Optimizing the provision of cultural ecosystem service for inhabitants: combing residential distance with landscape characteristics

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Introduction

Cultural ecosystem service (CES) constitutes a growing field of researches in integrated land planning, among which is how to optimize the provision to nearby neighborhoods. Thus an understanding of the value of CES appreciated by residents needs to be developed. Stated preference methods are popular in valuing CES, among which, willingness to pay (WTP) is the most widely used way. But still, it has two strong and unrealistic assumptions in response to spatial welfare heterogeneity (Brouwer et al. 2010) in terms of distance and location. These include spatial homogeneity or continuous distance decay (Johnston et al. 2011; Bateman et al. 2006; Hanley et al. 2003; Georgiou et al. 2000). Hence ecologists have been criticized for treating the city as homogeneous and urbanization as one-dimensional (Cadenasso et al. 2007). In fact, when considering the benefit of specific CES, people have a variety of options to choose from to acquire the same total welfare. That can be realized by considering CES with their diverse combinations of distance and characteristics. Many researches have revealed that the effect of distance on WTP varies across different resource types or spatial scale (Cadenasso et al. 2007 Berta et al. 2007; Pate et al. 1995). To be specific, some results showed that for certain goods distance did play a role in the determination of willingness to pay, such as rivers and national parks (Pate et al. 1997). For different spatial scale, it reveals the WTP for aesthetic and religious services follow a distance-decay function, while science and education do not since they are highly valued at a regional scale instead of local or landscape scale (Berta et al. 2007). These indirectly reflected

that the values of CES appreciated by the residents are affected by both distance as well as their characteristics. Therefore, to avoid the two biases of using WTP,
this study proposes to record residents' preferences by scoring their appreciations of the CES in targeted region. Then the effects of distance and characteristics of CES on the inhabitants' preference could be quantifying. The result definitely stimulates the planning goal of improving CES provision to residents.

Research Questions

1) To what extent does the residential distance influence residents' preferences on different CES;
2) What are the most preferred landscape when benefiting diverse CES and to their influencing extent respectively;
3) How to integrate the preferences of different CES into a holistic CES planning?

Methods

1) Spatial analysis with ArcGIS to extract: CES types, units, elements and spatial distribution, as well as distance between people's residence and their favorite CES;
2) Interviews and online survey will be given to local residents to acquire their preferences for specific CES with Likert scale score for different aims (for example, landscape aesthetic, outdoor sport, spiritual inspiration, cultural heritage…) in the study region, and some personal information (postcode, age, gender,…);
3) Logistic regression relationship between residents' preferences and distance as well as CES characteristics will be analyzed;
4) Spatial model to map the appreciations of integrated CES provision according to survey results, and then proposes a scheme for improving the suitability of CES supply.

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