

LAND ACQUISITION AS A TOOL FOR EROSION, SEA-LEVEL RISE AND CLIMATE CHANGE PROBLEMS: EBRO DELTA CASE STUDY

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1. Introduction

Several problems can be identified on coastal zone areas, as erosion, sea level rise, and climate change. The scientific method use to be useful analyzing causes and effects, as 'forcings' and responses. Different tools are needed in order to guarantee beach functionality: energy dissipation energy as a protective action; free space useful for everybody, focused on recreational and leisure aspects; and ecosystem of flora and fauna.

Nowadays different alternatives have been developed based on protection, adaptation, and retreat strategies. In fact beach protection has been reached applying hard structures or beach nourishment works. A lot of literature has been written about it. All these previous projects have been based on protection and adaptation strategies, based on dissipation energy mechanism and leisure aspects. Sometimes environmental aspects have been avoided.

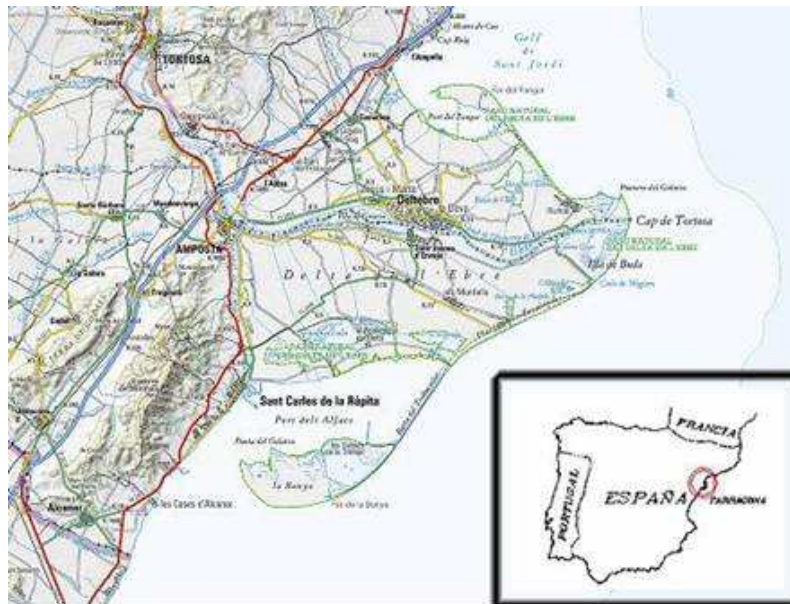


Figure 1. Site and location maps

New actions need to be proposed in order to guarantee protection, leisure, and environment. Retreat strategies are necessary for these purposes. In order to reach these objectives new policies are required. Land acquisition is a good tool for these purposes in retreat strategies that can be useful for preventing and solving erosion, sea level rise, and climate change problems. Land acquisition is needed for developing protection and sustained projects land ward. These projects are based on beach-dune-wetland-rigid dune scheme.

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2. Ebro Delta Case Study

In Spain this strategy is planned to be implemented in Ebro delta, see Figure 1. Ebro delta is located in north-east part of Spain in the Mediterranean Sea. It is a 325 km² plain delta with erosion and flooding problems that are increasing as a result of sea level rise and climate change phenomena. A pilot project is carrying out taking account retreat strategy. Land acquisition is necessary for this purpose, in Figure 2 a land acquisition practice is considered for retreat projects.

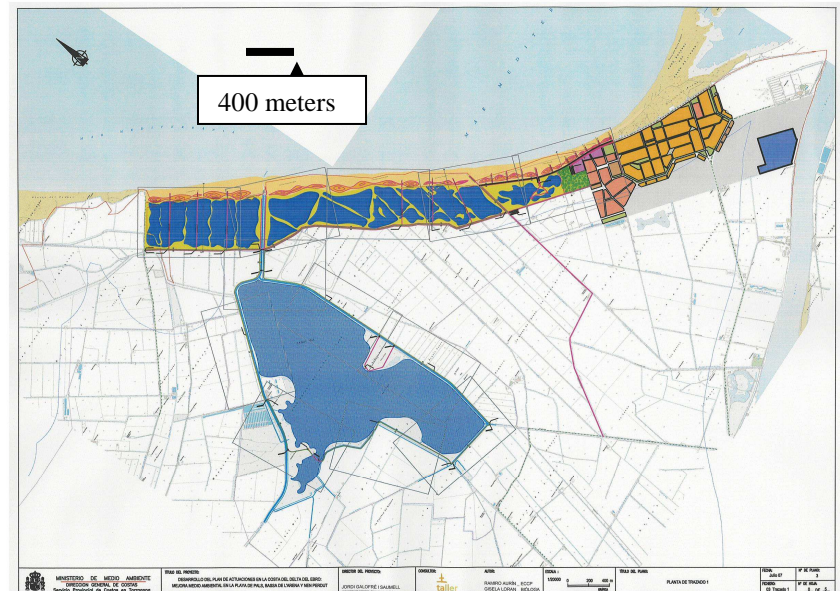


Figure 2. Land acquisition strategy and pilot project

The base of this project is the acquisition of 500 meters of strip from shoreline landward in order to reach a schematic equilibrium system consisting on beach-dune-wetland-rigid dune, see Figure 3.

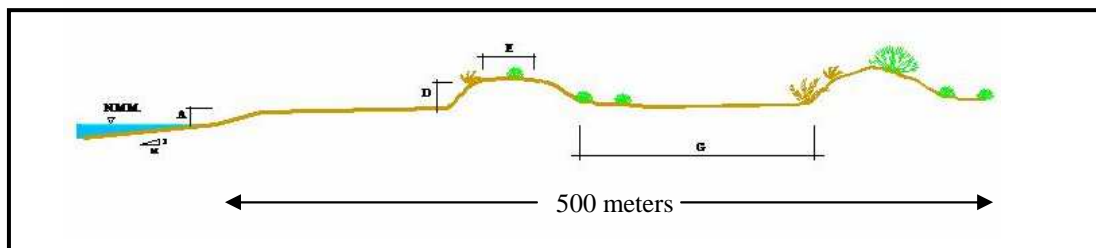


Figure 3. Beach-dune-wetland-rigid dune scheme

In this paper the analysis of land acquisition as a tool of integrated coastal zone management will be developed, using Ebro delta case study, for prevention and mitigation of erosion, sea-level rise, and climate change problems and effects. The case study will be developed in the 500 meters landward, along more than 4.0 km., that will be obtained by acquisition processes in order to incorporate all this land to the public domain.