

Accounting the value4money of Marine Protected Areas

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Introduction

Protected Areas (PAs) both terrestrial and marine are financed by public funds. Since the last 2014 the Italian Ministry of the Environment is asking Marine Protected Areas (MPAs) to report the public resource management and especially to assess the worth produced by MPAs at the local level. For this purpose, starting from the economic accounting, environmental benefits and costs have been valued and integrated building the Protected Area environmental accounting model. The model approach complies with the EU Biodiversity Strategy to 2020 (EU, 2011) and the Mapping and Assessment of Ecosystem Services Initiative (EU, 2014) carried out at European level aiming to promote the integration of environmental benefits into accounting and reporting systems at EU and national level.

The research on which this paper reports illustrates the model highlighting what and how much value the MPAs are able to create from the money allocated by government and funding bodies. In the Methodology section, the method is outlined and the environmental accounting model is given. In the following section the results are described. The last section provides an analysis of the results and draws the conclusions.

Methodology

PAs have been considered as organisations. Organisations usually have an internal accounting system known as financial statement taking into account the stock and flow of resources. Stock refers to the value of an asset at a balance date, while flow refers to the total value of transactions during an accounting period. Stocks and flows are related because the stock of resources available is usually increased by the flow of new investment and depleted by the flow of depreciation.

This accounting approach was adopted and adapted to PAs while developing a tailor-made environmental accounting model (Marangon et al., 2008). The model is based on two main accounts: the natural stock account and the natural flow account. As is the case for organisations, the aim of the environmental accounting system is to take into account resources in the PA, both consumed and produced. The model aimed to supplement monetary accounting (based on expenses and revenues) with environmental accounting which reflects not only environmental costs but also “environmental revenues”, *i.e.* environmental benefits. In line with the cost-benefit approach, the difference between economic and environmental costs and benefits represents the net benefit and the value produced or consumed by the PA.

Table 1 shows the environmental accounting framework, and includes the natural capital dimension (natural stock account) and the flow dimension (natural flow account).

Table 1. Environmental accounting model of Protected Areas

Environmental accounting model of Protected Areas		
Natural stock account	Natural flow account	
Natural stock:	Costs/expenses:	Benefits/revenues:
Qualitative analysis (e.g. diversity)	PA expenses	PA revenues
Quantitative analysis (e.g. visual census)	Environmental costs	Environmental benefits
Σ = PA net benefits produced/consumed		

Results

Natural stock account

Natural stock accounts is set up based on a long time series. Data referred to natural resource quality, *i.e.* diversity based on the biological classification used to group and categorize organisms into groups such as genus or species, and quantity, *i.e.* density assessed through the visual census.

Natural flow account

The natural flow account is based on the monetization of the environmental costs and benefits. As regards costs, the Organisational Life Cycle Assessment (O-LCA) is adopted in order to assess costs related to the institutional activities; Carbon footprint and Water footprint to assess impacts related to services provisioning and good production inside the MPA. As regards benefits, ecosystem services are mapped and assessed. The Common International Classification of Ecosystem Services is adopted and the following ecosystem services assessed: wild animals and their outputs, mass stabilization and control of erosion rates, experiential use of plants, animals and land/sea-scapes in different environmental settings, physical use of land/sea-scapes in different environmental settings, scientific and educational.

Discussion

PAs provide a series of fundamental services for the constituents of human well-being. Expressing the value of ecosystem services in monetary units is an important tool for policy-makers helping them assess the financial value for money and make effective decisions on resource allocation between competing uses.

With reference to the methodology, the environment is considered in the economic accounting system by analysing natural resources and their ecosystem services and by assessing the impact of activities carried out inside the PA through the LCA.

From an analytical perspective, the PA natural flow account is compared to the contribution allocated by the Ministry of Environment. The calculation of the public funding /total benefits ratio shows that one euro spent for protection returns a value in terms of environmental, social and economic benefits.

From a policy perspective, the model developed provides a framework for managing both economic and environmental information, through which the contribution of the environment to the economy and the impact of the economy on the environment can be analysed. This is intended to meet policy-makers' needs, by providing them with indicators and statistics to monitor interactions between the economy and the environment, and to be a tool for strategic planning and policy analysis so as to identify more sustainable development paths.



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