

Measuring the attractiveness of Dutch landscapes: Identifying national hotspots of highly valued places using Google Maps



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A B S T R A C T

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In a Cost-Benefit Analysis (CBA) or an Environmental Impact Assessment (EIA), determining the value that the general public attaches to a landscape is often problematic. To aid the inclusion of this social value in such analyses, a Google Maps-based tool, called the HotSpotMonitor (HSM), was developed. The HSM determines which natural places are highly attractive by having people mark such places on a map. The definition of attractiveness remains open to avoid having marker placement being influenced by preconceived thoughts. The number of markers an area receives is considered to indicate its social value. Six regions were selected, and from these, stratified samples were drawn (total $n = 3293$). Participants placed markers at three spatial levels: local, regional and national. This paper focuses on the markers at the national level. The first research question is whether the HSM can produce an accurate map of highly attractive places at a national level. The results indicated that while in principle HSM can produce such a map, the spatial representativeness of the sample is important. The region of origin of the participants influenced where they placed their markers, an effect previously termed spatial discounting. The second research question considers which qualities the participants associate with the marked places. These qualities were very similar at all three spatial levels: green, natural, presence of water and quiet were often selected out of the fourteen suggested qualities. The third, and more exploratory, research question concerns which characteristics of an area predict its attractiveness. Natural and forest areas had higher marker densities than water surfaces or all other types of land use combined. The discussion evaluates the potential of the HSM to generate input on social landscape values for CBAs and EIAs.

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Introduction

Growing importance of social landscape values

The evaluation of diverse spatial functions, interests, values and desires is important for spatial planning (Dramstad et al., 2002; Vizzari, 2011). In many urbanized regions, both cultural and natural landscapes are increasingly appreciated as leisure commodities (Jacobs & Buijs, 2011). Some of the major international conventions, including the Convention on Biological Diversity and the European

Landscape Convention, explicitly demand that the social values of landscapes be monitored (Antrop, 2005). As a result, landscapes need to be assessed not only according to their biodiversity (Green et al., 2005) or agricultural productivity (Strumse, 1994) but also according to their social and emotional value (Buijs & Lawrence, 2012). Moreover, given the multiple functions of the landscape, decisions on proposed spatial interventions or other developments in land use require the ability to assess trade-offs between these different functions. For example, does added landscape attractiveness outweigh the loss in agricultural production capacity? Quantifying the social value of spatially defined landscapes is an important step in facilitating processes such as Cost-Benefit Analysis (CBA) and Environmental Impact Assessment (EIA) (Boardman, Greenberg, Vining, & Weimer, 2011).

There are few tools to help decision-makers take social values into account (Bryan, Raymond, Crossman, & Hatton MacDonald,

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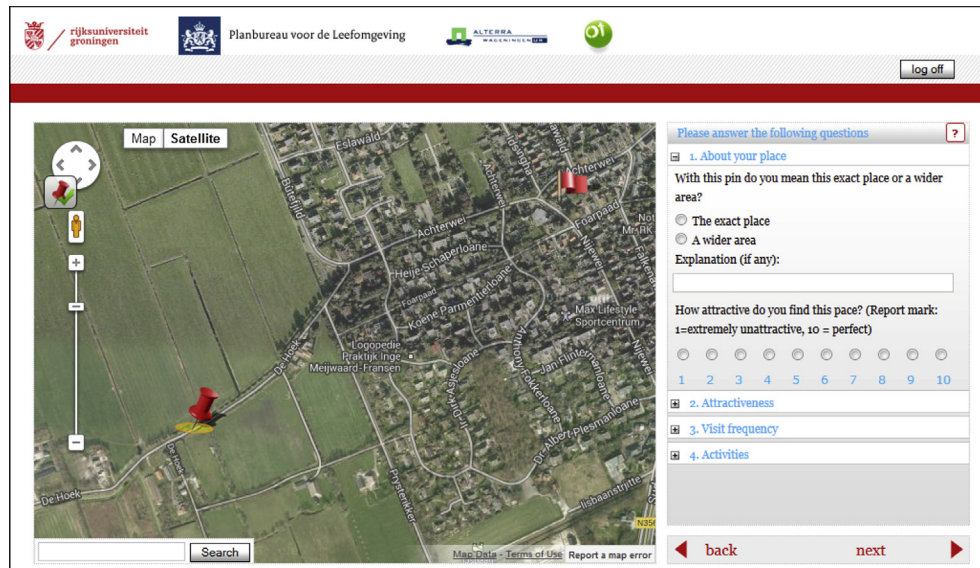


Fig. 1. Screenshot of the HSM at the moment a marker is placed.

2010; Sijtsma, Daams, Farjon, & Buijs, 2012). Especially at the national level, a valid and efficient methodology to measure social landscape values is absent (De Vries, Roos-Klein Lankhorst, & Buijs, 2007). Traditional questionnaire-based methods to collect data on the supra-regional or national level are not feasible. One reason for this lack of feasibility is the cost of collecting a sufficient amount of data to cover the entire area or country with a sufficient level of spatial detail. Another reason is the methodological challenge to allow each respondent to focus on the area of his or her choosing (Brown & Brabyn, 2012). There are some examples of tools to up-scale locally collected data to the national level, usually by relating the local data on valuable spots to the physical landscape features, such as landform and land cover, on which data are available nationwide (Brown & Brabyn, 2012; De Vries et al., 2007). However, not all types of places that are available at the national level are also available at the local level. The most valuable place at the local level may be less valuable when put in a national context, even if the qualities on which the assessment is based are the same.

Measuring social value by a PPGIS using Google Maps

At the start of this century, participatory mapping emerged as a new type of tool to capture spatial information on social landscape values. Many of these tools involve the use of a Geographic Information System (GIS), giving rise to the term Public Participation GIS (PPGIS) (Brown & Reed, 2012). Social value mapping is a type of PPGIS that combines the mapping of place-based social values with GIS techniques (Brown & Raymond, 2007). Typically, a representative sample of residents or tourists is asked to locate places in a predefined area that score high on a specific value, as defined by the researchers. Such map-based measures can provide information about at which places a certain value is perceived to be strongly present and according to how many people (Brown, 2005; Brown & Brabyn, 2012). By composing density maps of the places marked by the respondents, empirically based *hotspots* of social landscape values can be identified (Alessa, Kliskey, & Brown, 2008). Recent technological developments, such as Google Maps[®], have created new possibilities for measuring social landscape values and preferences (Bearman & Appleton, 2012; Brown & Reed, 2012). Google Maps applications enable respondents to mark values and special

places directly on GIS-based maps, rather than on paper versions of maps, which must be subsequently digitized (Miller, 2006).

Thus far, spatially explicit social values have only been collected at the local to regional level (Brown & Brabyn, 2012; Brown & Reed, 2012). Our goal is to contribute to the development of a valid and practical methodology for identifying social landscape values at the national level that can eventually be used in CBAs and EIAs. In line with this goal, the tool will ask for an overall or integral valuation of landscapes from an individual perspective: it is up to the individual to decide which value or values he considers to be important, and how important they are. The tool focuses on the valuation of the present situation. However, for planning purposes, it is also relevant to know how people value possible future situations. Therefore, we will investigate the following three questions:

1. Can the tool be used to generate an accurate map of highly attractive natural places in the Netherlands at a national level?
2. Why do people consider the areas with a high density of markers (hotspots) to be attractive?
3. Which objective characteristics or combination contributes to the attractiveness of such areas?

Regarding the first question, Brown and Brabyn (2012) described the theory of spatial or place-based discounting: humans tend to discount both across time and space, placing higher value on places that are more proximate. As the distance from one's place of residence increases, the chance that a spot will receive a marker decreases. This may have to do with both familiarity and the value generated through personal use of the place. Faraway places are less likely to be known, and even if they are known, they are less likely to be visited frequently due to higher travel costs and/or intervening opportunities. This effect of distance implies that the markers at the national level may differ depending on where one lives. The second question is important precisely because we did not predefine the values and/or qualities that people should look for when placing their marker. The third question is a first step towards determining what makes a place highly attractive and, therefore, which interventions are likely to make it more or less attractive (to Dutch people). In other words, this step is important for ex ante evaluations. In this paper, the question will be dealt with in an exploratory manner.

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