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Protected areas as elicitors of human well-being in a developed region: A new synthetic (socioeconomic) approach

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ABSTRACT

The socioeconomic impact of protected areas, crucial to conservation, has been investigated mainly in low-income, highly biodiverse, contexts. However, studies are needed on the impact of protected areas in high-income places managed for millennia. This work evidences spatial relationships of protected areas and human well-being changes in a highly biodiverse area of southern Spain. We calculated well-being using a synthetic indicator (called the P_2 distance) that integrates information from 22 socioeconomic variables using an iterative procedure to weight the input variables. We used 22 variables to describe well-being according to the categories proposed by the Millennium Ecosystem Assessment. The results reveal significant increases in well-being in Andalusian municipalities between 1989 (when these protected areas were designated) and 2009. This increase was significantly higher in municipalities within protected areas. We also found that a protected municipality increases in well-being irrespective of the size of the protected area encompassing it or the areal percentage covered by the protected area. These results strongly evidence a spatial correspondence between protected areas and improvement of the well-being of local municipalities in areas with long histories of human management.

1. Introduction

Can protected areas improve the well-being of local inhabitants? Or, do protected areas limit local economic development? This question is inherently related to the concept of protected area: sites where certain human activities are limited in order to maintain the ecological integrity of the site. Currently, the socioeconomic effect of protected areas is a crucial topic in the context of nature conservation (Adams et al., 2004; Dudley et al., 2014; Roe et al., 2013). This has become one of the key issues influencing the social acceptance of protected areas (Dudley et al., 2014) worldwide. In the last 20–30 years, scientists have created a compelling set of case studies on the socioeconomic impact of protected areas, providing evidence for both the advantages and disadvantages of such protection (Coad et al., 2008; Upton et al., 2008).

It is not easy to establish a general rule to explain the impact of protected areas on socioeconomic features of local human settlements (and buffer areas surrounding protected areas), partly because of the multifaceted local impact that can be exerted under any circumstance (Mackenzie, 2012). However, it is widely accepted that biodiversity loss and well-being are linked problems and that conservation and human well-being should be considered together (Adams et al., 2004). The relationships between protected areas and socioeconomic features are so intricate that they are difficult to describe thoroughly. Like some other social and scientific issues, they can be considered "wicked" problems (Webber, 1973). The complexity of assessing the impact of protected areas on well-being can be exemplified with the concept of confounding variables: effects that are contemporaneous with the protection and could also have an effect on well-being (masking the effect of protection) (Ferraro and Hanauer, 2014; Ferraro and Pattanayak, 2006). Thus it is not easy to distinguish between the effects provoked by protection on well-being from others provoked by different social or biophysical variables. For example, is the observed change in well-being provoked by protection or by the

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remoteness of the area? The existence of these confounding factors make it difficult to pinpoint the real cause-effect relationships (Andam et al., 2010). This problem is also common when assessing the effectiveness of parks as tools to protect biodiversity (Naughton-Treves et al., 2005; Porter-Bolland et al., 2012). It is possible to minimise the problem of confounding variables using several approaches (Ferraro and Pattanayak, 2006): (A) baseline characteristics can be used to compare between communities living in protected areas and others with similar features not affected by protected areas. Thus it is possible to control the initial conditions that could affect well-being (Andam et al., 2010; Ferraro and Pattanayak, 2006). (B) Covariate factors that could influence well-being (Ferraro and Hanauer, 2010). (C) Control groups. A set of communities or areas that are not protected but are similar to the protected ones (Kleijn and Sutherland, 2003). The results provided by studies that do not minimise the effect of confounding factors should be considered as correlations instead of cause-effect relationships.

The most relevant socioeconomic costs of protected areas are related to displacement (forced evacuation of local communities from their land due to the creation of a protected area in the surroundings) (Coad et al., 2008; Geisler and De Sousa, 2001; West et al., 2006), which provokes economic impoverishment. However, some displacement processes have improved well-being in local communities (Karanth, 2007). Changes in land tenure can also be considered an important cost (Bedunah and Schmidt, 2004). On the other hand, protected areas can provide significant benefits to local communities. The benefits of nature conservation are evident at a global scale (Balmford et al., 2002): Well-conserved ecosystems can offer more ecosystem services (Cardinale et al., 2006; Costanza et al., 2007) in addition to promoting tourism at the local scale (Ezebilo and Mattsson, 2010; Sims, 2010). This improvement in the capacity of ecosystems to provide services could be transferred to local communities that depend upon protected-area management.

Here, we present a diachronic analysis (1989 and 2009) where the main objective is to describe the relationship of protected areas with respect to well-being (measured as an aggregate of different indicators) in a high-income, highly populated, and biodiverse Mediterranean region of southern Spain. We have compared the well-being of municipalities in 1989 (when the protected areas were declared) and 2009. This diachronic analysis follows the hypothesis that well-being depends on natural-resource conservation (Adams et al., 2004). Specifically, we investigated three questions: (A) Did well-being significantly change in the municipalities between 1989 and 2009? (B) Are the observed changes in well-being related to the presence of protected areas? And (C) Is the well-being ratio from 1989 to 2009 related to the area of municipalities and protected areas? Fig. 1 shows both our conceptual model and the proposed hypothesis.

This study is novel for several reasons: (A) Most studies analysing the relationship between protected areas and well-being focus on areas where the human impact is recent and the economy is still in a developing phase (Canavire-Bacarreza and Hanauer, 2013), while there is a lack of case studies showing the impact of protected areas in places managed by humans for millennia (e.g. the Mediterranean basin). By contrast, this work presents evidence of differential changes in well-being in a high-income area

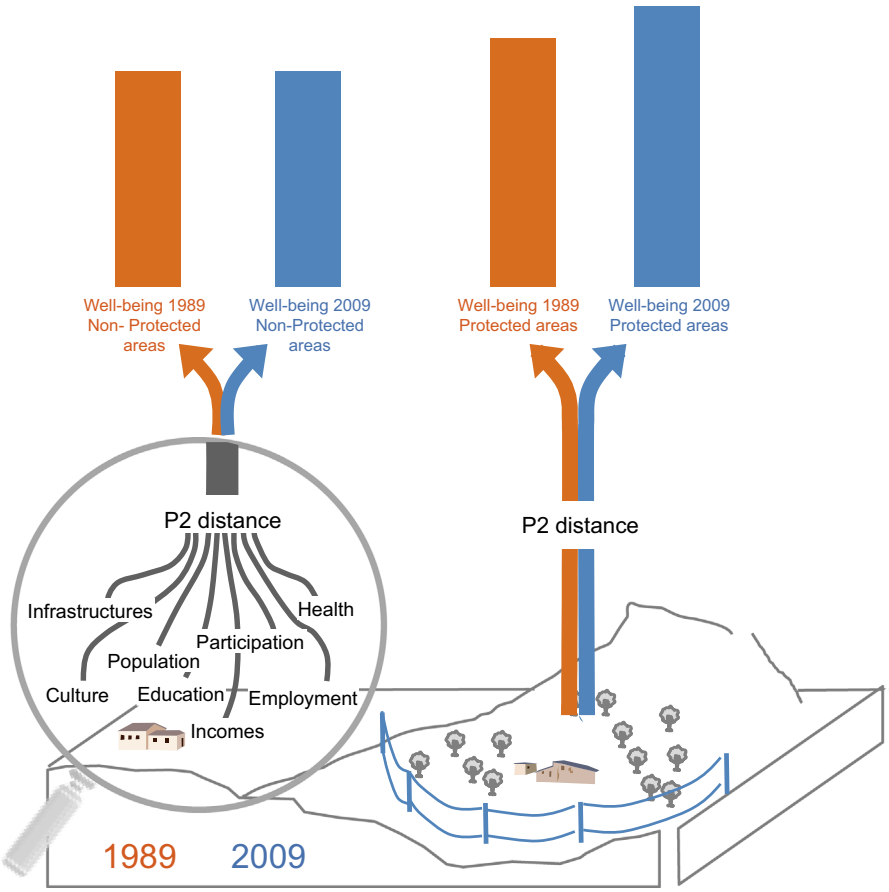

Fig. 1. Well-being is quantified using an aggregated index (P_2 distance) that considers both economic and social indicators. We compared the well-being index among protected and unprotected municipalities over a 20-year time span. The proposed hypothesis states that the well-being increased in Andalusia from 1989 to 2009, but this growth was higher in municipalities affected by a protected area.