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Cultural Value of European Landscapes

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2019

document version

Publisher's PDF, also known as Version of record

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citation for published version (APA)

Tieskens, K. F. (2019). *Cultural Value of European Landscapes: A quantitative approach*. [PhD-Thesis - Research and graduation internal, Vrije Universiteit Amsterdam].

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Summary

We depend on landscapes for most of our basic needs. We extract our food from it, we build our houses on it, and we are protected from natural hazards by it. Moreover, the landscape forms the stage in which we perform our daily lives. As such, cultural landscapes are the result of long-term, complex interactions between humans and nature and thus are bearers of indispensable cultural heritage. Over the past 70 years, globalization, economic growth, and increasing populations have induced changes in cultural landscapes that were far more disruptive than ever, often leading to irreversible depletion of cultural value. To help preventing the loss of valuable heritage it is important to identify what landscapes are culturally valuable, and why we value them.

Cultural landscape values are often intangible and can only be understood when the connection is made between the landscape and the people living, working, and playing on the landscape. This thesis focuses on these intangible cultural values of landscapes. What are they? Where can we find these values and how can we preserve them? Asking these questions already implies that some landscape contain more cultural value than others. However, since values are per definition subjective, this thesis does not seek to provide a conclusive method to identify cultural value. Instead, different approaches to quantifying cultural values of landscapes are provided to help understand the cultural component of landscapes and provide insights that can help steering the conservation of valued landscapes.

First, in chapter 2 an approach rooted in expert knowledge is presented to create a European characterization of different cultural landscapes. The characterization is based on a method to quantify the existing ideas of cultural value in the literature and provide a spatial representation of these ideas. A characterization of European cultural landscapes is presented based on the prevalence of three key dimensions of cultural landscapes: landscape structure, management intensity, and value and meaning. We mapped these dimensions across Europe at a 1-km resolution by combining proxies on management intensity and landscape structure with new indicators such as social media usage and registered traditional food products. We integrated the three dimensions into a continuous “cultural landscape index” that allows for a characterization of Europe’s rural landscapes. The characterization identifies hotspots of cultural landscapes, where all three dimensions are present, such as in the Mediterranean. On the other hand, Eastern and Northern European cultural landscapes are mostly characterized by only one of the dimensions.

Subsequently, in Chapter 3 a more bottom-up approach is used where cultural value is identified with crowdsourced data from various social media platforms. Social media are often used by people to express their appreciation for things in life. Spatially explicit data from social media therefore provide a unique insight into what people prefer at which location and for what reason. For this study we used both the content and location of all photos posted on Flickr, Panoramio, and Instagram in the last five years within a small peri-urban case study area in the Netherlands to get a better idea of people actually value in the landscape, as opposed to the expert-based approach in Chapter 2. The analysis shows that this area is appreciated by its visitors and residents for the presence of monumental buildings, small water bodies and opportunities for hikes along grasslands. The method successfully linked the structural elements of the landscape with the revealed preferences, providing a way of quantifying the appreciation of the landscape. qualitative surveys remain essential to study motivations for outdoor recreation, but social media data can be incorporated as evidence of what elements of the landscape are valued, where people are interacting with the landscape, and how these interactions characterize a landscape.

In the next chapter, I focus less on what cultural value is present and more on how cultural value can be preserved in the future. Using Agent Based Modeling a future scenario analysis of a local case study is carried out to explore how cultural

value of landscapes can be preserved under the imperative of intensification and scale enlargement. The agent-based modeling approach, parameterized with a site-specific survey, was applied to explore and discuss outcomes of future landscape change with stakeholders and co-designed preferred scenarios of landscape change during a workshop. Outcomes suggested that in the case-study area, scale enlargement has a negative effect on hedgerow quality when agri-environment scheme subsidies are low. In contrast, if the level of subsidy enrollment is high, scale enlargement can have a positive effect on hedgerow quality, as large holders are more likely to enroll for subsidies. Stakeholders acknowledged the need for agricultural intensification, but at the same time valued biodiversity and environmental value of the landscape. Current subsidies are able to retain a decent hedgerow quality. A lower level of subsidies might have a very negative effect as below a certain threshold scale enlargement can have an invigorative effect on hedgerow quality. As an addition to subsidies, harvesting wood fuel from coppiced hedgerows appears a promising way to incentivize rejuvenating hedgerow management without governmental subsidies.

Chapter 5 shows, again, a European-wide analysis of cultural value of landscapes. However, in this chapter we solely relied on social media. Using automated image classification, we compared landscape photos with other types of photos to show a clear difference between the appreciation of iconic landscapes and valued ordinary landscapes. Here we tried to use the full potential of social media to reveal cultural value of landscapes by combining the perception of people with the spatial characteristics of the landscape. We classified 375,000 geotagged photos from Instagram, Panoramio and Flickr across Europe in terms of the type of human nature-interaction they represent. This enabled us to identify and locate appreciated iconic landscapes and everyday landscapes. These landscapes not only differ in location but are also valued for very different reasons. We show that iconic landscapes are appreciated for their naturalness, while cultural heritage is more valued in everyday landscapes.

Whereas the methods of Chapter 3 and Chapter 5 focused on appreciation and perception of landscapes, we argued that value of landscapes transcends its mere consumption. The value of cultural landscapes is closely connected to its primary use of for instance agriculture and forestry. Moreover, the loss of value is often a direct consequence of land use change related to the actions of individual farmers and land managers. Culturally valuable landscapes deteriorate when farmers are forced either to intensify or abandon their land. Chapter 4 demonstrated how ABM can be used to highlight the importance of individual agency to landscape conservation. Landscape conservation can go hand in hand with active farming, but depends on the willingness and ability of farmers to engage. Land managers are aware of the cultural value their landscape. Fair financial compensation, through both government subsidies and grassroots landscape initiatives can utilize this awareness and bolster landscape conservation concurrently with large scale drivers of landscape change.

Although we could not provide a conclusive and quantitative definition of cultural value, the outcomes of this dissertation provide important tools to understand, manage, and protect the values of European landscapes. With the characterization of European cultural value of landscapes combining expert opinion (traditional landscapes) with mass popularity (social media) and place attachment (protected food), we identified different types of cultural value spatially. Places often mentioned as containing high cultural values, such as the hills of Tuscany, or the traditional agriculture in Southern France are indeed identified by this method. Careful decomposition of social media data on a continental scale, however, revealed that those areas identified with high cultural value by expert opinion are not necessarily recognized by the appreciation of the mass.

The mismatch of the expert-based approach and the grass-roots method reveals a fundamental caveat of scientific quantitative methods to identify cultural value. In the last synthesizing chapter, I explain how quantitative and economic accounting of cultural value can inadvertently lead to misrepresentation. Cultural value does not necessarily come with mass appreciation, and any indicator that tries to capture value in an economic term will underrepresent those areas that are

valuable but lack economic potential, and therefore are in need of conservation policy. Expert-based approaches are important to include qualitative and normative insights into the idea of value while more bottom-up approaches such as the social media method presented in this paper are necessary to include the perception of normal people. However, no study of cultural value should rely on just one method as the study of cultural landscapes and its cultural values and connotations is inherently transdisciplinary, while value is a concept that should not be expressed in purely economic terms.