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# D.3.2.3.

# Prerequisite for the operation of a MS cluster

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#### **Executive Summary**

This deliverables intends to provide and detail the key elements to constitute a transnational Maritime Surveillance Cluster in the Mediterranean.

This report summarizes the key characteristics of a cluster, its operation, the proposed members, the services to be provided and the role in the development of Maritime Surveillance sectors in the Mediterranean.

Local contexts from the participating countries where the nodes will be established are also presented and summarized based on the information analysed from the five regional reports covering Greece, France Italy, Portugal and Spain - *D.3.2.1. Regional reports on Mapping of Maritime surveillance sectors, challenges and involved actors.* 

This report will enrich the D.3.4.2 MED MS Cluster Methodology.

#### **List of Abbreviations**

AEIS: Agrupaciones Empresariales Innovadoras

**BBA**: Bluebio Alliance

CDC: Caisse des Dépôts et Consignations

**CISE**: Common Information Sharing Environment

**DLTM:** Liguria Cluster of Marine

DWT: Deadweight tons

EACP: European Aerospace Cluster Partnership

**EEZ**: Exclusive Economic Zone

ESCA: European Secretariat for Cluster Analysis

EU: European Union

EUMSS: European Union Maritime Security Strategy

FUI: Fonds Unique Interministériel

**GDP**: Gross Domestic Product

HASI: Hellenic Association of Space Industry

IDs: Industrial Districts

ISTAT: Italian Statistical Institute

MPP: Mar Portugal Plan

MS: Maritime Surveillance

**MSFD**: Marine Strategic Framework Directive

MED: Mediterranean

NOS: National Ocean Strategy

NSFR: National Strategic Reference Framework

PTNM: Italian 'Mare' Technology Platform

R&D: Research and Development

R&D&I: Research, Development and Innovation

**RIS3**: Regional Smart Specialisation Strategy

SAR: Search and Rescue

SME: Small and Medium Enterprise

VC: Venture Capital

#### Table of content

1.		PR	ROTEUS at a glance	7
2.	. Cluster: The basics9			9
	1.1	1.	Concept and definition	9
	1.2	2.	Cluster components	10
	1.3. Cluster objectives		Cluster objectives	11
	1.4	4.	Key success factors	12
1.4.1 Conditions related to size, organization and motivation		12		
1.4.2 Conditions related to the activity			12	
1.4.3 Conditions related to the geography		12		
1.4.4 Conditions related to the definition of clear objectives		4.4 Conditions related to the definition of clear objectives	12	
	1.5	5.	Main activities	13
	1.5.1 Develop interactions between cluster members		5.1 Develop interactions between cluster members	13
		1.5	5.2 Support the emergence of collaborative projects	13
	1.6. Funding mechanisms		Funding mechanisms	13
	1.7. Advantages and key characteristics		Advantages and key characteristics	14
	1.8	3.	Evaluation of the performance	15
3. Maritime Surveillance: The Mediterranean Context		17		
	3.1	1	Overall context	17
	3.2	2	Country level context	19
3.2.1 Greece		19		
3.2.2 France		21		
	3.2.3 Italy		2.3 Italy	24
	3.2.4 Portugal		30	
	3.2.5 Spain		32	
4.		Re	ecommendations for the establishment of the Mediterranean MS Cluster	36

## **Figures**

Figure 1 - National nodes	7
Figure 2 - PROTEUS Overall approach and role of project partners	8
Figure 3 - Cluster Components	10
Figure 4 - Common Information Sharing Environment in the EU	17

#### 1. PROTEUS at a glance

The Mediterranean Sea constitutes a cross road of continents and the main link among EU countries, Asia and Middle East, baring a huge load of maritime activities that need to be monitored in an efficient way. Maritime Surveillance (MS) aims at providing to the involved key actors the necessary methods and systems to achieve effective data exchange concerning various maritime risks and sectors (Port control, piracy, pollution and trafficking monitoring, border control, defense, fisheries controls).

An important issue within MS is the existence of communication and regulatory gaps that can lead to serious loss of time in case of emergency.

PROTEUS project aims at exploiting the growth potential of the Maritime Surveillance industry that can play a crucial role in the socio-economic development of MED area and in the generation of new job opportunities.

This objective will be addressed through the establishment of a MED MS Cluster based on 5 national nodes, fostering innovation and R&D capacities, knowledge and technology transfer, as well as transnational cooperation among the involved key MS actors, focusing on maritime security and safety mechanisms in MED area.



Figure 1 - National nodes

The Cluster will offer customized services in order to identify and exploit technologies related to MS and will achieve transferability through the creation of concrete linkages with other Blue Growth sectors that face common challenges and growth opportunities.

# A Mediterranean Cluster dedicated to Maritime Surveillance



Figure 2 - PROTEUS Overall approach and role of project partners

#### 2. Cluster: The basics

#### 1.1. Concept and definition

The concept of cluster creates strong interest for economic development professionals and policy-makers, attracted by the success of certain clusters of international renown.

It was in the early 1990s that Michael Porter, Professor at the Harvard Business School, popularized the concept of clustering and describing the phenomena of business clustering. Nevertheless, it is important to recall that the first studies devoted to the external agglomeration economies enjoyed by firms in geographical groupings date back to the end of the 19<sup>th</sup> century.

By 1890, the English economist A. Marshall was one of the first to approach the concept of cluster and lay the foundations of the modern theory of clusters by conceptualizing the benefits of concentration of companies in a given geographic territory, within the industrial districts<sup>1</sup>.

The notion of an industrial district was taken up a century later by G. Becattini, who highlighted the importance of informal elements (historical, informal collaborations between industries) in the industrial organization of Northern Italy. The way in which industrial districts are organized is based on a division of labor between several specialized firms and the economic aspects are linked to the affiliation of a local community marked by a history, values and a common vision<sup>2</sup>.

However, for other authors, such as Czamanski and Ablas, geographic concentration does not appear to be a major feature of clusters that are considered as a group of firms linked by a large flow of goods and services<sup>3</sup>.

There is today a large agreement on the definition and merits of clusters.

Over the past two decades, economists and politicians have paid particular attention to clusters. Indeed, this type of organization meets the needs of innovation-oriented economies, which must be able to mobilize the competitiveness factor: the knowledge and the capacity to innovate. The cluster makes it possible to better resist the competitive pressure resulting from the internationalization of production in the context of globalization.

There are many cluster approaches at international level but all of these initiatives share common objectives: competitiveness through increased innovation capacity, the emergence of collaborative projects, the stimulation of entrepreneurship, and the international visibility.

<sup>&</sup>lt;sup>1</sup> Principles of Economics, A. Marshall, 1890

<sup>&</sup>lt;sup>2</sup> Mercato e forze locali. Il distretto industriale, G. Becattini, Il mulino, Bologna, 1979

<sup>&</sup>lt;sup>3</sup> Identification of Industrial Clusters and Complexes: a Comparison of Methods and Findings, S. Czamanski, L. ABLAS, 1979

The definition commonly given is: "A cluster is a geographical proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and externalities". (Michael E. Porter, On Competition)

The cluster is presented as a concept defining a particular mode of organization and a new form of collaborative development. The cluster translates from the actors a particular state of mind which is a desire to develop not only in a spirit of competition but also of cooperation and exchanges.

While remaining competitive in the same market, companies can and do have an incentive to develop cooperation between them. Clustering allows them to deploy a more ambitious strategy than if they remain isolated.

The innovations are the result of collaborations that are formed on the territory between companies and other institutions of the knowledge economy: technical support organizations, research and training in particular. Geographical proximity becomes an asset by promoting the rapprochement between these different players and by creating opportunities for innovation.



Figure 3 - Cluster Components

#### 1.2. Cluster components

The purpose of the clusters may vary: some focus on technological innovation, some are organized around large companies, others are essentially SMEs oriented towards commercial innovations or services. But despite differences in size, theme or purpose, the composition and mode of organization of the clusters respect the same principles.

In a cluster, there are companies (usually competing and complementary businesses of different sizes), organizations related to applied research activities and training organizations. The value chain concept is based on the complementarity of business activities. Its extension will be at the heart of the cluster strategy.

Likewise, all clusters have a governance representing the different interests of its components (research, businesses and ecosystem). They are always led by a manager(s). Beyond a general assembly and an office, the traditional attributes of an association of natural persons, the internal organization of the cluster relies on thematic working groups that are structured around strategic areas of activity.

It is these groups that will gradually develop the projects that the cluster will bring. While many of these groups have technological objectives, others address cross-cutting issues such as the human resources management, training or the search for markets at national or international levels.

#### **1.3.** Cluster objectives

The objective of the cluster is to strengthen the networking opportunities between its various players in the perspective of stimulating innovation, project development, technology transfer and economies of scale.

The aim of setting up a cluster is therefore to create "economic value", according to an approach backed by the institutional prerogatives of public authorities that support it and by means of private actors, on a common geographical perimeter. Its actions are related to technical and commercial innovation:

- Marketing;
- Collaborative initiatives (associations of companies linked to a product / customer value chain);
- Skills transfer;
- Mutualization of services;
- Training of existing or new staff.

This notion of "animation" in order to create exchanges, and especially projects, implies two main consequences:

- The first is a dedicated, animation and governance team capable of initiating and detecting projects, choosing them and orienting them according to global economic policies;
- The second is the ability to provide technical means (through the provision of expertise or funding, through the implementation and management of technical research and technology platforms, pooling of rare technical means) and financial (by supporting part of the cost of the collaborative projects implemented) to these projects.

#### 1.4. Key success factors

From successful cluster analyzes, lessons can be learned about the conditions to be met in order to achieve the targeted objectives, namely to create the economic value mentioned above by generating innovations which will bring a competitive advantage to the companies members.

Experience shows, however, that between the time of the creation of the cluster and its maturity, several years have often elapsed. This is the time needed to establish trust between companies and to develop and realize collaborative projects. It is shorter in cases where the industrial community has been marked in the past by professional solidarities.

#### 1.4.1 Conditions related to size, organization and motivation

- A critical mass of companies with at least ten to fifteen members. The size of firms is not very important;
- Involvement of industrial personalities (with the capacity and willingness to mobilize the community and represent it outside);
- One (at least) experienced facilitator / manager

#### 1.4.2 Conditions related to the activity

- Expanding sector: if no sector is to be excluded a priori, the growth sectors will give tangible results faster. The confidence in a system based on pooling and sharing, is all the more important as there are prospects for increasing market share for all members. If the sector is emerging, the presence of researchers and funders is essential, since the cluster has to encourage the creation of innovative new companies;
- Potentialities for innovation and perspectives to upgrade in productivity and innovative content.

#### 1.4.3 Conditions related to the geography

- A location serviced by quality (physical and virtual) communication infrastructures, from which it is possible to easily access research centers, transfer centers, technical centers (or other sources of innovation);
- Support from the ecosystem and in particular from local and regional authorities.

#### 1.4.4 Conditions related to the definition of clear objectives

- Having clear objectives for cluster development;
- Define indicators to assess its efficiency.

#### 1.5. Main activities

#### 1.5.1 Develop interactions between cluster members

The management team will have to organize with the governance the life of the cluster. It will consider both collective actions to all companies to strengthen intra-cluster solidarity and it will set up an organization in thematic groups related to the specific areas of action.

It will have to manage these groups whose activity will be turned towards the definition of projects with innovative content.

#### 1.5.2 Support the emergence of collaborative projects

Considering that collaborative projects allow companies to carry out projects that they cannot do on their own. And that innovations can no longer emanate from a single player but from cooperation between different players: large firms, small and medium enterprises, research centers, VC companies.

The networking of actors and the stimulation of collaborative projects will constitute the core business of cluster governance.

Collaborative projects are of different types. In addition to private projects carried out by two or more companies and a research center to put new products on the market in the short to medium term, clusters can also promote research projects carried out by research organizations with the support of companies.

Creating new ideas in a collaborative context that allow to sketch new products or services is the first step in the process. It is generally a question of bringing together industrialists and representatives of the scientific community in working groups led by experts.

The next stage is the preparation of the project: it is a matter of moving from the idea to the formalized project with a precise description of the objectives sought.

The labeling of projects by the governance structure may be recommended. It translates the formal agreement of the members of the cluster and allows a hierarchy of the projects emanating from the cluster, appreciation of which the financiers will be used.

The third step is related to project management. The aim is to consolidate the project and to structure its initial results.

#### 1.6. Funding mechanisms

We cover in this section the budget exclusively dedicated to the governance, its operational activities and the associated costs in terms of salaries and non-staff costs. As detailed above, the definition of cluster can vary from a country to another. For the clusters that have a dedicated team to support the member's activities, the following sources of funding are identified:

• Public funding (including time-limited public funding programs);

- European Funding;
- Membership fees;
- Fee-based services (services offered to cluster members or outside);
- Private sources of funding as in-kind (non-cash) contributions (e.g. seconded staff from members).

The European Initiative for Cluster Excellence estimates that at least 20% of the cluster governance budget must come from private sources of funding, in order to ensure its sustainability in the medium and long term.<sup>4</sup>

Indeed, most of European clusters have been created with significant public support. As these funds are generally limited in time, it is necessary for the clusters to appropriate other sources of financing to ensure their sustainability. The increase in the share of private financing within a cluster can be considered as an evidence of a good management of a cluster insofar as paid products or services are proposed and accepted by the cluster members or other actors. This model implies that the added value is recognized by the cluster members.

The governance of the cluster must be based on a stable and sustainable financial base in order to concentrate its efforts on its primary missions. Without sustainable funding, governance must devote a large number of resources and time to seeking new funding. These resources are then not used for the development and implementation of services for cluster members.

Clusters require significant investment over a period of time. In all of the cases, cluster development policy had been implemented over a considerable period of time and in a coherent and consistent way.

#### 1.7. Advantages and key characteristics

**SMEs are an important factor for renewal within the industry** as they often end up in smaller niche markets where they can assess new ideas and product concepts. SMEs play an important role as suppliers to large companies and need to be at the core of the Cluster activities;

A Positive environment for all players: Clusters provide a positive environment for new firms, enabling access to customers, supply chains, to skilled labour and to information. Large firms benefit from specialist suppliers enabling them to focus on their core competencies, and benefit from SMEs that are experimenting at the cluster's periphery. Clusters enable SMEs to tackle issues that would be difficult to address in isolation. Large firms act as important partners and customers for SMEs;

**Foster co-opetition**: The geographic and social proximity facilitates collaboration alongside competition a culture of co-opetition. Strong clusters do not have clumps of isolated firms

<sup>&</sup>lt;sup>4</sup> Benchmark pour l'excellence des clusters 2012 - Secrétariat Européen d'Analyse de Clusters (ESCA)

but networks of interlinked firms with well-developed communications. As isolated solo players become more integrated into a system, a co-opetition culture is developed with companies better understanding where collaboration can be a win-win;

**Foster innovation**: Within a strong cluster there is rivalry and intense competition. This is central to fostering innovation. Close interaction and exchanges amongst co-located firms underpins competition and stimulates innovation. Moreover, cooperation and linkages among competitive core firms and new firms, often exploring new markets, new processes, new technologies, support firms and service providers, government departments and other foster innovation;

**Focus in internationalization**: in particular in small countries, internationalization should be at the centre of the cluster development approach. Developing the cluster's brand can be an element of export development and added value for small actors;

**Fosters cross-sectoral cooperation**: Successful clusters provide an important bottom-up input to the establishment of region's economic strategy involving also players from other sectors that may have positive impact on the target sector;

**Focus on results and impact and adopts continuous evaluation processes**: A continuous evaluation processes should be established and adopted from the cluster including: satisfaction questionnaires, assessment and benchmarking with other similar clusters etc. The cluster is engaging on activities that have noticeable impact on the cluster's firms and other members and the local economic impact as well;

**Provides added-value**: In order to effectively engage all the key players the cluster should provide an added-value to them and a win-win process targeted to their needs;

**Sector-specific methodology:** No one-size fits all. Design according to sector and region specific needs;

**Emphasis on all the different Phases:** covering Establishment, Building, Implementation and Evaluation;

**The Human factor**: cluster is about personal relationships and trust building. Selection of appropriate people for Governance Scheme is of key importance.

#### 1.8. Evaluation of the performance

The assessment of the performance of a cluster should be based on a review of indicators addressing the following categories:

- Formalization of economic, technological and scientific objectives;
- Evolution of the cluster perimeter (critical mass);
- Number and quality of the actors involved;
- Business-research-training synergies;
- Qualities of governance;
- International visibility and international projects;

- Territorial anchorage;
- Presence of funders;
- Human Resource and Training.

#### Indicators for measuring the level of cluster activity

- Total number of projects undertaken by clusters;
- Number of collaborative projects undertaken by clusters;
- Number of companies adhering to the clusters;
- Number of companies involved in projects;
- Number of companies involved in collaborative projects;
- Number of research-technology bodies working in cluster projects;
- Spending on the financing of the activity of the cluster (excluding collaborative contracts) borne by the member companies;

**Indicators for measuring the impact on business sectors** through the evolution of the macroeconomic indicators of the sectors of activity represented by the cluster: production, productivity, share of exported production, with a country study and a study of relative positioning compared to competing countries.

#### 3. Maritime Surveillance: The Mediterranean Context

#### 3.1 Overall context

Maritime spaces are a vital part of the European economy. Nearly 90% of the European Union's external trade and 40% of internal trade is transported by sea. Protection of global sea lanes is now considered one of the essential elements of security for both states and citizens.

Maritime Surveillance (MS) activities are carried out mainly by States and related Authorities. These activities have both national and transnational nature (mostly transnational) and fall under the responsibility of many actors (both at regional, national and transnational level). Navigation zones immensity raises various problems as the sea is free and accessible worldwide Maritime surveillance covers not only protection and safety of humans and goods during transportation but also environment protection and risks prevention.

The surveillance activities are covering the following fields:

- Maritime security which covers preventing and combating illicit acts like terrorism, malicious actions against ship, Piracy, crew and passengers or harbor infrastructures;
- Transport safety and maritime traffic facilitation fluidity;
- Fishery control;
- Environment;
- Border control and Migration;
- Trade and economy.



Figure 4 - Common Information Sharing Environment in the EU

All these sectors are usually under the responsibility of Independent Authority that operates at several levels, many time without connections and data/knowledge exchange.

Europe needs a more comprehensive approach at sea. EUMSS<sup>5</sup>, the EU Maritime Security Strategy, advocates the "strengthening of the information exchange to optimize the surveillance of the EU maritime area and its maritime borders" and provides a common framework, creating also the link between internal and external policies, bridging the civilian–military worlds. The following strategic systems complete the framework for delivering the strategy:

- **EUROSUR**<sup>6</sup>, the European Border Surveillance System, has the objective of strengthening the Union's external borders especially its southern maritime and eastern land borders, and step up the fight against irregular migration and cross-border crime. This is implemented through the introduction of a mechanism allowing the different national border authorities, to share operational information with a view to cooperating more close to each other, with Frontex (the EU agency responsible for border coordination), and with other European and international organizations working in the field. The extension of the operational duties of Frontex requires that all existing resources are jointly and efficiently exploited to deliver the full capabilities in border surveillance.
- **CISE**<sup>7</sup>, the Maritime Common Information Sharing Environment, seeks to further enhance and promote relevant information sharing between authorities involved in maritime surveillance from coastguards and navies to port authorities, fisheries controls, customs authorities and environment monitoring and control bodies.

The Mediterranean Sea is one of the most strategic maritime basins. In such a sensitive, unequal and geopolitically unstable region, it is necessary for the Mediterranean states to develop their maritime surveillance. The Sea is at the heart of international trades.

It represents 1% of the surface of the seas and concentrates 25% of global traffic and 30% of the world's oil traffic.

The Suez Canal plays a decisive role in supplying Europe and the American continent with hydrocarbons through the Straits of Gibraltar. More than 300 ships cross the Strait of Gibraltar every day, 100 the Suez Canal, 50 the Bosphorus Strait, 6 the Strait of Bonifacio, and nearly 2,000 vessels of all sorts are daily present at sea or in harbours.

Given the importance of this traffic and the ecological vulnerability of this sea, the Mediterranean Sea has been classified as a special area by the MARPOL 73/78 international convention.<sup>8</sup>

<sup>&</sup>lt;sup>5</sup> European Union Maritime Security Strategy, 11205/14, adopted by the General Affairs Council on 24 June 2014

<sup>&</sup>lt;sup>6</sup> Regulation (EU) No 1052/2013 establishing the European Border Surveillance System (Eurosur)

<sup>&</sup>lt;sup>7</sup> COM(2009) 538 final, 15 October 2009

<sup>&</sup>lt;sup>8</sup> PREMAR <u>https://www.premar-mediterranee.gouv.fr/</u>

#### 3.2 Country level context

#### 3.2.1 Greece

The Operational Programme Competitiveness, Entrepreneurship and Innovation 2014-2020 (EPAnEK) has designed to launch 2 cluster-related calls (funding of innovative actions) for Greece:

#### Innovative collaborative clusters in the fields of RIS3 (Innovation Clusters), focusing on:

- strengthening at the invitation of integrated building and support programs innovative collaborative business clusters and research organizations
- Implementation of partnerships with bodies experience in supporting innovation and sound business

# Developing clusters and meta-clusters to create domestic value chains in strategic sectors of the country, focusing on:

• Fostering the creation and development of clusters and business partnerships, research and educational institutions.

#### **Existing clusters**

#### Strategis | Maritime Center of Excellence <a href="https://strategis-cluster.com/">https://strategis-cluster.com/</a>

Strategis is a non-for-profit organization with the vision to become a global R&D and consulting center in advanced technologies, strategy & business models for the smart-sea & blue economy. STRATEGIS focuses on:

- Research & Development of frontier Maritime & Smart-Sea ICT Technologies;
- Strategy & innovative Business Models for the Blue Economy;
- Raising the region's Creative Capital (Intellectual & Human Capital);
- Development of infrastructures supporting smart, sustainable regional growth (smart sea, smart ship, smart port and smart city technologies);
- International standardization activities, policies and regulations facilitating efficient collaboration of stakeholders in the innovation ecosystem.

#### Si-Cluster |Space Technologies and Applications Cluster <u>http://www.si-cluster.gr</u>

The Hellenic Space Technologies and Applications Cluster (si-Cluster) is an emerging, industrially-led and user-driven innovation cluster in Greece, with a sizeable potential to compete worldwide in the challenging and fast-growing sector of space technologies and applications.

Aiming to develop Greece as a leading region for Space Technologies and Applications with a high international visibility, capable of developing and attracting high impact research, development and innovation and business activities, the Hellenic Space Technologies and Applications Cluster (si-Cluster) brings together private and public actors in the field of space technologies and applications and provides an efficient framework around themes of common interest in order to reinforce the competitive advantage of its members.

The Hellenic Association of Space Industry (HASI) in collaboration with the Corallia Clusters Initiative have been instrumental in the si-Cluster's initiation and development and are driving it towards achieving a World-Class Cluster status.

Regarding MS, it focuses on:

- Full exploitation of the services provided today by the modern space technology, emphasizing on the security and safety of the citizens. The provided services include disaster monitor, border surveillance and control, weather forecast, environmental disaster monitoring, smart citizen's transportation, electric power transfer, services for the reduction of the digital divide as well as high bandwidth internet services.
- Combination and synthesis of all space-related programs of different ministries and governmental organizations (e.g. Ministry of Defence, Ministry of Transportation, Ministry of Education, General Secretariat for Research & Development, etc.) in order to maximize economies of scale emphasizing on specific technological areas of national interest.

#### **Challenges and Opportunities**

- Greece is a country with long maritime tradition plenty of room for companies to offer surveillance services and products;
- growing demand for security products because of an increase in threats over the last decade, including piracy, illicit drug trafficking and terrorism;
- MS can not only create revenue for the country as a sector, but can secure revenues in other economic activities;
- Illegal Immigration and illicit trafficking growing trends;
- global rise in maritime security threats;
- Without a secure environment on the seas maritime activities are being compromised
- Increased competition by players from Germany, United Kingdom, Italy, Israel, China, and Taiwan;
- market of security and surveillance products is fragmented because of sectoral, institutional and legal differences within and between EU Member States;
- sharing of information between sectors and institutions is limited;
- legal framework that is not compatible or complementary to the other sectors;
- Europe's internal maritime borders are much less defined and easy to cross;
- Industry lacks clarity about demand which restricts investment;
- Limited standards and certification to facilitate the global market;
- Limited national budget;
- Public procurement and bureaucracy due to the public nature of the sector.

#### Selected MS focus sector(s)

Greece is a maritime nation by tradition, as shipping is the oldest occupation of the Greeks and has been a key element of Greek economic activity since ancient times. Today, shipping is the country's most important industry (worth €251.1 billion in 2015). It accounts for 6.5% of GDP, employs about 290,000 people (7% of the workforce), and shipping receipts are about 1/3 of the nation's trade deficit. In 2015, the Greek Merchant Navy controlled the world's largest merchant fleet, in terms of tonnage, with a total DWT of 334,649,089 tons and a fleet of 5,226 Greek-owned vessels, according to Lloyd's List. Greece is also ranked in the top for all kinds of ships, including first for tankers and bulk carriers.

The sector identified as most prominent one for the Greek National MS Node in PROteuS, is **maritime security and safety**. The criteria used for the selection of the focus sector are:

- No of actors operating in the sector according to the National Mapping (main selection criterion);
- Capacity of the sector to meet trends and megatrends identified (additional selection criterion).

#### 3.2.2 France

France has launched a national cluster policy in 2005. France is committed to creating a conducive environment for both firms and innovation. It offers assistance for cluster-based research and development, particularly via the Single Interministerial Fund (FUI), which provides support for cluster policy and for the forward-looking investments that are part of France's National Loan Programme. The State provides support for cluster development, at both national and regional levels:

- By allocating financial support to the best R&D projects and innovation platforms, through calls for projects from the Single Interministerial Fund and the Investments for the Future Programme
- Through partial financing of cluster governance structures, alongside local authorities and firms
- By providing financial aid for theme-based collective actions, through the intermediary of decentralized government departments. These actions, initiated by the competitiveness clusters in a wide range of areas, involve cluster members, particularly SMEs, with the aim to promote innovation and improve their competitiveness.
- By bringing additional partners on board : the French National Research Agency and BPI provide financing for R&D projects carried out by cluster members; the Caisse des Dépôts et Consignations (CDC) supports innovation platform projects;
- By relying on local authorities, who may also provide financial support for cluster projects (both R&D and innovation platforms)

- By helping competitiveness clusters and their member firms find the best international partners and set up technological partnerships with them focused on value creation
- Finally, by bringing to bear new resources from the Investments for the Future Programme earmarked for competitiveness clusters.<sup>9</sup>

A cluster dedicated to the Blue Economy is strongly active in the Mediterranean, the Pôle Mer Méditerranée which covers already, through a dedicated strategic group of companies (large and small), research actors, academics and public authorities the topics related to Maritime Security, safety and issues related to environment.

This strategic group unites in 2017 96 SMEs, 38 Large Enterprises, 41 research and training organizations and 22 members belonging to the ecosystem

The organizations active in this group are sharing different challenges related to:

# MARITIME SECURITY

The challenges identified in the regions concern specifically:

- Crisis management: consist of preventing or fighting against the development of land conflict from the sea, through maritime task forces deployed or prepositioned worldwide, implementing the strategic function "knowledge and anticipation"
- Piracy & Terrorism protections are both forms of violent interference with shipping. Their global reach and negative impact on sea transportation, safety and marine environment, as well as the threat they both pose to human lives and property, call for effective counter-measures. Among such counter-measure, those directed at strengthening the legal protection of shipping become of paramount importance
- Illegal Trafficking fight is in the French State customs domain. In the last few years, a set of international rules has been drawn up to facilitate intervention at sea and standardize control, with systematic efforts to disrupt business models and trafficking networks, to identify, capture and dispose of assets / vessels used by smugglers or traffickers.
- Sensitive zone protection include the protection of specific areas of facilities (e.g. oil and gas platforms, offshore wind farms), even at long distances from the coast. Barge fleeting facilities, container terminals, passengers vessel terminals are also vulnerabilities that need security measures.

# **MARITIME SAFETY**

The challenges identified in the regions concern specifically:

• Vessel traffic management especially in areas of heavy traffic for preventing accidents and controlling environment damage. In addition to existing international

<sup>&</sup>lt;sup>9</sup> Competitivite.gouv.fr The official website of French « Pôle de compétitivité"

and national laws and regulations (traffic separation schemes...), regional control and coordination are needed, for detecting abnormal routes or behaviour that may generate navigation risks;

- Exclusive Economic Zones (EEZ) & continental Shelf extension is a priority for States with important maritime expenses, with sovereignty on islands and/or new continental shelf extension of EEZ. Large maritime areas that have not yet been explored need to be monitored and protect in the future. New technologies are essential to monitor and protect all these zones, to gain a more extensive vision of the seas and react in a timely manner;
- Search and Rescue (SAR), Air and Sea SAR concerns accident and disaster responses as well as maritime leisure activities. The SAR zones are very large and require substantial means and resources, especially when weather conditions at sea are severe and deteriorate rapidly;
- Port & Coastal surveillance including ports and approaches. These are considerable vulnerabilities in terms of potential critical infrastructures and densely populated areas.

# **MARITIME ENVIRONMENT**

The challenges identified in the regions concern specifically:

- Waste management plays an important role in controlling and reducing the amounts of waste entering the marine environment from ships. This includes chemical, sewage, rubbish, ballast water, etc.;
- Hazardous Traffic control includes tankers and containers ships carrying hazardous materials: control of their routes through territorial waters and report of any damage they suffer, using inspection systems and coordinated standards;
- Pollution control includes the fight against illegal discharge of oil at sea and accidental pollution. In the first, measures will implement aircraft fitted with special remote sensor equipment. In the second case, maritime pollution intervention plans will be implemented;
- Fisheries control includes enforcing regulations in order to protect fishing resources, supporting crew moral or offering technical help, establishing peaceful coexistence with seamen from other countries.

Based on enquiries conducted among MS key actors, the following sectors appear to be of most importance for French actors and should be developed within the Mediterranean MS Cluster:

- Sensitive zone protection;
- Port & Coastal surveillance;
- Piracy & Terrorism protection;
- Illegal Trafficking fight;

- Search & Rescue operations;
- Vessel traffic management.

And, with a lesser importance:

- Crisis management;
- Fisheries control;
- Pollution control.

#### 3.2.3 Italy

One of the features of the Italian manufacturing system is the major presence of industrial districts (IDs), which are spread across the national territory. This feature is closely linked to the dimensions of firms: IDs mainly comprise SMEs and are typically specialized in traditional industries.

One of the main problems that arises in the measurement and the analysis of the economic role of industrial districts is finding a way to match the definition of IDs with the available statistics. In the 1990s the Italian Statistical Institute (ISTAT) using a rather complex algorithm identified 199 industrial districts as "socio-territorial entities where a community of people and a population of industrial firms are reciprocally integrated" and began to collect statistical information at district level (ISTAT, 1997). On the basis of the results of the 2001 Manufacturing Census, ISTAT reduced the number of districts to 156, which account for 25.4% of the total Italian employment and 39% of the manufacturing employment. Although IDs are spread across the Italian territory, they are historically more common in certain regions. The Centre of Italy and the 'North East' are the geographical areas where IDs are concentrated. In 2011 on the basis of Local market areas, ISTAT identified 141 industrial districts and the analysis of their economic specialization by using the data on economic units surveyed in the 9th Industry and Services Census. In comparison with 2001, the number of business clusters decreased by 40 units.

The cluster concept, differently by district concept focused only on a specific natural environment and a specific history of a location, attempts a global or universal development and applicability, and focuses on searching sources of competitive advantage especially 'knowledge, relationships and motivation' (Porter 1998)

Main structural changes in Italian clusters:

- Fading of the "district effect";
- Increasing heterogeneity within and between cluster;
- New strategies of internationalization;
- Innovation and access to external knowledge.

In Italian clusters, several studies find that the district effect on location, specialization and agglomeration is vanishing (luzzolino, 2008; Fores et al., 2009);

A location effect remains stable in urban areas, suggesting that firms gain more from locating in cities than in clusters (Di Giacinto et al., 2012).

In Italian clusters, there are three main groups of firms:

- Small, less efficient firms most suffering from the vanishing of the district effect, often unable to survive in the new highly competitive global context. Policy challenge: coping with the social impact of declining employment;
- Medium--sized and large firms with good capacity to cope with the evolving external business context, intensive interactions with commercial, supply and knowledge networks well beyond the cluster borders, some belonging to business groups or acquired by foreign multinational corporations; Policy challenge: keeping and sustaining their local engagement;
- Firms considering their local supply chain as core to their business success. Such leading high--end local companies prefer local suppliers, because of the combination of quality, lead times, and easy monitoring and control, which would not be guaranteed by distant suppliers (Capasso et al, 2013). Policy challenge: supporting the knowledge flows within the districts, and assisting subcontracting firms to extend their networks outside the cluster.

The industrial district officially enters the Italian industrial policies in the early 1990s. The first national example is the Law n.317, issued in 1991, which was aimed at regulating the public support to innovation for small enterprises. This law provided a policy definition of 'industrial district' and a general framework for the implementation of specific interventions within these systems (Caloffi, 2000; IPI, 2002; Altobelli and Carnazza, 2010).

The intervention proposed by this law would have been quite innovative for two main reasons. First, it is one of the first system-based policies to be designed in the European scenario. In fact, the unit of policy intervention is not the single firm, as it was in almost all the industrial policies of the time, but the system of local firms. In particular, the intervention does not focus on the provision of monetary incentives to the single firm, but instead on the creation of local-specific public goods (such as the promotion of business development service centres, the creation of logistic platforms, the funding of training organizations, etc.) (Bellandi, 2011).

Second, it gives to regional governments a specific policy responsibility, in a period when industrial policy is designed and implemented at central level. In particular, this law aimed at combining bottom-up actions with regional government policies: on the one hand, the leading agencies in each industrial district were supposed to form a local committee or consortium, for elaborating a 'district development plan', composed of several projects; on

the other hand, the Regions had to select the projects to be funded on the basis of periodical tenders.

However, the Italian government did not provide any fund to the Regions to implement those actions, which, therefore, have found a very limited application. Only in a small number of Italian regions the district development plans have been implemented with the help of EU funds for some years, favouring the creation of district logistic platforms, local R&D centres, service centres and similar infrastructures (Caloffi, 2000).

Then, at the beginning of the new millennium, Italian Regions, which have acquired new autonomy in the field of industrial policy, have opted for a different kind of intervention. They have no longer followed a 'policy by exception' approach, but instead they have inserted the promotion of industrial districts into more general policy lines targeting SMEs. In particular, in the programming period 2000-2006 no Italian Region has designed a policy by targeting only the firms located within the industrial districts. At the same time, most of the Italian Regions has introduced specific sectoral and territorial targets in their industrial policies, implicitly devoting a part of their funds to the promotion of firms or groups of firms located within the industrial targets in their industrial policies, within the industrial districts.

During the 2000s, the industrial district as such gradually disappears from the national political agenda, and make way for the reference to technology districts and similar concepts, as well as for a number of system-based policies which emphasizes R&D and innovation features.

New regional-level system-based units of industrial policy have emerged during the last years, which explicitly target the promotion of university-industry relations and technological change. These are the innovation poles which, in the definition provided by some Italian Regions, are groups of independent firms (innovative start-ups, SMEs or large firms) and of research organizations that are active in a particular sectoral or territorial context. These groups are aimed at stimulating the innovative activity by encouraging the interaction among agents, the sharing of common infrastructures, and the exchange of knowledge and competencies. The aim of these poles is to strengthen the R&D capacities of the local firms, promote technology transfer activities, and create an environment which is more diffusely conducive to research-driven innovation.

Together with the innovation poles, the Italian Regions have also promoted the formation of science and technology parks, innovative sectors and clusters and other policy (and economic) objects.

The recent history of Italian system-based policies shows that these policies are becoming increasingly important, both at the regional and at the national level<sup>10</sup>.

In Italy the main clusters, industrial and technology, related to Sea and Blue Economy are:

<sup>&</sup>lt;sup>10</sup> Marco Bellandi, Annalisa Caloffi," System-based policies in Italy: From industrial districts to technological clusters ",ERIEP, Number 5, mis en ligne le 09 janvier 2013.

Maritime Italian Cluster (V REPORT ON THE SEA ECONOMY from Censis – Federazione del Mare) composed by follow productive activities: Port Authorities, Port Logistics and Shipping, Naval Industry, Shipyards, Navy, Pleasure Craft, Harbormarster, Fishing.

The Federation of the Sea, which is the Italian maritime cluster, aims to give a unified representation to the Italian maritime sector, in order to highlight values, culture and interests through constant comparison with international experience.

Established in May 1994, the Federation of the Italian Maritime System (shortly the Federation of the Sea) brings together today a large number of organizations in the sector: AIDIM (Maritime Law), ANCIP (port work), ANIA (insurance), ASSOPORTI (port administration) ASSEMBLY (naval shipyards), ASSORTMENTS (harbor trailer), CAPITANI CONTEXT (maritime master), CETENA (naval search), CONFITARMA (merchant navigation), FEDERAGENTI (maritime agency and brokerage), FEDEPILOTI (pilotage), FEDERPESCA (fishing trawler) , FEDESPEDI (international transport), INAIL / exIPSEMA (maritime security), RINA (certification and classification), CONS.AR (Search) and UCINE (pleasure craft).

The Maritime Cluster cross-cuts the most important topics for the growth of the Country: sustainable mobility, energy efficiency, quality of the "Made in Italy" products, quality of the food chain, employment, safety and security, tourism and environmental quality. The Italian Cluster is consistent and able to feed a system of a very flexible network of enterprises and interchanges. Competitiveness and sustainability are key objectives for its growth in the era of globalisation, as investing in knowledge and education is one of the keys to success. Therefore, in line with the experience of European Technology Platforms, Italy created the Italian 'Mare' Technology Platform – PTNM, involving all stakeholders related to the sea (either economic, scientific or institutional), aimed at reaching a consolidated networking among actors, a shared vision in terms of technological growth, and developing initiatives of national relevance.

**mareTC FVG** established as an association in 2008 from the programmatic agreement between enterprises and local authorities of Friuli Venezia Giulia Region. In 2012, after the recognition by the Italian Ministry of Education, became a limited liability consortium. On 2015 was the completion year of the transformation of mareTC FVG in a technology cluster, in full conformity with the European definition, with reference to f maritime technologies domain (Blue Growth: shipbuilding, boatbuilding, offshore, transports, infrastructures, logistics, services for navigation and yachting). mareTC FVG aims to promote and develop and support scientific and applied research, technology development and training, dissemination of results and stimulate innovative activity, the shared use of facilities, the exchange of knowledge and experiences, technology transfer, networking and shared information among companies and research organizations, and internationalization.

Liguria Cluster of Marine Technology (DLTM) arises from the strong will of the local community and constitutes an emblematic collaboration between companies, research

institutions and administration, which, starting from La Spezia, embraces the whole Region of Liguria.

The aggregation of institutions and companies in DLTM involves the largest industrial groups of Liguria, a consortium of more than 100 innovative SMEs, the University of Genoa and all the public and regional research entities with interests in the reference sectors, as well as a comprehensive institutional representation. The DLTM consortium is open to new actors placed in the territory of Liguria, which share its goals and objectives, and is subsequently in constant growth.

The DLTM consortium was established with reference to the mission identified from Liguria Region and the Ministries of Education, University and Research, and Economic Development, on the basis of the feasibility analysis carried out in 2008.

DLTM operates in accordance with the National Research Programme, as a territorial entity of sectorial governance for research processes, innovation and training, capable to involve all the actors in governance processes for the development of an integrated local and global planning, and the integration between research, innovation and training process, with the aim of achieving measurable impact in terms of growth of the territories intangible heritage.

The National Technology Cluster "Trasporti Italia 2020" –Section Sea (CTN Tra.IT2020) is an association recognized by Ministry of University and Research as a reference for the sector of land and sea surface mobility and systems. The Cluster comprises the major national, industrial and scientific actors working in rubber, rail, waterways and intermodality, with the aim at creating synergies between the various chains and identifying future research trajectories and innovation in the field of surface transport.

**Nautical and Port District of Tuscany**, established in 2016, works on the development of innovation and technology dedicated to shipyards, branch companies, marine and port companies. With regard to shipyards, the services offered by the district aimed at encouraging and organizing innovative production processes, technology transfers through collaboration between businesses and training. It supports companies, particularly SMEs, to consolidate businesses through services aimed at enhancing their identity (training, business organization and management control, process and product certification, digitization, communication and management ) and their strengthening on the market (internationalization, strategic marketing and potential evaluation, network development and b2b events).

#### Sicilian Technology District on Commercial and Pleasure Shipping

#### **Technological Sea District of Marche**

In 2012, the *Ministry of Education, University and Research* (MIUR), in line with the priorities set by the EU Framework Programme for Research and Innovation *Horizon 2020*, promoted the creation and development of *National Technology Clusters*, each cluster is aimed at one of the following areas considered of strategic interest to the national industry: Aerospace,

Agrifood, Green Chemistry, Smart Factory, Means and systems for surface and marine mobility (Transport Cluster 2020 with the maritime section), Life Sciences, Technologies for Living Environments, Technologies for Smart Communities.

In 2016 the Ministry of Research opened a new call for the creation of four new National **Technology Clusters for Industrial Research** in the following areas of **specialization Sea Economy**, Technologies for Cultural Heritage, Design, Creativity and Made in Italy, Energy, by the end of 2017 it will born a new district in Blue Economy.

**Veneto Region**, through CluStrat project (Central Europe Program) whom developed around three founding concepts (i.e. clusters, emerging industries and cross-cutting) a new cluster concept model, with Law n. 13/2014 has introduced a new methodology to enhance cross cluster cooperation at regional level.

That means the CluStrat project outputs become an economic policy tool.

Particularly, the new legislation identifies new aggregating modes with flexibility of action with the obligation to work on common projects. It recognizes three categories: the Industrial District, the Regional Innovation Network, and the Aggregation of enterprises.

While industrial districts (with industrial or traditional handcrafted matrix) and aggregations (few companies operating in the same industry) are identified by the Regional Council, networks (networks that go beyond the specific production domain by becoming multisector) are identified on the basis of plans proposed by the network itself. Specific funding instruments are reserved for these three categories: funding provided through the conclusion of specific program agreements with legal entities representing the industrial district or regional innovation network and specific funding calls for each of the three types.

#### Main challenges in Maritime surveillance key sectors identified

The sector identified as most prominent one for the Italy National MS Node in PROteuS, is **maritime security and safety**, **fisheries control**, **marine environment and customs**. The criteria used for the selection of the focus sector are:

- Number of actors operating in the sector according to the National Mapping (main selection criterion);
- Ability to reach the actors selected and availability to be involved;
- Capacity of the sector to meet trends and megatrends identified (additional selection criterion).

The main challenges addressed by those are the following:

- Interoperability of Data Systems applied by each sector;
- Use of predictive analytics and behavioral models and increased availability of data, advances in Big Data analytics;
- Prevention of risks of accidents and environmental catastrophes;
- Unsustainable fast consumption of living marine resources;

- Over-exploitation , illegal, unregulated and unreported fishing;
- Preservation of marine biodiversity;
- Increasing of the maritime commerce, including cabotage and containerization;
- Foster synergies between the industry of oil&gas, renewable marine energies and offshore systems;
- Development of technologies applied to the Sea and MS.

#### 3.2.4 Portugal

In the Portuguese context, the public policy instrument that presents the vision of Portugal for the Sea is the National Strategy for the Sea 2013-2020, which proposes a model of economic development based on the preservation and sustainable use of resources and services of marine ecosystems, and identifies opportunities based on the sea.

The design of this national strategy was aligned with European policies, such as the Integrated Maritime Policy, its environmental pillar, the Marine Strategy Framework Directive (MSFD) and its research pillar, the European Maritime and Maritime Research Strategy. At the heart of this strategy were the European Union Maritime Strategy for the Atlantic Area as well as Europe's Blue Growth guidelines.

Portugal has one of the largest Exclusive Economic Zone (EEZ) areas and, soon, one of the largest extended platforms in the European Union. The project "Sea Portugal" aims to convert the "Economy of the Sea" into one of the main engines of economic and social development in Portugal. This requires a different paradigm based on a more comprehensive rationale for new service platforms and technology-based products that will enable the full integration of underwater marine operations and their control from command and control centers on shore.

"Portugal actively participates in European projects aimed at the integration of maritime surveillance, including through the exchange of information between agencies of the different Member-States participating in the project, in particular with regard to the monitoring of borders and customs, fisheries and marine pollution from ships and ports, to the prevention and suppression of illegal activities and navigational safety and safeguarding of human life and assets. " (The National Ocean Strategy 2013 -2020).

The National Ocean Strategy 2013 - 2020 (NOS2013-2020) will support to the regional development policy associated with the Ocean, as well as to the investments planned under the "Ocean Knowledge and Economy Cluster", part of the "Collective Efficiency Strategy" program of the National Strategic Reference Framework (NSRF). Mar-Portugal Plan (MPP), fixed for the 2013-2020 period, sums up all projects, programs and sectorial, trans-sectorial and private measures that are carried out under the NOS2013-2020.

In Portugal the main cluster related to Sea and Blue Economy is the "Portuguese Sea Cluster", promoted by Forum Oceano – Associação Economia do Mar (Association for the Sea Economy) - http://www.forumoceano.pt. It is one of the Portuguese competitiveness

clusters, recognized in Feb. 2017 by the ministries of Economy, Sea, Planning and Infrastructures and National Defense. Forum Oceano Forum results from the merger, by incorporation, of Oceano XXI - Association for Knowledge and Economy of the Sea (created in 2009) with AFEM - Business Forum Association of the Economy of the Sea (created in 2010), held in late July 2015. Forum Oceano is the representative of Portuguese Maritime Cluster, at international level. The Oceano Forum belongs to the PORTUGALclusters network since its formation on March 5, 2014. Signed by 16 National Poles and Clusters recognized in 2009 by the Management Authority of COMPETE.

The "Portuguese Sea Cluster" brings together more than 125 associates from different sectors of the Sea Economy, as the following: Conservation, Processing and Marketing of Fish; Marine Industries; Nautical and Nautical Tourism; Maritime Works; Fisheries and Aquaculture; Ports, Transport and Logistics; Maritime Culture; Defense and Maritime Safety; Services; Biotechnologies and Bio Marine Resources; Marine Renewable Energies; Offshore and Oil & Gas.

Also relevant to be mentioned is the BlueBio Alliance (http://bluebioalliance.pt/en\_GB/)

The **BLUEBIO ALLIANCE (BBA)** is a non-profit Portuguese association, founded in Cascais in July 2015, representing all players in the marine bio resources and blue biotech value chain, whose main goal is to promote and develop the blue bio resources sector. It has over 90 members currently and it includes all subsectors of the marine bio resources value chain in Portugal. It ranges from raw material producers, R&D units, to biotech SMEs, transforming centers and manufacturers, public sector & governmental entities, as well as support companies and final consumer product's developers.

Maritime safety is one of the subtopics included in the Mar Algarve cluster (Agenda Regional do Algarve).

Maritime security in the region, in its various aspects, is the responsibility of the Maritime Department of the South and the Port Authorities, which are respectively regional and local bodies of the Directorate-General of the Maritime Authority. They integrate the structure of the Captaincies the Maritime Delegations, as territorial extensions of the same. The Maritime Department of the South includes the Regional Maritime Police Command of the South and assumes at regional level the duties of the Institute of Relief to Castaways.

As mentioned in the section 3.2.1 of the Regional report the most important sectors within the MS framework are the following:

- Maritime Security and Safety in Tourism
- Maritime Security and Safety in Fishing and Aquaculture

The main challenges addressed by those are the following:

- Prevention of risks of accidents and environmental catastrophes.
- Unsustainable fast consumption of living marine resources,

- Over-exploitation , illegal, unregulated and unreported fishing,
- Robbery in Offshore and Onshore Aquacultures
- Preservation of marine biodiversity
- Increasing of the maritime commerce, including cabotage and containerization;
- Foster synergies between the industry of oil&gas, renewable marine energies and offshore systems
- Development of technologies applied to the Sea and MS
- Use of predictive analytics and behavioral models and increased availability of data advances in Big Data analytics;
- Data Systems applied by each sector/system are not harmonized.

#### 3.2.5 Spain

Catalonia launched in 1993 its first cluster initiatives, adapting the concept to their industrial reality. Their initial analysis suggested the transition from cluster to micro cluster, defining these as business groups often located in relatively small geographical areas.

Clusters like FEMAC, focused on agricultural machinery and located in Lleida, were strengthened. In 2012 FEMAC was the first Spanish cluster to receive the Gold Label of the European Cluster Excellence Initiative. These policies have evolved in Catalonia towards the development of more global initiatives and projects, suited to reach the global markets. An example of this recent approach is INDESCAT, the Catalonian sports cluster.

In 2006, the Spanish central government launched its first national program to support clusters. Consequently, a national registry for the Agrupaciones Empresariales Innovadoras (Innovative Business Groups - AEIs) was created, centralized in the Ministry of Industry.

The program supports clusters oriented to the international market, providing financial assistance to support their infrastructure during their first four years of existence, as well as it grants the development of their projects at any stage of their existence, while they remain registered. In 2013 the registry had 174 clusters recognized as AEIs by the ministry.

Innovation in AEIs is structured in 4 axis (Market, Organization, Process and Product). The goal is for AEIs to work in the 4 levels of innovation through projects led and structured by enterprises. The AEIs can be involved in projects and services in various ways:

- Promotion of strategic thinking, leading to actions and projects;
- Innovation Agendas;
- Detection of opportunities and generation of collaborative projects of:
  - Technology;
  - Competitive models;
  - Business models;
  - Training;
  - Management and transfer of knowledge.
- Launch of projects, working on the approach, search for partners and planning;

- Search for funding, facilitating access to financial resources for projects and services;
- Participation, especially in coordination and dissemination tasks;
- Management of projects;
- Leadership, where the cluster leads and executes projects.

Maritime Clusters identified in Spain operating in at least one of the 7 Maritime Surveillance subsectors the project tackles:

- SPANISH MARITIME CLUSTER: the initiative brings together companies that represent all the segments of the value chain in the ship industry. It involves activities such as: Maritime transport; Shipbuilding and repair; Marine auxiliary engineering and industry; Extractive fisheries and marine aquaculture; Nautical industry and marinas; Marine origin energies; The army; Ports and port services; Maritime services as well as regional clusters; Marine research; R&D&I system agents; Training bodies; Trade unions and professional associations; Culture, heritage and social welfare. Website: www.clustermaritimo.es
- MARITIME AND SHIPPING CLUSTER OF CADIZ: The aim is to promote R&D&I actions related to the blue economy. Website: <u>www.agenciaidea.es</u>
- **MARITIME MARINE CLUSTER OF ANDALUCÍA**: The initiative gathers innovative companies form the sectors of fishing, aquaculture, maritime transport, sport yachting and sailing, submarine archeology, port activity... Website: <u>www.cmma.eu</u>
- **DEFENSE INDUSTRY CLUSTER**: the aim is to promote R&D&I actions related to defense sector. Website: <u>www.rabanales21.com</u>
- AERA: The Aragonian Aerospace cluster Website: www.aeronauticaragon.org
- **UNIPORT** Cluster del Puerto de Bilbao: non-for-profit association representing companies of the Bilbao Port. Website: <u>www.uniportbilbao.es</u>
- **HEGAN** Basque aerospace cluster: Groups together Aeronautics and Space sector. Website: <u>www.hegan.com</u>
- Foro Marítimo Vasco Basque maritime forum: includes associations, banks, research centres and universities in the maritime sector. Website: www.foromaritimovasco.com
- CANARY ISLANDS MARITIME CLUSTER: The companies of the Canary Islands Maritime Cluster belong mainly to the marine and/or maritime industry, in the line of "Blue Growth" which the European Union promotes. Companies have a high export and international component, and understand the sector and industry ship repairs, the infrastructures and maritime transport, the aquaculture, marine biotechnology, extractive fishing, nautical sports and recreation, renewable offshore energies and the auxiliary maritime services. Website: <u>http://www.clustermc.es</u>
- CLUSTER OF RENEWABLE ENERGY, ENVIRONMENT AND WATER OF THE CANARY ISLANDS: Founded in 2009, RICAM Cluster is a young and active organization that brings more than 200 companies from renewable energy, water and environmental sustainability sectors which has put into effect the collaboration its members and

other institutions and organizations through collaborative projects, with the aim to improving capacities and research skills to develop new products and services in order to increase their competitiveness. Website: http://www.facebook.com/ClusterRICAM

- INNOVATIVE BUSINESS ASSOCIATION FOR NETWORK SECURITY AND INFORMATION SYSTEMS: The initiative groups companies, associations, Research and Development R&D centre and public and private entities interested in promoting the security and information systems. Website: <u>www.aeiciberseguridad.es</u>
- AERONAUTIC CLUSTER: Gathers aeronautic companies Website: <u>www.clusteraeronauticoclm.com</u>
- GALICIAN NAVAL CLUSTER ASSOCIATION: created by initiative of the Ministry of Innovation and Industry of the Galician Government, at the present time 113 companies participate in this cluster. Its main purpose is to improve the competitiveness and to promote the development of the group of companies that integrate the Galician naval sector. Website: <a href="http://www.aclunaga.es">www.aclunaga.es</a>
- MADRID AEROSPACE CLUSTER: Non-profit private association and Innovative Company Association (AEI) level of excellence by the Ministry of Industry, Energy and Tourism; Bronze Label Certificate awarded by the European Secretariat for Cluster Analysis (ESCA); Partner of the European Aerospace Cluster Partnership (EACP), representative of Madrid Regional Government at NEREUS, member of SME4SPACE and honorary member of SPACE, Participating in Copernicus Programme; Supporting 2014 Galileo Masters Competition in Madrid Region; this cluster gathers numerous partners such as Airbus, Thales or Accenture. Its main purpose is to:
  - Contribute to the development of the aerospace sector in Madrid Region;
  - Promote innovation and technical development of the aerospace industry;
  - Help aerospace companies get involved in European projects. Website: <u>http://www.madridaerospace.es</u>
- MARINE COOPERATION: Naval construction, maintenance and refurbish, operation of ports and hydro works, energy and industry, management of environment and water resources. Website: <u>www.navalydelmar.com</u>

Likewise, the conclusions of section 3.2.1 Regional report presented the following sectors as the most prominent within the MS framework:

- Defense;
- Maritime Security and Safety.

The main challenges addressed by those are the following:

• Opportunity for cooperation in terms of capacity building in order to reduce red tape to access public funding and to facilitate access to private funding for fisheries control;

- Development of Maritime Clusters to foster R&D in maritime security;
- New strategic partnerships;
- Use of predictive analytics and behavioral models and increased availability of data advances in Big Data analytics;
- Data Systems applied by each sector/system are not harmonized, Information is not shared and thus is being duplicated;
- Interconnectivity at port level and harmonization of procedures between different port authorities is still not achieved;
- Piracy increase in threats.

#### 4. Recommendations for the establishment of the Mediterranean MS Cluster

The concept of cluster, its operation and management have been characterized in detail, some preliminary recommendations are given in this section in a summary way. These recommendations are presented in a chronological way:

**Define the main strategic sectors** for each participating country. We can underline at this stage that Maritime security seems to be of key importance for most of the studied countries (Sensitive zone protection; Port & Coastal surveillance; Piracy & Terrorism protection; Illegal Trafficking fight; Search & Rescue operations; Vessel traffic management; Security and Safety in Tourism; Maritime Security and Safety in Fishing and Aquaculture.

**Identify the potential members to reach a critical mass** (4 helix: private companies (Small and large ones), business associations, research institutes and academics, public authorities). After defining the target sectors, the next activity is to compile a list of potential members of the MS Cluster. This list shall contain the data contact of all the identified stakeholders.

**Set a governance and clear objectives** define and establish both the governance mechanism and managing rules and regulations. The governance team shall be responsible for defining the strategic lines of action in consonance with the cluster membership priorities. (Cluster manager, management team and management scheme, establishment of an advisory board (representative from the members) to select the joint projects to be supported, working groups addressing key sectors of activities).

# Deploy a set of support services and encourage collaborative projects/ joint activities between its members

providing support such as networking opportunities, training, training or up-grading cluster members' skills and capabilities, presentation of a cluster at international conferences, organization of international conferences to make cluster known to the international community, lobbying, market intelligence or other not for profit activities.

- Assessing business model and business plan and recommendation for improvement;
- Identifying funding opportunities and complementarities that could leverage driven projects, and support to access funding;
- Assessing potential of technology or know-how in relation with emerging industries targeted ;
- Protecting foreground and results in collaborative projects with support to negotiate a consortium agreement and protect results (IPR).

## Communicate toward the stakeholders and potential

**members** that have already been previously identified. Each participating country should develop a list related to its area.

## Presentation of the MS Cluster proposal to the potential

**stakeholders** made by the consortium members to involve them in dissemination activities. This requires a clear definition of the potential benefits to obtain, being member of the Mediterranean MS Cluster.

**Develop synergies with existing clusters** where complementarities have been identified. Indeed, many countries have develop cluster policies which support especially the maritime industry. These clusters can contribute directly to participate to the MED MS Cluster as they are already established.

**Define a business model**: the MS Cluster members shall also set the different financing tools, by establishing the membership fee depending on different criteria (e. g. turnover volume, total staff, etc.) and Identifying public funding programmes (European, national, regional) as well as private funding lines.

**Marketing and advertising activities** the governance team shall define the business and communication strategy in line with the cluster objectives to increase the number of members involved in its activities and contributing to its funding.