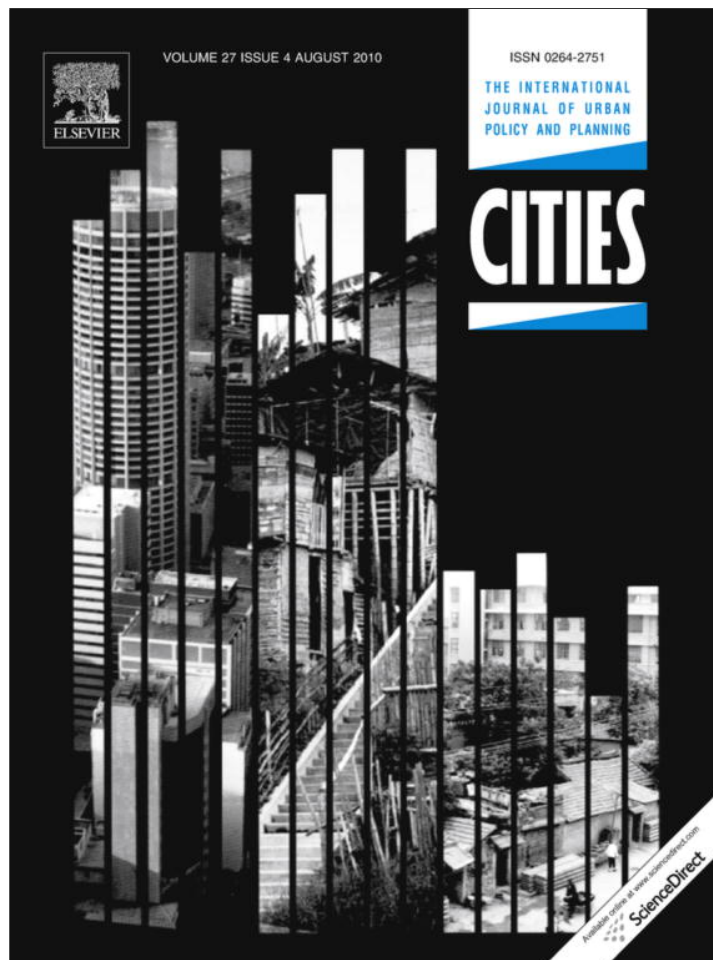


Provided for non-commercial research and education use.
Not for reproduction, distribution or commercial use.



This article appeared in a journal published by Elsevier. The attached copy is furnished to the author for internal non-commercial research and education use, including for instruction at the authors institution and sharing with colleagues.

Other uses, including reproduction and distribution, or selling or licensing copies, or posting to personal, institutional or third party websites are prohibited.

In most cases authors are permitted to post their version of the article (e.g. in Word or Tex form) to their personal website or institutional repository. Authors requiring further information regarding Elsevier's archiving and manuscript policies are encouraged to visit:

<http://www.elsevier.com/copyright>

Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

Cities

journal homepage: www.elsevier.com/locate/cities

Planning, competitiveness and sprawl in the Mediterranean city: The case of Athens

I. Chorianopoulos*, T. Pagonis, S. Koukoulas, S. Drymoniti

Dept. of Geography, University of the Aegean, University Hill, Mytilene 81100, Greece

ARTICLE INFO

Article history:

Received 4 February 2009
Received in revised form 6 October 2009
Accepted 30 December 2009
Available online 6 March 2010

Keywords:

Sprawl
Competitive city
Planning
Athens
Olympics

ABSTRACT

Competitiveness appears as a new element in the specific dynamics of the Mediterranean city. This paper explores the process of competitiveness at the local level, and the implications of the re-orientation of spatial planning priorities through case-study research. It looks at Athens, an example of a so-called 'winner' city, which hosted successfully the 2004 Olympic Games. It examines by means of satellite imagery and GIS the changing patterns of land development in the metropolitan area. Olympics-related infrastructural investments, such as the new ring road and international airport, facilitated the efficient execution of the Games. Olympic development priorities, however, sidestepped stated planning directions on metropolitan growth. Evidence presented in this paper point to a land-use change trend in the urban periphery that takes the form of unordered expansion. Competitiveness agendas exacerbate unsustainable development tendencies, compromising future growth prospects.

© 2010 Elsevier Ltd. All rights reserved.

Introduction

This paper brings together two seemingly distinct discussions on urban planning and policy that focus on European metropolitan areas. The 'urban competitiveness' discussion inquires into the ability of metropolitan areas to attract investment, addressing also the socio-economic implications of the re-orientation of planning goals in this direction. The rise of the term 'metropolitan governance' aims to capture the spatial re-articulation of local regulatory scales as a result of enhanced competitiveness efforts.

The second discussion explored in this paper revolves around the concept of 'urban sprawl'. Sprawl is primarily associated with cities experiencing modest overall population growth and significant population redistribution into the urban fringe (Batty et al., 2003). Most research on sprawl has been conducted in the USA, reflecting the comparatively earlier availability of factors that enabled the outward movement of manufacturing, services and housing (Richardson and Gordon, 1999). Lately, however, there has been a rising interest in Europe in mapping and exploring this particular pattern of growth. A increasing number of studies (Bontje and Burdack, 2005; Couch and Karecha, 2006) and EU research projects (SCATTER, 2005; URBS PANDENS) provide the debate with vivid arguments and satellite images of cities undergoing explosive changes, scattering over ever-greater areas.

The focus of the European literature on sprawl does not rest heavily on its negative effects, as is the case with the US example.

It pays though attention to the role of actors and processes involved in suburban and ex-urban growth (Phelps et al., 2006; Couch et al., 2007). In this paper, we argue that the seeing the city in isolation – without ample understanding of the wider context that shapes urban growth and its characteristics – leads to inadequate interpretations of sprawl and its impact. Sprawl is defined here as a process of uncoordinated change, an approach that broadens the analytical perspective to incorporate the role of spatial planning in steering the activity in the urban hinterland. In this light, we explore the impact of urban competitiveness as a key factor in influencing the direction of planning interventions and in inducing urban sprawl. At a second level of analysis, we examine competitiveness as a factor influencing the dynamics of the Mediterranean city. The literature on Southern European cities has adequately explored the post-war period of rapid urbanization in Spain, Greece and Portugal. While the distinctiveness of urban trajectories at the national and local level has been recognized, functional and morphological similarities were also registered, differentiating the mode of urban evolution in the South from the ideal-typical Northern European urban example (Leontidou, 1996; Chorianopoulos, 2002). Key amongst these differences was the incapacity of planning in the South to control urban expansion and the consequent popular colonization of the urban fringe (Wynn, 1984a; Gaspar, 1984; Munoz, 2003).

Sprawl in the case of Athens, as an example, is a structural characteristic of the way the city developed. It is noted in the post-war period of rapid urbanization, occurring simultaneously with growth in the urban core. It was sustained as a trend in subsequent phases of urban development, due to particularities of the socio-political environment, and the distinct land-use planning traits. Athens is currently demonstrating a new wave of sprawl,

* Corresponding author. Tel.: +30 22510 36462; fax: +30 2251036409.

E-mail addresses: ichorian@geo.aegean.gr (I. Chorianopoulos), apagonis@geo.aegean.gr (T. Pagonis), skouk@geo.aegean.gr (S. Koukoulas), geom04003@geo.aegean.gr (S. Drymoniti).

with already noticeable socio-economic and environmental consequences. This, in turn, is related to changed spatial planning priorities that promote the competitiveness of the local economy.

The paper is organized in three parts. The first part reviews the discussion on urban competitiveness and sprawl, and comments on the re-orientation of planning goals towards economic development targets. The second part looks at Athens. It outlines the urban trajectories of the city, providing an insight into the role of planning in guiding the process. It then considers recent planning moves aiming to enhance the competitiveness of the local economy. The interplay between competitiveness-related actions and growth patterns is investigated in the third part of the paper, dealing with land-use changes in the Messoghia plain, using satellite imagery and Geographical Information Systems (GIS). Messoghia is the area in which significant infrastructural investment took place under the auspices of the 2004 Olympics. Quantifying and mapping land-use changes (focusing primarily on land-cover changes) substantiates the discordance between planning goals and growth trends, underscoring the relationship between competitiveness and sprawl. Reflecting on the research findings, the paper concludes by discussing the need for more sophisticated analysis of the relationship between sprawl and competitiveness in view of the particularities of cities with underdeveloped land-use planning structures.

Competitiveness and sprawl

Planning goals re-orientation

Socio-economic restructuring processes and the emerging distributions of economic activities at an international scale suggest that the growth prospects of cities depend increasingly on their comparative advantages to attract investment and generate local development opportunities (Camagni, 2002). Most investment-related decisions are influenced by a combination of locational factors which, because they characterize a territory for all actors, operate as public goods. Key locational factors influencing development choices, therefore, can be provided or at least modified by local actors, who function as producers of public goods (Boddy and Parkinson, 2004). The term 'urban competitiveness' attempts to capture the shifting role(s) of local level actors in economic development. It indicates a change in the structural orientation of local public policies, from the political articulation of the nationally-determined priorities of domestic full employment and collective consumption (Goodwin and Painter, 1996), to the 'construction of territorial specificities' aiming at enhancing the growth potential of the locality (Preteceille, 1997). The shift towards the 'competitive' city (Harvey, 1989), is noticeable in the following, methodologically distinct, regulatory responses attempting to modify the competitive attributes of cities.

1. Supply-side actions, focusing on altering local administrative and economic characteristics that shape urban competitiveness. The spatial re-organization of the urban administration and the creation of metropolitan governance structures is, in this context, aiming at improving coordination among actors and boosting local development potential (OECD, 2000).
2. Demand-oriented actions, striving to respond to the attributes which firms are seeking from a particular location in order to operate. The construction of physical infrastructure designed to make the area more locationally-attractive for investment and favourable to the establishment and growth of local economic initiatives is a key example of such a response (Malecki, 2007).

3. Image development and image enhancement strategies, aiming to differentiate a place from other investment location choices by highlighting its core benefits, style and culture (Bennett and Savani, 2003). The promotion of rejuvenated urban images involves mobilization of diverse policy tools and resources, including, among others: the preservation of architectural heritage sites; flagship property developments aiming at altering city-centre landscapes; and the hosting of major cultural, entrepreneurial and sport events. Place marketing considerations, in that respect, are now viewed as a fundamental part of land-use planning, guiding the development of places (Bradley et al., 2002)

The consequences of such a development strategy re-orientation have attracted the interest of scholars the last two decades. Urban competitiveness, it is suggested, is embedded in a framework of zero-sum inter-urban competition for resources, jobs and investment in which as many cities lose as gain in the process, furthering the potential of uneven geographical development¹ (Zukin, 2006; Brenner, 2000). Inter-urban competition is regarded as a capacity-building and growth enhancing policy-orientation only for the successful urban regions (Cheshire and Gordon, 1995). Even in the case of 'winner' cities, however, the literature questions the effectiveness of competitiveness-oriented policy interventions in tackling social inequalities (Boddy, 2002). The replacement of universal support structures with the targeting of particular (geographically-specific and economically-promising) places for intervention is a process that fosters exclusionary mechanisms (Swyngedouw et al., 2002). In light of the absence of higher-scale regulatory and redistribution policies, place-focused development approaches re-organize the city's socio-economic fabric along fragmented lines, accentuating polarization (Brenner and Theodore, 2002).

Urban competitiveness strategies have been adequately analyzed in terms of their social, political and economic implications at both the inter- and intra-city levels. Building on this work, this paper explores their impact on patterns of land-use change. Studies examining the effects of urban form on economic outcomes suggest that the physical make-up and shape of cities influences economic performance: compact and accessible urban regions enjoy higher productivity rates (Prud'homme and Lee, 1999; Cervero, 2001). Competitiveness-related policies do generate a spatial restructuring dynamic with distinct implications on the urban form and functions. Research reported in this paper, however, argues that in the case of cities with underdeveloped land-use planning structures, this restructuring dynamic is associated with sprawling tendencies, jeopardizing future economic performance. The literature on competitiveness has not adequately explored this dimension, or outcomes, of shifting planning orientations. There is a reason for this. Sprawl is a particularly elusive concept.

Erratic sprawl

Similar to urban competitiveness, the concept of 'sprawl' is another umbrella term surrounded by a controversy regarding its features, causes and effects. 'Sprawl' is generally perceived as occurring in rapidly growing areas on the urban fringe. This growth is seen as undesirable with respect to infrastructure, transportation and the housing needs it generates.

The exercise of defining sprawl in terms of its corresponding density traits, spatial forms, socio-economic and environmental impacts presents inherent difficulties. Focusing on the density factor, sprawl is positioned against the ideal-typical urban models

¹ The increase in inter-urban disparities in the EU level since the Single European Act (1986), for instance, has been approached along the lines of the above argument (Cheshire, 1999; McCarthy, 2000).

(Burgess, 1925; Alonso, 1971), in which the density of urban activity follows a declining slope away from the city centre. Changes in density at different distances from the city centre reflect, and are distorted by, a variety of factors, including land morphology, transport routes and the type of activity measured. In cases of sprawl, it is argued, the density gradient of urban activity is always becoming less steep (Couch et al., 2005, p. 119). In this argument, however, sprawl comes across as a matter of degree, not easily quantified. Moreover, what is understood as low-density development differs from place to place, rendering the designation of the process a relative and place-specific exercise (Chin, 2002).

Similarly, the urban forms that are considered to correspond to a sprawl-type of growth present a high degree of variation. Key examples include, among others:

- 'suburban' growth, or contiguous expansion of existing development away from a central core;
- 'strip' development, referring to growth along major transport routes;
- 'scattered', or, discontinuous development positioned against a multi-centred city; and
- 'leapfrog' development, a form of growth that is discontinuous and it is positioned against a monocentric city (see Heim, 2001; Galster et al., 2001).

As too many patterns of land development are gathered under one term, sprawl is defined on an ad hoc basis, following the characteristics of the case-study examined. An alternative approach at distinguishing sprawl is to view the process indirectly, looking at its impact. Recent research projects that explored the consequences of sprawl in European cities identified the following land-use conversion, transport, and (low) density related processes of change:

- (a) *environmental*, with reference to the consequences of increased rural land consumption, loss of forested and environmentally fragile land, ecosystem fragmentation, greater consumption of resources per capita, and heightened car transport usage;
- (b) *economic*, referring to land value speculative dynamics, augmented costs for public infrastructure investment and maintenance, and to the problematic viability of public service provision; and
- (c) *social*, with reference to increased commuting and weakened sense of community, income-related spatial segregation of residential development, and increased risk of social exclusion and underinvestment in the inner cities (Johnson 2001; EEA, 2006; Phelps et al., 2006).

Such impacts describe at best what sprawl does, instead of what it is (Galster et al., 2001). Attempting to recognize sprawl through its effects, in other words, creates a tautology: one that assumes the negative consequences of sprawl, to define, in turn, all undesirable impacts of urban growth as sprawl (Chin, 2002). Sprawl, therefore, is a term applicable to many unwanted conditions. The negativity that accompanies it draws from the costs associated with urban expansion. As cities gain population, however, increased central density is not always a viable option. The setting in of diseconomies of scale in the form of congestion affects directly the efficiency of urban markets (Batty et al., 2003). Also, in the face of continuing housing demand in peripheral areas, limiting supply through urban development controls could only lead to an increase in house prices, furthering socio-spatial segregation (Couch and Karecha, 2006). In that sense, sprawl does not encompass all modes of expansion. The aforementioned costs come primarily across in cases of unplanned and unsustainable growth.

The quest for sustainable development takes in the case of sprawl, the form of 'smart growth'² strategies, consisting of land-use controls sensitive to the issues of housing diversity, traffic congestion and environmental degradation (Burchell et al., 1998). The capacity of land-use planning to influence urban expansion through smart-growth policies, however, presupposes that policy objectives reflect primarily growth-control considerations. The increased weight of competitiveness-related priorities in the planning agenda unsettles this prioritization. In the case of cities with underdeveloped land-use planning structures, the re-prioritization of planning goals towards the development target is risking unordered expansion. The following section of the paper explores this argument in the Athens Metropolitan Area.

Planning an uncontrolled city

Athens and sprawl

Athens is a formative example of the Mediterranean city thesis (Leontidou, 1990). Exhibiting similar traits with Spanish and Portuguese cities, its economic structures in the post-war period of rapid urbanization were not based on manufacturing (Hudson and Lewis, 1984, p. 197–201). Instead, urbanization economies³ triggered industrialization (Louri, 1988). As a result, the city did not experience the de-industrialization/disurbanisation wave noted in Northern Europe since the 1970s. It has kept on exhibiting population gains (Turok and Mykhnenko, 2007), displaying a distinct 'life cycle' model (Van der Berg et al., 1982). A further characteristic of the Mediterranean city noted in Athens is the unplanned mode of its expansion. The history of Athenian growth trajectories supports this argument as it portrays a city that keeps on growing in an un-designed fashion, based on small, self-financed property development schemes, with limited public expenditure for urban infrastructure (Economou et al., 2007; Mantouvalou et al., 1995; Chorianopoulos, 2003). A snapshot of this development is shown in Fig. 1, revealing three main phases of expansion, each one characterized by sprawling dynamics.

These spontaneous urbanization processes driven by self-promoted housing strategies are imprinted on the physical and functional facets of the Athenian urban environment, characterized by: (a) a combination of high densities in the urban core and sub-optimal land-use in the metropolitan periphery; (b) a high degree of land-use mix and lack of open public spaces in central areas; (c) a low quality of environmental infrastructure and concomitant private car transportation dependence; and (d) significant distortion of the historical and natural topography (Economou et al., 2007; Leontidou et al., 2007).

The Athens Regulatory Master Plan (1985), paying particular emphasis to environmental protection and the control of peri-urban growth dynamics, aims to deal with the structural problems of the conurbation in a comprehensive way. A central government agency, the Organization for Planning and Environmental Protection of Athens (OPEPA) oversees its implementation. Its role, however, is constrained by limited formal competences and the structural deficiencies of the planning system. OPEPA operates as a subsidiary to the Ministry of the Environment

² The emphasis on compact development as a way to conserve resources and the encouragement of investment in older city centres are examples of the way the 'smart growth' approach has guided planning policy in a number of US and European cities since the mid-1990s (Burchell et al., 1998, p. 37; EEA, 2006).

³ Urban growth, by creating economies of scale, enabled an industrialisation process underscored by rapid growth and the economic transformation of Spain, Portugal and Greece into urban-industrial economies.

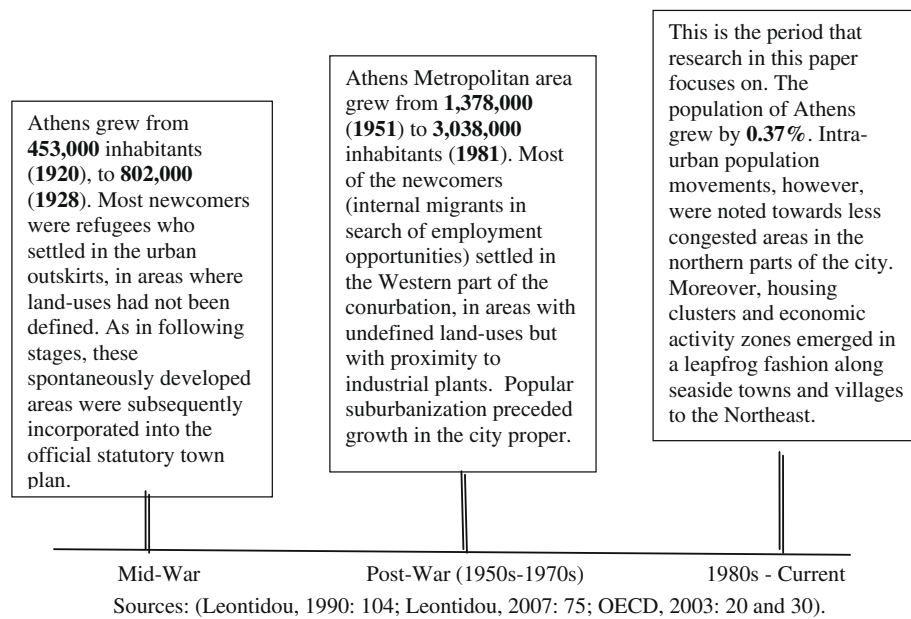


Fig. 1. Key stages of Athenian expansion.

and Public Works. It has a primarily advisory role, lacking sufficient implementation powers and corporate capability to respond to the acute needs of metropolitan management and coordination. Its role is further challenged by the presence of a variety of political-administrative bodies with overlapping planning competences. Institutional fragmentation arrests the articulation of coordinated spatial development goals that address the metropolitan area.⁴ Moreover institutional capacities prevent OPEPA's directives from being successfully implemented 'on the ground'. A key example of current obstacles to planning efficiency is the absence of basic land management tools, like the national cadastre, or of mechanisms that monitor land-use change and update surveys and data-bases.⁵

The existence of such impediments, however, does not shed light on the reasons behind the non-development of appropriate planning frameworks and tools during all these decades. In this context, a number of authors view uncontrolled growth as an example of a tacit short-term attempt at strengthening economic growth. In the first urbanisation phases, it is argued, tolerance by the respective authorities of unplanned housing on the urban fringe provided a temporary solution to the urgent housing

requirements of the migrants, while it allowed consequent political exploitation of the issue⁶ (Wynn, 1984b). Regarding more recent sprawling periods, the literature stresses the important contribution of building and infrastructure activities to national economic indicators, as well as to the capacity of the sector to absorb large amounts of labour by providing opportunities for employment (Wynn, 1984b, p. 123). It was the choice between sustainable land-use planning objectives and economic development priorities, therefore, which tipped the balance towards the second target, obstructing the emergence of a rational planning framework for the metropolitan area. In the last decade, the capacity of regulatory planning to guide growth has been challenged by the re-prioritisation of development goals towards the promotion of economic competitiveness. The 2004 Olympic Games is the key example of this trend.

Athens and competitiveness: the Olympics turning-point

With a concentration of around one third of the total population of the country and a contribution of over one third of its total income (OECD, 2003, p. 39), Athens Metropolitan Area dominates the Greek urban system. Athens was for many decades, however, credited with one of the lowest indicators of competitiveness in Europe due to a variety of factors relevant to its introverted economic traits, long lasting environmental problems and outdated infrastructure. The Olympics, therefore, were perceived as an opportunity to project a new 'winner' image for the capital and, in the words of the organizers, to 'prove to the world that the city has also a future besides a glorious past' (METREX, 2001, p. 36). In this light, staging the Games was perceived as a national rather than a local effort. The government re-oriented regional policy towards this goal and allocated significant funds for the realization of projects aimed directly at raising urban competitiveness. Two key project categories reflect this prioritisation:

⁴ The Attica region, a central government administrative arm, is subdivided into four prefectures run by directly elected, second tier, local authorities. A directly elected supra-prefecture assumes coordination, but it is entrusted with limited decision-making powers. Moreover, a total of 369 ministerial directorates and state agencies are also actively involved in local development. Looking at the first local authority tier we note that the Athens metropolitan area comprises of over 90 municipalities and 30 communes, with no legal capacity however to determine land-uses. The latter is the responsibility of OPEPA, with local authorities overseeing the implementation of relevant planning guidance.

⁵ Greece possesses a complex spatial planning framework, characterized by a rigid top-down approach that lacks clarity (Giannakourou, 1999). Four distinct stages of plan-making are noted: (a) the *Regulatory Master Plan*, relevant to Athens and Salonica metropolitan areas; (b) the *General Urban Plan*, undertaken at the municipal level; (c) the *Town Planning Study*, undertaken at the neighbourhood level; and (d) the *Implementation Act* that deals with the specifics of property and taxation. Meanwhile, a side legislative tool permits land owners to bypass this lengthy process by granting development rights to every plot of land outside statutory plans that fulfills minimum terrain prerequisites, and does not form part of a forested or protected area. Construction standards are particularly favorable to development along the main road network, triggering uncontrolled growth pressures in the respective areas.

⁶ The legal recognition of squatter settlements and their integration in town plans prior to national elections, were common occurrences in Spain, Portugal and Greece; part of an attempt by the authorities to generate dependence on the state (Leontidou, 1990, p. 255; Williams, 1984).

- First, those aiming at reducing peripherality and improving the functional aspects of the metropolitan area, focusing on telecommunication and transport infrastructure provision. Key examples include the new Athens Underground, the international airport, the Athens ring road, the suburban railway and the tramway connecting the city centre with the western waterfront.
- Second, those aiming at improving the attractiveness of the urban area and the city's capacity to act as an international venue for year-round tourism. Examples include the unification of archaeological sites in the city's historical centre, the regeneration of the western waterfront area, and the post-Olympic conversion of sporting facilities to convention, business and entertainment venues (Beriatos and Gospodini, 2004).

Part of this wide redevelopment program was financed through the national budget. Most of funding, however, derived from the 3rd Community Support Framework (CSF).⁷ In some cases, such as the post-Olympic conversion of athletic facilities, the construction and operation of the Athens ring road⁸ and the new international airport, the Greek state initiated public-private partnership schemes, signing for the first time exclusive build and transfer agreements with private consortiums. This shift towards new state-led entrepreneurial strategies unsettled dominant ideas regarding the future development of the city. It marks a clear break from past policy directives on Athenian planning, which opposed investment in major projects in an attempt to halt the over-concentration of activities and population in the metropolitan area.

The Olympic Games, therefore, acted as a catalyst for the redirection of spatial policy towards the promotion of urban competitiveness. The extent to which the above policy shift will trigger economic growth, as well as the way in which expected benefits will be distributed within the city in the long run, generated a distinct controversy (see OECD, 2003; Stathakis and Hadjimichalis, 2004). The focus of this examination turns towards exploring the impact of these policies on the ground, with respect to sustainable urban development and sprawl. Two key aspects of the above changes guide analysis in this direction.

- First, the emergence of new spatial links that alter development dynamics. Major transport projects, such as the underground, the suburban rail and the Athens ring road, by establishing new connections between previously ill-linked areas, expanded the functional urban limits and transformed the geography of the metropolis.
- Second, changes in real estate dynamics, associated with the high level of infrastructural investment, and with the novel role of the private sector in relevant undertakings. The emergence of developers' consortiums, focusing on investment opportunities in large retail, office, entertainment, and housing estate projects, affects land prices and intensifies development pressures (Delladetsima, 2006). Infrastructure investment took place in various locations around Athens. It was primarily channelled, however, into the eastern part of the metropolis, the area called the Messoghia plain.

⁷ Side projects were financed through the *Regional Operational Program of Attica* of the CSF (2000–2006). Most funding, however, derived from the *National Sectoral Programs* for transport, urban development and road works, and the environment of the CSF. The ministries of the environment, transport and culture overlooked implementation through ad hoc agencies, while the municipality of Athens handled its largest grant to date to manage aesthetic improvements in the city (Pagonis, 2006).

⁸ The so called *Attica Road* was built from scratch as a closed urban highway system, also connecting the new airport with the national motorway network.

Mapping recent urban growth in the metropolitan periphery

The study area: the Messoghia plain

Messoghia is part of the Athens Metropolitan Area, regulated by the city's Master Plan. With a size comparable to the conurbation of Athens (see Fig. 2) and relatively low levels of development, Messoghia has been recognized in official planning documents as a regional territorial 'asset'. The goals of the Master Plan (1985), in particular, suggested the reinforcement of primary sector activities, stressing the necessity of adopting measures in support of the area's rural character.

As seen in Fig. 2, the plain extends eastwards of the Athenian conurbation. Hymettus Mountain to the west has acted as a physical barrier separating the plain from the conurbation, providing also a reason as to why the area escaped the waves of intensive urbanization that transformed Athens throughout the 20th century. Messoghia, in fact, retained its agricultural character until the early 1980s, when marked population increases were set off. The area, however, still lacks a major spatial pole of economic development. The settlement pattern is defined by various small towns scattered across it, and several sea-side resorts to the east that grew as second home areas to Athenians. Administratively, Messoghia is subdivided into 13 municipalities and communes.

The beginning of change for Messoghia started in the 1980s when the decision to relocate the city's international airport in the area was taken. This decision alone cancelled *de facto* official planning directions re. the area's prospects. Subsequent appropriation of agricultural land for airport construction was followed by further infrastructural investment, which materialized due to Olympic Games funding. The construction of new road and rail links, connecting the airport with the city, transformed the area's accessibility patterns. The picture was completed with the construction of two major Olympic venues (the Equestrian Centre and the Shooting Centre, both near the town of Markopoulo) again built on appropriated agricultural land.

Recognizing the socio-economic consequences deriving from such infrastructure investment activity, OPEPA commissioned in the early 1990s a comprehensive spatial planning study of Messoghia (OPEPA, 1997). This resulted in new regulations for the area's land-use, subdivision and building, restrictions that were activated as late as 2003,⁹ a year before the Games commenced and almost two decades after the adoption of the Athens Master Plan. Throughout this period, no regulatory mechanism was controlling development outside statutory urban plans. The consequences of this belated planning response are explored next. Investigation starts by assessing the extent to which the Messoghia study area has been urbanized. Locating and quantifying land-use change, in turn, provides a framework for approaching the role of regulatory land-use planning in guiding growth processes in the area.

Land-Use change detection in Messoghia

Satellite imagery and aerial photographs are often used to map land-cover for several time periods and to quantify land-cover changes. For the quantitative analysis of these images, various techniques are used, such as image differentiating, image ratio, correlation, principal component analysis, vegetation indices and post-classification comparison. Most change detection studies have focused on post-classification comparison (for example, Carlson and Sanchez-Azofeifa, 1999; Schneider et al., 2005; Symeonakis

⁹ Outside the borders of statutory plans urban growth in Attica is regulated by a system of 10 Urban Development Control Areas (UDCAs), part of implementing the Regulatory Master Plan (1985). Some of them are already in force, while others are still in the study/approval phase.

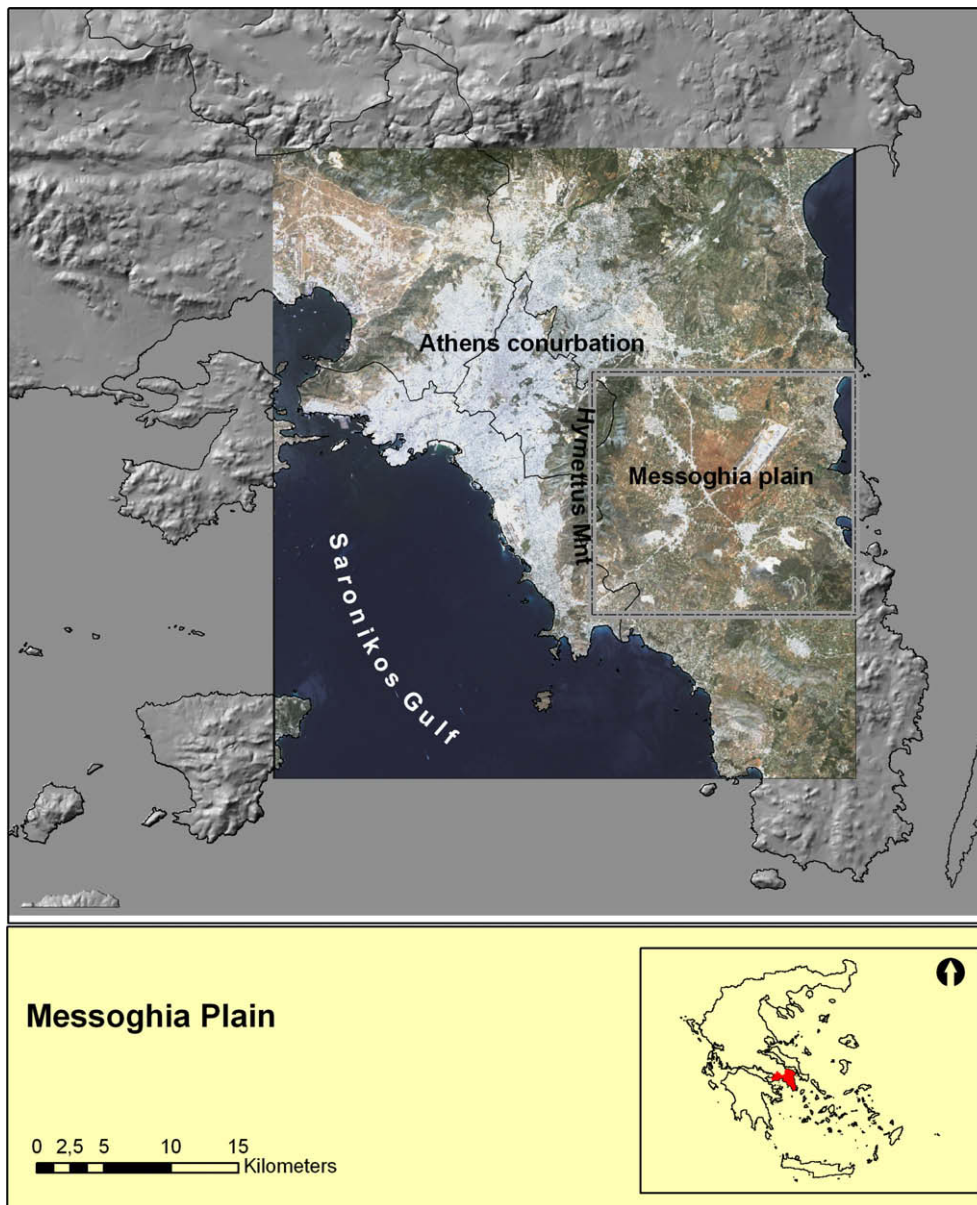


Fig. 2. Messoghia plain.

et al., 2006; Gatsis et al., 2006; Koukoulas et al., 2007). The main advantage of post-classification analysis is that it overcomes the problems occurring upon comparing images acquired at different times of the year by different sensors. However, it presents significant difficulties concerning the accuracy of each classification individually and especially the assessment of land-cover accuracy based on historical data.

A more specific research field is that of urban growth monitoring, especially of big metropolitan centres. Urban growth monitoring is a special case of land-cover/use change. Monitoring urban growth using remote sensing is materialized by comparing classified images of different dates and detecting changes of pixels from one class (non-urban) to another (urban).

In our research, two Landsat TM 5 satellite images (June 1987 and May 2003, seven bands, nominal pixel size: 30 m) were employed for identifying land-cover changes in the study area. Geometric correction of the images was performed using 2nd order polynomials and nearest neighbour resampling with an RMS error smaller than one pixel. The two scenes were referenced to a com-

mon projection (Greek Geodetic Reference System, 1987) and were classified using the maximum likelihood classification rule, with randomly selected samples within each land-cover class (identified using existing land-cover maps). Initially seven land-cover classes were chosen, using the Corine classification system for interoperability with other classification products.¹⁰ As our study is orientated towards urban growth monitoring, change detection focuses on the transformation of non-urban land-uses to urban land-uses. Thus, we have proceeded to post-classification merging of all non-urban land-use types in one class in order to differentiate them from urban land-uses.

¹⁰ Urban uses (discontinuous urban fabric, industrial or commercial units, airports, mineral extraction sites, construction sites), various cultivations (fruit trees and berry plantations, complex cultivation patterns, land principally occupied by agriculture with significant areas of natural vegetation), olive groves, vineyards, low vegetation (natural grasslands, sclerophyllous vegetation, transitional woodland-scrub), forest (coniferous) and water bodies.

Change detection using only two satellite images does not always produce reliable results, as confusion among similar classes often occurs. Spectral signatures of some cultivated areas and bare land are similar to urban areas (with varied density) and this compromises the accuracy of land-cover mapping and moreover that of change detection. In order to alleviate this problem a wide range of approaches has been used by other researchers (such as multitemporal, multisensor and/or advanced classification techniques). For example, Symeonakis et al. (2006) adopted a multitemporal methodology, Schneider et al. (2005) used a multiseasonal set of images, while others employed less resource-demanding approaches; Gatsis et al. (2006) and Koukoulas et al. (2007) focused on a rule-based approach to limit the false and random changes. We have limited our study area to exclude nearby mountainous surfaces that could cause confusion and with the help of basic rules regarding possible/not-possible changes, we were able to limit our errors in the urban cover maps and the final map of changes. Accuracy assessment was applied using error matrices as described in Koukoulas and Blackburn (2001), Khorram (1999) and Congalton and Green (1999). In Fig. 3, three types of change are observed:

Table 1

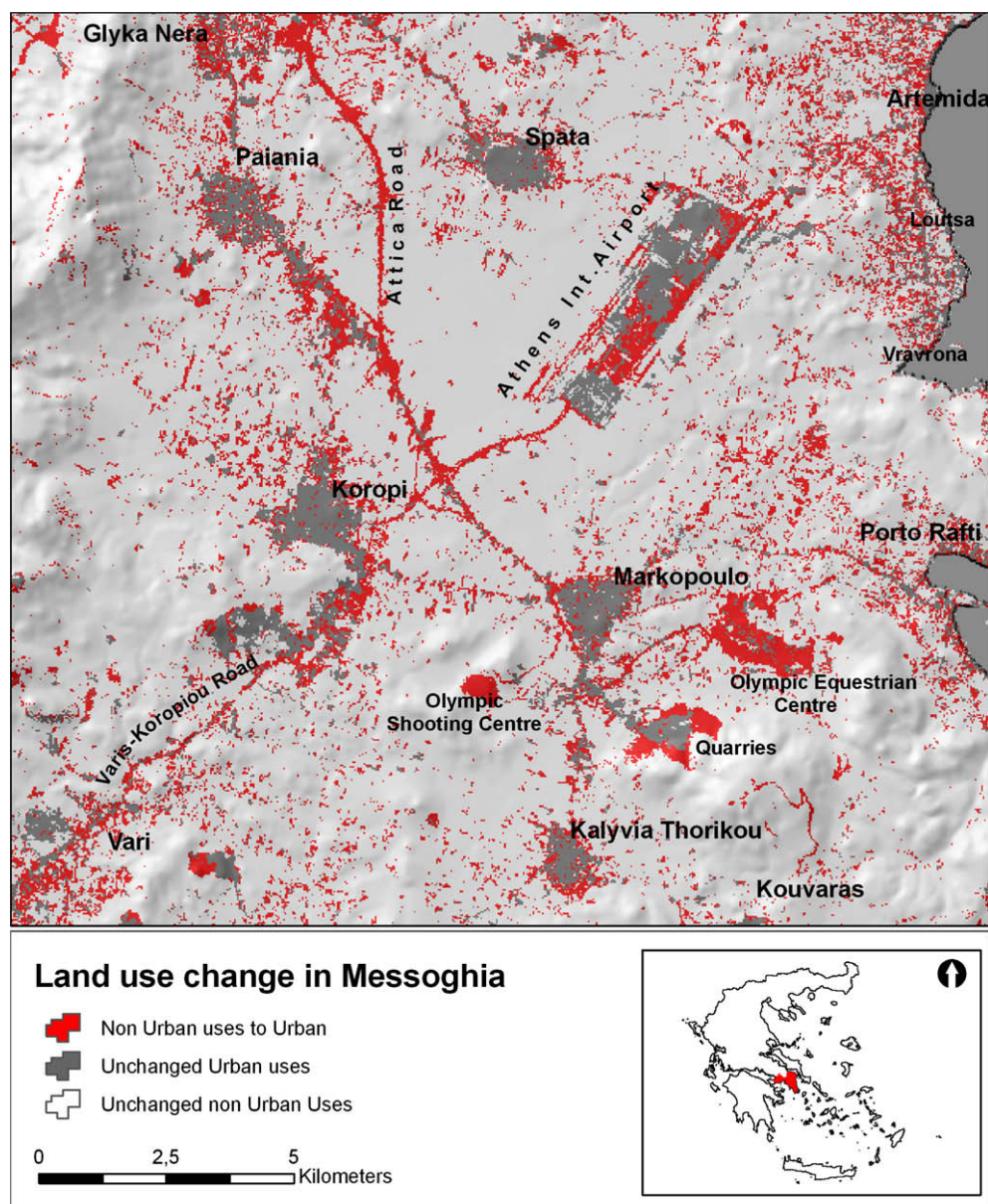
Land-use change in Messoghia plain (1987–2003).

Type of land-use change	Area (km ²)	Percentage (%)
Non-urban land-uses to urban land-uses	40.8	12
Unchanged urban land-uses	24.1	7
Non-urban land-uses	278.2	81
Total	343.1	100

- Unchanged urban areas.
- Unchanged non-urban areas.
- Areas changed from non-urban to urban land-uses.

The accuracies of the initial land-cover maps were 93% and 94% respectively. The estimated accuracy of the final change map is 86%. From Table 1, we see that in the 1987–2003 period, a total of 12% of the study area (40.8 km²) acquired new urban land-uses.

Thus, a significant change in the character of Messoghia is noted, from a rural to an increasingly urban landscape. In order

**Fig. 3.** Land-use change in Messoghia (1987–2003).

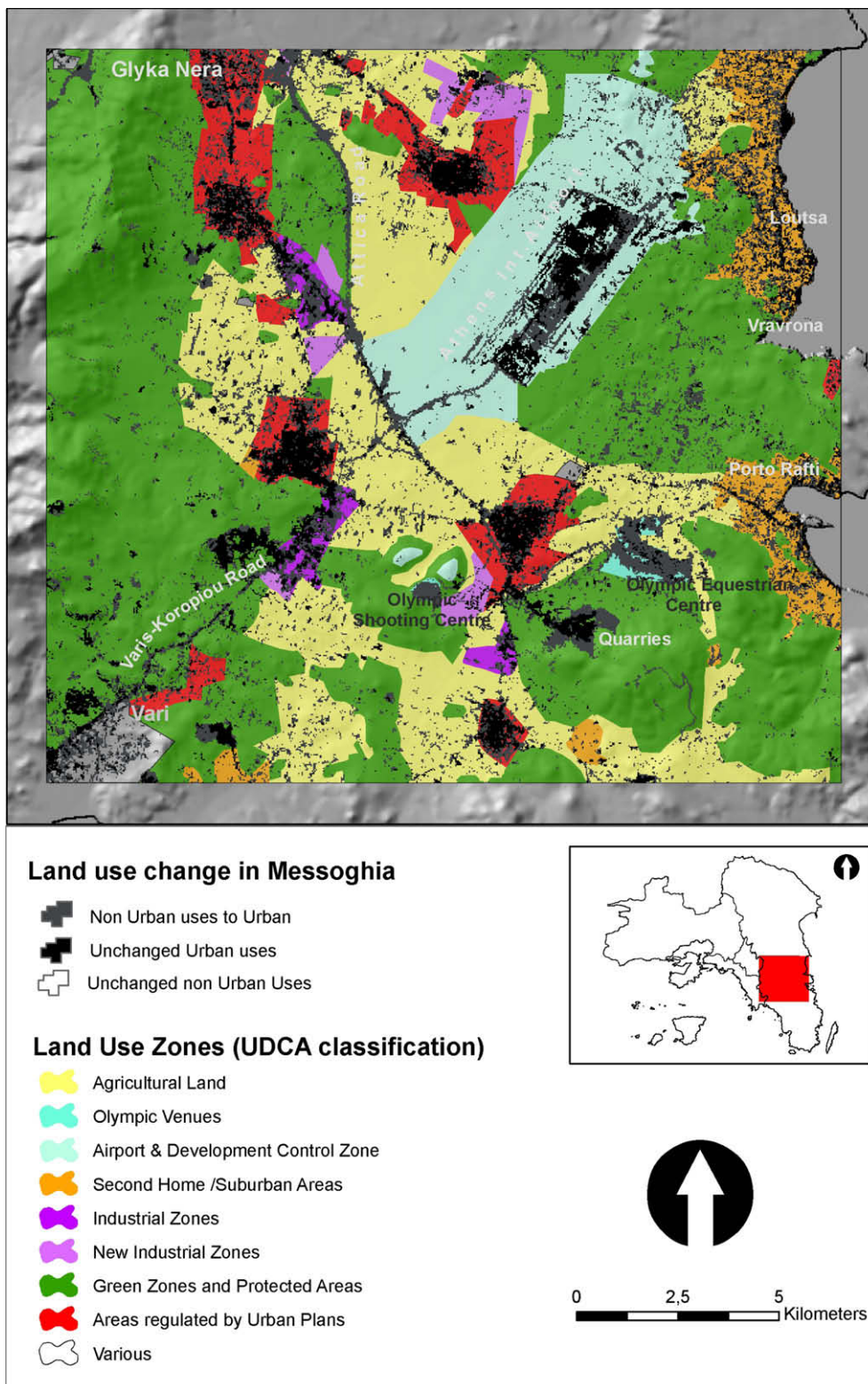


Fig. 4. Land-use changes overlaid to the designated Messoghia land-use zones.

to make a more accurate interpretation of the relationship between new urban development and the regulatory framework, we overlaid land-cover changes to the designated Messoghia land-use zones. Results are portrayed in Fig. 4. Table 2 shows the increase in urban land-uses noted in each of the area's zones during the 1987–2003 period.

The following points are induced from the table:

- The amount of new urban land-use that corresponds to large scale infrastructure projects, (namely, the Airport and Olympic Venues) amounts to 15% of total land-use change in Messoghia.

Table 2
Land-cover change in designated land-use zones (1987–2003).

Designated land-use zones (UDCA) ^a	Area (km ²)	Urban uses (km ²)		Increase (%)
		1987	2003	
Areas regulated by urban plans	27.72	7.65	13.56	177
Second home/suburban areas	18.15	2.86	7.74	270
Industrial zones	5.16	1.27	3.17	249
New industrial zones	5.06	0.28	0.95	339
Airport and development control zone	35.35	4.17	8.72	209
Olympic venues	2.41	0.22	1.87	850
Agricultural land	77.23	2.10	10.74	511
Green zones and protected areas	167.57	5.02	16.46	328
Various	4.50	0.53	1.72	325
Total	343.15	24.1	64.93	249.4

^a The land-use zones depicted on the map derive from the Zoning Diagram of the approved UDCA decree for Messoghia. For parts of the Study Area that fall outside its boundaries we have overlaid the zones of the neighbouring UDCA's, namely that of 'Lavreotiki' and 'Hymettus Mountain'. For reasons of clarity we have merged the detailed decree zones into thematic categories (e.g. all zones with various degrees of protection have been merged into one).

- More than 50% of new urban land-uses materialized in areas designated as 'protected' ('green zones' or 'agricultural land'). Such zones take up 70% of the Messoghia surface area and exhibit the highest rate of increase in urban land-uses.
- Significant increase in urban land-uses is noted in old and newly designated Industrial Zones, suggesting a trend towards the location of productive activities in the area.
- Less than 15% of new urban land-uses took place in areas regulated by Structural Urban Plans. This category also presents the lowest rate of increase in urban land-uses amongst all Messoghia planning zones.

Is growth in Messoghia sprawl?

The examination of spatial data on land-use change confirmed the emergence of a process of urban growth, which diverges significantly from the stated planning targets for the area. What we actually see in Figs. 3 and 4 is the significant loss of agricultural land and the rapid urbanization of the countryside driven by market forces. Growth in the Messoghia plain therefore, constitutes unplanned urban expansion and, hence, sprawl.

Exploring the reasons behind the inadequacy of land-use planning in metropolitan Athens to control growth, we noted the underdeveloped traits of land management tools. We also commented upon regulatory and municipal fragmentation, associated in the literature with the limited capacity of planning to control sprawl (Razin and Rosentraub, 2000). The 13 Messoghia municipalities are called upon to manage growth, while the presence of a decision-taking unit overseeing developments is missing. More, importantly, however, we noted the non-prioritization of planning agenda implementation.

Following the approval of the *Athens Master Plan* (1985), the process of defining land-uses for Messoghia started in 1994, with the respective regulations coming into force in 2003. During those years, the area was transformed by Olympic Games infrastructural investment, a fact that rendered relevant regulations obsolete before their very implementation. Land-use planning regulations for Messoghia have to practically adapt to new developments, even though their very purpose was to sway them. The most illustrative example of this is the failure of existing urban receptors to attract new growth, despite the fact that most Urban Plans in the area were revised in the 1990s in anticipation of incoming growth.

Conclusions

Uncoordinated growth takes the form of place-specific land-use changes. Approaching the impact of such changes is an exercise that cannot be distinguished from the causes of urban dispersal.

In this context, it is the motivating factors and mode of urban expansion that should be looked at (Briassoulis, 2008). The promotion of competitiveness-related spatial policies is an internationally-oriented and place-focused activity. In the case of Athens it brought into the spotlight a geographically specific and economically promising part of the metropolitan area. Supra-local spatial interventions in Messoghia aimed to both address overdue urban infrastructure deficiencies and to trigger economic development, reflecting the re-orientation of planning priorities towards competitiveness targets. Yet they were devised and implemented by a number of ad hoc special-purpose agencies, focusing on short-term efficiency and the timely delivery of Olympics-related projects (Pagonis, 2006). Formal comprehensive planning structures were not implicated in this attempt. The endorsement of competitiveness notions was never translated into a coherent spatial policy on sustainable metropolitan development. As a result, the spatial restructuring dynamic of interventions in Messoghia ended up in sprawl.

The literature on urban competitiveness stresses the role of both supply and demand-side regulatory responses in any attempt aiming at altering local growth prospects. In the case of Athens, however, supply-side actions, related to the creation of metropolitan governance structures, have not been developed. Such policies would not only improve coordination amongst actors, promoting the growth objective; they would also enable the management of growth pressures in the area. Their absence signals traits of path dependency in the role and the performance of land-use planning controls.

Popular colonization of the urban fringe was a structural trait of the way the city grew in the post-war period, accompanied by inadequate planning regulations and performance. Local authorities at that time were absent from influencing development processes, leaving peri-urban space unregulated (Chorianopoulos, 2003). Their presence in directing spatial development is still not registered, despite the fact that competitiveness-related policies are proliferating in the name of local development. Unmediated by local interests, central government decisions on the future of the area displaced mainstream planning priorities, this time by competitiveness-related spatial interventions. This arrested the appearance of smart-growth policies for Messoghia. The risk this time, however, is not popular colonization. The high degree of expansion of the city's functional limits – justified by the type of projects promoted – puts at risk of unsustainable development an area the size of the Athenian conurbation (Sayas, 2006; Kandylis et al., 2008). More importantly, current planning priorities in the area do not address such concerns.

Under public consultation since March 2009, the revised Master Plan proposes a set of directives, actions and measures aiming to

enhance the role of metropolitan Athens as a 'networking node in the South-eastern EU zone'. The metropolitan region is singled out as an area capable of attracting investment in innovative and dynamic sectors, generating growth trajectories able to trigger development in the rest of the country (Ministry of Environment, 2009). The above goals are already incorporated in the Operational Programme (2007–2013) of the Attica region. Within this framework, Messoghia is approached a regional 'growth pole', while prospective investment in transport infrastructure in the area is expected to further strengthen regional development prospects. Competitiveness, therefore, is now formally recognized as the policy principle guiding planning interventions in the area. The institutional framework guiding urban growth, however, is still missing. Urban sprawl underscores the critical role of regulatory land-use planning structures in accommodating the pressures deriving from the pursuit of urban competitiveness. In the absence of policies geared towards social and environmental goals, the very success of competitiveness-related actions mortgages future growth prospects.

Sprawling, auto-centric urban landscapes are seen in the literature as poor economic performers (Cervero, 2001).

References

- Alonso, W (1971) A theory of the urban land market. In *Internal Structure of the City: Readings on Space and Environment*, L Bourne (ed.), pp. 154–159. Oxford University Press, New York.
- Batty, M, Besussi, E and Chin, N (2003) *Traffic, Urban Growth and Suburban Sprawl*. Centre for Advanced Spatial Analysis, Working Paper Series 70, University College London.
- Bennett, R and Savani, S (2003) The rebranding of city places: an international comparative investigation. *International Public Management Review* 4(2), 70–87.
- Beriatos, E and Gospodini, A (2004) "Urban" landscapes: Athens and the 2004 olympics. *Cities* 21(3), 187–202.
- Boddy, M (2002) Linking competitiveness and cohesion. In *Urban Competitiveness: Policies for Dynamic Cities*, I Begg (ed.), pp. 33–54. Policy Press, Bristol.
- Boddy, M and Parkinson, M (2004) Competitiveness, cohesion and urban governance. In *City Matters: Competitiveness, Cohesion and Urban Governance*, M Boddy and M Parkinson (eds.), pp. 407–432. Policy Press, Bristol.
- Bradley, A, Hall, T and Harrison, M (2002) Selling cities: promoting new images for meeting tourism. *Cities* 19(1), 61–70.
- Brenner, N (2000) The urban question as a scale question: reflections on Henri Lefebvre, urban theory and the politics of scale. *International Journal of Urban and Regional Research* 24(2), 361–378.
- Brenner, N and Theodore, N (2002) Cities and the geographies of 'Actually Existing Neoliberalism'. *Antipode* 34(3), 349–379.
- Briassoulis, H (2008) Land-use policy and planning, theorizing, and modeling: lost in translation, found in complexity? *Environment and Planning B: Planning and Design* 35(1), 16–33.
- Bontje, M and Burdack, J (2005) Edge cities, European style: examples from Paris and the Randstad. *Cities* 22(4), 317–330.
- Burgess, E (1925) The growth of the city. In *The City*, R Parks, E Burgess and R Mackenzie (eds.), pp. 47–62. University of Chicago Press, Chicago.
- Burchell, RW, Shad, NA, Listokin, D, Phillips, H, Downs, A, Seskin, S, Moore, JS, Moore, D, Helton, D and Gall, M (1998) *The Costs of Sprawl—Revisited*. National Academy Press, Washington, DC.
- Camagni, R (2002) On the concept of territorial competitiveness: sound or misleading? *Urban Studies* 39(13), 2395–2411.
- Carlson, TN and Sanchez-Azofeifa, GA (1999) Satellite remote sensing of land-use changes in and around San José, Costa Rica. *Remote Sensing of Environment* 70, 247–256.
- Cervero, R (2001) Efficient urbanisation: economic performance and the shape of the metropolis. *Urban Studies* 38, 1651–1671.
- Cheshire, P (1999) Cities in competition: articulating the gains from integration. *Urban Studies* 36, 843–864.
- Cheshire, PC and Gordon, IR (1995) European integration: the logic of territorial competition and Europe's urban system. In *Cities in Competition: Productive and Sustainable Cities for the 21st century*, J Brotchie, M Batty, E Blakely, P Hall and P Newton (eds.), pp. 108–126. Longman Australia, Melbourne.
- Chin, N (2002) *Unearthing the Roots of Urban Sprawl: A Critical Analysis of Form, Function and Methodology*. Centre for Advanced Spatial Analysis, Working Paper Series 47, University College London.
- Chorianopoulos, I (2002) Urban restructuring and governance: north–south differences in Europe and the EU URBAN initiative. *Urban Studies* 39(4), 705–726.
- Chorianopoulos, I (2003) North-south local authority and governance differences in the EU networks. *European Planning Studies* 11(6), 671–695.
- Congalton, R and Green, K (1999) *Assessing the Accuracy of Remotely Sensed Data: Principles and Practices*. Lewis Publishers, CRC Press.
- Couch, C and Karecha, J (2006) Controlling urban sprawl: some experiences from Liverpool. *Cities* 23(5), 353–363.
- Couch, C, Karecha, J, Nuissl, H and Rink, D (2005) Decline and sprawl: an evolving type of urban development – observed in Liverpool and Leipzig. *European Planning Studies* 13(1), 117–136.
- Couch, C, Leontidou, L and Petschel-Held, G (2007) *Urban Sprawl in Europe: Landscapes, Land-use Change and Policy*. Blackwell Publishing, Oxford.
- Delladetsima, PM (2006) The emerging property development pattern in Greece and its impact on spatial development. *European Urban and Regional Studies* 13(3), 245–288.
- Economou, D, Petrakos, G and Psycharis, Y (2007) Urban policy in Greece. In *National Policy Responses to Urban Challenges in Europe*, L Van den Berg, E Braun and J Van der Meer (eds.), pp. 193–216. Ashgate, Aldershot.
- EEA (2006) *Urban Sprawl in Europe: The Ignored Challenge*. Office for Official Publications of the European Communities, Luxembourg.
- Goodwin, M and Painter, J (1996) Local governance, the crises of Fordism and the changing geographies of regulation. *Transactions of the Institute of British Geographers* 21, 635–648.
- Galster, G, Hanson, R, Ratcliffe, MR, Wolman, H, Coleman, S and Freihage, J (2001) Wrestling sprawl to the ground: defining and measuring an elusive concept. *Housing Policy Debate* 12(4), 681–717.
- Gaspar, J (1984) Urbanisation: growth, problems and policies. In *Southern Europe Transformed: Political and Economic Change in Greece, Italy, Portugal and Spain*, A Williams (ed.), pp. 208–235. Harper and Row publishers, London.
- Gatsis, I, Koukoulas, S, Vafeidis, A, Lagoudakis, E and Gkoltsiou, K (2006) Monitoring and mapping of land cover/use changes in an agricultural and natural environment, using multitemporal satellite data and GIS (Lesvos island, Greece). In *Proceedings of RSPSoC Annual Conference, Understanding a Changing World, Cambridge, UK, 5–8 September*.
- Giannakourou, G (1999) The institutional framework of urban planning in Greece. In *The Development of Greek Cities: Interdisciplinary Approaches of Urban Analysis and Policy*, D Economou and G Petrakos (eds.), pp. 457–480. University of Thessaly Press, Volos.
- Harvey, D (1989) From managerialism to entrepreneurialism: the transformation in urban governance in late capitalism. *Geografiska Annaler* 71(B), 3–17.
- Heim, CE (2001) Leapfrogging, urban sprawl and growth management. *American Journal of Economics and Sociology* 60(1), 245–283.
- Hudson, R and Lewis, JR (1984) Capital accumulation: the industrialisation of southern Europe? In *Southern Europe Transformed: Political and Economic Change in Greece, Italy, Portugal and Spain*, AM Williams (ed.), pp. 179–207. Harper and Row, London.
- Johnson, MP (2001) Environmental impacts of urban sprawl: a survey of the literature and proposed research agenda. *Environment and Planning A* 33, 717–735.
- Kandylis, G, Arapoglou, V and Maloutas, T (2008) Immigration and the competitiveness–cohesion equilibrium in Athens. In *Cities between Competitiveness and Cohesion. Discourses, Realities and Implementation*, P Ache, H Andersen, T Maloutas, M Raco and T Tasan-Kok (eds.), pp. 119–133. Springer, Netherlands.
- Khorram, S (1999) *Accuracy Assessment of Remote Sensing-derived Change Detection*. American Society for Photogrammetry and Remote Sensing, Bethesda, MD.
- Koukoulas, S and Blackburn, GA (2001) Introducing new indices for accuracy evaluation of classified images representing semi-natural woodland environments. *Photogrammetric Engineering and Remote Sensing* 67(4), 499–511.
- Koukoulas, S, Gatsis, I, Vafeidis, A and Gkoltsiou, K (2007) Analysing spatial patterns of land cover/use change derived from satellite remote sensing. In *Proceedings of 32nd International Symposium on Remote Sensing of Environment, Sustainable Development Through Global Earth Observations, June 25–29, 2007*. San Jose, Costa Rica.
- Leontidou, L (1990) *The Mediterranean City in Transition: Social Change and Urban Development*. Cambridge University Press, Cambridge.
- Leontidou, L (1996) Mediterranean cities: divergent trends in a united Europe. In *The European Challenge: Geography and Development in the European Community*, M Blacksell and AM Williams (eds.), pp. 127–148. Oxford University Press, Oxford.
- Leontidou, L, Afouxenidis, A, Kourliouros, E and Marmaras, E (2007) Infrastructure-related urban sprawl: mega-events and hybrid peri-urban landscapes in Southern Europe. In *Urban Sprawl in Europe: Landscapes, Land-use Change and Policy*, C Couch, L Leontidou and G Petschel-Held (eds.), pp. 71–101. Blackwell, Oxford.
- Louri, H (1988) Urban growth and productivity: the case of Greece. *Urban Studies* 25, 433–438.
- Malecki, B (2007) Cities and regions competing in the global economy: knowledge and local development policies. *Environment and Planning C: Government and Policy* 25, 638–654.
- Mantouvalou, M, Mavridou, M and Vaiou, D (1995) Processes of social integration and urban development in Greece: southern challenges to European unification. *European Planning Studies* 3(2), 189–204.
- McCarthy, L (2000) European integration, urban economic change, and public policy responses. *Professional Geographer* 52(2), 193–205.
- METREX (2001) *Planning for Major Events: Report on the Findings and Conclusions of the METREX Expert Group Meeting, 9–10 March, Hannover*. <<http://www.eurometrex.org/EN/Activities>> (accessed 07.01.08).
- Ministry of the Environment, Spatial Planning and Public Works (2009) *Regulatory Master Plan of Attica – Draft Law*. <<http://www2.minenv.gr/press/press.html>> (accessed 23.04.09).

- Munoz, F (2003) Lock living: urban sprawl in Mediterranean cities. *Cities* **20**(6), 381–385.
- OECD (2000) *Metropolitan Governance*. Public Affairs and Communications Directorate. <www.oecd.org/publications/Pol_brief>.
- OECD (2003) *The review of Athens. 5th Session of the Working Party on Territorial Policy in Urban Areas, 22 October 2003, Sevilla, Spain*. Public Governance and Territorial Development Directorate, Territorial Development Committee.
- OPEPA (1997) *Economic Development and Regional Planning of the Messoghia Plain 1995–2020. Spatial Arrangements of the 'Eleftherios Venizelos' Airport: Final Proposal of Spatial Organization of the Airport Impact Area*. Panteion University Regional Development Institute, Athens.
- Pagonis, A (2006) *Olympic Legacy and Metropolitan Planning in Athens. The Transformation in Urban Governance as a Result of Organizational Fragmentation*. PhD Dissertation, Department of Architecture, National Technical University of Athens.
- Phelps, NA, Parsons, N, Ballas, D and Dowling, A (2006) *Post-suburban Europe: Planning and Politics at the Margins of Europe's Capital Cities*. Palgrave Macmillan, Basingstoke.
- Prud'homme, R and Lee, G (1999) Sprawl, speed and the efficiency of cities. *Urban Studies* **36**, 1849–1858.
- Preteceille, E (1997) Urban economic restructuring and public policy. In *Cities*, F Moulaert and AJ Scott (eds.), *Enterprises and Society on the Eve of the 21st Century*, pp. 219–228. Pinter, London.
- Razin, E and Rosentraub, M (2000) Are fragmentation and sprawl interlinked? North American evidence. *Urban Affairs Review* **35**(6), 821–836.
- Richardson, HW and Gordon, P (1999) Is sprawl inevitable? Lessons from abroad. In *Paper presented at the ACSP Conference, Chicago, November 1999*. <http://www-rcf.usc.edu/~pgordon/pdf/LESSON_A.pdf>.
- Sayas, J (2006) Urban sprawl in the periurban coastal zones of Athens. *The Greek Review of Social Research* **120**(B), 71–104.
- SCATTER (2005) *Sprawling Cities and Transport: from Evaluation to Recommendations*. <www.casa.ucl.ac.uk/scatter/download_final.html>.
- Schneider, A, Seto, KC and Webster, DR (2005) Urban growth in Chengdu, Western China: application of remote sensing to assess planning and policy outcomes. *Environment and Planning B: Planning and Design* **32**, 323–345.
- Stathakis, G and Hadjimichalis, C (2004) Athens as a 'World' city: from the anxiety of the few to the reality of the majority. *Geographies* **7**, 26–47.
- Swyngedouw, E, Moulaert, F and Rodriguez, A (2002) Neoliberal urbanization in Europe: large-scale urban development projects and the new urban policy. *Antipode* **34**(3), 542–577.
- Symeonakis, E, Caccetta, PA, Wallace, JF and Koukoulas, S (2006) Land-use/cover change detection in the Spanish Mediterranean coast. In *Proceedings of ISPRS Mid-term Symposium 2006 "Remote Sensing: From Pixels to Processes"*, 8–11 May, Enschede, The Netherlands.
- Turok, I and Mykhnenko, V (2007) The trajectories of European cities, 1960–2005. *Cities* **24**(3), 165–182.
- Van der Berg, L, Drewett, R, Klaasen, LK, Rossi, A and Vijverberg, CHT (1982) *Urban Europe: A Study of Growth and Decline*. Pergamon Press, Oxford.
- Williams, A (1984) *Southern Europe Transformed: Political and Economic Change in Greece, Italy, Portugal and Spain*. Harper and Row, London.
- Wynn, M (1984a) *Planning and Urban Growth in Southern Europe*. Alexander Press, Oxford.
- Wynn, M (1984b) *Housing in Europe*. Groom Helm, London.
- Zukin, S (2006) David Harvey on cities. In *David Harvey: A Critical Reader*, N Castree and D Gregory (eds.), pp. 102–120. Blackwell Publishers, London.