



Towards a new Integrated Beach Management System: The Ecosystem-Based Management System for Beaches



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ABSTRACT

Massive use of beaches has forced traditional management of these systems to focus on the service offer to users. Consequently, human activity and behavior prevailed over other biological and physical processes and functions. Mirroring this tendency, the use of Performance Awards (Blue Flag) and Environmental/Quality Management Systems (ISO 14001, EMAS, and Q of Quality) were popularized as standards of environmental quality. In parallel to this process, recent international coastal and marine policies have emphasized the need to develop sustainable strategies for implementing the principles of the Ecosystem Approach into management with the overarching goal to maintain ecosystem integrity while enabling the sustainable use of ecosystem goods and services in systems under management. As Performance Awards and Environmental/Quality Management Systems do not follow the Ecosystem Approach, an Ecosystem-Based Management System for beaches (EBMS-Beaches) is introduced to overcome this issue. The EBMS-Beaches is intended as a formal standard framework that add new aspects not considered in a classical beach management process by the introduction of the principles of the Ecosystem Approach, between them: a) a clear vision-driven process; b) a holistic approach from a geographical perspective; c) pressure analysis and institutional coordination inside clear participatory planning; d) use of risk management techniques in planning; e) the ecosystem service concept as the central piece of the system; f) use of the DPSWR as accountable framework of indicators; g) desired vision based on state indicators and using BQI partial indices; and h) timely participation by local population. The EBMS is structured along three pillars (managerial, informative and participatory pillars) working in an adaptive management way. Based on these three pillars, existing management practices can be standardized into a viable, systematic means of implementing, in an integrated way, the new international policies for beach social-ecological systems. An initial experience of EBMS implementation in a particular beach (S'Abanell beach, Girona-Catalonia, Northwestern Mediterranean) has been initiated and it is presented.

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1. Introduction

The Ecosystem Approach emerged as the dominant paradigm for managing coastal and marine ecosystems (Olsen et al., 2009).

New international policies emphasize the need to develop sustainable strategies for implementing the principles of ecosystem management (“Ecosystem Approach” -EA, “Ecosystem-Based Approach” -EBA, “Ecosystem-Based Management” -EBM three concepts considered similar according Farmer et al. (2012) that will be used indistinctly here). This approach offers new opportunities for sustainable use of the sea but requires better understanding of how marine social-ecological systems operate, how they generate goods

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and services, how well these benefits are captured and sustained, how human degradation of the systems affects human welfare and generates costs, and the complex social relations and value systems underpinning human governance of marine systems. In Europe for example, the achievement of Good Environmental Status (GEnS, following Borja et al., 2010, 2013) and sustainable use of marine ecosystems became primary objectives of the new Environmental Marine Policy of the Union (Marine Strategy Directive-MSFD [2008/56/EU]; Maritime Spatial Planning-MSP [2014/84/EU]). This new policy is aimed towards the achievement of a common vision and a holistic integrated approach using the Ecosystem Approach as its framework of reference. In the Mediterranean region, the “Mediterranean Action Program” (MAP) also has included the Ecosystem Approach as its basic marine strategic framework. While all countries belonging to the European Community supports its marine strategy, the MAP program has been ratified by 22 countries of the Mediterranean beyond their different political and social affinities (Cinnirella et al., 2014). All of this confirms the international support to the principles of the ecosystem approach at the level of policy and send a clear message of how it should be the future management of the coastal and marine environments.

In practice, realities are a little bit different. Different guides and manuals have been developed to facilitate the implementation of these strategies (Shepperd, 2008; Ehler and Douvère, 2009; PISCES, 2012) and several regulatory tools have been proposed (i.e. in Europe, MSFD, MSP and the Mediterranean Protocol of Integrated Coastal Zone Management-ICZM [2009/89/EC]), however, the application of the principles of the ecosystem approach into management and the use of its associated jargon is still confusing, makes its related type of management nebulous rendering it difficult to put into practice. In addition problems get accentuated by the complex institutional system that manage these environments, with very fragmented responsibilities and extremely reactive actions (Cormier et al., 2010; Bainbridge et al., 2011; Sardá et al., 2014). All these issues and controversies can be seen in present practices of beach management.

Beaches are social-ecological systems that play a key role in coastal environments. Beaches play multiple functions, being three the most important ones: to act as natural reservoirs, to offer coastal protection, and to provide human recreation. A long list of ecosystem services is provided by these three assigned functions (Sardá, 2013). In the Mediterranean region, as in many other regions of the world, beaches constitute the main asset for the maintenance of the tourism industry and a clear relation between quality, user's perception and economic valuation is found (Ariza et al., 2012a). Following such issues most of its public/private management has been developed around its recreational function and other functions observed in beaches have been just seen as a complement of the previous one and, in many cases, managed in a reactive way.

During recent decades, in order to bring the best recreational attributes for beach users (clean sand for lying, clean water for bathing and the best services possible), environmental quality standards and environmental management systems have been widely used in beach management. Although it is clear that those frameworks improved the way in which beaches were managed, these schemes are far to applied the principles of the Ecosystem Approach. The introduction of the Ecosystem Approach in beach management arrangements would requires the incorporation in the used framework of a set of principles to ensure the inclusion of essential components such as participation, planning and decision-making, integration, promoting accountability and quality assurance, as well as a new jargon of concepts such as social-ecological systems, ecosystem functions and services,... (CBD, 1998; Balvanera et al., 2001; Cognetti and Maltagliati, 2010; Sardá et al.,

2014). To advance into the solution of this deficit, this paper presents the development of a new formal procedure for beach management, intended to be used in practice, the Ecosystem-Based Management System for Beaches (EBMS-Beaches). The Ecosystem-Based Management System was recently developed as a formal standard management system to implement the Ecosystem Approach into the management of public goods (Sardá et al., 2014). It is one of the main outputs of the FP7 KnowSeas project (www.msfd.eu). The EBMS is an adaptive management system that combines the theory of environmental and risk management (Measham and Lockie, 2012) with the principles of ecosystem management (Farmer et al., 2012) and permit its application in a nested way at different spatial scales, whether national, regional, sub-regional or local.

This paper describes the structural and operational components of this new management model (EBMS-Beaches). In its first section, the paper describes the evolution of beach management in Spain, a country that it has always distinguished itself by introducing innovative aspects in the management of beaches. In a second section we describe what the new system incorporates into previous managerial standard systems in order to introduce the EA principles. In the third section, the EBMS for beaches is described and the applications of several internal tools to the beach of S'Abanell (Blanes-Girona, Spain) are used as examples. Finally, we present some general conclusions that we believe can make the EBMS sufficiently attractive for its use.

2. The development of beach management frameworks in Spain

2.1. From the initial services in beaches to the use of environmental managements systems (EMS)

In Spain, it was not until the end of the First World War when the first transformation of the pre-tourism industry was observed, from low supply activities (spa-resorts) to the initial development of new specific generic types of tourism, which would result in the “sun and sand” tourism model during the second part of the century (a good analysis of this evolution can be found in Garay and Cánoves, 2010). The pre-fordist tourist phenomenon was then initiated and beaches become part of the human landscape like other areas of the territory. At that period, the ecosystem concept was not introduced in public management and only scattered services on beaches were disposed without considering these systems as natural resources of economic interest (Fig. 1).

Innovative beach management processes were initiated in Spain during the 1950s and 1960s following the long post war period after the Second World War. A new fordism stage of tourism was born and the preponderance of the “sun and sand tourist model” became a reality. The Spanish Coastal Act of 1969 established the so-called General Zoning Plan for beaches (PGOP) allowing to plan for services and facilities, and the first management guidelines were published for urban environments. During the 1970s Spain developed the “Indicative Plan for the Use of Public Domain” (PIDU) who had a great importance during the 1980s at the beginning of the Spain's democratic transition (Fig. 1). The green environmental movement was born during these decades and a change in the prevailing worldview of our relation with nature recognizing the need for a sustainable use of natural resources was introduced.

The Sustainable Development concept globalized the environmental issues and the mainstreaming of environmental values within all sector and policies during the 1980s. The new Constitution of Spain (1978) promoted the development of a new Coastal

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