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Is urban spatial development on the right track? Comparing strategies and trends in the European Union

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ABSTRACT

Urban spatial development is a crucial issue for spatial planning and urban governance, ultimately determining cities' sustainability. While a set of spatial strategies to address urban development are progressively gaining international consensus, their actual applicability is still contested. An interesting test-bed is represented by the European Union (EU), where common spatial strategies have been discussed since 1993. This paper aims to identify the main spatial strategies promoted at the EU-level and to investigate whether the recent spatial development trends of EU cities have been following the directions suggested by the strategies. By analysing 30 policy documents, we identified six main strategies: *compact city*, *urban regeneration*, *functional mix*, *no land take*, *green city*, and *high density*. For each strategy, we selected a set of indicators and applied them to the analysis of 175 cities representative of the variety of conditions across the EU.

Most cities progressed towards compact city and functional mix, but almost none halted land take. Urban regeneration was more intense in Northern and Western cities, while Southern cities show the most significant increase in green spaces. Growing cities achieved a higher density, but expanded inefficiently producing abandonment of urbanized areas and fragmentation of agricultural land. Shrinking cities continued in the paradox of contemporary population loss and expansion already observed by previous studies. The results highlight potential conflicts and trade-offs in the implementation of the strategies. Similar analyses can stimulate comparison, exchange, and cooperation among cities, thus supporting the mainstreaming of non-prescriptive strategies formulated at the international level.

1. Introduction

The spatial development of cities, i.e. the evolution of the urban form and the spatial arrangement of land uses, is a crucial issue for spatial planning and urban governance, and has long been a central topic in the planning literature (Alberti, 1996; Kasanko et al., 2006). Several studies have analysed key spatial features of urban systems and discussed how they affect cities' performance in terms of mobility (Camagni, Gibelli, & Rigamonti, 2002), energy and resource efficiency (Alberti, 1999; Ewing, 2010), climate change mitigation and adaptation (Hamin & Gurran, 2009), and biodiversity and ecosystem services (Tratalos, Fuller, Warren, Davies, & Gaston, 2007), ultimately determining their sustainability (Jabareen, 2006). Spatial strategies to direct urban development have been formulated and adopted in cities and urban regions across the world, including strategies addressing cities' territorial extension, e.g., "no net land take" (Seto, Fragkias, Güneralp, & Reilly, 2011); relation with surrounding rural and natural areas, e.g., green belts and green wedges (Amati & Taylor, 2010; Frey, 2000); urban form, e.g., compact city and polycentric development (OECD, 2012; Parr, 2004); and arrangement of land uses and activities, e.g., functional mix and high density (Grant, 2002; Jabareen, 2006). The implementation of these strategies in different contexts allowed assessing their potential effectiveness, and provided insights into adjustments and solutions applicable in different local conditions (see for example McCrea and Walters (2012); Millward (2006); Westerink et al. (2013)).

More recent is the inclusion of spatial strategies for urban development in international policies, following long processes of dialogue and negotiations. The New Urban Agenda adopted in 2016 represents a milestone along this process, advancing a set of spatial strategies for the

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first time agreed-upon at the global level: compactness, density, polycentrism, mixed use, and prioritization of urban renewal (UN General Assembly, 2016, §51–52). However, the applicability of such spatial strategies to the large variety of conditions of cities worldwide is debated (Watson, 2016), and divergent theoretical approaches as well as local barriers are expected to emerge in the implementation phase (Barnett & Parnell, 2016).

The European Union (EU) is an interesting test-bed to understand the potential outcomes of this process. In the last 25 years, the debate around European spatial planning provided EU Member States with a common ground to discuss urban spatial development under the overall objective of territorial cohesion (Faludi, 2010). A series of documents agreed among Member States' representatives traces the evolution of the discussion up until the most recent Urban Agenda for the EU 'Pact of Amsterdam' (European Commission, 2016b). Parallel to this, policies directly promoted by the European Commission also defined and supported specific spatial strategies, mostly in relation to the implementation of sectoral policies under the direct competence of the EU (e.g., environment, energy, mobility) (Ravesteyn & Evers, 2004), thus contributing to steer the principles expressed in the Urban Agenda for the EU (Atkinson, 2001). This ongoing process makes Europe an advanced case in the definition and application of a set of common spatial strategies to cities with different historic backgrounds, planning traditions, economic and social conditions, as well as current and expected development trends (Commission of the European Communities, 1997; Nadin & Stead, 2008).

As the spatial strategies promoted at the global level by the New Urban Agenda, also the strategies promoted at the EU level are "soft regulations" that do not rely on statutory land-use plans, hence the need of mobilizing the lower governance levels through joint visions, coordination, and cooperation (Dühr, Stead, & Zonneveld, 2007; Faludi, 2010). This non-prescriptive status calls for a comparative approach, able to explore the implications of the strategies across the large variety of conditions that characterizes European cities (Sykes, 2008). However, although in the last decade comparative studies have been published on a variety of topics, from population dynamics (Turok & Mykhnenko, 2007) to land use development models (Kasanko et al., 2006), to the availability of green spaces and ecosystem services (Kabisch & Haase, 2013; Kabisch, Strohbach, Haase, & Kronenberg, 2016; Larondelle, Haase, & Kabisch, 2014), changes in different spatial features have been rarely analysed together, and a systematic monitoring of the progresses in the multiple directions suggested by EU-level strategies is still lacking.

The overall objective of this paper is to study whether the recent trends in the spatial development of European cities have been following the directions suggested by the main spatial strategies agreed-upon in the EU. To this aim, we analyse the spatial development trends of 175 European cities through a set of indicators that measure if the observed trends are consistent with the directions suggested by the strategies. The use of a large and differentiated sample of cities across Europe allows understanding relations among the strategies, revealing potential synergies and trade-offs, and shedding light on the context- and path-dependencies, as well as land use legacies, that may affect urban development, eventually catalysing or hindering a successful implementation of the strategies. The article first identifies the main spatial strategies promoted by EU-level policy documents (Section 2), and then selects a set of indicators suitable to measure whether the observed spatial development trends of cities have followed the direction suggested by the strategies (Section 3). Section 4 presents the results for the whole sample and for specific categories of cities defined by geographical location and population dynamics. Section 5 discusses both the findings and the methodological approach. Finally, Section 6 draws some key conclusions, including directions for future application and research.

2. Identifying EU spatial strategies for urban development

To identify spatial strategies for urban development agreed-upon at EU level, we analysed relevant policy documents published since 1993, i.e. the year in which the EU replaced the European Community. We performed a snowball search through references (Greenhalgh & Peacock, 2005), starting from the list of reference documents of the latest Urban Agenda 'Pact of Amsterdam' (European Commission, 2016b) and progressively integrating the list with other documents related to urban spatial planning. Since spatial planning encompasses different sectoral policies, strategies may respond to multiple objectives, including protection of cultural and natural heritage, biodiversity conservation, social inclusion, reduction of air and water pollution, resilience to natural hazards, and climate change mitigation and adaptation (European Commission, 2011a; UN General Assembly, 2015). Therefore, the review considered policies on urban environment, resource use efficiency, green infrastructures, soil protection, and smart and inclusive growth, among others.

We limited the search to two types of documents, which capture the formulation of policies at the supra-national strategic level:

A Documents agreed by Member States Ministers during informal meetings (bottom-up agreements on common strategies to pursue EU-wide);
B Communications from the European Commission (top-down recommendations to Member States to adopt EU-relevant strategies in their internal policies).

The search resulted in 30 policy documents, 13 from group A (Table A.1) and 17 from group B (Table A.2), which were analysed through qualitative content analysis (Hsieh & Shannon, 2005). Spatial strategies explicitly referring to cities and urban areas and addressing either the urban form or the spatial arrangement of land uses were defined as relevant contents. The analysis followed two successive steps. First, we studied the documents and compiled a database of relevant contents. Second, we identified recurring spatial strategies as emerging categories and clustered the entries according to the strategy of reference. To ensure that no relevant content was omitted, a second-round keyword-based search through the documents was performed, using selected keywords associated to each strategy (Table A.3). The analysis identified the six main spatial strategies presented in Table 1 according to the chronological order of appearance in the documents: *compact city*, *urban regeneration*, *functional mix*, *no land take*, *green city*, and *high density*.

3. Analysing urban spatial development

3.1. Methods and indicators

Progresses in the direction suggested by the strategies can be captured by measuring changes in relevant spatial features of cities over time (Grădinaru, Iojă, Pătru-Stupariu, & Hersperger, 2017; Seto & Fragkias, 2005). Although some strategies also include qualitative aspects, here we focus on quantifying changes related to the urban form and the spatial arrangement of land uses. A number of indicators suitable to this purpose exist in the scientific literature, including indicators based on land uses and land covers, population, landscape metrics, and a combination of these (Clifton, Ewing, Knaap, & Song, 2008; Lowry & Lowry, 2014; Schwarz, 2010). To compare the observed spatial development of cities with the six spatial strategies identified in Section 2, we selected three types of indicators, namely: i) indicators related to the share of different land use and land cover (LULC) classes and population density, ii) landscape metrics (Uuemaa, Antrop, Marja, Roosaare, & Mander, 2009) related to urban form and spatial arrangement of LULC, and iii) land cover flows (EEA, 2006) that detail the amount of land involved in each type of LULC transition. All

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