and mitigating the adverse effects of rapid expansion.

My comparative study, which involved analyzing urban development strategies from cities such as Barcelona, Montpellier, Alexandria, and Abu Dhabi, revealed that Latakia's current urban planning framework does not adequately address the challenges of rapid population growth and urban sprawl. These inadequacies result in structural disorganization, reduced quality of life for residents, and significant environmental degradation.

Thesis 5: I observed a profound spatial transformation in Latakia city due to rapid urban expansion and found that the existing Master Plan inadequately addresses these changes, prioritizing short-term economic benefits over long-term sustainability.

My research reveals that while urban expansion has led to economic growth, it has also caused considerable strain on the city’s infrastructure, increased environmental degradation, and diminished the overall quality of life. The current Master Plan lacks a comprehensive, forward-looking approach that considers the long-term impacts of urban growth on environmental sustainability, social equity, and economic stability.

Thesis 6: I found that the Latakia Master Plan neglects crucial aspects of social structure and environmental sustainability in its proposed expansion strategies and new residential areas.

My research reveals that these oversights have led to practical problems, such as housing duplication, significant vacancies in certain urban sectors, and inadequate infrastructure development. These issues exacerbate existing problems, including traffic congestion and

increased environmental pollution, due to a lack of comprehensive road infrastructure and effective public transportation systems.

Thesis 7: I identified a critical gap between Latakia's expanding urban areas and its underdeveloped public transportation system, which hinders resident mobility and increases reliance on private vehicles.

My research indicates that the absence of a well-coordinated and extensive public transport network contributes significantly to traffic congestion, increased commuting times, and air pollution, thus undermining the city's sustainability objectives. A decentralized planning approach, which actively involves public and stakeholder engagement, is necessary to develop a comprehensive public transportation system that addresses the needs of Latakia's growing population.

Thesis 8: I found significant deficiencies in Latakia's green network and infrastructure development, which are critical to the city's resilience to climate change and the maintenance of a healthy living environment.

My research shows that the current urban development framework in Latakia lacks sufficient green spaces and fails to invest adequately in sustainable infrastructure. This limitation hinders the city's capacity to manage environmental challenges, such as urban heat islands and stormwater runoff, and to provide a high quality of life for its residents. Adopting international best practices in green infrastructure, such as the creation of urban parks, green corridors, and initiatives like urban agriculture, can significantly enhance biodiversity, improve climate resilience, and promote environmental sustainability.

5.2 Recommendations

For effective spatial transformation and master plan development in the Syrian Coastal Region, several key recommendations are essential. Sustainable housing practices should integrate local materials, climate-adapted designs, and energy-efficient techniques to reduce negative impacts on rural landscapes. Policies should promote sustainable agriculture and crop diversification to strengthen rural economies and preserve cultural heritage. Balanced regional development must focus on equitable economic opportunities and infrastructure investment in rural areas to avoid excessive urban concentration. Land-use planning should address the socio-economic impacts of transportation infrastructure to maintain cultural heritage and ensure balanced growth. Revising the Latakia Master Plan to include sustainable urban development principles—such as compact design and green infrastructure—will address local challenges effectively. A holistic approach to urban planning, incorporating diverse stakeholder perspectives and emphasizing environmental conservation, social equity, and economic resilience, is crucial. Social and environmental impact assessments should guide decision-making and prioritize investments that enhance community well-being and environmental quality. Additionally, investing in robust public transportation and green infrastructure will reduce congestion and pollution while improving ecological resilience and quality of life.

5.3 Further Research Recommendations

While this research provides valuable insights, further studies are recommended to build on these findings and address gaps in understanding:

- Long-term Studies on Housing and Environmental Impact: Further research is needed to conduct longitudinal studies that track the long-term environmental impacts of different housing styles in the region. This will provide deeper insights into the sustainability of various housing practices over time.

- Detailed Socio-economic Impact Analysis: Additional studies should focus on the detailed socio-economic impacts of urbanization and transportation development on rural communities. This includes examining changes in income distribution, employment patterns, and social structures to better understand the full scope of urban-rural interactions, and their impacts on landscape.

- Evaluation of Policy Implementation: Research should be conducted to evaluate the effectiveness of policies aimed at promoting sustainable development in Latakia on a site-specific basis. This includes assessing the implementation and outcomes of policies related to sustainable agriculture, urban planning, and transportation infrastructure.

- Exploration of Innovative Green Infrastructure Solutions: Investigating innovative green infrastructure solutions that can be adapted to the specific climatic and geographic conditions of Latakia is essential. Research can explore the potential of urban agriculture, vertical gardens, and other green initiatives to enhance urban resilience.

- Community-Based Research on Public Perception and Participation: Understanding the perceptions and participation of local communities in sustainable development initiatives is crucial. Further research should focus on community-based approaches to gauge public opinion, promote stakeholder engagement, and foster collaboration in planning and development processes.

SUMMARY

The Syrian coastal region, especially Latakia Governorate, is experiencing rapid urban expansion, which, while offering growth opportunities, also places significant strain on infrastructure and widens the gap between residents' needs and available services. This thesis investigates how effectively Latakia's master plans manage the "spatial transformation" across both rural and urban landscapes, considering the broader socio-economic and environmental impacts.

The research begins by analyzing various urban expansion models and their economic drivers, followed by a study of successful urban development strategies from cities like Barcelona and Abu Dhabi. Focusing on Latakia, the analysis examines both the historical and current landscape transformations, assessing changes within urban centers and rural areas of the Governorate. A dedicated section explores the rural transformation, highlighting the impacts of urbanization on transportation networks, social dynamics, and the ecological environment.

The core of the research critically evaluates the effectiveness of Latakia's master plans in managing these transformations throughout the Governorate. This evaluation extends beyond specific planning strategies to a comprehensive assessment of the master plan’s capacity to address the diverse challenges of urban and rural development, including housing, infrastructure, and environmental sustainability. A comparative analysis with regional and international case studies identifies gaps and areas for improvement.

Ultimately, the thesis presents original research findings derived from this analysis, offering critical insights into the complex challenges of Latakia's urban expansion. These findings provide valuable guidance for developing more sustainable and resilient urban and rural planning strategies, ensuring that Syrian coastal region can achieve balanced growth that meets both present and future needs.

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APPENDICES

The Questionnaire distributed in the coastal rural area

1. Name of the village you live in.

_____

2. Type of house you live in.

Mark only one oval.

- ◯ Traditional house
- ◯ New house.

3. Your age?

_____

4. Gender?

Mark only one oval.

- ◯ Male
- ◯ Female

5. what is your main profession/career?

Mark only one oval.

- Employee
- Farmer
- Craftsman
- Other: _____

6. where is your workplace located?

Mark only one oval.

- in the same village
- In another village
- In the city

7. How long do you need to reach your workplace?

Mark only one oval.

- 15 minutes
- 30 minutes
- 45 minutes
- 60 minutes
- 75 minutes
- 90 minutes

8. please give an evaluation of the public transportation system in your village?

Mark only one oval.

	1	2	3	4	5	
Bad	◯	◯	◯	◯	◯	Very good

9. 2- Do you prefer to live in the city or in the village?

Mark only one oval.

- ◯ In the city
- ◯ In the village

10. 3- Do you prefer to live in a traditional house or a new one?

Mark only one oval.

- ◯ Traditional
- ◯ New

11. 4- Do you feel that you belong to the place that you live in?

Mark only one oval.

- ◯ Yes
- ◯ No

12. 5-If no, please explain very shortly why?

_____

13. 6- Do you feel that this house fits into the surrounding landscape?

Mark only one oval.

- Yes
- No

14. 7- Are you satisfy with your house?

Mark only one oval.

- Yes
- No

15. 8- If no, please try shortly to explain why?

_____

16. 9- If you live in a new house: Do you have any connection with the surrounding landscape?

Mark only one oval.

- Yes, I have a garden and I use it
- Yes, I have a garden but I do not use it
- No, I do not have any connection

17. 10- Do you have any problems with your house?

Mark only one oval.

- Yes
- No

18. 11- If yes, which kind of problems do you have?

Check all that apply.

- [ ] Problems with thermal insulation
- [ ] Moisture inside the house
- [ ] Sanitation problems
- [ ] electrical installations Problems
- [ ] Water problems
- [ ] Other: ____________________

19. 12- Do you own agricultural land in the village?

Mark only one oval.

- ( ) Yes
- ( ) No

20. 13-A- If yes, do you do any agricultural activities on this land?

Mark only one oval.

- ( ) Yes
- ( ) No

21. 13-B- If yes, Any of your family members help with these activities?

Mark only one oval.

- ( ) Yes
- ( ) No

22. 14- Do you do any activities in the nature around you?

Check all that apply.

- [ ] No
- [ ] Picnic
- [ ] sports activities
- [ ] Horticultural activities
- [ ] Others

23. 15- Do you have good relations with the neighbors?

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Medium

24. 16- Do you share your house with another family (Are the different generations live together)?

Mark only one oval.

- ◯ No
- ◯ With my family
- ◯ With my children family
- ◯ With my wife family

25. Please pick the photos that you prefer most from the following.

Mark only one oval.

◯ Option 1 ◯ Option 2

26.

Mark only one oval.

◯ Option 1 ◯ Option 2

27.

Mark only one oval.

Option 1

Option 2

28.

Mark only one oval.

Option 1

Option 2

29. *Mark only one oval.*

Option 1

Option 2

ACKNOWLEDGEMENTS

I would like to begin by expressing my sincere gratitude to the Stipendium Hungaricum program for funding my PhD studies. I am also deeply thankful to MATE University, particularly the Institute of Landscape Architecture, Urban Planning, and Garden Art, for providing the platform and resources necessary to pursue my academic career.

A very special note of appreciation goes to my supervisor, Dr. Sárospataki Máté, whose expert guidance, insightful feedback, and patience have been pivotal in shaping this research. His continuous support and encouragement have been essential throughout my studies.

I am also grateful to my esteemed professors at Tishreen University in Syria, whose mentorship has greatly influenced my academic development.

I would like to acknowledge the contributions of Dr. István Valánszki and Dr. Honey Fadaie, the reviewers of my dissertation, for their thoughtful comments and constructive suggestions, which have significantly enhanced this work. I also appreciate the commitment of the entire evaluation committee, including the third reviewer, for their dedication during my defense.

On a personal note, I am deeply thankful to my family. To my father, whose unwavering support has been a constant source of motivation; to my late mother, whose spirit was always with me, encouraging me through every challenge. Your soul, and your memory has been a powerful source of strength throughout this journey. To my sisters Rehab, Forat, Rajaa, Ahlam, Reem, and to my brother and soulmate, Feras, whose steady encouragement and support have meant a lot to me. I owe much of my success to you all.

I am especially grateful to my wife, Soulaf, whose unwavering love, patience, and belief in me have been my greatest pillar of strength. Her constant encouragement has made this achievement possible, and I am beyond thankful for her presence by my side.

I also extend my heartfelt gratitude to my second parents, Abd Alkareem and Roaa, for being with me through every step of this journey, offering their love and support like my own family.

A special thanks to my colleagues Ning, Nawarah, Patricia, Barbara, and to my friends Bashar, Ayman, Rayan, Ali, Mohamed, Nsreen, and Maisan for their invaluable support. Special recognition goes to Dr. Yahya Ibrahim for his help and efforts during this time.

Lastly, I would like to thank everyone who believed in me, supported me, and contributed to the successful completion of this research. Your help has been deeply appreciated.