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The sociological perspective in coastal management and geoengineering approach: effects of hydraulic structures on the resilience of fishing communities (NW Portugal)

Fernando Rocha (1), Ana Pires (2), and Helder Chamine (2)

(1) Geobiotec, University of Aveiro, Geosciences Department, Aveiro, Portugal (tavares.rocha@ua.pt), (2) Geobiotec, Laboratory of Cartography and Applied Geology, School of Engineering (ISEP), Porto, Portugal

The coast plays an important role in global transportation and is the most popular tourist destination around the world. During the years coastal scientists "walking on the shore", have tried to understand the shoreline in relation to the processes that shape it, and its interrelationships with the contiguous superficial marine and terrestrial hinterland environments. Those factors encourage the need for Integrated Coastal Zone Management (ICZM), because of its possible use in identifying coastal management issues to take into account in policy strategies, measures and planning. Therefore this research presents an integrated strategy and a holistic approach to researching and studying coastal areas involving a wide number of sciences including sociology. Because of the numerous types of hazards in coastal areas the only possible response involves a holistic, integrated and long term approach. Combining marine sociological research, resilience and flexibility of a particular coastal community with other scientific fields will help to understand and manage marine social problems.
This study also shows an integrative and "eclectic" methodology and adapts it to coastal management. Hence a new integrated coastal geoengineering approach for maritime environments was proposed, which is the core foundation of this approach. Also it was important to incorporate in a broader sense coastal geosciences and geoengineering GIS mapping to this final equation resulting in conceptual models.
In Portugal there are several areas buffeted by sea invasions, coastal erosion and severe storms. The Portuguese coastal zone is one of Europe's most vulnerable regarding coastal erosion. The case study presented herein is an example of one of the most vulnerable sites in Portugal in terms of coastal erosion and sea invasions and how the meeting of local fishing community and coastal projects are extremely important. The coastal stretch between Figueira da Foz and Espinho (Centre and NW Portugal) case shows the link between governance – stakeholders – contractors – researchers – local community as a necessary management strategy and more, such as the holistic synergy. It defined a "social mesh" embracing a platform or a project which comprises different vectors and combines social aspects, economic factors, culture and heritage with activities, upgrading the traditions in fishing communities, to somehow forget and accept the sea invasions and the hard solutions like coastal protection structures (e.g. groynes, seawalls) as well as the reinforcement and requalification of the urban areas and the improvement in the seashore area. In the course of this project and during this period, the community worked as a live laboratory and as an experimental field. The study takes advantage of GIS tools to contribute to the understanding of the geomorphological dynamics of Espinho (NW Portugal) presented here as one of the examples (already addressed by the authors in several publications and works).
This type of framework can be adapted and applied in other geographical settings and other coastal environments to develop innovative sustainability paths and help to solve coastal issues.