

## Integration of Coastal Changes trends in Coastal Management Plans: the short and medium term perspective of the spatial planning process

Fátima Lopes Alves <sup>(a)</sup>, Lisa Sousa <sup>(a)</sup>, Luís Carvalho <sup>(b)</sup>, Sérgio Barroso <sup>(b)</sup>, Margarida Pereira <sup>(c)</sup>

(a) CESAM & Department of Environment and Planning  
[malves@ua.pt](mailto:malves@ua.pt) / [lisa@ua.pt](mailto:lisa@ua.pt)

(b) CEDRU - Centro de Estudos e Desenvolvimento Regional e Urbano, Ld  
[luis.carvalho@cedru.com](mailto:luis.carvalho@cedru.com) /  
[sergio.barroso@cedru.com](mailto:sergio.barroso@cedru.com)

(c) FCSH - Universidade Nova de Lisboa  
[emapp@fcsb.unl.pt](mailto:emapp@fcsb.unl.pt)

### ABSTRACT

Spatial planning can be seen as an interdisciplinary science that ensure to the sustainable development and land use, since integrates policy, social, cultural, economic and environmental management. Marine and coastal spatial planning is particularly challenging due to their vulnerable and dynamic nature and to the problems of sea level rising, erosion processes and land-use pressures in the coastal zone. Based on these challenges spatial planning processes in the coastal areas should address the potential impacts of climate change on coastal ecosystem, settlements and development, and develop policies/measures to minimize these impacts.

Coastal erosion, flooding and shoreline retreat are serious problems along the coast of Portuguese mainland. Past human impacts, inappropriate management interventions, climate variability and coastal dynamic have been identified as major contributory factors.

The study developed for the Portuguese central region (stretch Ovar - Marinha Grande) is integrated in the Coastal Management Plan and uses an innovative approach on coastal zone spatial planning. In order to address the problems regarding climate change, and considering the dynamic and complex nature of coastal environments, alternative planning policies were developed. The study also revealed the need of incorporate in spatial planning the socio-economic analysis and the identification and valuation of ecosystems services and land use, in order to ensure the sustainable development, but also to support de decision-makers.

According to this approaches the Coastal Plan was developed considering three environmental scenarios to respond to the coastal erosion trends, based on a development model for the coastal region. In addition, the scenarios consider the public investments constraints (national budget) expected to the next decade and the short and medium term of the Plan.

**KEY WORDS:** *Coastal Management, governance, spatial planning, Portugal.*