



ECONOMIC VALUE OF THE SUSTAINABLE BENEFITS COMING FROM THE MEDITERRANEAN MARINE ECOSYSTEMS

Report summary

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SUMMARY (provisional translation)

The Mediterranean Sea represents only 0.3% in volume and 0.8% of the surface of world oceans but its position between three continents, semi-enclosed character and seasonal climate makes it a crucible of biodiversity. Conscious of this wealth, the Mediterranean Action Plan (MAP) developed a Strategic Action Plan to Protect Biodiversity (SAP BIO 2003) which defines the strategic actions to be transposed by countries in national policies to preserve this biodiversity today under threat by coastal artificialisation, overfishing, proliferation of alien species, impacts of human activities (pollution, loss of habitats ...) and climate change. MAP also wishes to support this action plan through a better understanding of the links between environment and economy. To this end, the Blue Plan, one of the MAP Regional Activity Centre, was tasked to explore these linkages by developing an economic approach to the environment.

This report presents the results of an evaluation of economic benefits from sustainable ecosystem services provided by marine ecosystems of the Mediterranean during 2005. The results illustrate the economic potential of marine ecosystems for sustainable development of coastal countries. This assessment focuses on the value of the flows coming from environmental assets that make up the marine natural capital, without revealing the value of the stock of natural capital.

The methodological framework for the evaluation (Chapter 1) was drawn from a literature review of numerous works on economic evaluation of services provided by ecosystems. The major types of Mediterranean marine ecosystems were characterized and considered according to their functions as providers of environmental services: Production, Cultural and Regulation, as categorized by the Millennium Ecosystem Assessment (MEA, 2005). For each of these three categories of ecological functions, various services provided by the considered ecosystems have been identified in relation to the human uses they allow or to which they contribute. In this study, methods used to value perceived benefits through the use of services provided by ecosystems are derived from the framework of the United Nations Environmental and Economic Accounting (UN, 2003). Consistent with the concern for sustainable development in the Mediterranean, a sustainability criterion regarding the use of services provided by ecosystems has been introduced.

This study is based on the consideration of five ecosystems: meadows of the sea grass *Posidonia oceanica*, hard bed associated with Coralligenous biocenosis, hard beds associated with photophilic algae, soft mud and sand bottom substrates and open sea (beyond 100m depth). The surfaces of these ecosystems were estimated from literature review and expert knowledge. The benefits valued refer to three categories of ecosystem functions, as outlined in the following table:

Categories of environmental services	Environmental Services	Benefits valued
Production Services	Production of food resources	Resource rents linked to the production of food resources of marine origin
Cultural Services	Amenities	Resource rent linked to the provision of amenities and recreational supports
	Support to recreational activities	
Regulation Services	Climate regulation	Value of sequestration of anthropogenic CO ₂
	Natural hazard mitigation	Value of protection against coastal erosion
	Waste treatment	Value of nutrient cycling

In this study, the values of benefits coming from the ecosystems has been estimated following two different approaches, depending on the type of beneficiary : value added created in the private sector, avoided costs or tutelary value in the case of collective benefits.

A specific valuation has been carried out for each type of benefit, highly dependent of data availability (Chapter 2). Profits from the production of food resources were evaluated from data on fisheries and aquaculture. The benefits associated with the provision of amenities and recreational materials were evaluated using data on rental property, hotel and catering and tourism. The benefits related to climate regulation have been estimated from the mass of anthropogenic CO₂ absorbed by marine ecosystems, valued at the 2005 average price per tonne of CO₂ on the EU Emissions Trading Scheme. The benefits related to mitigation of erosion has been estimated based on the fraction of coastline exposed to the risk and where Posidonia meadow are present and effective, benefits being valued at the replacement cost of protection works. Finally, the benefits associated with nutriment cycling by marine ecosystems have been valued by observing a tutelary value corresponding to a situation in which the discharges are in accordance with environmental standards.

The aggregation of these results proposes an approximation of the overall value of benefits provided by the Mediterranean marine ecosystems (Chapter 3). Regionally, the profit estimate stands at over 26 billion € for 2005, with greater than 68% of the profits from the provision of amenity and recreational supports. Benefits from the production of food resources represent 11% of the overall benefit estimate. The study also presents results for two Mediterranean countries, Greece, for which profits are 3 billion € or 1.6% of its Gross National Product (GNP) in 2005 and Tunisia, where the profits made by ecosystems amount to more than 520 million € or 2.3% of GNP the same year. The study also proposes a distribution of profits from the production of food resources by type of ecosystem. So, with regard to fisheries, open sea catches represent more than 70% of the benefits, in proportion to the volume of catches. However, the study shows that these are areas of Posidonia meadows and hard bed substrates that offer the best fishing productivity per unit area.

The results obtained by this exploratory study are a first attempt to assess economic benefits coming from the marine ecosystems in the Mediterranean. The option to apply a criterion of sustainability for the evaluation of the benefits and the lack of robust data for some potential benefits, that could not thus be integrated into the evaluation, lead to establish an initial estimate, probably à low-end estimate , of the value of the annual sustainable benefits provided by marine ecosystems.

As such it calls for additional work on data collection and evaluation methods. From now on, some further studies are included in the work program of the Blue Plan.