Ecological Economics 140 (2017) 89–98

Contents lists available at ScienceDirect

Ecological Economics

journal homepage: www.elsevier.com/locate/ecolecon

Analysis

Multidimensional Analysis of Regional Tourism Sustainability in Spain

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ARTICLE INFO

Article history:
Received 3 November 2016
Received in revised form 21 March 2017
Accepted 2 May 2017
Available online xxxx

Keywords:
Tourism sustainability
Composite indicator
Multicriteria methods
Regional ranking

ABSTRACT

In a context of expansion and development of the tourism sector worldwide, assessing the tourism sustainability performance of regions or countries becomes an important goal of strategic planning as a means to ensure an appropriate balance between present and future opportunities of areas with a tourism-based economy. Due to the multidimensional nature of the sustainability concept and the difficulties encountered in its measurement, composite indicators have increasingly been used as useful tools for the operationalization of sustainability. In this paper the study of tourism sustainability of Spanish regions is addressed by building a composite indicator that uses multicriteria decision techniques for the aggregation and weighting of the simple indicators considered. The developed index allows the representation of both the weak and strong sustainability paradigms, as well as other compromising, midway concepts between those. Moreover, the sustainability performance of the studied regions can be easily compared and a fair ranking of the regions can accordingly be obtained, which can serve as a starting point that stimulates public and private debate and promotes improvement actions to achieve sustainability.

1. Introduction

Since the emerging manifestations of tourist activities in the late nineteenth century to the present, there have been many changes in the paradigm of tourism development. In the middle of the last century, technological changes that affected traveling together with the rising of income levels in the western world made a formerly elite-oriented tourism industry develop into a mass tourism model, characterized by an intensive and generally unplanned use of destinations' tourism resources. Soon, a growing concern about the harmful effects of mass tourism on the territories, both at environmental and social levels, made academics and managers discuss limits to tourism development, giving rise to new, more environment-respectful paradigms of tourism development. In this context the concept of sustainable development was naturally adopted in the field of tourism.

The term sustainable development was formally defined for the first time in 1987 in the World Commission on Environment and Development report as the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". So defined, the concept has been criticized for its vagueness, which eventually could lead to multiple interpretations usually adapted to fit the interests of different stakeholders (Wall, 1997), although this did not prevent the issue to capture the widespread interest of institutions, governments, businesses and civil society and soon the paradigm of sustainable development turned into a fundamental principle of strategic planning and economic progress both at global and regional scales. Within the tourism sector, a universally accepted definition of sustainable tourism is also difficult to attain, although one of the most commonly referenced descriptions alludes to the "tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities" (UNEP and UNWTO, 2005). Put this way, we are facing a multidimensional concept in which economic, environmental and social aspects must be simultaneously taken into consideration.

The practical implementation of the concept is also a rather controversial problem that has been receiving considerable attention in the past decades. The use of indicators has been widely recognized as an appropriate tool to assess the achievements towards sustainable development and facilitate the operationalization of the concept (Bell and Morse, 2008; Mayer, 2008), and a number of national as well as international organizations are getting increasingly involved in the collection and dissemination of several indicator measures. However, the simultaneous analysis of the large amount of data contained in a system of multidisciplinary indicators is a hard task that complicates an overall evaluation of the considered regions. This problem is usually addressed by reducing the information that the indicator system comprises into a single aggregated index or composite indicator. This approach is very common in studies of sustainability and quality of life (Böhringer and Jochem, 2007; Chaaban et al., 2016; Mori and Christodoulou, 2012; Munda and Saisana, 2011) as well as in tourism analysis at different

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http://dx.doi.org/10.1016/j.ecolecon.2017.05.004
0921-8009/

spatial scales (Blancas et al., 2015; Castellani and Sala, 2010; Kozic and Mikulic, 2014), proving to be rather useful as communication and decision-making tools (Kondyli, 2010).

Although no single methodology has been found more suitable than any other for building composite indicators (OECD, 2008), multicriteria decision making (MCDM) techniques seem to be particularly appropriate for this task due to their ability to deal with multiple conflicting attributes, as is the case in sustainability assessments, and they have been profusely used in the specialized literature (Diaz-Balteiro et al., 2017). The simplest and best-known method is the weighted linear aggregation, with indicator weights that can be obtained either by subjective methods, that introduce decision-maker's preferences (Krajnc and Glavic, 2005), or objective methods, that exploit the information contained in the data set (Pulido and Sánchez, 2009). Other methods commonly used include the Weighted Product (Sevigny and Saisana, 2016; Zhou and Ang, 2009), Compromise Programming (Diaz-Balteiro and Romero, 2004; Gómez-Limón and Sanchez-Fernandez, 2010), Goal Programming (Blancas et al., 2015; Lozano-Oyola et al., 2012) or Data Envelopment Analysis (Hatefi and Torabi, 2010; Reig-Martínez et al., 2011).

Following a MCDM approach, the present research represents a further attempt in the assessment of regional tourism sustainability. More precisely, this work is aimed at the development of a composite indicator to be used for a comparative analysis of the sustainability performance of the Spanish regions. At a methodological level, the construction of the composite indicator presents an innovative scheme that combines an objective procedure for computing indicator weights with the use of aggregation procedures based on Compromise Programming in order to guarantee certain desirable properties in the final index. Empirically, the analysis provides a regional approach to the issue of tourism sustainability in the world's third international destination both in tourist arrivals and tourism receipts (UNWTO, 2016), in order to identify which regions in the country are exploiting their tourist resources in a more sustainable way. As a result, a ranking of Spanish regions will be obtained according to their relative level of tourism sustainability, which can serve as a starting point to define improvement strategies at the regional level.

The rest of the paper will be organized as follows: After this introduction, the methodological approaches used in the construction of composite indicators for sustainability assessments are discussed. In the third section an original procedure will be proposed to develop a composite indicator of tourism sustainability. Section 4 presents the empirical framework that this paper focuses on and discusses the selected indicators, followed by Section 5 which summarizes the results of the analysis performed in comparison with two different known methods. Finally, some concluding remarks are provided.

2. Methodological Approaches to Tourism Sustainability Assessment

Despite the multiple interpretations that the broad definition of sustainable development brings about, the core idea of sustainability as a universal paradigm, applicable in all areas of human development and particularly in tourism, is widely recognized and accepted. A common understanding of the concept whenever it is discussed involves the integration of economic, environmental and social aspects of the activity under consideration as well as the search for a compromise between these three facets or dimensions of development (Mori and Christodoulou, 2012).

In recent decades there have been many methodological as well as empirical initiatives aimed at measuring the level of sustainability achieved in different human activities, such as the Human Development Index, Ecological Footprint, Environmental Sustainability Index, Wellbeing Assessment, among others (Böhringer and Jochem, 2007). Particularly, there are many valuable contributions focused on the implementation of the sustainability paradigm in tourism and different methodological approaches for the evaluation of tourism sustainability have been discussed (Schianetz et al., 2007).

Whatever the field of interest, the most common approach to measuring sustainability is based on the use of indicators, frequently of a multidisciplinary nature, which come to play an important role as quantitative tools for decision-making (Bell and Morse, 2008). The analysis of highly complex phenomena requires the selection of a comprehensive set of indicators, which represent attributes, characteristics or properties of the system under evaluation, and are relevant for understanding the current situation or indicating possible changes in its future evolution. For a systematic interpretation of the data compiled, indicators are usually presented within a well-structured framework, grouped into a number of categories related to the objective of the study (OECD, 2008), the conceptualization that builds on the three dimensions of sustainability (economic, social, environmental) being the most commonly used in tourism analysis (Mikulic et al., 2015).

Meanwhile a detailed examination of the indicator system provides valuable information that offers a complete, compartmentalized view of real-world problems, an integrated assessment of the evaluated territories is typically difficult to achieve, due to the multidimensional nature of the system that usually provides conflicting evaluations across the different dimensions (Rowley et al., 2012). For that reason, policy makers often demand some type of aggregate index that supports a clear, unambiguous interpretation and can be used to easily convey the current situation to a non-expert audience (Böhringer and Jochem, 2007). Composite indicators are thus used to synthesize into a single numerical value all the information contained in the whole indicator system, facilitating a systematic assessment of the level of sustainability achieved in each territory (Blancas et al., 2010; Pulido and Sánchez, 2009). They also allow a comparative assessment of the units against the objectives of sustainability and therefore they can also be used to derive a ranking of the territories considered (countries, regions, etc.) according to their level of sustainability. Since rankings are known to draw the attention of politicians, managers and general public, possibly triggering certain political, business or consumer decisions, composite indicators can be of great value for regional planning.

Over the past years a wide variety of methods have been used for deriving a composite indicator (referred hereafter as CI) from an initial system. In such processes the weighting and aggregation of the indicators considered are rather controversial topics given that different methodologies used in those stages can affect the final result (Mayer, 2008). Therefore, it is necessary that all decisions at the methodological level are taken in a transparent manner, so that the limitations of the process are made explicit.

From a technical point of view, the aggregation of individual indicators into a CI is not essentially different from the standard multi-criteria decision making problem (Munda and Saisana, 2011), that seeks to assess and rank a set of alternatives according to their performance against several criteria or attributes that, because of their conflicting nature, do not allow an immediate comparison and ordering of the alternatives. This resemblance justifies that different multi-criteria decision techniques have been used for the construction of composite indicators, either to determine the weights of indicators (or attributes) or to rank the regions (or alternatives). The weighted linear aggregation is a widespread approach in applications of composite indicators (Diaz-Balteiro et al., 2017) although other techniques have also been used in a number of studies. In this work we are particularly interested in the distance-based approaches, such as Compromise Programming, which computes an aggregated index that measures the distance between each alternative and a reference or ideal point, representing the best possible outcomes for the considered indicators (Diaz-Balteiro and Romero, 2004). In agreement with the so-called Zeleny's axiom of choice, stating that "Alternatives that are closer to the ideal are preferred to those that are farther away. To be as close as possible to the perceived ideal is the rationale of human choice" (Zeleny, 1982: p. 156), the Compromise