

Conflict/Synergy Among Different Uses on Land and at Sea Stability

Spanish scale





Analysis of Threats and Enabling Factors for Sustainable Tourism at Pilot Scale

Conflict/Synergy among different uses on land and at sea Stability Spanish scale



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OVERVIEW

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REVIEW

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Abstract

This report aims to identify the main Conflict/Synergy among different uses on land and at sea and land-sea interaction in Blue Growth. It is developed through the review of existing data at European, national and regional scale. The document is structured as follows:

The first part is a brief introduction to land-sea interaction.

The second part describes the Maritime-Terrestrial Public Domain in Spain.

The third part describes the methodology and characteristics of Conflict/Synergy among different uses on land and at sea and land-sea interaction parameters selected in this project.

I. Introduction

Coastal zones offer a wide variety of habitats and ecosystem services that are important to humans and have drawn them to the regions. In addition to being attractive areas for settlement and tourism, coastal zones serve as important business and transit hubs.

Intensive population growth and excessive exploitation of natural resources, however, place enormous pressure on our coastal ecosystems, causing biodiversity loss, habitat destruction, pollution, and conflicts between potential uses (European Commission, 2013).

Since the well-being of populations and the economic viability of many businesses in coastal zones are directly related to the environmental status of these areas, it is essential to use long-term management tools, such as integrated coastal management, to enhance the protection of coastal resources while increasing the efficiency of their use. Sectoral approaches result in disconnected decisions that can undermine each other, lead to inefficient resource use, and miss opportunities for more sustainable coastal development (European Commission, 2013).

Integrated coastal management aims for the coordinated application of the different policies affecting the coastal zone and related to activities such as nature protection, aquaculture, fisheries, agriculture, industry, offshore wind energy, shipping, tourism, development of infrastructure and mitigation and adaptation to climate change. It will contribute to sustainable development of coastal zones by the application of an approach that respects the limits of natural resources and ecosystems, the so-called 'ecosystem-based approach'.

In order to further promote sustainable development of coastal zones, the Commission adopted on the 12th of March 2013 a draft proposal for a Directive establishing a framework for Maritime Spatial Planning and integrated coastal management (European Commission, 2013).

The application of maritime spatial planning will improve the planning and management of sea-land interfaces, such as the connection of offshore wind energy installations to the electricity grid on land or the effects of infrastructure works to protect coastlines against erosion or flooding on activities in coastal waters, such as aquaculture or the protection of marine ecosystems.

The coastal zone is used extensively and increasingly for a large number of activities. These multiple uses are not always compatible and may result in a wide array of problems for resource users and decision-makers (Clark, 1992).

Coastal land is used for human settlement, agriculture, trade, industry and amenity. The coastal sea presents problems related to transport, fishing, dumping, mining, etc., stemming from an intensification and diversification of ocean uses. There is

overexploitation of fishery resources, pollution by dumping and an array of conflicts due to the interaction among user groups in congested marine areas (Clark, 1991).

As the “sink” for the continents, coastal zones receive and concentrate pollutants and other negative effects of development activities in the hinterlands. Often, rivers have been altered for irrigation purposes, and they carry pollutants from inland agricultural and industrial activities to the coast. General development may result in overexploitation, pollution, or alteration of natural systems, as well as conflicts between users of limited, but highly prized, coastal and shoreline space, so its impacts must be understood and countered.

The main uses of coastal zone are (Clark, 1992):

- **Urban Settlement:** the shoreline is in increasingly high demand for human settlements, agriculture, trade, industry, amenity and marine transport activities such as shipping, fishing boats and recreational marinas.
- **Industrial Development:** Coastal locations for heavy industry may engender a wide variety of environmental problems with impacts that extend considerably beyond the plant sites.
- **Waste disposal:** Harbours of large coastal cities and industrial ports give organic wastes (e.g., sewage) and toxic industrial wastes.
- **Shore Protection Works:** when shoreline development begins, these habitats are often the first to be obliterated - by seawalls, groynes, bulkheads, and gabions.
- **Ports and Marine Transportation:** Port development and coastal support facilities are required by several types of activities such as offshore oil and gas development, container storage, fisheries and military operations.
- **Land Transportation Infrastructure:** Roadways, bridges, airports, and other transportation infrastructure create special problems along the coast.
- **Water Control and Supply Projects:** Quantity and seasonal cycles of water flowing to the sea should be maintained because they are very important for sustaining coastal ecosystems.
- **Sea Fisheries:** fishing industries exploit marine and environmental resources.
- **Aquaculture:** marine species aquaculture spreads across the boundary between land and sea where it uses either the land (bivalve ponds) or the sea (fish cages or artificial reefs).
- **Coastal Agriculture:** conversion of natural coastal lowlands to agriculture which have potentially harmful side effects on coastal ecosystems as the release of agricultural chemicals and nutrients.

- **Extractive industries:** mining has been an important industry in many countries. The effects of oil spills in the oceanic environment are more visible, but perhaps less serious in the long run, than discharges of nutrients and toxic chemicals, except for big spills in semi-enclosed seas.
- **Tourism:** Environmental deterioration threatens the tourism industry in many regions. For tourism, the environment is itself a significant part of the product which a country has to offer.
- **National Security:** Naval ports and harbours, coastal airfields, and special bases of all kinds are cited in the coastal zone, usually with a high priority and intense security.
- **Lagoons and Estuaries:** Fisheries, shipping, commerce, industry, tourism, housing, and institutions all crowd along their shores and, if this growth is not managed, the result can be rapid and severe degradation of the lagoon ecosystems and loss of natural resources.

In addition to natural processes across the land-sea interface, LSIs involve the interrelationships between human activities in this zone. Many of the issues of concern for ocean governance are closely related to LSI (Kidd, 2018). This author presents a general framework for considering LSI that has been developed to inform the emerging MSP arrangements in the European Union. The framework illustrates the range of options for institutional and legislative arrangements to address LSI and the variety of scales of governance that are available to address interactions between the land and sea (Kidd, 2018).

II. The Marine-Terrestrial public domain in Spain

Maritime-terrestrial public domain includes coastal waters and transitional waters. Hydrographic Demarcation refers to the boundary between an area of terrestrial and marine waters that is composed of one or more hydrographic basins and the transitional, underground, and coastal waters associated with them (Article 16 of the Consolidated Water Law Text; Directive 2000/60/EC).

The Maritime Terrestrial Public Domain (DPMT) is the only category of property in the Spanish state public domain directly individualised by the 1978 Constitution itself, without leaving it in the hands of the ordinary legislator (BOE-A-1978-31229). The Ministry of Ecological Transition and Demographic Challenge offers a web page where information regarding the Coastal Law can be consulted ([Ministerio para la Transición Ecológica y el Reto Demográfico](#)).

According to the Constitution, the maritime-terrestrial zone, the beaches, the inland waters, the territorial sea, as well as the natural resources of the economic zone and the continental shelf are the property of the DPMT, and the Coastal Law specifies these concepts. DPMT owns such valuable and desired goods as beaches, dunes, escarpments, berms, cliffs, marshes, coastal wetlands, etc., both for their protection and enjoyment by the people.

The right to enjoy these DPMT assets must be guaranteed, of course, with appropriate uses, which do not compromise their physical integrity or imply that others cannot also enjoy them. Coastal Law is based on this idea, and all the administrative powers it collects and all the procedures and resolutions it regulates are at its service. As part of the Coastal Law, the Ministry of Ecological Transition also carries out the demarcation plan, processing and approving the files that define the maritime-terrestrial public domain. Coastal Law has been modified by Law 2/2013 on the protection and sustainable use of the coastline (BOE-A-2013-5670).

III. Coastal management in Spain

Coastal waters and marine resources are economically important if the environment is able to withstand new pressures or to guarantee current ones in a sustainable manner. This determines the availability of environmental services that, unlike other economic sectors, are not associated with the modification of nature but with its good state of conservation (European Green Deal, European Commission).

Therefore, ecosystems' ability to provide the environmental services associated with a good state of conservation is inversely proportional to the pressures they receive as a result of economic activities.

With a coastline of nearly 10,000 km, Spain is a maritime country par excellence, which, together with other factors that make our country unique from a coastal perspective, such as its strategic location, its peculiar and unique oceanographic characteristics, the beauty of its landscapes, and great biological diversity, have, over time, created an inseparable relationship between the goods and services the sea provides us and our economic and social development.

Traditionally, fishing, maritime transport and national defence can be considered the main activities related to the sea. Fishing dates back to unmemorable times and the tradition and importance of Spanish fisheries and the trade in fish products have formed a sector of great value in the national economy as a whole. The same is true for maritime transport and defence functions. Similar to these uses and activities, there are more and more interests that have a place in such valuable spaces, including aquaculture, extraction of aggregates, use of waves, wind, and tides for energy, scientific research, protection of species, and facilities for capturing and sequestering CO₂. 49 % of the urban populations of the country live in municipalities or urban areas facing the sea. Urban occupation supposes the artificialization of 24% of the coast (De Andrés et al. 2017). In the last five decades, this occupation has led to the degradation of the coastal zone and its ecosystems (Serra et al. 2008).

In general, there are three fundamental aspects that mark the trend in the period 2008-2018 (Barragán et al., 2016; De Andrés et al. 2020):

1. Influence of international guidelines that conduct efforts towards the management and planning of marine space, its uses and activities, that have not yet established excessive connections with the coast;
2. Approval of Law 2/2013 on Conservation and sustainable use of the coastline, which amended the 1988 Coastal Law, which became a benchmark in several Latin American countries. The new law has meant a notable setback for the conservation of coastal and marine ecosystems in the Public Maritime Terrestrial Domain (DPMT), for the integrated management of this space and a commitment only to more economic development of the Spanish coasts;
3. Continuous transfer of competence in the area of planning and management of the coastline from the General State Administration to the Autonomous Communities.

The management of the coastline in Spain has not shown any special progress in recent years if we compare it with its situation in the 2008-2010 periods (Arenas, 2009; Barragán, 2010). A public policy for the management of the coastal zone does not exist in Spain, nor is there any evidence that the authorities intend to formulate one. There is a law that addresses the maritime public domain and its easement zone, but not the integrated management of the entire coastal zone. The competences and the institutions that are responsible for coastal management are distributed among different ministries and councils, mainly in those of the environment (De Andrés et al. 2020).

The strategic and operational instruments for the management of the most important coastal zones in Spain are approved under the orbit of the Autonomous Communities, since from the state level no progress has been detected in terms of formulation of an integrated management strategy or plan.

At the national level, most of the existing instruments are of an operational nature, focused on the planning of engineering works in the public domain. Regarding university training, there is the capacity to train managers in the field of integrated management of coastal and marine areas.

Nevertheless, some public administrations still have shortcomings in the training and updating of managers. While progress has been made in disseminating the information necessary for coastal-marine management and planning, it is still very limited in several coastal autonomous communities. Public participation for coastal management is not sufficiently established in the country, with few viable experiences and mechanisms to develop it (De Andrés et al. 2020).

On a national scale, it is noticeable that the amount of resources allocated to coastal management in Spain has decreased. Specifically, the budget for “Actions on the Coast” has decreased since 2009, when 301 million euros were allocated to this program, while in 2016 and 2017 these budgets have fallen to 92 and 95 million, respectively (Fig. 1) (Ministry of Finance and Public Function, 2018; De Andrés et al. 2020).

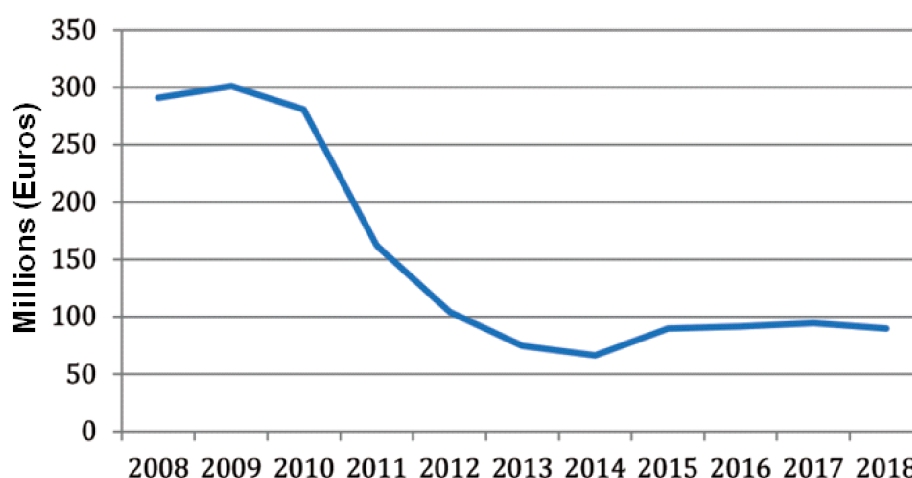


Figure 1. Budget for actions on the coast in the period 2008-2018 (Ministry of Finance and Public Function, 2018; De Andrés et al. 2020)

IV. Selection of parameters in CoEvolve4BG

IV.1. GIS database

Geographic Information Systems (GIS) are computer systems that manage spatial data visually, allowing us to analyse, manage, and interpret geographic information. The methodology of this study consisted of searching and processing shapefile layers, followed by GIS analysis. Shapefile layers have been downloaded from official national statistical platforms (Ministry of Ecological Transition and Demographic Challenge, MITECO, 2021) and from European platforms such as the European Marine Observation and Data Network (EMODnet, 2021).

The Spatial Reference System has the ETRS89 datum with UTM projection in the 30 North zone, with EPSG code: 25830. In addition, they are based on official statistical platforms or rigorous studies, which guarantee the soundness of the information expressed. The GIS results were expressed by NUTS administrative boundaries from the EU (EUROSTAT, 2021).

NUTS classify the economic territory of the EU Member States into territorial units (regions; Fig. 2). The classification is made up of three hierarchical levels: each Member State and the UK are divided into NUTS 1 regions, which in turn are subdivided into NUTS 2 regions and then further divided into NUTS 3 regions. Each of these regions has a unique code and name. In order to distinguish between several different regions within Europe with the same name, an abbreviation for each country has been added.

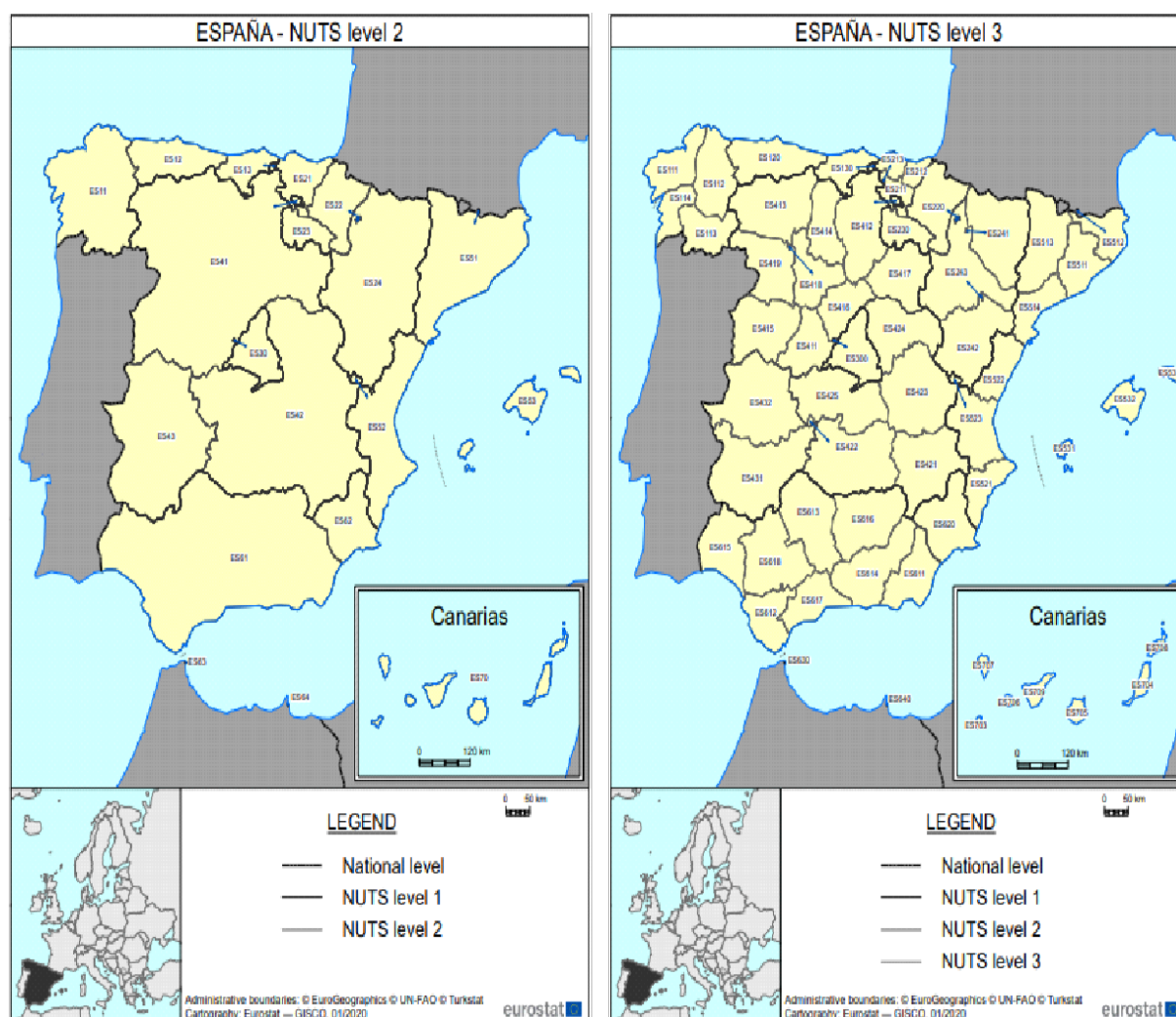


Figure 2. Spain (España): NUTS level 2 and 3 (EUROSTAT, 2021)

IV.2. Data Records

This report includes a csv file with all the information at Nuts 3 level into the repository. The database will be updated and expanded as soon as new and improved data become available. Several publicly available datasets have been used to develop this database, which has been thoroughly documented and described in scientific reports (Table 1). As a result, these datasets have been rigorously tested and validated. For those parameters for which there was no consistent information for the studied area, new datasets were created.

IV.3. Conflict/Synergy among different uses on land and at sea and land-sea interaction in Blue Growth

A Co-Evolve4BG's working group at the Mediterranean level, composed of experts and other stakeholders, has selected these parameters of "Conflict/Synergy among different use forms on land and at sea in the context of Blue Growth" to be analyzed at the National and Mediterranean levels (Table 1). In the supplementary material is located the excel table with the values of the parameters selected at the level of Spain.

Table 1. Selected parameters of "Conflict/Synergy among different uses on land and at sea and land-sea interaction in Blue Growth"

Parameters	Variable	Description	Source
Area allocated to aquaculture during 2009	ha	Area of occupation of aquaculture during 2009	Ministerio de Agricultura, Pesca y Alimentación: https://servicio.pesca.mapama.es/acuivisor/
Area allocated to aquaculture during 2019	ha	Area of occupation of aquaculture during 2019	Ministerio de Agricultura, Pesca y Alimentación: https://servicio.pesca.mapama.es/acuivisor/
Growth of aquaculture areas	%	It identifies the increase/decrease of the area allocated to aquaculture for the last 10 years	Own data
Presence of conflicts between Tourism and Aquaculture	Yes/No	It indicates the presence of conflicts between Tourism and Aquaculture activities in the coastal regions	Own data
Level of conflict between Tourism and Aquaculture	High, Medium, Low	It indicates the level of conflict between Touristic activities and Aquaculture in the coastal regions.	Own data
Area allocated to Industrial Zones in 2009	ha	Area of occupation of Industrial Zones during 2009	Own data
Area allocated to Industrial Zones in 2019	ha	Area of occupation of Industrial Zones during 2019	Own data
Growth of Industrial Zone	%	It identifies the increase/decrease of the area allocated to Industrial Zones for the last 10 years.	Own data

Presence of conflicts between Tourism and Industry	Yes/No	It indicates the presence of conflicts between Tourism and Industrial activities in the coastal regions.	Own data
Level of conflict between Tourism and Industry	High, Medium, Low	It indicates the level of conflict between Touristic activities and Industry in the coastal regions.	Own data
Area allocated to Agriculture in 2009	ha	Area of occupation of Agriculture during 2009	Instituto Nacional de Estadística (INE): https://www.ine.es/jaxi/Datos.htm?path=/t01/p042/a2009/prov17/I0/&file=0101.px
Area allocated to Agriculture in 2019	ha	Area of occupation of Agriculture during 2019	Instituto Nacional de Estadística (INE): https://www.ine.es/jaxi/Datos.htm?path=/t01/p042/a2009/prov17/I0/&file=0101.px
Growth of Agriculture	%	It identifies the increase/decrease of the area allocated to Agriculture for the last 10 years.	Own data
Presence of conflicts between Tourism and Agriculture	Yes/No	It indicates the presence of conflicts between Tourism and Agricultural activities in the coastal regions.	Own data
Level of conflict between Tourism and Agriculture	High, Medium, Low	It indicates the level of conflict between Touristic activities and Agriculture in the coastal regions.	Own data
Area allocated to Touristic Zones in 2009	ha	Area of occupation of Touristic Zones during 2009	Golf in Spain: https://www.golfinspain.com/esp/mapa-golf/ Own data
Area allocated to Touristic Zones in 2019	ha	Area of occupation of Touristic Zones during 2019	Golf in Spain: https://www.golfinspain.com/esp/mapa-golf/ Own data
Growth of Touristic Zones	%	It identifies the increase/decrease of the area allocated to Touristic Zones for the last 10 years.	Own data

V. Conclusions

The main conclusions of this work are:

- The Maritime Terrestrial Public Domain (DPMT) is the only category of property in the Spanish state public domain directly individualized by the 1978 Constitution itself (BOE-A-1978-31229).
- Since 2010, Spain has made very little progress in integrating management of its coastal areas, although some progress has been noted in some Autonomous Communities.
- Coastal Law is primarily concerned with the terrestrial maritime public domain and its easement zone, but it does not include management of the entire coastal zone. Diverse ministries and councils have the competence and responsibility for coastal management, mainly those of the environment.
- On a national scale, the decline in investments in coastal management in Spain over the last decade is noticeable.

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