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Monetary and Non-Monetary Valuation of Cultural Ecosystem Services in Marine Protected Areas

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Chapter 8

Monetary and Non-Monetary Valuation of Cultural Ecosystem Services in Marine Protected Areas

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Abstract

Cultural Ecosystem Services (CES) are recognized but still considered as the "residual" ES subcategory and remain understudied. Their potential to shape common identities and impact societal perspectives on ocean/marine resources' management explains why further research on CES can widen the range of information needed for policymaking, especially in cases of blue tourism interventions. In this chapter[5], we review some possible conceptual frameworks for the CES classification along with the monetary and non-monetary (revealed and stated preference) methods for their valuation. Attention is given to the stated methods that the last years have received increasing attention and exhibit some potential to be linked with Maritime Spatial Planning decisions. An attempt to operationally define CES in the context of Marine Protected Areas and investigate the determinants of perceived cultural heritage and identity features has been adopted in two Interreg projects, AMAre and RECONNECT.

Key words: Marine Protected Areas, Cultural Ecosystem Services, non-monetary methods, Maritime Spatial Planning

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8.1 Introduction

The concept of Ecosystem Services (ES) originates in the 1970s when a first attempt to define the beneficial ecosystem processes and functions was made based on a utilitarian approach, aiming to increase public support for ecosystems' conservation. In the mid-1990s the economists Costanza and Daily were among the first researchers to introduce in the literature the concept of ecosystem services valuation (Costanza et al 1997). During the 2000s, the concept of ES has already received much attention and after the publication of the Millennium Ecosystem Assessment synthesis reports (MEA, 2005) it is well-placed in the policy agenda. In MEA, the Cultural Ecosystem Services (CES) are for the first time officially defined as a framework for understanding the ecosystems processes and functions, as well as the relationship of ecosystems with human well-being. Long before that, attempts to integrate the economic aspects of ES within policy decision-making have been made and resulted to the establishment of several markets of ecosystem services or payment-for-ecosystem-services schemes within that context. However, the CES is the least developed category of ES, especially as far as the context of "ocean space" is concerned.

Later, another framework that has also attracted the interest of the research community, The Economics of Ecosystems and Biodiversity (TEEB, 2010) explicitly included CES as a services category linked to commercial or non-commercial cultural-related values. But more than a decade later, CES are still not fully operationalized in valuation exercises and the decision-making process, while the definitions, conceptual models and assessment indicators related to CES are not yet standardized. The qualitative and interpretative nature of CES as well as their confusing and overlapping meanings can explain why standard assessment indicators are missing and why their measurement raises methodological challenges.

The boundaries of Marine Protected Areas (MPAs) contain ocean/marine space or settings that can combine several cultural elements such as protected shipwrecks, marine conservation areas, marine parks, settlements, green spaces for leisure, diving sites etc. Thus, MPAs have the potential to bring new levels of integration and protection to the management of cultural resources within the coastal and marine environments. This explains how cultural benefits are placed within the context of MPAs, which can be associated with a range of culturally defined attributes (e.g. scenic beauty, distinctiveness etc). Although management plans based on the valuation of ecosystem services provided by the habitats within their boundaries has a track record of application (Börger et al., 2014), CES are rarely part of the valuation exercises because they take place at different levels and realized by diverse methods, as will be explained in the next sections.

8.2 Operationalisation of CES

A literature review by Cheng et al (2019) on the CES valuation methods in 293 publications showed that the rate of publications increased from 3 papers per year in 2005 to 90 papers per year until 2017. This fact reveals the increasing need to operationally define CES in socio-economic models. The multitude of perspectives for approaching CES reflects a new multi-disciplinary dynamic field under progress, but it also shows a lack of well-established and readily applicable research framework. Different conceptual frameworks have been used for the categorization and definition of the CES, attempting to find an approach that can render

the CES operational, not only in the research but also in policy agenda and in decision-making.

The UN Millennium Ecosystem Assessment first defined ES as the *"benefits that people obtain from ecosystems"* (MEA, 2005) and divided them in provisioning, regulating, supporting and cultural services. In MEA, CES are defined as mostly intangible and invisible that related to the *"non-material benefits that people obtain from the ecosystem"* and influence the quality of life, while the provisioning, regulating and supporting ES are considered as material services. In the same framework, the classification is based on the practices and experiences that arise in the environmental spaces under consideration and for that reason it has been criticized in various occasions. The notion behind the critique is that some practices such as recreation (consumptive or non-consumptive) fall into 2 services categories (e.g. cultural and provisioning), a fact that may result in double-counting.

Another classification is the Common International Classification of Ecosystem Services (CICES) developed in 2013 by the European Environment Agency (EEA) as part of the work on environmental-economic accounting, which is led by the United Nations Statistical Division. Its central focus is the standardization of the ES description to ease their accounting. Besides ES valuation it introduces the need of mapping. CICES divides all ES in classes, where each ES is made up of a bio-physical output and an eventual use or benefit. In CICES, services are distinguished from benefits and CES are defined as *"the characteristics of elements of nature that provide opportunities for people to derive cultural goods or benefits".* Further CES subcategorization depends on whether the opportunities are realized from direct contact or remote interaction with nature (Haines-Young, R. et al 2018). This classification became the link with the Mapping and Assessment of Ecosystem Services (MAES), a flagship project of the EU which proposes specific indicators for the measurement of the condition of terrestrial, freshwater and marine ecosystems.

A third classification system is the UK National Ecosystem Assessment and its follow-on phase (UK NEAFO) that categorizes values according to the environmental settings or spaces were CES can be identified. Specifically, the system mentions that CES "*encompass the environmental spaces and cultural practices that give rise to a range of material and non-material benefits to human well-being. These spaces and practices interact with contemporary cultural values to shape people's identities, provide experiences that contribute benefits in terms of well-being, mental and physical health, and equip people with a range of skills and capabilities"* (Church et al. 2014). This framework allows for an assessment of CES taking into consideration: the extent and state of different spaces, the practices (e.g. snorkeling, wildlife watching, diving) and the well-being benefits associated with spaces and practices through capacities (e.g. knowledge and skills), identities (e.g. cultural identities) and experiences (e.g. spiritual and aesthetic experiences). For the above reasons, that framework can allow the consideration of multiple cultural and natural features in the geographical area under consideration and thus is also suitable in MPAs.

8.3 Monetary and Non-Monetary Valuation Methods

An approach used for describing and capturing the benefits from the diverse ES is the Total Economic Value (TEV) (Defra, 2007), which is based on individuals' preferences extracted either via stated or via revealed preference methods. To link the TEV with the designation

and management of MPAs with regards to the CES, we need to identify the values categories within the various ecosystems of an MPA. Under this framework, examples of direct use CES values may be those attached to species watching, snorkeling, diving, boating, angling, etc. within the MPA ecosystems. Regarding indirect use CES values, examples might include values derived through research, education, etc. Non-use bequest and existence CES values may come from MPA wilderness and seascape preservation for the next generations and the appreciation of the place identity created by the MPA ecosystem, even if never visited. Figure 1 below depicts the above classification.

The methods to estimate the economic values described above are divided in two categories, revealed and stated preference approaches; both can be monetary and non-monetary. In the case of monetary methods, the revealed preference methods are based on market prices or observed choices (e.g. touristic destinations) as proxies of public's preferences over ecosystem services.

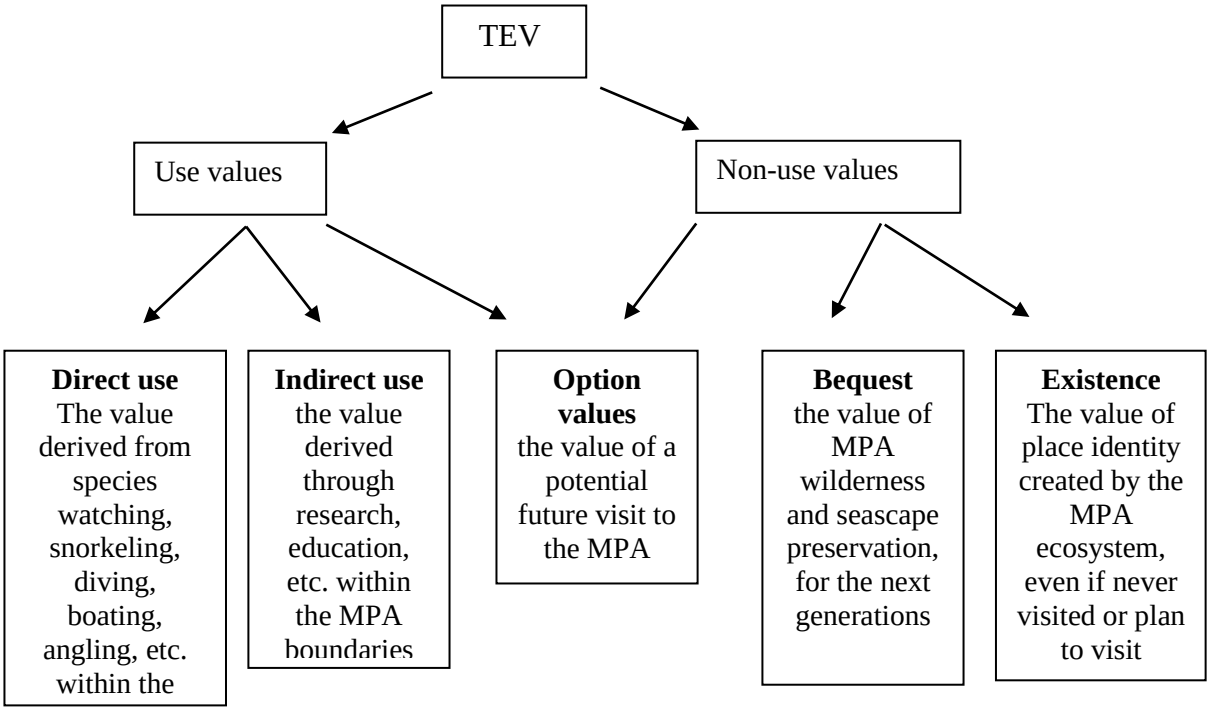

Figure 1. Total Economic Value of CES-related MPA ecosystems

The stated preference methods on the other hand, are based on the construction of hypothetical markets and are conducted through direct questionnaires. In such questionnaires, the public/stakeholders are asked to directly place a value to the ES described in the survey or to choose between hypothetical scenarios that include bundles of services affect by the management scenarios. The services are described by unique characteristics of each ecosystem (or "attributes") which in the case of CES can be leisure features of the area or other features for which tourists and locals are attaching a value on protecting against future degradation/harm. These characteristics are combined with a cost attribute (usually MPA

entrance fee of tax) to form scenarios or choice situations and then researchers can infer their relative rankings and monetary values by collecting preference data.

During the last few years, the strand of literature that involves non-monetary valuation methods is receiving increasing attention. Cheng et al. (2019) identify thirteen such non-monetary methods, that they also divide in revealed and stated preference, just like the monetary ones discussed above. The three revealed methods use observation, or and images, photos posted by the public, advertisements or data from social media (that might include underwater cultural heritage, marine wildlife, extraordinary seabed etc.) as proxies to obtain the values on people's preferences. Stated preference methods use again questionnaires, but unlike monetary valuation, the questions now focus on qualitative information. Such narratives are obtained by either asking respondents to engage in storytelling or describe their perception of well-being from CES, using various indicators. These indicators can be combined with other techniques, such as participatory mapping, participatory GIS or public participatory GIS to combine citizen science and inform spatial planning decisions. The 'participatory mapping method' links the CES perceived by respondents to a specific location, while the participatory GIS incorporates GIS, GPS and remote sensing image analysis software with interviews /questionnaires and human spatial knowledge. Finally, the public participatory GIS brings out the perceptions of the public with the use of geographic technology education.

8.4 CES Valuation and MPA management

8.4.1 Monetary valuation

The EU Maritime Spatial Planning Directive 2014/89/EU defines the Maritime Spatial Planning (MSP) as *"a process by which the relevant Members State's authorities analyse and organize human activities in marine areas in order to achieve ecological, economic and social objectives*". In its turn, it follows the ecosystem-based approach meaning that MSP should be based on the best available scientific knowledge on the ecosystems and their dynamics. Its practical implementation necessitates, among others, the evaluation of conflicting uses and interests and states that the marine strategies *"shall apply an ecosystem-based approach to the management of human activities, ensuring that the collective pressure of such activities is kept within levels compatible with the achievement of good environmental status and that the capacity of marine ecosystems to respond to human-induced changes is not compromised, while enabling the sustainable use of marine goods and services by present and future generations".*

As part of the MSP process, MPAs should be able allocate marine resources to anthropogenic uses and integrate geospatial and scientific information in the decision-making. MPA designation and management should aim to identify and map areas that are useful for each use and then minimize the conflicts between ecological, social, and economic interests. The CES at the depths of MPAs can accrue from underwater seascape, seabed aesthetic, biodiversity, iconic, non-iconic species, archaeological remains (in ocean these are historic shipwrecks and rarely late Pleistocene/ early Holocene remains) and the resulting benefits for the public are associated with history, heritage, education, identity related to the sea or to aesthetics. Although currently there is no EU policy to govern CES, the ES management approach has already had an impact on the policies regarding natural resources management. This is traced

back to 1992, when the UN Convention on Biological Diversity (CBD), made the ES management approach, the primary framework for action to achieve a balance among the three objectives of the Convention: the integrated management of land, water and living resources. In 2008, the ES management approach appears as a cornerstone of the EU Marine Strategy Directive (2008/56/EC) along with its amendment in 2017, which links it to the human pressures and impacts on the marine environment, using the 11 descriptors and the aim of achieving Good Environmental Status of the EU's marine waters by 2020.

To make CES values operational in MPA management using a monetary stated preference approach, we need to define the attributes that can be used for their monetary valuation as described in the previous section. A pilot operationalisation of the proposed methodology was developed in the case of the Interreg projects RECONNECT (Regional Cooperation for the transnational ecosystem sustainable development) and AMAre (Actions for Marine Protected Areas). In these projects the essential socio-economic and cultural variables offered by seagrass habitats of targeted MPAs in Greece, Cyprus, Albania and Bulgaria (RECONNECT) and Spain, Malta, Italy and Greece (AMAre) were studied, with the overall objective to develop management scenarios based on the seagrass ES valuations that can be of use for the policy makers. The CES included were relevant to the natural environment itself. In particular, the ability of Posidonia meadows to become hot spots for biodiversity providing food, habitat, refuge and nursery ground for marine flora and fauna, including iconic or non-iconic species and their ability to reduce currents velocities and water turbidity, contributing to water clarity and purification. Consequently, the experimental design included attributes such as "aesthetic benefits". and "water visibility/ clarity". Such attributes are particularly important for divers as well as for snorkelers and bathers who can enjoy the seascape beauty from the surface in low depths.

RECONNECT also included attributes accruing from the underwater cultural heritage, whose presence is preserved by seagrass. Posidonia oceanica has a particular function to lock out oxygen that otherwise degrades the archaeological remains and to form a protective matt above these treasures. As a result, the "preservation of underwater cultural heritage" was included in the design, assuming that the higher the number of archaeological remains per extent area the more possibilities to capture cultural tourism preferences. The presence of underwater cultural spots of importance to visit (such as widely known shipwrecks) increase the tourist attraction even to non-divers.

Other parameters taken into account but not monetized in both projects were the underwater seascape (the more "beautiful" the underwater scenery that snorkelers and divers will come across, the higher is the possibility to be willing to visit or to preserve it), the diversity of substrate type (the wider the substrate, the more opportunities for bather/snorkelers/divers to visit the area more than once), the spots with extraordinary fish productivity (the higher the fish stock the higher the education opportunities). Other attributes are made up of existing diving routes (qualified tour operators and diving centers can showcase the MPA and increase the perceived value of diving. Routes that are tested and divided to levels and difficulty are more attractive to divers), level of diving difficulty (the deeper the scenery to visit (shipwrecks, reefs, tunnels etc), the less divers can access), seabed quality (the existence of

rock formations, archways, tunnels, vertical walls offer a very particular experience to snorkelers and divers).

8.4.2 Non - monetary valuation

For non-monetary valuation of CES within the MPA framework, qualitative information may come from previous research related to socio-cultural value of ecosystems, such as Bryce et al. (2016) and Schmidt et al. (2016). Bryce et al. (2016) presented Likert-scale indicators from known constructs, such as the reflection and sense of wholeness (Dallimer et al., 2012; Fuller et al., 2007; Irvine et al., 2010), the sense of place identity and continuity with past (Dallimer et al., 2012; Fuller et al., 2007; Tengberg et al., 2012), the transformative values and inspiration (Chan et al., 2012a, 2012b), as well as some newly-suggested well-being indicators inspired by other scales, like the Human Scale Development Matrix (Cruz et al., 2009; Max-Neef, 1989), the Monitor of Engagement with the Natural Environment (Natural England, 2012), the UK National Ecosystem Assessment of Cultural Services (Church et al., 2011).

A number of identified factors and corresponding indicators have been identified, such as the engagement and interaction with nature, the place identity and therapeutic value, captured by indicators showing how people connect with nature (e.g. educational or spiritual). Other indicators could be the ones used from Schmidt et al. (2016) for parks benefits using CICES (Haines-Young and Potschin 2013) definitions. These include recreation, sense of place and inspiration perceptions, with the CES-related ones being either experiencing nature (Experiential use of plants, animals, and land- or seascapes in different environmental settings), physical use of nature (Physical use of land- or seascapes in different environmental settings), education, cultural heritage or aesthetics.

8.5 Conclusions

The management of human activities in marine areas is particularly complex, due to the usually fragmented political and administrative nature of such areas. The intensive use of maritime space calls for more integrated management practices, to avoid negative effects on marine ecosystems, user conflicts, and to create synergies between maritime activities and promote the blue economy. MPAs can be an efficient tool to achieve these goals and ES-based management has a vital role in this process, considering that in most marine areas, human activities are not spatially managed and monitored, while human impacts on ecosystems services are not taken into account when management initiatives are considered. But even in cases where ES do have a role in MPA management, CES are usually the least considered, if not ignored. However, the designation of MPAs that include historic shipwrecks, endangered habitats etc. can offer combined opportunities for leisure activities and blue tourism but also social resistance by impacting people's perceptions on the marine environment and affect the CES such as seascape, leisure, cultural identities.

As a result, CES valuation can become an extremely useful tool that can shed light to the benefits derived from the cultural aspects of MPAs, guiding policymakers and management authorities. Integrated and adaptive management will help MPA managers to identify and adopt policies and practices that involve both cultural and natural resources at the ecosystem

and landscape levels. This necessitates perception studies on CES to reveal potential conflicts and trade-offs or synergies which in turn highlights the need for a common framework and further research in monetary and non-monetary methods for capturing all the necessary information. So far, the variety of conceptual frameworks around the CES categorization has undermined this opportunity. Recent developments and the shift of the research agenda can create a fertile ground for the integration of CES in MPA planning and management. Given the highly subjective nature of CES, stated preferences methods have the lion's share in this debate and there seems to be a consensus that the more CES will become important, the more these methods will need to be developed to accommodate the specificities associated with these services. Recent projects that apply the combination of monetary and non-monetary valuation methods in MPA management are AMARE (Interreg) and RECONNECT (Interreg).

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