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Assessment of scenic, natural and cultural heritage for sustainable management of tourist beaches. A case study of Gran Canaria island (Spain)

Carolina Peña-Alonso[a,*], Emma Pérez-Chacón[a], Luis Hernández-Calvento[a], Eduard Ariza[b]

[a] Grupo de Investigación de Geografía Física y Medio Ambiente, Instituto de Oceanografía y Cambio Global, IOCAG, Universidad de Las Palmas de Gran Canaria, ULPGC, Parque Científico Tecnológico Marino de Taliarte, s/n, 35214 Telde, Las Palmas, Spain

[b] Department of Geography, Grupo de Investigación en Recursos Costeros y Paisaje (INTERFASE), Facultat de Filosofia i Lletres, Universitat Autònoma de Barcelona, (UAB), Bellaterra, Spain

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ABSTRACT

In the last few decades, the recreational use of beaches and their surrounding areas has increased substantially, influencing the alteration and the loss of heritage elements. For beaches with year-round tourist activity, such as those located in the Canary Islands (Spain), it is especially important to evaluate heritage-based values and in this way contribute to their preservation and integration in local management policies. In this work, an indicator system (comprised of three partial indices: scenic, natural and cultural value) is developed, integrating scientific-technical procedures with narratives of different stakeholders (users, managers, academics, etc.) to assess the value of heritage-based assets in urban, semi-urban and natural beaches. The results obtained reflect a low cultural value and moderate-high scenic value for the three beach types and a high natural value for urban beaches, which is by contrast low in semi-urban beaches. Special importance is given to the need to integrate the heritage values that were identified in the management and planning of each beach.

1. Introduction

The coastal space is home to multiple ecological and social resources and functions that satisfy the needs of a majority of the world's population (Nonn, 1987), a fact that explains the continuous and increasing human occupation of the first 100 km of coast (Martínez et al., 2007). The patterns of exploitation and the perception/preferences of coastal resources have varied over time. Currently, there is a mass attraction of society to coastal spaces (particularly those linked to beaches). Population development, especially during the nineteenth and twentieth centuries, shaped the coast through a succession of uses and territorial transformations associated with demographic pressures, the perception of resources, economy, free time and technological advances (Nordstrom, 2004). At present, beaches are economically highly prized environments, where tourism and recreation are elements that are especially developed (Barbier et al., 2011). The mass arrival of foreigners (Cowen, 2009), the transformations suffered in beach use (from a functional space in the past used almost exclusively by fishermen to a leisure area in the present), and the changes in local beach management have generated a cultural shock and induced a change in society's perception of its relationship with the beach (Villares et al., 2006).

The relationship between society and the natural beach environment has traditionally been analyzed using indicators of varying nature with the aim of improving the management of these areas. In this context, there are studies based on indicators that integrate different dimensions of the beach (Leatherman, 1997; Morgan, 1999; Barbosa and Da Costa, 2008; Cervantes and Espejel, 2008; Ariza et al., 2010; McLachlan et al., 2013; Botero et al., 2015) which consider physical, biological, recreational and environmental elements and functions. The dimensions analyzed in these studies include variables related especially to elements of natural heritage (flora and fauna species and geomorphological elements of interest), as well as landscape elements used to assess the environmental state of the beach, with cultural value generally not included among the indicators.

However, evaluations of the heritage values of beaches, such as flora and fauna of particular interest for conservation, landscape elements or cultural points of interest have generally been excluded from beach planning (Bianchi, 2004) despite their importance (Christie, 2011). Tourism policies are not usually based on processes that integrate the narratives of all the stakeholders of the territory, due to the pressure of private sectors and priorities imposed by other influential stakeholders (Bramwell, 2011). As a result, the development of a series

* Corresponding author at: Grupo de Investigación de Geografía Física y Medio Ambiente, Instituto de Oceanografía y Cambio Global, IOCAG, Universidad de Las Palmas de Gran Canaria, ULPGC, Spain.

E-mail addresses: cpena@becarios.ulpgc.es, carolina.pena@ulpgc.es (C. Peña-Alonso), emma.perez-chacon@ulpgc.es (E. Pérez-Chacón), luis.hernandez.calvento@ulpgc.es (L. Hernández-Calvento), eduard.ariza@uab.cat (E. Ariza).

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of conflicts in local management can take place (Janssen et al., 2007; Ostrom et al., 2007) as a consequence of prioritising recreational over heritage elements (Williams and Micallef, 2009), even though the latter also attract beach users (MacLeod et al., 2002).

In this sense, despite the deficiencies existing in Spanish legislation regulating the protection of the coast, the Coastal Act 22/88, modified by Act 2/13, (Losada, 2013) establishes as its main objective the attainment of a balance between a high level of protection and an environmentally friendly activity so that beaches can be enjoyed by future generations. However, the degradation and disappearance of heritage assets in the coastal perimeter of the country are widespread phenomena. This process is intensified in island environments due to the inability to filter out the numerous external influences to which they are exposed (Mimura et al., 2007), resulting in a gradual loss of identity. The Canary Islands (Spain) are such an example given their limited coastal resources as a result of their island nature and the year-round arrival and presence of tourists.

The concept of "heritage" is plural in nature (Sax, 1990) as a consequence of the existence of different social capitals. From an anthropological point of view, it is taken to refer to cultural heritage, but other interpretations of heritage concern tangible and intangible properties linked to the qualities of a society or territory that must be preserved, such as nature or landscape (Korstanje, 2011).

Within a beach-centred framework, heritage elements have been partially analyzed through studies based on landscape (Ergin et al., 2006; Williams et al., 2007; Phillips et al., 2010), nature (Gray, 2008; Schlacher et al., 2008), or culture (MacLeod et al., 2002; Callegari, 2003; Howard and Pinder, 2003). However, such partiality does not cover the cross-sectional relationships between society and the natural environment of the beach as a socio-ecological system (Anderies et al., 2004; Curtin and Prellezo, 2010). Such relationships need to be evaluated (Peña-Alonso, 2015). In this context, natural heritage elements form part of beach ecosystem services that benefit the surrounding society. Cultural heritage refers to infrastructures built throughout history that explain the relationship between society and territory, as well as the cultural character of the current society and its socio-economic background. Finally, landscape heritage is a manifestation of the relationship between society and territory that has been built over time, and its valuation, in terms of scenic value, allows assessment of the social perception of its structure.

In this study, the heritage concept is addressed using the definition of Korstanje (2011), which includes in the cultural dimension historical features that indicate the cultural bases of today's society. Given the discrepancies between beach management and heritage asset evaluation, the main objective of this research is the proposal of an indicator system that allows the evaluation of the natural, cultural and scenic properties (partial indices), and their interrelationships, of beaches with different degrees of anthropic pressure in the island of Gran Canaria (Spain). The analysis carried out is proposed as an initiative for the diagnosis of the heritage of beaches and their surroundings.

2. Study area

2.1. Types of beaches. Coastal evolution and characteristics

The economic growth of the Canary Islands in general and Gran Canaria in particular is due to the development of the tourist industry. Since the arrival of mass tourism in the 1960s, beaches have been the showcase attraction. In this time span, the wide-ranging changes in the coastal occupation model (Fig. 1) have had a strong impact on the economy, society, culture and the environment (Garín-Muñoz, 2006), with the landscape being a graphic representation of these changes.

Even so, it is still possible to find beaches in the Canary Islands with differing degrees of human occupation, that is, with different degrees of alteration of the natural, cultural and scenic components. In order to carry out an analysis adapted to these particularities, a series of studies available in the literature (Williams and Micallef, 2009; Roca and Villares, 2008; Vaz et al., 2009; Ariza et al., 2010) were used as reference to classify the beaches depending on the degree of human influence. The criteria of these investigations were adapted to the particularities of the Canarian beaches (Table 1).

2.2. Selected beaches

The indicator system developed in this research is applied to a selection of beaches located on the island of Gran Canaria (Spain), and is representative of the archipelago's natural, scenic and cultural heritage (Fig. 2). Beach selection was based on representing the heterogeneity of the Canarian coast, concentrating on physical configuration (waves, wind, slope, width, granulometry, material, etc.), and broader aspects of anthropic influence (population centres constructed in historical moments and different objectives, uses, landscape configuration, management policy, environmental protection figures, etc.).

The distribution of the beaches is almost homogeneous in the island perimeter, with the exception of the western zone. Access to this area is limited due to the presence of very deep ravines that run from the interior of the island to the coast, without the possibility of terrestrial communication in most of this area. The beach of Veneguera (key of Fig. 2 = beach number 34) is representative of the natural and anthropic configuration of this strip of the coast of the island.

3. Heritage dimensions and data analysis

The indicator system proposed has three dimensions or partial indices (natural, cultural and scenic value). These partial indices integrate the narratives of beach users with the criteria established in validated variables in previous scientific and technical studies (Peña-Alonso, 2015). The creation of each partial index (Table 2) was done in two stages: 1) conceptualization of partial indexes, development of their structure and choice of their variables; and 2) the establishment of metrics for evaluation of the variables.

The proposed variables are measured individually in a range from 0 (low heritage value) to 4 (high heritage value). The definition of each of the partial indices is related to its meaning and contextualization within the concept of beach heritage. For this reason, different procedures were carried out to construct the lists of variables and the establishment of the metric in each case, as defined below.

3.1. Natural value (NatV)

The natural value partial index is analyzed through the presence of natural elements cataloged on the beach and in its immediate surroundings ($\leq$200 m) and the existence of figures of protection of the natural environment at different territorial scales (regional, state and European). More specifically, this partial index integrates the existence of species of flora and fauna protected by European regulations (Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora; Directive 2009/147/EC of 30 (Royal Decree 139/2011 of 4 February on catalog of endangered species of Spain) and regional ones (Law 4/2010 of 4 June on the catalog of protected species of the Canary Islands), as well as the geomorphological-sedimentological value (Díez-Herrero et al., 2008). In the latter case, points of geological interest were identified by: 1) geodiversity, through the information contained in the geological map (quantity of geological materials and landforms) consulted via the WMS service of the web platform of GRAFCAN S.A. (Government of the Canary Islands); 2) scientific repercussions, based on a search of academic literature that addresses the study of the geology or geomorphology of the selected beaches and; 3) didactic and tourist interest, through guides, interpretation centres and information panels on the geological assets of the beaches.