

## Residents' preferences for cultural services of the landscape along the urban–rural gradient

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### ARTICLE INFO

#### Keywords:

Cultural services  
Landscape valuation  
Maastricht  
Urban–rural gradient

### ABSTRACT

Cultural services of the landscape contribute to a higher quality of life. The provision of these services differs along the urban–rural gradient, as does their appreciation by local residents. This paper investigates residents' preferences for cultural services along the urban–rural gradient through a map-based survey in and around the Dutch city of Maastricht. We focus on the importance of location in explaining these preferences, distinguishing the location of residents (relative to the preferred landscape units) and the location of landscape units (relative to their positions on the urban–rural gradient). The study shows that residents prefer nearby locations for all distinguished cultural services. Locations' valuation along the urban–rural gradient, however, differs by service type: for cultural heritage locations near the city centre are preferred, while outdoor recreation and sports and passive enjoyment of green landscapes are enjoyed more in rural areas. When considering the spatial distribution of the land-use types that provide these services, we further find that people prefer green areas closer to the city for outdoor recreation and sports and passive enjoyment of green landscapes. The results illustrate the heterogeneity of people's preferences for cultural services along the urban–rural gradient beyond the distance from their residences. We recommend policy makers to take the urban–rural gradient into account when valuating landscape units, and in particularly the importance of green landscape units close to the city for different cultural services.

### 1. Introduction

Landscapes are spatial human-ecological systems that support a multitude of functions that can be valued by people for economic, sociocultural and ecological reasons (de Fries et al., 2004). The direct and indirect contributions to human wellbeing and welfare derived from these landscapes are generally described as landscape services (Termorshuizen and Opdam, 2009). The concept of 'landscape services' differs from the more general term 'ecosystem services' in its emphasis on pattern-process relationships. As a man-made construct, landscape services more closely link to the practice of integrated landscape planning, policymaking and developing financing instruments (de Groot et al., 2010; Termorshuizen and Opdam, 2009). Landscape services can be categorised into three main groups: provisioning, regulation and maintenance, and cultural services according to the well-known Common International Classification of Ecosystem Services (CICES) by Haines-Young and Potschin (2010). Examples of such services include the growth of food and materials, providing regulation against hazards, and facilitating recreational activities (Vallés-Planells et al., 2014). These cultural services are particularly important because

they significantly contribute to both a person's physical and spiritual wellbeing, for example through facilitating relaxation, outdoor activities, spiritual enrichment, recreation and natural and cultural education (Gulickx et al., 2013; Willemsen et al., 2012).

Yet, the mapping and valuation of cultural services has received less attention than that of provision and regulation services (Feld et al., 2009; Plieninger et al., 2013; Vallés-Planells et al., 2014). Our study aims to partly fill this void and contribute towards a better understanding of the public appreciation of landscapes for the provision of cultural services. In doing so we build on recent literature that analysed people's preferences for landscape units for their provision of specific landscape services (Plieninger et al., 2013; Swetnam et al., 2011; Zoderer et al., 2016). We follow their land-use based delineation of landscape units as the basic elements for service provision and share their emphasis on obtaining, mapping and explaining public perceptions of the cultural services provided by the landscape using a GIS and statistics-based approach. Giving attention to the social and spatial context in which the landscape provides its services is crucial for understanding how valuable these services are to the general public (Vallés-Planells et al., 2014), and essential if we want to move beyond a

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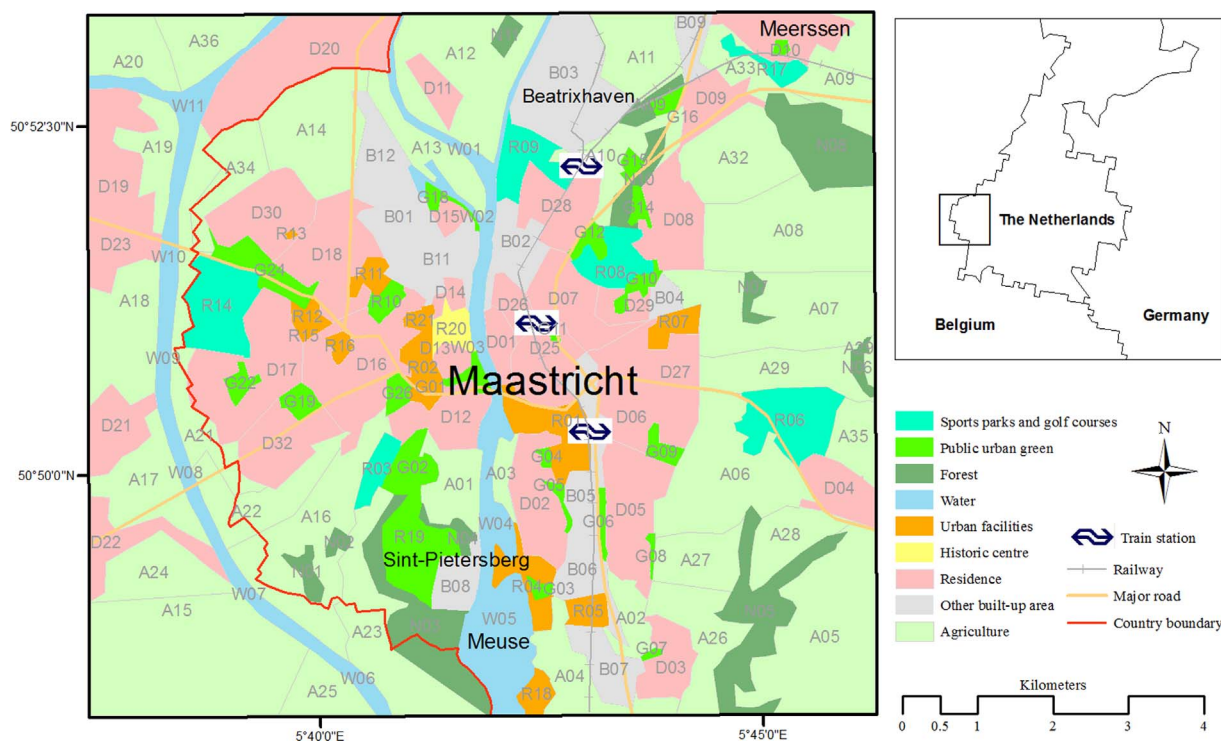


Fig. 1. Study area with the distinguished landscape units and the codes used in the survey.

mechanistic, biophysical quantification of the supply of services that is common to many studies that applies value transfer methods to map the services supplied by the landscape.

In our approach we include two new aspects that we consider important for understanding public preferences for landscape units. First, we explicitly address the importance of the location of residents relative to locations of the landscape units that they may prefer in their surroundings, and second we include the position of these landscape units on the urban–rural gradient. We assume that spatial differences in the provision of services are likely to affect the way people value the landscape in their surroundings. These preferences will on the one hand be steered by the availability of services (you can only value what is present), but may on the other hand be influenced by scarcity, city parks in densely populated central areas may be more popular than larger open areas in more distant rural areas (see, for example, Geoghegan et al., 1997; Sander and Haight, 2012). In addition, the appreciation for landscape units such as recreational forests is known to decrease with increasing travel distance (Cheung and Jim, 2013; Hörnsten and Fredman, 2000; Li et al., 2016), as is generally the case with people's preferences for environmental or public goods (Hanley et al., 2003; Pate and Loomis, 1997).

To characterise spatial variation in the provision of landscape services we partly rely on the urban–rural gradient concept that characterises the transition from built-up to more open and natural landscapes (McDonnell and Pickett, 2013). This gradient renders a schematic depiction of the relative abundance of different types of services: food and water supply, aesthetic services and spiritual services are typically found to be more prominent at the rural end of the gradient where agricultural and natural land-use types are more prominent (Kroll et al., 2012; Lowicki and Walz, 2015; Radford and James, 2013). Yet other services such as water flow regulation, pollination potential and recreation do not show such clear trends as was, for example, documented in a study of the Greater Manchester region (Radford and James, 2013). A recent comparative study of four European cities also revealed that the provision of some landscape services (e.g. local climate regulation, air cooling) did not follow a typical urban–rural gradient, whereas others (such as recreation that was related to the

presence of urban green areas) did show higher supply levels towards the rural end of the gradient (Larondele and Haase, 2013). If anything, these studies indicate that the provision of landscape services differs across space depending on the type of service and local characteristics. Addressing the spatial distribution of the studied landscape units relative to the observer (representing the demand for services) and other landscape units (reflecting the supply of services) seems essential in studying the appreciation of cultural services.

To explore how the location of landscape unit matters for the appreciation of the cultural services they offer, we set up a map-based questionnaire asking local inhabitants to pinpoint their favourite places for enjoying a selection of services offered by the landscape. The study was performed in the Dutch city of Maastricht, which has an important historic centre and is situated in a diverse and attractive cultural landscape. The region clearly exemplifies that urbanised environments also offer cultural services as was previously demonstrated by others (e.g. Bertram and Rehdanz, 2014; Derksen et al., 2015; Haase et al., 2014). Some services (e.g. recreation and education services) are considered to be even more important in urban landscapes than in agricultural or rural landscapes (Haines-Young and Potschin, 2008), especially in areas with high population density (Wu et al., 2013).

## 2. Methods

### 2.1. Study region

The study was performed in and around the city of Maastricht, located in the province of Limburg at the southern tip of the Netherlands. The city is attractive for its rich history, having the second-highest number of national monuments in the country.<sup>1</sup> The city has been inhabited continuously since the Roman era when it was a small settlement next to a bridge crossing the river Meuse (Cillekens and Dijkman,

<sup>1</sup> Maastricht has 1681 monuments. This is much less than Amsterdam (7504), but more than number three Utrecht (1439). Source: <http://rijksmonumenten.nl> (last Accessed 7 November 2017).

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