



Putting domestic gardens on the agenda using empirical spatial data: The case of Flanders



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Spatial data are considered to be an essential entry point to get domestic gardens on the agendas of land use monitoring, spatial planning and environmental policies. As a green facet of urbanization, gardens cover a substantial part of land all over the world. Moreover, domestic gardens deliver several ecosystem services. The sustainability turn in planning however focuses on densification. In densification scenarios, planners could consider domestic garden area as a land reserve. Yet, due to a lack of data they would be ill-informed on the domestic garden services and potentials and not be able to make well-founded choices. So, the strategic value of domestic gardens remains largely unquestioned. By developing and applying a mixed methodology that combines an existing land use map with empirical data, this study provides data and insights on the spatial coverage, distribution and growth of domestic garden area in Flanders (the northern region of Belgium). The results show that 8% of the Flemish area is covered by domestic gardens, as well as 21% of the total area of Flemish residential cores. The highest concentrations are found in peri-urban areas and around ribbon developments. About 8% of the garden area that existed in the period 2002–2005 was new compared to the period 1988–1990 and occupied mainly former agricultural land (90%). The results clarify the regional significance of domestic gardens in terms of spatial coverage. The developed mixed methodology made the domestic garden theme analysable. The insights offer an entry point for a debate on the strategic value of domestic gardens.

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Introduction

Urban and residential fabric is usually perceived as a mosaic of buildings, roads and artificially covered areas (Gill et al., 2008). Yet a closer look behind this urban façade confirms the existence of thousands of domestic gardens (Gaston, Smith, Thompson, & Warren, 2005; Gaston, Warren, Thompson, & Smith, 2005; Loram, Tratalos, Warren, & Gaston, 2007; Smith, Gaston, Warren, & Thompson, 2005) differing in size, composition, use and management. Domestic gardens are beyond the scope of land use statistics, spatial and green structure planning and environmental policies (Perry & Nawaz, 2008; Thompson et al., 2003). Main reasons are their private and small scaled character

(Phillips, Page, Saratsi, Tansey, & Moore, 2008; Van Delm & Gulinck, 2011) and the lack of data. As a consequence, the value of domestic gardens as a strategic land use remains largely unquestioned.

Detailed information on the stock of domestic gardens is needed to develop all-inclusive policies that include domestic gardens. We consider spatial data as an entry point for the theme of domestic gardens on the agendas of research and policy. Such data will allow to demonstrate the spatial and strategic significance of domestic gardens in relation to more traditional and better acknowledged land use categories. It will also allow to better assess the impacts and the ecosystem services of domestic gardens at a regional scale.

Since regional spatial data on domestic gardens is only limited available, a mixed methodology was developed. This research aims to collect data on the available stock of garden area and its spatial characteristics for Flanders, the northern region of Belgium. By placing our results in the broader context of densification, we want to start a debate on the strategic significance of domestic gardens.

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In need for new perspectives on domestic gardens?

The unsealed and green characteristics of domestic gardens invite to consider them as strategic land use units. Although scientific literature on gardens is scarce in comparison to literature on forests, nature conservation areas and public parks, it provides substantial information on the ecological, social and economic characteristics, functions and services of domestic gardens.

Positive effects of gardens on well-being and physical health are described (Clayton, 2007; Dunnett & Qasim, 2000; Gross & Lane, 2007; Milligan, Gattrell, & Bingley, 2004) as well as their role for biodiversity (Daniels & Kirkpatrick, 2006; Goddard, Dougill, & Benton, 2010; Tratalos, Fuller, Warren, Davies, & Gaston, 2007). Also economic relevance (Dunnett & Qasim, 2000), organic waste processing (Barr et al., 2013; Dewaelheyns, Elsen, Vandendriessche, & Gulinck, 2013) and home food production (Alayon-Gamboa & Gurri-García, 2008; Calvet-Mir, Gómez-Baggethun, & Reyes-García, 2012; Niñez, 1987; Pandey, Rai, Singh, & Singh, 2007; Reyes-García et al., 2012; Siviero, Delunardo, Haverroth, de Oliveira, & Mendonca, 2011; Taylor & Lovell, 2012) are of general interest. Gardens also have a role in global challenges like climate change. The use of water (Aitken, Chapman, & McClure, 2011; Breyer, Chang, & Parandvash, 2012; Syme, Shao, Po, & Campbell, 2004), greenhouse gas emissions from lawn fertilizer usage (Bijoor, Czimczik, Pataki, & Billings, 2008; Howarth, Boyer, Pabich, & Galloway, 2002; Kaye, Groffman, Grimm, Baker, & Pouyat, 2006; Livesley et al., 2010; Lorenz & Lal, 2009; Trudgill, Jeffery, & Parker, 2010), and the storage of carbon by garden soils (Groffman, Law, Belt, Band, & Fisher, 2004) are a few climate related aspects. For a review on the contribution of the domestic garden to urban green infrastructure, we refer to Cameron et al. (2012).

Domestic gardens in urban development and spatial planning

The origin of domestic gardens relates strongly to the history of urbanization. In many languages the words for 'garden' refer to the act of enclosing outdoor space (Turner, 2005). The first gardens appeared when early settlements and cities started to develop (Niñez, 1987; Pregill & Volkman, 1999; Turner, 2005) and gardens and urbanization evolved in relation to each other. In fact, many of the world's best-designed cities have been inspired by garden concepts (Turner, 2005).

In the nineteenth and early twentieth century, several housing and city models were developed based on the social and ecological benefits of both public and private green, for example the 'Garden City' of Ebenezer Howard (1970) and the 'Lobe City' model of Tjallingii (1995). Improving the urban living quality was thereby a main argument. The promotion of domestic gardens has even been explicit in the development of the garden cities Letchworth and Welwyn in Britain (Pregill & Volkman, 1999) and by the promotion of the housing model of a single-family house with a garden in Belgium (De Decker, 2011; Van Herck & Van Avermaete, 2006).

The total area of domestic garden is increased by both planned and unplanned urbanization processes. Residential development is often accompanied with garden area (private or collective). Also unplanned and small scaled non-agricultural processes lead to an increase of garden area in peri-urban and rural areas. For example the re-use of former agricultural buildings as bed & breakfast or wellness centre (Verhoeve, De Roo, & Rogge, 2012) is often accompanied with an increase of garden area. But the increase of garden area is not only a consequence of housing. Gardens themselves may be an object of investment and restructuring (Paquette & Doman, 2003; Phillips et al., 2008). For example, gardens in the countryside or peri-urban areas are expanded by annexing (a part of) an adjacent agricultural parcel to the garden. Such autonomous

processes (Antrop, 1998) are often deviant from land use policies and hard to grasp without empirical data.

In reaction to some undesirable effects of continuing urbanization of open space, like increased fragmentation and high mobility costs, a 'sustainability-turn' appears in planning theory (Atkinson-Palombo, 2010; Berke, 2002). Concepts like 'smart growth' and 'new suburbanism' proclaim the raising of residential densities in both new-growth areas and existing neighbourhoods as a solution for the space consuming effects of sprawl (Atkinson-Palombo, 2010; Downs, 2005; Filion, 2003). In horizontal densification models – essentially by infill of remaining open space in between housing – the domestic garden area can be considered as land stock for housing development.

The long-term effects of densification initiatives are not known yet (Preuss & Vemuri, 2004), neither are the full range of related aspects. For example from the perspective of biodiversity, Olive and Minichiello (2013) state that smart growth programmes have not yet taken seriously into account the recovery of endangered species. As densification programmes are likely to be realized at the expense of the domestic garden area and their associated value (for example for biodiversity, food production and climate adaptation and mitigation), it should be clear what the effects of densification on these functions could be.

Spatial data on domestic gardens

There is only a handful of studies that focus on the spatial footprint of domestic gardens, since they are often not represented by traditional mapping approaches (Gill et al., 2008). Perry and Nawaz (2008) and Mathieu, Freeman, and Aryal (2007) point out that little information is available about the extent of individual gardens. Nevertheless, several studies confirm the spatial importance of gardens. For example, in Edinburgh, Belfast, Leicester, Oxford and Cardiff (U.K.), domestic gardens take up between 22 and 27% of the total area within the administrative city boundaries (Gaston, Warren, et al., 2005; Loram et al., 2007; Tratalos et al., 2007).

Domestic gardens also represent an important share of urban green space. They take up 35–47% of urban green in the United Kingdom (Loram et al., 2007) and 42% of the urban green in the Brussels Capital Region (Belgium) (Van de Voorde, Vlaeminck, & Canters, 2008). In New Zealand, the vegetated garden area occupies 46% of the residential area, and 36% of the total urban area (Mathieu et al., 2007).

These studies essentially deal with urban domestic gardens, although gardens are also an important land use component in peri-urban and rural areas (Marco et al., 2008). Because of their focus on urban areas, none of the above studies sufficiently informs about regional spatial coverage and distributions of gardens. This limits a full appreciation of strategic values of the total garden area at regional or national level.

Research objectives

From a spatial perspective, domestic gardens can be considered both as consumers of open space and as land stocks for housing development. Surprisingly little information is available on the spatial footprint and characteristics of domestic gardens. The overall goal of this research is to make the domestic garden theme analysable by collecting data on the available stock of garden area and its spatial characteristics.

We developed a mixed methodology to measure the spatial footprint of domestic gardens. This methodology involves the improvement and update of an existing land use map by using empirical data. The empirical data is collected by digitizing

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