

River Publishers Series in Social, Urban, Economic and
Environmental Sustainability

PERI-URBAN CONFLICTS AND ENVIRONMENTAL CHALLENGES

A MEDITERRANEAN PERSPECTIVE

Editors:

Antonio Tomao
Matteo Clemente



River Publishers

**Peri-urban Conflicts
and Environmental Challenges:
A Mediterranean Perspective**

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Editors

Antonio Tomao

University of Tuscia, Italy

Matteo Clemente

University of Rome La Sapienza, Italy



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List of Contributors

Cillis, Giuseppe, *Scuola di Scienze Agrarie, Forestali, Alimentari e Ambientali, University of Basilicata, Viale dell'Ateneo Lucano, I-85100 Potenza, Italy; E-mail: giuseppe.cillis@unibas.it*

Clemente, Matteo, *Department of Architecture and Project, 'Sapienza' University of Rome, Via Flaminia 359, I-00196 Rome, Italy; E-mail: matteo.clemente@uniroma1.it*

Coluzzi, Rosa, *Institute of Methodologies for Environmental Analysis of the Italian National Research Council (IMAA-CNR), Contrada Santa Loja snc, I-85050 Tito Scalo, Italy; E-mail: rosa.coluzzi@imaa.cnr.it*

Conte, Adriano, *Italian Council for Agricultural Research and Economics (CREA), Research Centre for Forestry and Wood, Via Valle della Quistione 27, I-00166 Rome, Italy; E-mail: adriano.conte@crea.gov.it*

Ferrara, Agostino, *Scuola di Scienze Agrarie, Forestali, Alimentari e Ambientali, University of Basilicata, Viale dell'Ateneo Lucano, I-85100 Potenza, Italy; E-mail: agostino.ferrara@unibas.it*

Imbrenda, Vito, *Institute of Methodologies for Environmental Analysis of the Italian National Research Council (IMAA-CNR), Contrada Santa Loja snc, I-85050 Tito Scalo, Italy; E-mail: vito.imbrenda@imaa.cnr.it*

Lanfredi, Maria, *Institute of Methodologies for Environmental Analysis of the Italian National Research Council (IMAA-CNR), Contrada Santa Loja snc, I-85050 Tito Scalo, Italy; E-mail: maria.lanfredi@imaa.cnr.it*

Quaranta, Giovanni, *Department of Mathematics, Computer Science and Economics Department, University of Basilicata, Viale dell'Ateneo Lucano, I-85100 Potenza, Italy; E-mail: giovanni.quaranta@unibas.it*

Salvati, Luca, *Department of Methods and Models for Economics, Territory and Finance (MEMOTEF), Faculty of Economics, Sapienza University of Rome, Via del Castro Laurenziano 9, I-00161 Rome, Italy; E-mail: luca.salvati@uniroma1.it*

Salvia, Rosanna, *Department of Mathematics, Computer Science and Economics, University of Basilicata, Via dell'Ateneo Lucano 10, I-85100, Potenza, Italy; E-mail: rosanna.salvia@unibas.it*

Sorgi, Tiziano, *Italian Council for Agricultural Research and Economics (CREA), Research Centre for Forestry and Wood, Via Valle della Quistione 27, I-00166 Rome, Italy; E-mail: tiziano.sorgi@crea.gov.it*

Tomao, Antonio, *Department for Innovation in Biological, Agro-food and Forest systems (DIBAF), University of Tuscia, Via S. Camillo de Lellis, I-01100, Viterbo, Italy; E-mail: antonio.tomao@unitus*

List of Abbreviations

ADJBUI	The ratio of adjacent buildings on total buildings (2001)
AVGFSU	Average fire size by municipality (2009–2012)
CLC	Corine Land Cover
CROP	Proportion of burnt cropland on total burnt area (2009–2012)
DENPOP	Population density (2011)
DIST	Distance from Athens
DPSIR	Drivers, pressures, state, impact and response model of intervention
ELEV	Elevation (0: lowland; 1: upland municipalities)
EU	Europe
FIRDEN	Density of forest fires on total municipal area (2009–2012)
FIRSU%	Percentage of municipal area affected by fires (2009–2012)
For	Per-capita forest cover
INCOME	Average per-capita declared income (2011)
LC	LaCoast project
LCC	Land Cover Change
NSSG	National Statistical Service of Greece
PAST	Proportion of burnt pastures on total burnt area (2009–2012)
POPRAI	The ratio of present to resident population (2011)
SDG	Sustainable Development Goals
SUPMUN	Municipality surface area
UA	Urban Atlas
VARDEM	Annual population growth rate (2001–2011)
WCED	World Commission on Environment and Development
WOOD	Proportion of burnt forests on total burnt area (2009–2012)
WUI	Wildland–urban interface

2

Densifying, Decompacting, Rethinking Cities: A Mediterranean Debate

Antonio Tomao¹, Tiziano Sorgi², Matteo Clemente³, and Luca Salvati⁴

¹Department for Innovation in Biological, Agro-food and Forest systems (DIBAF), University of Tuscia, Via S. Camillo de Lellis, I-01100, Viterbo, Italy

²Italian Council for Agricultural Research and Economics (CREA), Research Centre for Forestry and Wood, Via Valle della Quistione 27, I-00166 Rome, Italy

³Department of Architecture and Project, 'Sapienza' University of Rome, Via Flaminia 359, I-00196 Rome, Italy

⁴Department of Methods and Models for Economics, Territory and Finance (MEMOTEF), Faculty of Economics, Sapienza University of Rome, Via del Castro Laurenziano 9, I-00161 Rome, Italy
E-mail: antonio.tomao@unitus.it; tiziano.sorgi@crea.gov.it;
matteo.clemente@uniroma1.it; luca.salvati@uniroma1.it

Abstract

In the chapter, trends regarding population growth and urbanization rates of the Mediterranean region will be analysed. Successively, taking advantage of the analysis of urban dynamics of a paradigmatic example of a Mediterranean city (Athens), some words will be spent in demonstrating the connection between over-urbanization and the growing vulnerability of cities towards natural disasters. Finally, an analysis on the observed consequences of urban sprawl—and more specifically of 'coastalisation', the general urban development pattern of the region—will be presented.

Keywords: Mediterranean city, Urban form, Land consumption, Exurban development, Planning.

2.1 Introduction

Coastal territories represent an important resource for Europe since they contribute to the local economy (e.g., tourism), human well-being (recreation opportunities) and harbor a large number of natural well-preserved habitats (Gasparella et al., 2017; Tomao et al., 2018). The growing importance of coastal territories has led to substantiating positive population dynamics of this terrestrial surface. Coasts of EU Member States are also the most densely populated zones in Europe and particularly of Mediterranean countries (UNEP/MAP and Plan Bleu, 2020). According to various studies (e.g., Kurt, 2016; Valev, 2009), coasts include around 12% of Europe's municipalities and more than a third of its total population. Among the countries of the European Union, 40% of the territory and 40.8% of the population lived there in 2011 (Eurostat regional yearbook 2012). This phenomenon of concentration of population and economic activities in coastal areas with consequent urbanization of these territories has been defined as 'coastalisation' (Bell et al., 2013; Kasanko et al., 2006; Leontidou, 1990; Morelli and Salvati, 2010; Salvati and Forino, 2014; Sreeja et al., 2016; Mikhaylov et al., 2018).

Such shift towards the sea, also named as 'coastal sprawl' has been described for numerous Mediterranean cities (Salvati, 2014; Salvati et al., 2016), where urban pressure largely increased during the last 50 years when built areas doubled or more than doubled within one kilometre from the sea (UNEP/MAP and Plan Bleu, 2020). Moreover, urbanization rates are expected to further increase throughout the entire region in the next decades (Salvati and Serra, 2016).

These phenomena have been associated with a relevant change in urban expansion models. In the last century, several Mediterranean cities have changed their shape from the classic and traditional 'compact' form in various 'dispersed' forms, characterised by a relevant and very fast sprawl around the urban area (Schneider and Woodcock, 2008). After the Second World War, Mediterranean cities have expanded as a result of consecutive waves of compact and dispersed urbanization that formed highly polarized metropolitan regions. Actually, a 'deconcentration' phase can be recognised in Mediterranean Europe, as urban urbanization is expanding at much faster rates than population growth. Examples of this trend can be found in Lisbon (Mascarenhas et al., 2019), Barcelona (Zambon et al., 2017; Pagliarin, 2018), Rome (Di Felicianantonio and Salvati, 2015), Athens (Pili et al., 2017) and many other cities. The diffusion of these sparse, low-density settlements has witnessed over-densification of central districts but has also caused

the homogenisation of urban environments and the standardisation of the landscape (Salvati et al., 2016).

The reasons for such urbanization trend are manifold and vary between cities, regions and countries in Europe. Driving forces range from economic (e.g. globalization, economic development) to societal (demographic dynamics) and governance (deregulation and informality) factors and are therefore dependent on the political, social and economic conditions in each city (Christiansen and Loftsgarden, 2011). The study of these 'territorial symptoms' of undefined evolution can provide useful information to policy-makers to adopt the correct measures with the need to preserve the natural and human environment.

With these premises, the objective of this research is to analyze the recent dynamics of urban transformation of the Mediterranean area and understand the reasons that have led to the consequent urban sprawl. For the purpose of this chapter, two issues currently debated within the 'urban geography' and 'landscape' disciplines are examined by considering the coastal metropolis of Athens as an exemplificative case study:

1. Rural-urban migration and socioeconomic disparities;
2. Coastal urbanization and environmental changes threatening natural capital and cultural heritage.

The loss of areas originally devoted to arable lands, pastures, vineyards, and annual crops is only the most visible effect in metropolitan regions. A more subtle phenomenon transforming, fragmenting, simplifying, and deteriorating the rural landscape is in progress. While in the past, urban growth occurred primarily on agricultural and semi-natural areas at the urban fringe, now sprawl invaded larger areas more and more distant from the city centre (Bruegmann, 2005; Tomao et al., 2017).

2.2 Mediterranean Urbanization

The urbanization of the Mediterranean region of Europe has a long and complex history which has led to distinctive and original urban forms. The scientific literature has largely debated about how to define an archetype of 'Mediterranean city' based on the similarities in socioeconomic development patterns and urban morphology (e.g. Leontidou, 1996; Salvati and Gargiulo Morelli, 2014). The economic and social structures of the cities of the northern Mediterranean are justified by a peculiar history of interactions between demographic, cultural and political factors that featured unique landscapes

(King et al., 1997). However, despite Southern Europe has been reported as generally homogeneous in terms of urban structure (e.g. Leontidou, 1996; Colantoni et al., 2016), several scholars have highlighted how both dense and dispersed urban models are present in the Northern part of the Mediterranean basin (Couch et al., 2007). Leontidou (1990) has described the Mediterranean city with a ‘hyper-compact’ form characterized by dense settlements with poor infrastructural networks and public services, and a ‘popular land control’ manifested by informal settlements. In particular, the latter is rather common expansion processes across the decades of the 20th century in several Mediterranean cities (King et al., 1997). Such a spontaneous urban expansion, coupled with planning deregulation, has produced socially fragmented landscapes with a spatial pattern difficult to label as ‘polycentric’ (Maloutas, 2007; De Muro et al., 2011).

As an additional outcome of deregulated urban expansion is social stratification and economic polarization (Malheiros, 2002; Arapoglou et al., 2009). The socio-spatial pattern based on the ‘inverse Burgess model’ has lasted up to the 1980s in many different Mediterranean contexts (Leontidou, 1990). Furthermore, it was associated not only to economic informality and planning deregulation, but also to family-oriented welfare regimes and (partly) ineffective housing policies (Arbaci, 2007; Arbaci and Malheiros, 2010). Among the push- and pull-factors that conditioned urbanization in the Mediterranean context, population growth has been a key driver in the rapid expansion of large cities (Figure 2.1). The demographic data of Mediterranean countries indicate two different patterns (Figure 2.2). Between 1850 and 2000, the population of the Southern European EU-member countries doubled. During the same period, the rest of the Mediterranean countries showed a 9-fold increase in population (Table 2.1). In 2050, a decrease in population is expected in the five Southern European countries, while major increases in North Africa (+97 million) and in the Eastern Mediterranean (+84.3 million) are projected. Furthermore, in the 12 Middle East and North African countries, more people will be added until 2050 than presently live in the five Southern EU countries (177.3 million).

If compared to the rest of the world, where half of the population lives in urban areas, two-thirds of inhabitants in the countries bordering the Mediterranean already live in towns (United Nations, 2019). In the Mediterranean coastal region, the population went from 285 million in 1970 to 427 million in 2000 and will probably overcome 400 million in 2050. This represents a real challenge in the Mediterranean coastal region, especially in the light of the Agenda for Sustainable Development (SDG Target 11.1 expressing the need



Figure 2.1 Compact settlements in Kallithea, central Athens prefecture.

Source: Authors' photographic archive.

to 'make cities and human settlements inclusive, safe, resilient and sustainable'). Moreover, Mediterranean coasts are threatened by changing climate conditions (UNEP/MAP and Plan Bleu, 2020) and the potential impacts of this phenomenon are further exacerbated by the process of coastalization due to a combination of specific social, economic and environmental characteristics such as rapid rural to urban migration and mass tourism. Indeed, in the last years of the 20th century, the increase of international tourism has invaded the shores of the Mediterranean. In this regard, the globalization of the economy and the consequent disintegration of the traditional rural economies have contributed to coastal urban growth.

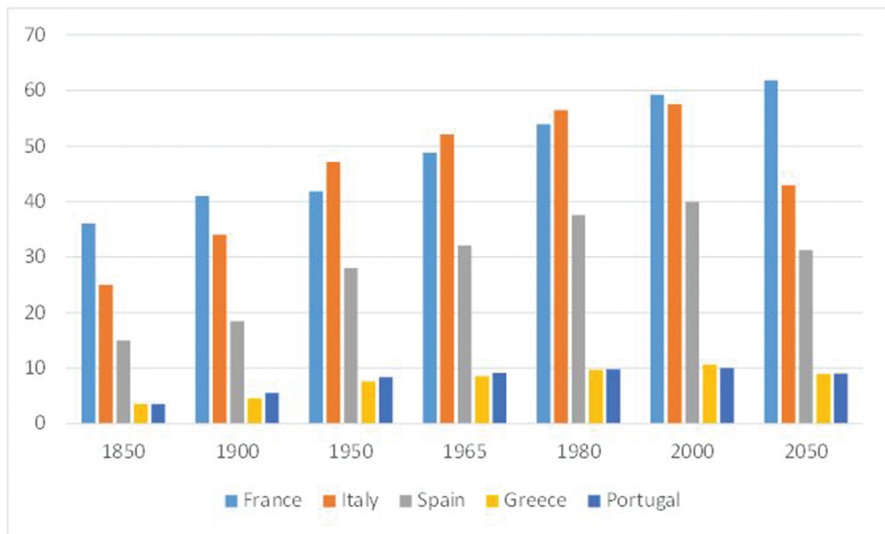


Figure 2.2 Population growth (millions of inhabitants) in the five Mediterranean Countries of EU during the last 150 years.

Source: McEvedy/Jones 1978; UN, 2001.

Table 2.1 Population growth (millions of inhabitants) in the Mediterranean Countries. Mediterranean Europe includes the countries of Figure 2.2. North Africa includes Algeria, Morocco, Tunisia, Lybia and Egypt; Mid-East includes Jordan, Israel, Palestine Authonomy, Lebanon, Syria and Turkey

	Change								
	1850	1900	1950	1965	1980	2000	2050	1950–2050	2000–2050
Med. Europe	83	103	132.9	150.6	167.3	177.3	154.1	21.2	-23.2
North Africa	13.1	22.3	44.1	62.9	91.4	142.8	239.4	193.3	96.6
Mid-east	10	13	20.8	31.1	44.4	55.7	98.8	78.0	43.1

Source: Authors' elaboration from UN (2006) data.

In this context of population change, urbanization trends around the Mediterranean basin have differed significantly. In Southern Europe the rate of urbanization has been projected to increase by 2030. An even greater trend is expected in North Africa. According to the United Nations Urbanization Prospects, by 2030, projections estimate that the urban population will be 84.5% in Spain, 82.2% in France, 81.6% in Portugal, 76.1% in Italy and 71.6% in Greece. These projections clearly show how the pressure for urbanization in Southern European and Northern African cities will increase in the

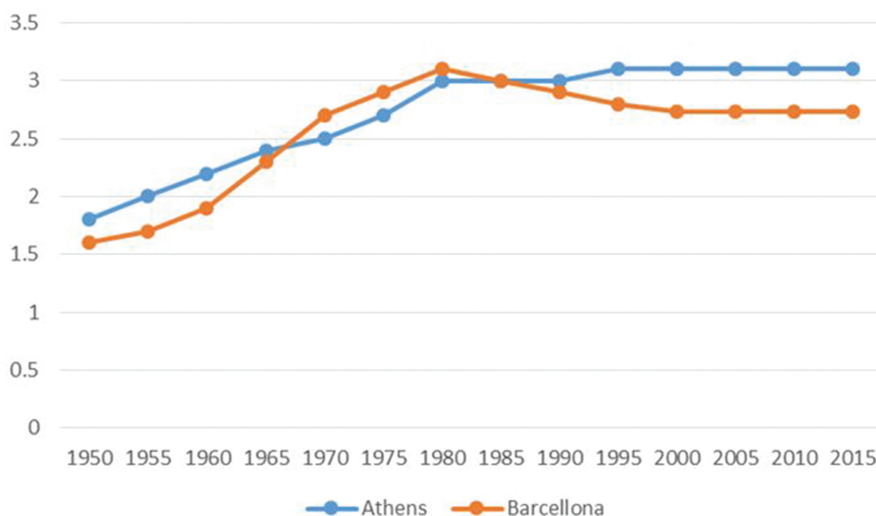


Figure 2.3 Urbanization rate (%) of two examples of Mediterranean coastal cities in the period 1950–2015.

Source: Authors' elaboration from UN (2006) data.

near future. Figure 2.3 shows how, from 1950–2000, two examples of typical Mediterranean coastal cities (i.e., Athens and Barcelona) have experienced a continuous increase in urbanization rates (1.1–1.8-fold) and are expected to stabilize in the next decade up to 2030.

2.3 In between Planned Compaction and Desired Dispersion: The Case of Athens, Greece

The detailed analysis of the urban development of Athens in the 20th century is of interest for various reasons. First, the urban development of Athens can be seen as a typical example of the trajectories shared by many Mediterranean cities, which are changing the urban form paradigm from a compact model to a sprawled and poly-centric one. Therefore, understanding the drivers behind this transition can help to improve our comprehension of Urban Sprawl in the Mediterranean. In this regard, a peculiar characteristic of the Mediterranean the city particularly evident in Athens is the unplanned urban expansion outside city core. Second, Athens is among the few large urban areas of Europe that is still showing a relevant demographic increase. This phenomenon is coupled with a drastic over-urbanization and high rates of land take which are

modifying the typical rural landscape. The area under consideration requires a detailed analysis of latent factors and active determinants of the sprawl, which is particularly young and intense, in order to apply appropriate policy strategies to control it. Last, Athens is a very good example for the analysis of the effects of 'Mega-Events' in the new context of Global City-Regions. The Olympic Games of 2004 have made the city an interesting example in Europe for studying how the new 'entrepreneurial city' is influencing urbanization processes.

As in other European contexts such as Spain and Italy, Athens' economic structures in the aftermath of the World War II were not based on manufacturing but rather on urbanization economies which have triggered an industrialisation process. However, this process did not result in the deindustrialisation/disurbanization phase that happened after the 1970s in Northern Europe (Economou et al., 2007). Athens' urban development mainly occurred through illegal housing, sprawling onto suburban land with a lower cost but severe infrastructure deficiencies including lack of sewage systems and poor infrastructures (Nickayin et al., 2020). This led to multiple adverse consequences on the natural capital. Furthermore, it was associated with the increase of social exclusion and vulnerability of the residents of these fringe areas.

The morphological structure of the Greek landscape has influenced the traditional urban system of Athens, which was characterized by a clear polarisation between city and countryside. Indeed, during the 20th century, this relationship has rapidly changed, mainly because of the development of the economic capital, relevant immigration fluxes a lack of effective planning (Tomao et al., 2017; Nickayin et al., 2020). In this context, the progressive urbanization of the surrounding areas of greater Athens has caused the spatial distribution of the activities and therefore the disappearance of the urban-rural polarity.

Athens had to face also with one of the highest population densities in Mediterranean Europe (about 20,000 inhabitants per km² in the consolidated urban core). The city structure and the relationships with the surrounding areas have to be adapted. The increasing request for new sites for the construction of commercial, industrial, residential and recreational assets has led to the expansion of the urban area outside its traditional boundaries. The more suitable locations to this aim were Messoghia plain and Thriassian. To better understand the sprawl process in Attica, it is worth considering that the functional urban area of Athens can be described through four prefectures: Athens, Piraeus, East and West Attica. Athens and Pireo are the

more densely populated and contain most of the industrial sites of the Attica region, while East and West Attica host most of the rural territories, including the Messoghia and Thiriassio plains.

The first phase of the urban expansion of Athens (1850s–1900s) was characterised by a balanced distribution of the population over the territory and an equal growth of urban and rural areas. However, since the 1860s growth rates of the centre of Athens began to increase faster than in the rest of Attica. In the second phase (1900s–1940s) a compact poly-centric configuration was developed around the two main urban centres of Athens and Piraeus. In this period, new industrial activities were attracted in the surroundings of Athens and especially in Piraeus, where the commercial port is located. As a direct consequence of this, the rates of population growth sharply increased in these two areas. The demand for new housing for the new residents caused the establishment of new spontaneous suburbs around the centres of Athens and Piraeus. These informal settlements, even if not exactly characterized by a low density, can be considered the first signs of Urban Sprawl.

During the third phase (1950s–1980s) of urban expansion, the traditional poly-centrism of the region was transformed. Workers and rural immigrants moved to the fringe areas of Athens and Piraeus in search of affordable housing close to the industries. Consequently, the residential densities in the urban centres became more and more similar to those in the peripheries. Moreover, in these decades the process of the urbanization of the Messoghias plain also began. According to the results of various studies about land consumption in the Attica region, during the period from 1960 to 1980, new urbanized areas were established at the urban-rural interface on agriculture and the surrounding forested lands (Tomao et al., 2017). This urban-rural depolarization was favoured by the permissive urban policies and building code together with the development of transport infrastructures. The sprawl process has been made evident by the demographic trend of population migration from the main urban centres towards the rest of Attica.

In the 1980s–1990s decades, the fourth phase of sprawl has been described and is characterized by the movement of middle-class and elite from the urban centres. Athens' periphery (i.e. Acharnes, Ano Liossia, Filis), rural zones (Messoghia and Thiriassio plains) and coastal areas experienced rapid urban growth in those years. Following this period, in the decade 1990–2000, the natural capital in the rural areas was threatened by the abandonment of cultivated fields and the conversion of forests to pastures as a consequence of recurrent fires. In both cases, these land-use changes were promoted by

suburbanization and then Urban Sprawl. The conclusion on the demographic and urban development of the region is that the traditional city-countryside polarisation of the Greek territory has radically been replaced by sprawl patterns throughout the 20th century.

In the new millennium, the 2004 Olympic Games have greatly influenced the dynamics of sprawl in Attica. Urban competitiveness for natural and financial resources has grown more than ever, favouring the creation of an entrepreneurial city model. In this context, such Mega-Events have represented an opportunity for self-promotion and therefore have been preceded by infrastructure development and strategies for promoting the image of Athens as the hosting city (i.e. upgrade of the underground and suburban railway, expansion of the International airport and improved connection of the archaeological sites). Therefore, the Olympic Games acted as a sort of ‘catalyst’ for the new policies oriented to the improvement of the urban reality of Athens. However, the Games have also caused the expansion of the functional urban limits due to the emergence of new spatial links and raising values of rural and peripheral land. Furthermore, urban interventions have been carried out in the entire Athens’ urban area, determining a ‘multi-nucleated urban regeneration program’. As a consequence, new sprawl patterns and therefore the ‘spillover’ of Athens have been indirectly favoured (Salvati and Serra, 2016).

In the case of the Attica region, the so-called Post-Olympic leapfrogging Urban Sprawl was the most common sprawl pattern. It is characterized by the expansion of urban areas through sub-centres around the Olympic sites spatially separated by the city core (even if connected by roads infrastructure). Other examples of leapfrog development in Attica are ‘Metropolitan Periphery Industrial Development’ (urban clusters around industrial sites) and the ‘Housing Cooperatives’ (new settlements created by groups of interest). Ribbon sprawl patterns have been detected throughout the region. Strip urban developments have sprang along major transport axes and such result is proof that Infrastructure-driven Urban Sprawl is dominant or widely diffused in Greece (and the Mediterranean).

2.4 Concluding Remarks

Along with the European coastal regions, Urban Sprawl and landscape change are becoming endemic. The environmental impacts of sprawl are evident in a number of ecologically sensitive areas located in coastal zones and mountain areas. With regards to the Area studied by the Plan Bleu and Centre d’Activités Régionales (2020) there is little prospect of relief over the

next two decades, especially with a predicted increase in population. The development-related impacts on coastal ecosystems and their habitats and services, have produced major changes in these coastal zones. The Mediterranean coast, one of the world's 34 biodiversity hotspots, is particularly affected, and the increased demand for water for urban use, competes with irrigation water for agricultural land. The consequences of Urban Sprawl on the environment, economy and quality of the cities include:

- the ever-growing cost of urban infrastructures;
- the loss of farming and natural land along the coasts that is often amongst the richest in the countries in question;
- the disappearance of wetlands and coastal erosion;
- the destruction of highly valuable natural habitats (shallow water areas, posidonia beds, sand dunes, turtle nesting sites, etc.);
- reduction of small-scale fishing;
- global degradation of the quality of Mediterranean landscapes;
- intensification of the effects of natural disasters in urbanised areas.

The list above refers specifically to the consequences of Urban Sprawl along the coasts of the Mediterranean. This list can be further expanded if we also include the observed impacts of low-density urbanization in the rest of the region, which include:

- a constant increase in demand for travel, linked to the decoupling of home from work;
- generalised congestion along the main transport arteries and, consequently, a drop in travel speed;
- recurrent shortcomings in public transport provision in terms of servicing and level of service;
- a constant rise in greenhouse gasses emissions linked to the transport sector, mainly road transport which is heavily dependent on fossil energy;
- increased land consumption per capita;
- higher dependency on fossil fuels;
- loss of economic attractiveness of the city.

Faced with these trends, the policies of integrated management of the coastal areas, of sustainable conservation of the coastline, wetlands and periurban farming land, promoting sustainable agriculture and rural development of inland areas and of integrating tourism and sustainable development should be strengthened everywhere. The Mediterranean Commission on Sustainable

Development endeavours to produce ideas and strategic proposals in this regard and efforts are being made on the regional level and in most of the Mediterranean countries, but results are still very limited.

In these regards, processes driving urban growth are inherently related to multiple socioeconomic factors, making the analysis of urban form vs socioeconomic functions a challenging and complicated endeavor (Brueggemann, 2005; Cohen, 2006; Hall and Pain, 2006; Angel et al., 2011). To identify the main determinants of city growth, it is necessary to consider a number of fundamental factors and contextual indicators, including economic and demographic variables, the socio-spatial structure and territorial patterns, as well as institutional and cultural attributes (Musterd and Ostendorf, 1998; Kazepov, 2005; Cassiers and Kesteloot, 2012).

In Mediterranean cities, long-established urban contexts remain heavily influenced by a complex interplay between these factors (Morelli and Salvati, 2010; Salvati et al., 2013; Salvati and Di Felicianantonio, 2014). Burgel (1975) depicted the Mediterranean region as represented – overall – by innumerable landscapes, urban forms, economic structures and social contexts, which would justify the inherent difficulty of explaining and interpreting the uniqueness of each Mediterranean city within this complex panorama. The case study of Athens demonstrates the variety that these areas have, despite the homogenous Mediterranean context. They differ in morphology and have had a different territorial and political configuration, but have common land use trajectories (Tomaio et al., 2021a; 2021b). The study of these cities simultaneously is useful for addressing the issues of the management and policies of sprawl.

References

- Angel, S., Parent, J., Civco, D. L., Blei, A., and Potere, D. (2011). The dimensions of global urban expansion: Estimates and projections for all countries, 2000–2050. *Progress in Planning*, 75(2), pp. 53–107.
- Arapoglou, V. P., and Sayas, J. (2009). New facets of urban segregation in southern Europe: Gender, migration and social class change in Athens. *European Urban and Regional Studies*, 16(4), pp. 345–362.
- Arbaci, S. (2007). Ethnic segregation, housing systems and welfare regimes in Europe. *European Journal of Housing Policy*, 7(4), pp. 401–433.
- Arbaci, S., and Malheiros, J. (2013). De-segregation, peripheralisation and the social exclusion of immigrants: Southern European cities in the 1990s. In *Linking Integration and Residential Segregation* (pp. 67–96). *Routledge*.

- Bell, S., Peña, A. C., and Prem, M. (2013). Imagine coastal sustainability. *Ocean & Coastal Management*, 83, pp. 39–51.
- Bruegmann, R., 2005. *Sprawl: a compact history*. University of Chicago Press, Chicago.
- Burgel, G. (2004). Athènes, de la balkanisation à la mondialisation. *Méditerranée*, 103(3), pp. 59–63.
- Cassiers, T., and Kesteloot, C. (2012). Socio-spatial inequalities and social cohesion in European cities. *Urban Studies*, 49(9), pp. 1909–1924.
- Christiansen, P., and Loftsgarden, T. (2011). Drivers behind urban sprawl in Europe. TØI report, 1136, 2011.
- Cohen, Barney. (2006). Urbanization in Developing Countries: Current Trends, Future Projections, and Key Challenges for Sustainability. *Technology and Society* 28(1-2), 63–80.
- Colantoni, A., Grigoriadis, E., Sateriano, A., Venanzoni, G., and Salvati, L. (2016). Cities as selective land predators? A lesson on urban growth, deregulated planning and sprawl containment. *Science of the Total Environment*, 545, pp. 329–339.
- Couch, C., Petschel-held, G., Leontidou, L., 2007. *Urban Sprawl In Europe: Landscapes, Land-use Change and Policy*. Blackwell, London.
- De Muro, P., Monni, S., and Tridico, P. (2011). Knowledge-based economy and social exclusion: shadow and light in the roman socio-economic model. *International Journal of Urban and Regional Research*, 35(6), pp. 1212–1238.
- Di Felicianantonio, C., and Salvati, L. (2015). ‘Southern’ Alternatives of Urban Diffusion: Investigating Settlement Characteristics and Socio-Economic Patterns in Three Mediterranean Regions. *Tijdschrift voor economische en sociale geografie*, 106(4), pp. 453–470.
- Economou, D., Petrakos, G. and Psycharis, Y. (2007). National urban policy in Greece. In L. Van den Berg, E. Braun and J. Van der Meer (eds.) *National Policy Responses to Urban Challenges in Europe* (193–216). Aldershot, UK: Ashgate.
- Gasparella, L., Tomao, A., Agrimi, M., Corona, P., Portoghesi, L., and Barbati, A. (2017). Italian stone pine forests under Rome’s siege: learning from the past to protect their future. *Landscape Research*, 42(2), pp. 211–222.
- Hall, P., Pain, K., (2006). *The polycentric metropolis. Learning from mega-city regions in Europe*. London, UK: Earthscan.
- Kasanko, M., Barredo, J. I., Lavalle, C., McCormick, N., Demicheli, L., Sagris, V., and Brezger, A. (2006). Are European cities becoming

- dispersed?: A comparative analysis of 15 European urban areas. *Landscape and Urban Planning*, 77(1-2), pp. 111–130.
- Kazepov, Y. (2005). *Cities of Europe: Changing Contexts, Local Arrangements, and the Challenge to Urban Cohesion*. Oxford, UK: Blackwell.
- King, R., Proudfoot, L. and Smith, B. (1997). *The mediterranean. Environment and Society*. London: Arnold.
- Kurt, S. (2016). Analysis of Temporal Change Taking Place at the Coastline and Coastal Area of the South Coast of the Marmara Sea. *Gaziantep University Journal of Social Sciences*, 15(3).
- Leontidou, L. (1990). *The Mediterranean city in transition*. Cambridge University Press, Cambridge.
- Leontidou, L. (1996). Alternatives to modernism in (southern) urban theory: Exploring in-between spaces. *International Journal of Urban and Regional Research*, 20(2), pp. 178–195.
- Malheiros, J. (2002). Ethni-cities: residential patterns in the Northern European and Mediterranean metropolises—implications for policy design. *International Journal of Population Geography*, 8(2), pp. 107–134.
- Maloutas, T. (2007). Socio-economic classification models and contextual difference: The ‘European Socio-economic Classes’(ESeC) from a South European angle. *South European Society & Politics*, 12(4), pp. 443–460.
- Mascarenhas, A., Haase, D., Ramos, T. B., and Santos, R. (2019). Pathways of demographic and urban development and their effects on land take and ecosystem services: The case of Lisbon Metropolitan Area, Portugal. *Land Use Policy*, 82, pp. 181–194.
- Mikhaylov, A. S., Mikhaylova, A. A., and Kuznetsova, T. Y. (2018). Coastalization effect and spatial divergence: Segregation of European regions. *Ocean & Coastal Management*, 161, pp. 57–65.
- Morelli, V. G., and Salvati, L. (2010). *Ad hoc urban sprawl in the Mediterranean city: Dispersing a compact tradition?*. Edizioni Nuova Cultura.
- Musterd, S. and Ostendorf, W. (1998). *Urban segregation and the welfare state: Inequality and exclusion in western cities*. London, UK: Routledge.
- Nickayin, S. S., Tomao, A., Quaranta, G., Salvati, L., and Gimenez Morera, A. (2020). Going toward Resilience? Town Planning, Peri-Urban Landscapes, and the Expansion of Athens, Greece. *Sustainability*, 12(24), pp. 10471.
- Pagliarin, S. (2018). Linking processes and patterns: Spatial planning, governance and urban sprawl in the Barcelona and Milan metropolitan regions. *Urban Studies*, 55(16), pp. 3650–3668.

- Pili, S., Grigoriadis, E., Carlucci, M., Clemente, M., and Salvati, L. (2017). Towards sustainable growth? A multi-criteria assessment of (changing) urban forms. *Ecological Indicators*, 76, pp. 71–80.
- Salvati, L. and Di Felicianantonio, C. (2014). ‘Exploring social mixite in the urban context through a simplified diversity index.’ *Current Politics and Economics of Europe* 24(3–4), pp. 1–11.
- Salvati, L., Morelli, V. G., Rontos, K., and Sabbi, A. (2013). Latent exurban development: City expansion along the rural-to-urban gradient in growing and declining regions of southern Europe. *Urban Geography*, 34(3), pp. 376–394.
- Salvati, L., and Gargiulo Morelli, V. (2014). Unveiling Urban Sprawl in the Mediterranean Region: Towards a Latent Urban Transformation?. *International Journal of Urban and Regional Research*, 38(6), pp. 1935–1953.
- Salvati, L. and Forino, G. (2014). A ‘laboratory’ of landscape degradation: social and economic implications for sustainable development in peri-urban areas. *International Journal of Innovation and Sustainable Development*, 8(3), pp. 232–249.
- Salvati, L., Quatrini, V., Barbati, A., Tomao, A., Mavrakakis, A., Serra, P., Sabbi, A., Merlini, P., and Corona, P. (2016). Soil occupation efficiency and landscape conservation in four Mediterranean urban regions. *Urban Forestry and Urban Greening*, 20, pp. 419–427.
- Salvati, L. and Serra, P. (2016). Estimating rapidity of change in complex urban systems: A multidimensional, local-scale approach. *Geographical Analysis*, 48(2), pp. 132–156.
- Schneider, A. and Woodcock, C. E. (2008). Compact, dispersed, fragmented, extensive? A comparison of urban growth in twenty-five global cities using remotely sensed data, pattern metrics and census information. *Urban Studies*, 45(3), pp. 659–692.
- Sreeja, K. G., Madhusoodhanan, C. G., and Eldho, T. I. (2016). Coastal zones in integrated river basin management in the West Coast of India: Delineation, boundary issues and implications. *Ocean & Coastal Management*, 119, pp. 1–13.
- Tomao, A., Quatrini, V., Corona, P., Ferrara, A., Laforteza, R., and Salvati, L. (2017). Resilient landscapes in Mediterranean urban areas: Understanding factors influencing forest trends. *Environmental Research*, 156, pp. 1–9.
- Tomao, A., Mattioli, W., Fanfani, D., Ferrara, C., Quaranta, G., Salvia, R., & Salvati, L. (2021a). Economic Downturns and Land-Use Change: A Spatial Analysis of Urban Transformations in Rome (Italy) Using a

- Geographically Weighted Principal Component Analysis. *Sustainability*, 13(20), 11293.
- Tomao, A., Quaranta, G., Salvia, R., Vinci, S., & Salvati, L. (2021b). Revisiting the ‘southern mood’? Post-crisis Mediterranean urbanities between economic downturns and land-use change. *Land Use Policy*, 111, 105740.
- UN (United Nations). (2006). *World Urbanization Prospects: The 2005 Revision*. New York: United Nations.
- United Nations Environment Programme/Mediterranean Action Plan and Plan Bleu (2020). *State of the Environment and Development in the Mediterranean*. Nairobi.
- United Nations. (2019). *World Population Prospects 2019*, Online Edition. New York, NY: *Department of Economic and Social Affairs*. Retrieved from <https://population.un.org/wpp/>
- Valev, E. B. (2009). The problems of development and interaction of seaside territories in Europe. *Regional Studies*, 1(22), pp. 11–23.
- Zambon, I., Serra, P., Sauri, D., Carlucci, M., and Salvati, L. (2017). Beyond the ‘Mediterranean city’: Socioeconomic disparities and urban sprawl in three Southern European cities. *Geografiska Annaler: Series B, Human Geography*, 99(3), pp. 319–337.

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About the Editors

Antonio Tomao graduated in “Forestry and Environmental Sciences” from the University of Tuscia (Viterbo, Italy) in 2011 and holds a PhD in “Landscape and environment design management and planning” from the University of Rome “La Sapienza” in 2015. He is a fixed term researcher at the Council for Research in Agriculture and the Analysis of Agricultural Economics (CREA) and adjunct professor of “urban and territorial planning” at the Department of Economics and Law of the University of Macerata. Since 2011, he has been a collaborator in research activities and subsequently a research fellow (in role until 2021) at the Department for Innovation in Biological, Agro-food and Forest systems (DIBAF) of the University of Tuscia. He has carried out research periods abroad as a “visiting researcher” at the Forest Science and Technology Centre of Catalonia (CTFC) in Spain in 2015 and the Swedish University of Agricultural Sciences (SLU), in Sweden, in 2019. He has a background and expertise in geomatics applications to environmental monitoring, urban forest risk assessment, urban planning, regional planning and green infrastructure planning.

Matteo Clemente, Architect, PhD in Surveying and Representation of the Built Environment (1999). Research fellowship (2013/2017) at the Department of Architecture and Design of the University of Rome La Sapienza. He carries out research on the issues of redevelopment of the contemporary city, with particular reference to the re-design of public spaces, from the scale of urban design to that of landscape design and temporary set-up. He has an academic license for Associate Professor in Architectural Design and Urban Planning in 2018. He taught Exhibit and Public Design at the University of Rome La Sapienza, Architectural and Urban Design at the Federico II University of Naples, and Landscape Planning at the University of Tuscia. His publications include: *Re-design dello spazio pubblico*, FrancoAngeli, 2017, *Comporre e scomporre l'architettura*, Aracne, 2012, and *Estetica delle periferie urbane*, Officina Edizioni, Roma, 2005.

He is owner of a planning firm based in Rome mtstudio srl (www.mtstudio.it).

PERI-URBAN CONFLICTS AND ENVIRONMENTAL CHALLENGES

A MEDITERRANEAN PERSPECTIVE

Editors

**Antonio Tomao
Matteo Clemente**

Urban expansion and the preservation of fringe landscapes are clearly interconnected issues. This book discusses the relationship between landscape and peri-urban agriculture and the possible implications of sustainable land management for fringe land quality, proposing a framework to evaluate the latent nexus between agro-forest systems and human settlements in Southern Europe. Eco-sustainable planning integrated with multi-faceted policy actions (social, economic, cultural and political dimensions) is a relevant approach to reinforce sustainability of fringe landscapes. Permanent assessment of these factors allows for the implementation of different development scenarios. The present work definitely contributes to systemic and multi-scale approaches informing environmental policies, with the aim of achieving an integrated management of peri-urban agricultural landscapes.

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