



# Cooperation and the emergence of maritime clusters in the Atlantic: Analysis and implications of innovation and human capital for blue growth



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## ARTICLE INFO

### Article history:

Received 25 October 2014

Received in revised form

6 March 2015

Accepted 24 March 2015

### Keywords:

Absorptive capacity

Innovation

Human capital

LOGIT

Maritime cluster

Proximity

Social capital

## ABSTRACT

The so-called 'blue economy' is gaining emphasis in European policy making due to the expansion of its relevance beyond traditional economic sectors but also to new and developing ones that exhibit rapid growth. Much of the discourse has focused on the emergence and consolidation of maritime clusters. However, there has been less attention on the regional development aspect and this article provides a timely contribution to filling the gap in knowledge by presenting the findings and analysis of a survey applied to blue economy organisations in Portugal, Spain, Ireland and Scotland. Specifically, issues of innovation, human capital and social capital provide the basis of inquiry around the creation and consolidation of maritime clusters. The article uses the survey data to understand the determinants of the variety of cooperation dynamics. A key finding reveals that participation in innovation activities and absorptive capacity are critical factors in increasing cooperation. From the analysis it is clear that there are significant discrepancies in participation between sectors, such as tourism where participation rates are below average. The article concludes by defining the core activities that should feature in a maritime cluster.

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## 1. Introduction

The blue economy has an important contribution to make for the overall competitiveness of the European Union (EU) with sectors related to the exploitation of the sea representing between 3% and 5% of the EU regions' gross domestic product (Table 1). Maritime and marine activities feature prominently in many regional economies, and especially those with coastlines. Further, these activities contribute significantly to the creation of the Atlantic Area identity, not only from a socio-cultural and economic perspective, but also in its land and urban shaping beyond the size of their economic output. In the modern ecology, it is evident that several branches of the blue economy are facing considerable challenges in effecting increasing competitiveness, such as fisheries [20], whereas others, such as offshore renewable energy, offer opportunities for economic growth and employment [21].

At EU level, DG Mare ranks blue economy activities by current size, recent growth and future potential [19]. The top activities in

relation to size comprised coastal tourism, deep sea shipping, short sea shipping, offshore oil and gas, yachting and marinas, passenger ferry services, and fisheries for human consumption. And in terms of growth, the rank order is offshore wind, cruise tourism, securing fresh water supply, short sea shipping, yachting and marinas, marine aquatic products, and protection against flooding and erosion. The activities with high potential for the future are identified as being blue biotechnology, offshore wind, protecting against flooding and erosion, ocean renewable energy, traceability and security of good supply chains, environmental monitoring, and marine minerals mining (Table 2).

In the Atlantic Area with peripheral coastal areas, some of these activities, such as biotechnology and ocean renewable energy, remain in the development stage of the industry lifecycle. While the creation of new activities in these value-chains is of strategic relevance, there is a critical need for the revitalization of existing sectors, such as fisheries, seafood and tourism. Both revitalisation and new economic activities are clearly linked to the implementation of innovation through development of new products, processes and markets.

Policy has played an important role in this process of development such as the introduction of the Atlantic Action Plan in May 2013 by the European Commission with the overarching objective of generating blue economy growth, fostering employment and stimulating growth

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**Table 1**  
Weight of maritime economy in Atlantic area countries.  
Source: Adapted from Surís-Regueiro et al. ([58]: 116).

Country, zone	(%) of GDP	Author and year of publication
United Kingdom	4.2	Pugh [52]
France	1.5	Kalaydjian et al. [29]
Ireland	0.8	Morrissey and O'Donoghue [37]
Spain	2.9	Innovamar [28]
Portugal	2.4	Simões [57]
European Union	4.0	European Commission DG MARE [19]

in the coastal areas. This lends impetus to the development of emerging maritime sectors such as ocean energy, marine biotech and the exploration and exploitation of deep sea natural resources whilst simultaneously revitalising traditional industries such as aquaculture and coastal tourism. The Action Plan has four overarching priorities including the promotion of entrepreneurship and innovation; the protection, security and enhancement of the marine and coastal environments; the improvement to accessibility and connectivity; and the creation of a socially inclusive and sustainable model for regional development. The Action Plan does not have a dedicated EU funding instrument for its implementation, but rather relies on existing funding instruments defined by member-states in their partnership agreements.

This article reports on the findings of a survey carried out as part of the EU funded HARVEST Atlantic Area project that investigates regional and economic development in the Atlantic coastal area. The analysis provides a valuable contribution to current knowledge and the debate surrounding the role of the blue economy in the regional development of those areas. The work begins by clarifying the concept of maritime clusters within the broad context of socioeconomic structures and the environmental dynamics of the coastal areas. Maritime clusters exhibit varying degrees of complexity depending on such aspects as competition in the markets and the cooperative behaviour between a variety of companies, suppliers, customers, knowledge producers and decision-makers within the blue economy. The results derived from a survey designed and implemented for the HARVEST project are presented and form the basis for analysis and insights around issues of innovation and human capital in the blue economy. The data collected in this survey is explored to create an econometric model to verify the cooperation variety determinants of the blue economy's stakeholders. As part of the conclusions the article provides comment on the policy implications of the findings.

## 2. Blue economy and the emergence of maritime clusters

### 2.1. Clusters as a policy artefact

The notion of clusters in an industrial setting has received significant attention in the academic literature due to the important

role that clustering dynamics play in the successful implementation of development strategies. In fact, the 'industrial cluster' concept has a long history and is a key feature of the classical school of economics, most notably in the writing of Marshall who refers to concentration of specialised industries in particular localities in his work 'Principles of Economics' [34]. The profile of clusters was enhanced by the contributions of Porter [49–51] who viewed clusters as geographically proximate groups of interconnected companies, suppliers, service providers and associated institutions. The emergence of clusters is based on the fact that actors are located in a geographical context and are strongly influenced by externalities, mainly positive, that affect productivity. These positive externalities emerge through knowledge and workforce agglomerations that connect industries, technologies, skills, and purchased inputs.

The cluster concept takes on different meanings depending on the sectors in which it is being examined and varies according to a spectrum that can range from geographical perspectives to socio-cultural factors or even territorial dimensions. Porter [49] understands a cluster as a manifestation of the economy in which proximity amplifies all the existing constraints to innovation and the increase of economic performance. According to Monteiro et al. [36], fundamental characteristics in the understanding of clusters include geographic concentration; specialization (focus in an activity in which all agents are related); multiplicity of actors (companies, universities, R&D centres, public authorities and other related institutions); competition and cooperation (characteristics of the relationship between the different actors of the cluster); critical mass (to generate internal dynamics) and innovation (cluster organizations should be involved in processes of technological, commercial and organizational change). There are also different ways in which clusters can be organised. Three types of clusters are the 'hub-and-spoke' industrial district; the 'satellite industrial platform'; and the 'state-anchored' industrial district presented in Table 3 [33]. Each specific region combines elements from these types of organised clusters.

Chorincas et al. [7] present another typology of the four ideal-types based on size. This includes micro clusters, industrial clusters, regional clusters and mega clusters. A micro cluster, or local cluster, is represented by the number of companies and geographically close institutions operating in an identified field of activity that are connected by common and complementary aspects. An industrial cluster acts as a set of interconnected companies and associated institutions which operate in different fields and use different but complementary technologies. In this type of cluster the innovation generated by each agent generates benefits others, thereby ensuring that all members benefit from increased competitiveness. A regional cluster works in the same way that the industrial cluster does except that it does so within defined regional boundaries. In this case the geographical proximity has a crucial role in the dynamics of interaction between the actors that are usually led by regional governance bodies. This

**Table 2**  
Top-7 sub-functions ranking in order of size/growth/scores in Maritime Activities at EU level.  
Source: European Commission, DG MARE (2012).

Top-7 current size	Top-7 recent growth	Top-7 future potential
Coastal tourism	Offshore wind	Blue biotechnology
Deepsea shipping	Cruise tourism	Offshore wind
Shortsea shipping (incl. RoRo)	Securing freshwater supply (desalination)	Protection against flooding and erosion
Offshore oil and gas	Shortsea shipping and deepsea shipping	Ocean renewable energy (wave, tidal, OTEC, thermal, biofuels, etc.)
Yachting and marinas	Yachting and marinas	Traceability and security of goods supply chains
Passenger ferry services	Marine aquatic products	Environmental monitoring
Catching fish for human consumption	Protection against flooding and erosion	Marine minerals mining

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