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General Insights of the Portuguese Maritime Economy and Particularly of the Algarve Region: Contributing Towards a Strategic Vision

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ABSTRACT

The purpose of the current paper is to provide a critical characterization and evaluation of the current situation concerning the more relevant maritime sectors in Portugal and particularly in the Algarve region. It aims to contribute to a necessary and urgent debate on relation to the absolute need for a new strategic vision for Portugal and for the Algarve, based on a new set of distinctive factors capable of levering the competitiveness of the economy. In face of this crucial challenge, a cluster approach for the economy of the sea is defended in this article. To take full advantage of the immense natural resources offered by the enormous Portuguese EEZ requires a coordinated and integrated effort through interactive and mutually interdependent processes of coopetition, involving private and public actors, companies and their clients and suppliers, I&D institutions, sectoral organizations, and other relevant stakeholders. The creation of a dynamic and virtuous Diamond for the maritime economy begins by understanding what are the main characteristics and distinctive factors that can substantiate the proposal of a differentiation framework for a national and/or regional maritime cluster.

1. Introduction

Justifying the importance of the sea for the Portuguese economy is (almost) redundant: reasons of geographical, historical, geostrategic, economic and social nature are at the core of that assumption. Portuguese connection to the sea has gained prominence during the Age of Discovery, which decisively marked the beginning of the globalization process. With about 1.6 million km^2, the Exclusive Economic Zone (EEZ) of Portugal is the largest in the EU, representing 3.5% of the North Atlantic surface, and one of the largest in the world. It is also possible that Portuguese jurisdiction might be extended to other maritime zones (it only concerns the seabed and marine subsoil rights and not to any fishing rights), that could more than double the current area of its EEZ. If the extension until the 350 miles, proposed by the Portuguese Government in April 2010, is accepted by the International Commission on the Limits of the Continental Shelf of the United Nations, Portugal could obtain a territorial acquisition of nearly 2,150,000 km^2 (therefore, holding a sea area under its jurisdiction which is more than 40 times its land area, above India's land area and corresponding to more than 80% of the land area of the EU-27), thereby strengthening its ranking position among the world's largest countries on sovereign territory (see Fig. 1). Knowing that the immersed part of the Earth has an area of 361 million km^2, of which 81.6 million km^2 are covered by the Atlantic Ocean, while the submerged part represents 149 million km^2, the future Portuguese continental shelf will match a little more than 1% of the immersed part of the planet, 2.5% of the submerged part and 4.5% of the Atlantic Ocean (Cajarabille, 2010).

The Algarve region, with a coastline of approximately 220km, has always presented with the sea a particular affinity, as a result of its excellent natural conditions, historical reasons, as well as cultural aspects and notorious know-how related with traditional maritime activities: the famous Nautical School of Sagres created by Prince Henry, where the navigation pilots who initiated Portugal's Age of Discoveries received instruction, became the core of the Portuguese maritime expansion during the first

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Figure 1: The extended Portuguese continental shelf.

Source:
http://forumdacasa.com/extensions/InlineImages/image.php?AttachmentID=57128

half of the XV century and the most advanced centre for studies and research worldwide; historically, fisheries and fish processing industry (the tuna capture in the Algarve coast goes back before the Roman occupation) have always been crucial economic activities with a strong tradition; more recently nautical activities, such as tourism and recreational boating, have been gaining increasing importance. However, the strongly specialized development assumed in the Algarve in recent decades has led major regional traditional sectors, such as coastal fishing, canning industry, shipbuilding and naval repair, among others, to a situation of general decline, that is worsening over time (partly as a result of these sectors own inability in adapting to new operating logics of the market), along with a deeply asymmetrical territorial occupation. It not seems to be merely circumstantial the fact that the Algarve is currently the Portuguese region more strongly penalized by the economic crisis that has developed in a more acute way since 2008: in this strongly depressed context, unemployment is undoubtedly the main social scourge affecting Algarve. It's urgent to struggle against this situation, because the same is undermining the cohesion and the fundamentals of its socio-economic structure. This is only feasible by strengthening the regional competitiveness factors through a healthily diversified economy. In this context, the effective use of the underlying opportunities from sea related activities, built over a sustainable and integrated approach, should be regarded as a powerful aid to fulfil these purposes.

2. Methods

The purpose of the current paper is to provide a critical characterization and a state of the art evaluation of the current situation concerning the more relevant maritime sectors in Portugal and particularly in the Algarve region. With the present paper we want to assess the inherent potential and strategic interest associated with the use and exploitation of marine and maritime resources in Portugal and particularly in the Algarve region. To improve the effectiveness of this process, we strongly defend the creation of a formal national and/or regional maritime cluster, involving, as stated by Porter (1998, p.197), *"... geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (for example, universities, standard agencies, and trade associations) in particular fields that compete but also cooperate"*. Around the world in recent decades, awareness has emerged that the management and governance of the ocean, coastal zones and human activities associated with it, should be addressed at an ecosystem approach, of sustainable development, based on a comprehensive view, not sectorial but integrated (EMAM, 2007, p.13). As expressed by SaeR (2009), among the scientific community it's almost unanimous the advantage for the use of a cluster approach, embodied through the concept of the "Hypercluster of the Sea", which encompasses a complex of activities ranging from Tourism and Leisure to Logistics and Maritime Transport, Fisheries and Aquaculture, Naval Construction and Repair, Related and Supporting Services, to Research and Development. This way of approaching the issues from the sea, being systemic, requires a global vision and a holistic and interactive performance in the search for strategic solutions to increase the efficient use and value added generated by the sustainable exploitation of the resources of the sea.

In the next section will be presented some of the most significant facts and statistics of the theoretical framework that contextualizes the baseline for the main premise inherent to this article: that the creation of a dynamic and virtuous Diamond for the maritime economy begins by understanding what are the main characteristics and distinctive factors that can substantiate the proposal of a differentiation framework towards a national and/or regional maritime cluster.

3. An Evolutive Perspective of the Portuguese Maritime Economy

Having three thousand kilometers of coastline on the Northern Atlantic, projected at the crossroads of three continents, being the door to the South Atlantic basin and, simultaneously, having the largest exclusive economic zone on Europe, would be reason enough for Portugal to be a maritime country.
But no! Today and for the last 40 years, Portugal has been a country with an enormous maritime territory, but not a maritime country. Without a long-term maritime strategy, many experts would say that we turned our back to the sea. Results on the panel of the Sea Economy Barometer (PwC Portugal, 2010), show that only 10% of the 20 top managers related with all Portuguese relevant maritime sectors, interviewed there, think that Portugal, being a coastal country, monetizes sufficiently the sea resources. The following examples are considered paradigmatic of that.

In the mid-sixties of the late century, the Portuguese fishing industry reached its pick due to several factors: externally, abundant marine resources and virtually free access, which allowed the development of a long distance water fleet (LDWF) in Northwest and South Atlantic (respectively cod from Terra

Nova and Greenland, and the hake from White Cape and Mauritania): the self-sufficiency rate jumped from only 16% in 1934 to 75% in 1966; from fifth European producer of dried salt cod in 1938, Portugal became the first world producer twenty years later (Garrido, 2001). Nowadays cod catches by the fishing fleet represent slightly more than 1% of the national consumption demands (the Portuguese are world consumer leaders of dried salt cod; cod represents 40% of all Portuguese fish imports).

Aquaculture already accounts for 47% of the world production of fish for human consumption, being the food production system with the highest annual growth rates worldwide. Despite having Europe severe restrictive policies against overfishing and unsustainable fishing practices (for instance in terms of total admissible catches - TACs and fishing quotas, technical measures, etc.), the European aquaculture production stands clearly below its potential (it represented in 2007 only 2.6% in volume and 5.1% in value of the world production, according to CE (2010). The situation in Portugal is even worst: the national aquaculture production merely represents 0.6% of the EU-27 and a residual 0.016% of the world total.

In 1950, Portugal held the 17th largest merchant fleet in the world representing 0.64% of the worldwide load capacity. From the seventies of the last century began a sharp decline that reached its climax in the 80s with the extinction of the last two major companies. More recently, in 2007, according to the data from Lloyd's Register, Portugal had 1.1 million gross tonnage (GRT) registered with the national flag (an insignificant 0.16% of the world capacity).

Despite its excellent geostrategic situation, as Sines is the only deepwater port in the Atlantic coast of the Iberian Peninsula that offers direct services to key markets as is the case of North America (United States, Canada and Mexico), Asia and Eastern Mediterranean, and after decades of fruitless intentions, Sines still hasn't a direct rail link Badajoz-Madrid-Irun for the transport of goods, a powerful handicap, because it would substantially increase its competitiveness by reducing the connection costs and thus allowing the extension of its hinterland. The World Bank publishes an indicator, the Logistic Performance Index (LPI), of enormous importance for the understanding of the factors that determine the competitiveness of supply chains in each country. Germany is the country which, in 2010, achieves the highest LPI: 4.11 points. Portugal ranks the 34th place (3.34 points), with a performance that represents 75% of the German classification, which means there is still much work to do in increasing our competitiveness in this field. One of the problems of low competitiveness of domestic ports lies in the high price of rents collected by the state to port authorities, terminal concessionaires and that lead to inflating the cost of cargo handling, both in exports and imports.

Cyclically, the public discourse focuses onto the sea and on its potential. There were outbursts and some concrete steps. The Lisbon Universal Exposition dedicated to the oceans (1998), the White Paper on Maritime-Port Policy (1999), the creation of the Task Force to prepare a proposal to the UN to double the length of the Portuguese Continental Shelf (2005), followed by the delivery of the application to the UN in 2009, the 2006 (and its latest revision already in 2013) National Maritime Strategy are examples of that.

A possible justification to this erratic behavior may reside in the following historical facts:

- The internal political changes occurred (the 1974 revolution and the traumas associated with the decolonization process associated to the end of the overseas colonies)
- The oil crisis of 1973
- The emergency of new world players or "how the precursors [the Portuguese] of the first globalization miss the entrance in the second one"
- International maritime law changes (the emergency of the EEZ movement following the Montego Bay Convention)
- Portugal entrance in the European Economic Community (in 1986): more restrictive fishing policies (TAC and quotas), along with the opening of markets and the change of the national focus towards the east (the European mainland)

The Portuguese maritime sectors currently employ one hundred thousand persons, generating annually more than 8,000 million Euros. According to Governo de Portugal (2013), it's estimated a total revenue from economic activities linked to the sea around 2.4% of the national GDP and 2.3% of the total employment, which seem clearly insignificant in face of the inherent potential. For example, the proportion of employment generated by the national maritime activities in total employment is about two times less than that recorded in Norway and Greece, not to mention being $\frac{1}{4}$ of what happens in Malta.

As expressed in Table 1, the set of economic activities that constitute the maritime cluster of the Algarve represents approximately 2.7% of the Algarve's GDP.

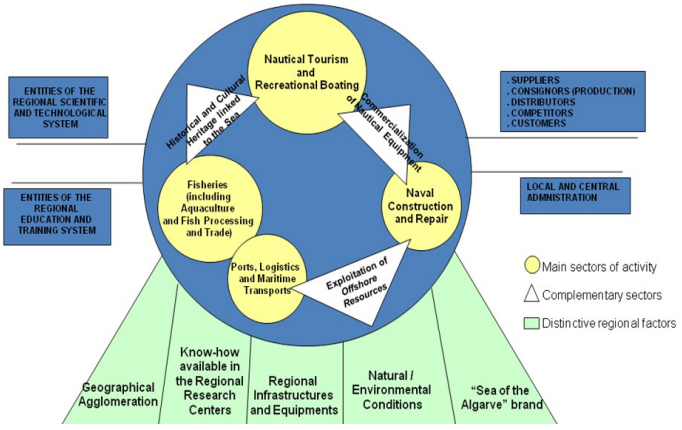
Portugal is one of the few EU member states without an officially organized cluster and only recently laid the foundation in order to create some regional clusters (case of Northern and Central regions). For example Luxembourg, which has no sea, has a maritime cluster... However some significant steps have been done recently: in July 2009, the "Ocean XXI" - Association for the Knowledge and the Economy of the Sea was recognized as a collective efficiency strategy for the use of EU structural funds in the area of maritime clusters. The Ocean XXI adds about 50 partners, involving companies, trade and professional associations, universities and I&D centres, and other organizations, and plans to invest till 2013 about €120 million in seven investment projects related to sea activities. Already in April 2010 was officially launched the "Business Forum for the Economy of the Sea", an association of companies created under the study *Economic Hypercluster of the Sea* prepared by the Portuguese consultant firm SaeR. In just one year, the Forum gathered 78 members from private and public sectors. Its short-term objective is to constitute an investment fund of 100 million Euros to finance projects related to the maritime economy, focusing initially on priority investment projects related to fish production in aquaculture, marine tourism (in partnership with various municipalities) and military shipbuilding.

Table 1: Economic importance of the maritime cluster of the Algarve region (revenue values and % GDP)

Algarve	**Value(Euros)**	**% GDP**
GDP (2009)	7,241,150,000	
Maritime economic sectors		
Fisheries, corresponding to landings of fish, live, fresh or chilled, in regional ports and includes finfishes, crustaceans and molluscs	52,632,000	
Aquaculture	21,335,000	
Fish processing industry	4,385,000	
Nautical tourism and recreational boating (only includes practitioner's accommodation, moorings and other services such as repairs in yards located in marinas and recreational ports, surf and recreational diving)	99,500,000	
Commercial ports	5,000,000	
Naval construction and repair	9,500,000	
Marine Works	4,500,000	
Total	196,852,000	2.72

Source: authors

Figure 2: The maritime cluster of the Algarve region.



Source:Monteiro (2012)
Note: The size of the symbols representing the sectors (main and complementary) is proportional to their relevance in terms of cluster

Meanwhile, in July 2011, was formally established the "Algarve Sea Platform" - Association for the Streamlining of Knowledge and Economy of the Sea in the Algarve, which has as founding members five reference regional companies related to fisheries, tourism and shipbuilding, besides the University of the Algarve and the municipalities of Faro, Olhão and Portimão. In parallel, is being finalized the process for the accession of the Algarve Sea Platform to the Ocean XXI cluster association.

An architectural model for the case of the maritime cluster of the Algarve region is proposed in Figure 2.

The Portuguese economy of the sea possesses some positive distinctive factors related to its excellent natural and geostrategic conditions:

- The prime location, at the junction of some of the most important international shipping routes, opens up numerous possibilities for its constitution as a major hub, not only in terms of maritime and nautical tourism (cruise and yachting), but also for the commercial ports (such as platforms for transshipment) and leisure (marinas and similar infrastructure).

- The Portuguese per capita consumption of fish, valued at 55.6 kg / capita / year (FAO apud CE, 2010), is more than twice the EU average and the third worldwide, just behind Japan and Iceland.

- Existence of fish resources (although, because the continental shelf sinks rapidly, the commercial stocks aren't very productive) and the potential associated with offshore aquaculture (especially shellfish such as oysters, mussels and scallops).

- Recent bioprospecting studies indicate that over 95% of marine species live near the seafloor, thus resulting immeasurable the opportunities opening to Portugal for example in the areas of biotechnology and biopharmacology.

- High potential for sea energy sources, either renewable or fossil (strong evidences of the existence of natural gas, namely in the Algarve's deep-offshore basin - the Spanish company Repsol has just concluded 3D/4D seismic studies), but also for future energy sources (e.g. methane hydrates buried in the sediments of the ocean floor).

- Recent prospecting studies identified marine mineral deposits that open prospects for the exploitation of metals like gold, silver, zinc, cobalt, nickel, copper and special high-tech metals like lithium, neodymium and gallium (required to the manufacture of key components for wind turbines, solar cells, batteries for hybrid vehicles, etc.). The commercial exploitation of those deposits, as technology evolves and market prices increase, has gone from

fiction to reality, as demonstrated by the Canadian company Nautilus Minerals, which began the commercial exploitation of a utility area on the seabed of Papua New Guinea.

- National I&D opportunities: biotech services, development of submarine devices for resource monitoring and mining.

- Nautical tourism besides generating a significant number of synergies with coastal tourism (e.g. sun & beach, catering and hotel accommodation, etc..), leverages a broad range of complementary activities, which encompass areas such as port management, construction and naval repair, sale and rental of recreational boats and other equipment, creation and promotion of nautical sports events, among others.

- The widening works (in progress and projected to finish in 2014) of the Panama Canal, which will allow the passage of container carriers up to 13,000 TEUs, will attend the resurgence of the once so important "Round-the-World services". In this context, the port of Sines has excellent conditions to enhance its strategic role in the international supply chains, because it's the first European deep waters port on the route of the giant vessels coming from China and crossing the Panama channel. This will give it significant advantages in the progressive extension of its hinterland into the interior of the Iberian Peninsula or functioning as a transhipment hub for the Mediterranean, North and South Africa, with very favorable conditions for the development of Short Sea Shipping.

- Portugal has the largest (so far) surfed wave in the world, an achievement done by the surfer Garret McNamara in Nazareth's North Canyon, with the right to be referenced in the Guinness, and Ericeira was classified as World Surfing Reserve - the first in Europe and second in the world, rivaling with Malibu - by the international association Save the Waves. A study prepared in 2009 by 2 researchers from the Portuguese Higher Technical Institute states this activity could yield three thousand million euros per year in total revenues, provided it is managed properly.

- Innovative equipments being tested for the production of offshore renewable energy (e.g. the Windfloat prototype installed by the Portuguese company EDP at Aguçadoura since 2011, with 2 MW of capacity; the Waverroler prototype installed by the Finnish company AW-Energy at Peniche's nearshore since 2012 to harness wave energy).

3.1. Algarve

- This is the only region of Portugal that has higher percentage of immersed area than onshore. According to Lopes and Cunha (2010), the immersed sector (offshore) of the Algarve Margin occupies about 2,500 km^2 until the 200m isobath, while the area between the isobaths of 200m and 1,000m comprehends about 6,000 km^2.

- There is no city, town or village of the Algarve coast that has not had originated in fishing or related activities. Portimão, Faro and Vila Real St^o António are typical cases of cities of the Algarve where today there is still a significant impact of fishing activities on its social dynamics.

- Fisheries and fish processing industry (the tuna capture in the Algarve coast goes back before the Roman occupation) have always been crucial economic activities with a strong tradition (at the beginning of the 20th century, there were until 17 bluefin tuna traps released throughout Algarve's nearshore; the first factory built in Portugal for the conservation of fish, essentially tuna, was the "Casa Parodi", based in Vila Real de Santo António and inaugurated in 1879, and in the first half of the past 60 decade there were sixty active factories across the Algarve).

- Due to the excellent natural conditions for oyster production in the Algarve, either in the lagoon systems (Ria Formosa and Ria de Alvor) and offshore (e.g. fattening juveniles held off Sagres, 2 miles away from the coast), the Algarve oysters have a excellent quality and reach commercial maturity by 1.5 years, while for example in Brittany, one of the major producing regions of France, it takes 4 years. Ria Formosa is by far the biggest contributor to aquaculture production in Algarve, accounting for 94% of all bivalve mollusks nurseries existent in Portugal.

- Algarve has excellent natural conditions for the development of aquiculture production. Since 2008, the region has showed a very interesting capacity to attract significant investments namely on offshore production systems (mostly longlines for bivalve mollusks like mussels, oysters and scallops, and bluefin tuna traps, but also fish cages for gilthead bream and sea bass, among others). The estimated production for new offshore aquacultures investments co-funded by the European Fisheries Fund during the Programming Period 2007-13, recently concluded or ongoing in the Algarve region, reaches more than 14,000 tons in an area of 416 hectares and represents a total expenditure of more than 19 million euros.

- More recently, activities related to nautical tourism and recreational boating have been gaining increasing importance. Nautical tourism is considered a strategic touristic segment and a way to diversify and reinforce the competitiveness of Algarve tourist destination, because:

  - It enriches the experience of other touristic products;
  - Contributes to differentiate the offer, mitigate seasonality and maximize the touristic potential of the country;
  - It's a positive factor towards the qualification and sophistication of Portugal's destination image;

- The Algarve region offers several favourable conditions for the practice of nautical activities, such as:
  - Extensive coastline with excellent natural conditions for recreational boating good climate and natural conditions throughout the year for different activities;
  - Location at the crossroads of the Mediterranean and Atlantic routes;
  - Strong maritime tradition;
  - Good infrastructure (marinas and ports) and facilities (hotels and restaurants) with high quality;
  - Existence of supplying service firms;
  - Good levels of safety and hospitality (human resources fluent in foreign languages).
- One major positive externality of nautical tourism, particularly concerning the segments related with yachts and nautical sports, is the potential mitigation of tourism seasonality in the region, benefiting among other aspects from the quality and exquisite location of the infrastructures available and the tempered Mediterranean climate. The Algarve Marinas reach in August occupancy rates consistently above 80%, but, perhaps more important, is the fact that annually these rates rarely fall below 70% in a region where classified accommodation establishments presented in 2007 an Seasonal Amplitude Index of 3.58 (Perna et al., 2008).
- According to the World Tourism Organization, the segment of diving and underwater tourism has a strong growth potential worldwide. As an effort to explore this market niche, in the area of the Portimão Municipality, a public-private consortium began sinking, three miles away from the entrance of the Portimão bar, and about 30 feet deep, 4 vessels decommissioned from the Portuguese Navy. The aim is to create, through the "Ocean Revival" initiative, an artificial reef and simultaneously the first Portuguese underwater museum. The joint combination of such initiatives with the right international promotion has the potential to create a market of 100,000 dives per year and €70 million of revenue.
- In the Algarve, shipping holds a clearly inferior significance comparing to other modes of transport. The two active commercial ports (Faro e Portimão) are limited by their small size, deficient infrastructural conditions and the competition from much bigger neighboring ports (Sines, Setúbal and Huelva). However, the port of Faro will close the year 2013 with 400 thousand tons of cargo handled, an increase of over 30% in relation to last year and thereby reinforcing its importance for regional production trade: cement exported to Algeria and Cape Verde, stone, iron and tile to be sent to Gibraltar, carob to England, salt and rock salt, tuna from the offsohre traps going to Japan, are the most significant exports.
- The Cruise Port of Portimão started operations in 1996. For those ships coming from the Atlantic, Portimão is the last cruise port before entering the Mediterranean, hence its strategic importance while being just a night of navigation from the Port of Lisbon. In 2013, the Cruise Port of Portimão continued its sustainable grow (for the 3rd consecutive year) having received 35,000 passengers, an increase of about 44% with respect to 2009, corresponding to 55 ship stops.
- In the domain of the R & D activities dedicated to maritime/marine fields of expertise, the Algarve can be considered well-equipped in terms of number and quality of the reference institutions regionally located (e.g. associated laboratories of the University of Algarve like CCMAR and CIMA, the national laboratory for fisheries and aquiculture investigation - IPMA), which are important cornerstones of the regional and national innovation systems in this particular field;

4. Conclusions

Along this article, we've been advocating the creation of a formally established national and/or regional maritime cluster, understood, as stated in Monteiro, Noronha and Neto (2013, p.27), as "...an integrated ecosystem where innovation-dependent highly specialized producers and capable locally-based specialized suppliers of goods and services, educational and research institutions, financial institutions and other private and government bodies, related through solid forward and backward linkages, evolve in competitive and demanding contexts, which increase the importance of science-based clustering and favors the creation of a fertile environment much suitable for the promotion of RDI networks of excellence, as well as strong interdependence relations not only with other sectors of economic activity, but also with other international maritime clusters, thereby improving the structural conditions and the competitiveness factors either of the sea related sectors and of the nations/regions involved".

This proposition is based on a set of advantages and distinctive factors that may in our opinion make the difference in terms of reinforcing the competitiveness of the various sectors of economic activity related to the sea potentially involved (see 2) and by doing so allowing the desired increase of their respective contribution to the national/regional GDP. Among those advantages associated to a maritime cluster approach we highlight:

- The evolution of maritime clusters often emanates from both deterministic (legacy, culture, history, availability of specific natural resources) and proactive forces (e.g. Lowering transaction costs especially in accessing and transferring knowledge; Economies of scale and scope; Specialisation of supply from factor markets with respect to labour, capital, or technology sources; Accessing and sharing information on market and technology change; Triggering learning processes and more sophisticated demand; Strengthening the leverage of public/private cooperation through centres of maritime excellence).

- Frequently clusters are based on local skills existing since long ago. They represent organised efforts to enhance the competitiveness of certain sector(s) within a particular region, involving private business, public bodies and/or academic institutions. To accomplish this, a satisfactory coupling between government, capital and knowledge is needed for entrepreneurial ventures to succeed in an international maritime market increasingly competitive.
  These initiatives can be based on a ”bottom-up” / ”top-down” or ”hybrid” (by combining the latter) approach, and very often they are managed by specialised institutions, such as cluster associations, which have tight connections with I&D organizations.

- Among their various achievements, knowledge dissemination (although varying in intensity from case to case) is an essential cornerstone, once the development of maritime clusters critically depends on interconnecting firms and RDI bodies through shared knowledge.

- Also, there are strong evidences of: a conscious effort to improve the microeconomic business environment and towards the upgrading of human resources; the expansion of the cluster by stimulating entrepreneurship and by attracting outside firms; commercial collaboration through joint export initiatives and collective purchases to suppliers aimed at increasing the negotiation power and generate scale economies; and the permanent upgrading of technology and the establishment of close ties with other international maritime clusters.

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