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ANALYSIS

An econometric analysis of willingness-to-pay for sustainable development: A case study of the Volčji Potok landscape area☆

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ABSTRACT

When the market for a certain good is competitive enough, economic activities can be studied by the market pricing mechanism. Because this is usually not feasible in case of environmental goods with embodied natural and cultural heritage, particular methods for economic valuation of such goods have to be applied. The present article represents the economic valuation of the Landscape Development and Protection Area of Volčji Potok, which is an important Slovenian cultural landscape area with internationally recognized qualities. For this purpose we combined classical contingent valuation with a closed-version of discrete choice method, where the protest responses have been removed. By using econometric analysis we obtained the value of willingness-to-pay and established its determinants. We also made an attempt to control for different biases that arise in such analyses. At last, we used the adjusted average individual value of willingness-to-pay to calculate the aggregate willingness-to-pay. The present analysis represents one of the very few applications of the method to Central and Eastern European countries.

1. Introduction

Local communities often find themselves in a position where they have to decide on what spatial changes and development guidelines to implement within the scope of nationally or regionally adopted spatial and development planning documents. Their decisions must address not only operating costs, but also the positive and negative spatial impact of the development programmes on people's welfare. As the former are expressed in monetary terms and the latter usually only in terms of quantity or by way of description, it can happen that the spatial impact is under- or overrated in the intuitive decision-making process. Ensuring that spatial and environmental impacts are given appropriate weight in

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the decision-making process, it is imperative to determine their monetary value.

In the case described in this article, the spatial impact of targeted development of the Landscape Development and Protection Area (LDPA) of Volčji Potok is evaluated, together with its natural and cultural goods. This is a landscape area with distinct qualities of international importance. The purpose of the study was to evaluate the overall value of environmental goods, i.e. the use value and the non-use value for residents and visitors to the area. For this purpose, the contingent valuation method was selected; mainly due to significant non-use values in the area, the total value for residents and visitors, and the varying selection of goods in this area. Only stated preference methods, such as contingent valuation method (*cf.* Whittington, 1998; Garrod and Willis, 1999, pp. 125–126; Nunes et al., 2003, pp. 94–95; Verbič, 2006) can be used to estimate environmental values such as biotic diversity, landscape appearance, preservation of cultural and art collections, artefacts and monuments, and features of old towns and villages.

Contingent valuation surveys were first proposed in theory by Ciriacy-Wantrup (1947) as a method for eliciting market valuation of a non-market good. The first practical application of the technique was done by Davis (1963) on the economic value of recreation in the Maine woods. Numerous applications of the method to various public goods and studies of its methodological properties were conducted worldwide in the 1970s and 1980s. A review of the theoretical and empirical basis of contingent valuation is presented in Mitchell and Carson (1989), Arrow et al. (1993) and, more recently, in Moons (2003), Venkatachalam (2004) and Schläpfer (2006). Nowadays, the method is widely used in cost–benefit analysis and environmental impact assessment. Recent applications that are relevant for our study include Hadker et al. (1997), Cicia and Scarpa (2000), Lette and de Boo (2002), Navrud and Ready (2002), Laitila and Paulrud (2006) and Bateman et al. (2006).

The main concept of the contingent valuation method is to model individuals' responses in terms of their reactions in specific hypothetical situations. In the *ex ante* analysis in the case of environmental evaluation, questions relate to the highest sum that individuals are prepared to pay for a change (improvement or purchase) at the environmental goods level (willingness-to-pay — WTP). Changes in the level of environmental goods can then be described by a number of different development scenarios. Two development scenarios were drawn up for the purpose of this evaluation. The form of the contingent valuation method was defined on the basis of scenarios and research objectives. In this article we combine classical contingent valuation with a closed-version of discrete choice method, where the protest responses are removed. The present analysis represents one of the relatively few applications of the method to cultural landscapes, and certainly one of the very few applications of the method to Central and Eastern European countries (CEECs) in general. Among the very scarce analyses available for CEECs one should consult Tošovská (1996), Fomenko et al. (1997), Kluvánková (1999), Markowska and Żylicz (1999), Visintin (2004), De Groot (2006) and Marangon and Visintin (2007).

The outline of the article is as follows. In Section 2, the Landscape Development and Protection Area of Volčji Potok is presented in brief. A description of the scenarios and questionnaire formation process follows in Section 3. In Sections 4 and 5 the article then offers an analysis of the stated willingness-to-pay and an analysis of the "true" willingness-to-pay, respectively. In Section 6 the aggregate value of willingness-to-pay is being calculated. Subsequently, in Section 7 the results are compared, as much as possible, with those from similar studies in CEECs. The article concludes in Section 8 with the key findings regarding the potential development policy for the relevant area.

2. The Volčji Potok landscape area

The LDPA Volčji Potok is located in the vicinity of Ljubljana, the capital of Slovenia. It encompasses 2000 ha of unspoilt natural landscape with numerous wetlands and rare plant and animal species. At the same time this is an area featuring exceptional cultural landscapes with many stately residences, castles and other cultural heritage monuments, and small settlements with a well preserved village character.

At the heart of the area are the villages of Blata and Mlake, and the Češeniške and Prevojske Gmajne marshes, which are sites of protected plants and bird species that fall under the aegis of the EU Habitat and Birds Directives. The cultural landscape area was named after the most famous landscape park in this part of Slovenia — Volčji Potok Arboretum. Also included in the cultural landscape area is a section of the Kamniška Bistrica river, which is important both ecologically and in terms of landscape and has rather well preserved water and riverside areas. Another characteristic of the Kamniška Bistrica is its many mill streams, with two larger ones reaching into the studied area. The last two watermills with mill stones are found in this area. They both used to be large mills and had Venetian saws. These water-powered buildings are today among the most endangered monuments of technical heritage and farm architecture in Slovenia. They are in fairly poor condition but could still be restored to some extent and preserved for future generations. The numerous medieval plains castles with castle parks give the landscape a special charm. The majority of these are at the moment in bad shape as well, but have great potential for revitalisation in terms of expanding the area's tourist offer. To the north is a wooded aquifer with high-quality drinking water that is ranked among the best in the country. There are four water wells providing drinking water for a wider area.

The beauty and features of the area today face great developmental pressure due to their exceptional accessibility and the vicinity of settled areas. Alongside the neglected and disintegrating cultural heritage structures, the pressures involve immigration of non-indigenous inhabitants, increasing volume of traffic, deficient and in places unregulated public utility infrastructure and uncoordinated use of space. These pressures are a threat to realising a sustainable development vision, based on reinstating a naturally and culturally protected area. The vision supports the ecological economy, sustainable development and the introduction of a network of paths for recreation, education and relaxation.