



The use of subjective indicators to assess how natural and social capital support residents' quality of life in a small volcanic island

Irene Petrosillo^{a,*}, Robert Costanza^b, Roberta Aretano^a, Nicola Zaccarelli^a, Giovanni Zurlini^a

^a Lab. of Landscape Ecology, Dept. of Biological and Environmental Sciences and Technologies, University of Salento, Lecce, Italy

^b Institute for Sustainable Solutions (ISS), Portland State University, Portland, USA

ARTICLE INFO

Article history:

Received 26 January 2012

Received in revised form 26 July 2012

Accepted 27 August 2012

Keywords:

Social–environmental indicators

Social capital

Natural capital

Quality of life

Residents' perception

ABSTRACT

Quality of life is a multi-dimensional concept and it is essentially subjective even if we can often find objectively measurable proxies for it. High levels of quality of life are the results of the interplay of social, economic and environmental aspects that together make people satisfied with their life. People living in small islands can enhance their quality of life through appropriate programs that guarantee the conservation of natural capital, provided by ecosystems, and networks and norms that facilitate good governance and social cohesion. In this paper an integration of natural and social capital subjectively evaluated by people living in Vulcano Island (Sicily Region, Italy) is proposed as a first approximation of the perception of quality of life. This paper explores whether there are differences in such perception between permanent and seasonal residents, who live there only for tourist economic reasons. Results show that the perception of natural capital is high in both communities, while social capital and the quality of life is less perceived by seasonal respect to permanent residents. The results of this research highlight that natural capital and social capital, taken into account independently, provide only a partial vision of quality of life that is strongly dependent on the combination of both. In this respect, a list of potential subjective social–environmental indicators useful to assess the quality of life is proposed.

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1. Introduction

Quality of life can be seen as a multidimensional concept (MEA, 2005; Costanza et al., 2008) as it consists of (1) the basic material needs for a good life including access to a secure and adequate livelihood, income and assets; (2) health that depends on interacting genetic, environmental, social, and medical factors; (3) security meaning access to a safe environment, to ecosystem services and to secure rights; (4) good social relations referring to the degree of influence, respect, cooperation, and conflict that exists between individuals and groups; (5) freedom and choice including the ability to acquire, to experience, to fulfil personal choices and to select what someone likes. For this reason, to achieve a high quality of life, human beings need multiple kinds of goods and services (Jacobs, 1995), such as the basic physiological needs (clean air, food, water) as well as many other needs such as freedom, recreation, norms and values, experiences, relationships, on the individual, community, national, and global levels (Chiesura and de Groot, 2003; Costanza et al., 2007, 2008). These needs are essential at personal and at

the collective levels and, when fulfilled, benefit both single individuals and the community, because some aspects of well-being are mainly collective properties of a community, for example resilience to social, economic and ecological shocks or stress (MEA, 2005; Malkina-Pykh and Pykh, 2008). In this context, a good quality of life requires a society that can rely on different forms of capital (de Groot et al., 2010). The essence of the concept of capital is that it is a stock able to generate a flow of good and/or services to human society (Costanza and Daly, 1992; Ekins et al., 2003). In particular, natural capital is the result of a wide range of process through which natural and semi-natural ecosystems and landscapes provide ecosystem goods and services (Daily, 1997; MEA, 2005) now and in the future, to meet human needs (Collados and Duane, 1999; de Groot, 2006; Haines-Young et al., 2006; Costanza et al., 2007; Fisher et al., 2009). Natural capital through their supporting, provisioning, regulating, and cultural ecosystem services, provides both goods that have a market value as food and fuels, as well as non markets goods and services such as recreation and amenities, which are more intangible, and less directly ascribable to economic mechanisms of production and consumption activities. Markets and non-markets goods and services are as much as critical for the sustainability of human society (Porter et al., 2009; Chiesura and de Groot, 2003; Kulig et al., 2010). In addition, human perception of the environment shapes human knowledge of the environment and involves interpretation of events or information

* Corresponding author at: Lab. of Landscape Ecology, Dept. of Biological and Environmental Sciences and Technologies, University of Salento, Prov.le Lecce Monteroni, 73100 Lecce, Italy. Tel.: +39 0832 298896; fax: +39 0832 298626.

E-mail address: irene.petrosillo@unisalento.it (I. Petrosillo).

(Bechtel, 1997). The landscape consists of two basic elements, the biophysical characteristics of an area affected by human activities and analysed through “objective” analysis, and the perception and the value assigned to the environment by people, evaluated through “subjective” analysis (Petrosillo et al., 2007). Humans are active participants in the landscape. They think, feel and act, so they attribute a meaning and a value to specific landscapes and places where they live, work, visit, for different reasons ranging from instrumental value (e.g., places that provide sustenance) to symbolic value (e.g., places that represent ideas) (Brown, 2005).

However, because of many ecosystems are public, goods and services are considered free (Heal, 2000) and people take them for granted, overuse them, and underinvest in them, taking only the benefits (Hardin, 1968; Petrosillo et al., 2009; Lautenbach et al., 2011). For natural capital management and conservation, the development of a high level of social capital is needed, because social institutions, based on trust and reciprocity, and on agreed norms and rules for behaviour, can mediate this kind of unfettered private action.

The definition of social capital has evolved over time, but in the literature there is a growing recognition that social capital stands for the ability of actors to secure benefits by virtue of membership in social structures or social networks and the associated norms of reciprocity and trust (Coleman, 1988; Portes, 1998; Putnam, 2000; OECD, 2001; Kroll, 2011; Kulig et al., 2010). From this perspective, social capital is a multidimensional concept consisting of non material values such as belonging to social networks and social connections, social norms, trust and reciprocity, which influence individual behaviour and interaction among people and make it possible to form a community. Actors establish relations purposefully and continue them when they perceive the benefits provided by these connections (Coleman, 1988). All these components are important basis for sustainable livelihoods (Pretty and Ward, 2001) and can also have powerful effects on people' quality of life (Helliwell and Putnam, 2004; Wills-Herrera et al., 2011).

In this perspective, beyond how well human needs are met it is also important which individuals or groups perceive satisfaction or dissatisfaction in various life domains (Costanza et al., 2007). Quality of life can be experienced and perceived differently depending on the context and situation, because it reflects social and personal factors such as geography, age, gender, and culture (Butler et al., 2005).

Given the recognized interplay between natural and social capitals in supporting subjective quality of life, the primary aim of this paper is to propose a list of subjective social–environmental indicators that can be integrated with the objective ones, traditionally used in environmental assessments. In many Mediterranean islands “permanent residents”, who live on the island for the entire year, share the same space with people that live there from April to October for their involvement in economic activities related to tourism (“seasonal residents”). Therefore, a survey was carried out to investigate residents’ (both permanent and seasonal) perception of quality of life in a small Mediterranean island. In particular, three aspects were taken into account: (1) their perception of natural capital; (2) their perception of social capital; and (3) their perception of the possible risk of losing natural and social capital. Furthermore, the possible statistical differences in the perception shown by seasonal and permanent residents were analysed to investigate whether these two groups can be considered as a single community.

2. Insularity and quality of life

It is widely acknowledged in the literature that islands and small islands, in particular, are natural laboratories for the study

of social and ecological processes (MacArthur and Wilson, 1967; Patton, 1996; Vogiatzakis et al., 2008). Small islands, due to insularity, share some drawbacks such as remoteness, limited resources, high dependence on imports, high transportation costs, and susceptibility to natural disasters (MEA, 2005; Vogiatzakis et al., 2008). Small islands are characterized by limited physical size, generally limited natural resources, high susceptibility to climatic changes and natural hazards (hurricanes, storms, droughts, tsunamis, and volcanic eruptions), and relatively reduced fresh water supplies, which depend on sea level changes. In addition, climate forcing such as sea level rise, changes in rainfall distribution, and salinization of coastal aquifers are exacerbated in such systems and are expected to increase with climate change (MEA, 2005). Although insularity is clearly increased by geographic, socio-economic, and political isolation (Granger, 1993), socio-cultural factors are probably more important in defining the insular characteristics of islands (MEA, 2005). Islands are also places where the inhabitants are aware of being islanders, and the sea together with the volcano, if present, permeates the whole island, both physically and culturally.

According to the Amsterdam Treaty, these weaknesses generally make the people living there more environmentally, economically, and socially vulnerable. However, communities can reduce their vulnerability and enhance their quality of life through appropriate actions and programs that guarantee the conservation and sustainable management of natural capital, in terms of renewable and non renewable goods and services provided by ecosystems, and high levels of social capital through networks and norms that facilitate good governance, labour productivity, social cohesion and cooperative action (MEA, 2005).

The Mediterranean Sea hosts numerous small islands among which a volcanic archipelago (Aeolian archipelago), included in the World heritage list as part of the patrimony of humanity because of its exceptional universal value and for its peculiar volcanic aspects (Rossi et al., 1996). Living in a volcanic island can affect both negatively and positively the lives of people (Dominey-Howes and Minos-Minopoulos, 2004) because of the risk associated with an active volcano threatening the lifestyle of people, and, on the other hand, for the benefits such as fertile soils, minerals, hydrothermal water and power, and the beauty of volcanic landscapes, which represent important ecosystem services (MEA, 2005).

In addition to the natural capital, we can argue that social capital, i.e. the sense of belonging to a community, plays a relevant role in keeping people living in a volcanic island. The landscapes of Mediterranean islands are a mosaic of many land-cover and coastal types and are characterized by exceptional cultural elements (Vogiatzakis et al., 2008). For this reason, they can provide important ecosystem services, such as food, fibre, pollination, climate regulation, habitat, recreation, and cultural heritage (Costanza et al., 1997; Daily, 1997; Hein et al., 2006; Raymond et al., 2009). Insularity leads to strong linkages between ecosystem services and inhabitants and among inhabitants as well (MEA, 2005). In particular, a volcanic island, by offering beautiful landscapes for several tourist activities such as geothermal spas and climbing the crater, provides many cultural ecosystem services with economic benefits to inhabitants (Eagles et al., 2002). Consequently, traditional activities that have been shaping island landscapes, such as mining, agriculture, and wood cutting (Dominey-Howes and Minos-Minopoulos, 2004), have been almost fully replaced by tourist activities in the last 50 years (Colin and Baum, 1995; Margaris et al., 1996; Ioannides et al., 2001; Kousis, 2001; Petanidou et al., 2008). As a consequence, tourism, driven by natural capital and cultural heritage, supports the economic development of an island but, meanwhile, it is the main threat to natural and social capital (Petrosillo et al., 2006; Lacitignola et al., 2007, 2010).

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