MED MARITIME INTEGRATED PROJECTS

CoRINThos

"MARITIME CLUSTERS SUPPORTING RESEARCH & INNOVATION TO ENHANCE BLUE ECONOMY ENTREPRENEURSHIP"

Priority 1: Maritime Innovation and economic development

Topic 2: Innovation in new economic sectors

D.2.1.2.C.

"Benchmarking Report on the prerequisites/ conditions for research activities in leading successful maritime clusters"

Work package 2: Technical Component

Phase 2.1: Definition of the project analysis methodology and Definition of Triple Helix Matrix

Responsible partners: Maritime Institute of Eastern Mediterranean

Partnership:

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Introduction

Aim of the report

This report has been conducted in the framework of the project "CoRINThos-Maritime Clusters Supporting Research & Innovation to Enhance Blue Economy Entrepreneurship". It aims at presenting the characteristics of the mapped maritime clusters that have been identified in the participating countries (Spain, Italy, Greece, Cyprus) and compare them to some of the most successful ones at international level (Norway, Denmark, Germany, Japan). Through the analysis, the consortium will try to define the prerequisites and the conditions that enhance research activities leading to successful maritime clusters.
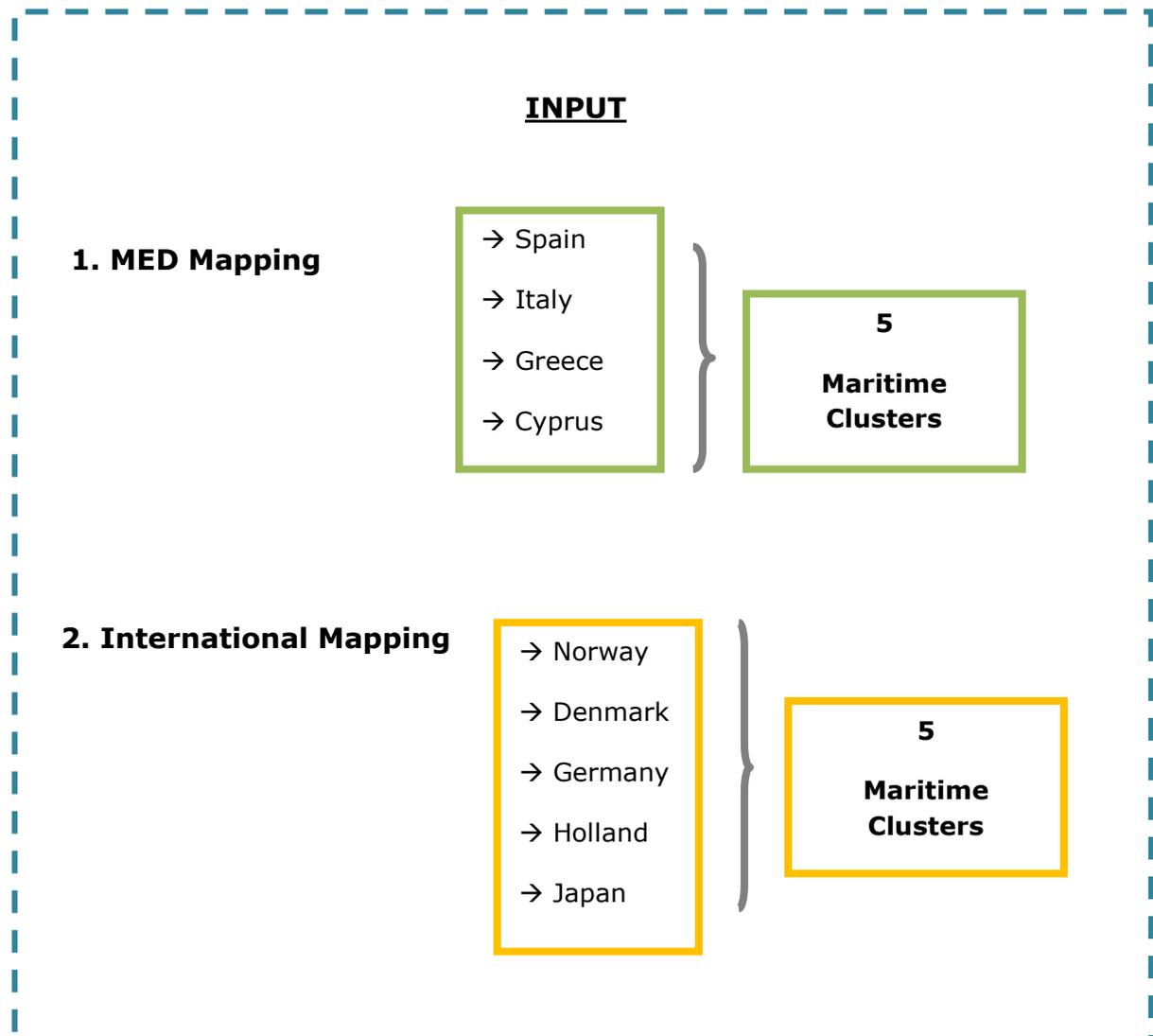
Methodology

The current section presents the methodology that has been followed in order to implement the benchmarking report, based on the input that the partnership has collect during the previous phases of the project.

As it is shown in the following diagram, the first source of data for the report comes from the National/ Regional mapping of maritime clusters in the participating countries, namely:

- the Region of Murcia Maritime Cluster,
- the Maritime Cluster of Balearic Islands,
- the Federazione del Mare and
- the potential maritime clusters of Greece and Cyprus.

The second source comes from the following successful maritime clusters:

- Norwegian
- Danish
- German
- Dutch
- Japanese

INPUT

1. MED Mapping

→ Spain
→ Italy
→ Greece
→ Cyprus

} **5 Maritime Clusters**

2. International Mapping

→ Norway
→ Denmark
→ Germany
→ Holland
→ Japan

} **5 Maritime Clusters**

The phases for the elaboration of the benchmarking report are two and are presented in the next points:

1. Planning Stage

→ Determine to what the methodology will be applied/ Indicators

→ Benchmarking Team

→ Select Maritime Clusters

→ Gather Information

2. Analysis Stage

→ Build the matrix for the comparison

→ Analysis of the results

→ Validate the results

1. Input for the benchmarking report

a. Presentation of the mapped MED maritime clusters

General Information, Characteristics, Similarities, Differences, Obstacles, Positive aspects

b. Presentation of International successful maritime clusters

General Information, characteristics

MED maritime clusters

In previous activities, and within the framework of the CoRINThos project, the responsible partners collected data about the Regional/National status regarding potential or existing maritime clusters in their area. The data resulted in the mapping of the existing clusters in each country, and results were further analyzed with regards to characteristics, similarities, positive aspects and other criteria. To summarize, the following MED clusters were identified:

Existing:

- Murcia Region Maritime Cluster
- Maritime Cluster of Balearic Islands
- Federazione del Mare

Potential:

- Potential Cluster of Cyprus
- Potential Cluster of Greece

Maritime Institute
of Eastern Mediterranean

Projet cofinancé par le Fonds Européen
de Développement Régional (FEDER)
Project cofinanced by the European Regional
Development Fund (ERDF)

L'Europe en Méditerranée
Europe in the Mediterranean

Murcia Region Maritime Cluster - Spain

General Information

The **Murcia Region Maritime Cluster** was founded in 2009 and is governed by private entities at a percentage of 70% and by public at a percentage of 30%. It consists of 115 private entities and 15 public, while it involves 4 large enterprises and 111 SMEs. The cluster has established cooperation with Universities and Research Institutes, promoting activities that are related to Research and Development. In addition, the partners organize training seminars and events and participate in research projects. Some of the services that are offered to its members are business development, Internationalization, Business network, R&D project management.

Characteristics

The development of the cluster of Murcia is based on five main strategic objectives:

- The creation of a climate of cooperation among its members.
- Provide the visibility and representation of sectors of common interest.
- The development of technical, technological and managerial services.
- Identify and capture new business opportunities.
- Creation and promotion of good environmental practices in the shipbuilding sector and the sea.

The cluster operates in the sectors: shipbuilding, maintenance and repair, ports, services and supplies, industry and energy, water management and environment. One of the main objectives of the cluster is the focus on creating new products or services for markets where there is no direct competition and the complementarities of the companies constitute a clear added value. The implementation of cooperative activities strengthens the capacities of members of the group and generates a climate of trust and soundness.

The Maritime Cluster consists of companies from various professional backgrounds within the Maritime sector and related sectors, allowing an ideal complementation between companies to address the development of any common interest.

Maritime Cluster of Balearic Islands - Spain

General Information

The **Maritime Cluster of Balearic Islands** was established in 2008 and the ratio between private and public participating entities is 90% - 10%. This cluster is much larger than the one in Murcia as it consists of 100 large companies, 17.900 SMEs and 250 public entities. It has established strong collaboration with Universities and Research Centers and organizes many training sessions on Research and Development proving that this sector is one of its key priorities. In addition the cluster invests in eco friendly and alternative energy applications and offers a series of services to its members like access to Funds, Participation in fairs, employment counseling, juridical counseling, fiscal counseling, R&D activities, support in projects participation, training etc. The share in Gross National Product is around 2,60% and the Direct value added amounts 16.016.000.000 Euros.

Characteristics

The main goal of the cluster is to serve as a meeting point between economic and social agents, Government, Research centers/ polls, Other organizations with interests in the sea.

The general objectives of the Maritime Cluster are the following:

- Encourage training and culture of the sea (fishing, transport etc…) and the development of the maritime sector in Balearic sea
- Contribute to Maritime Spatial Planning and Blue Growth
- Ensure the establishment of an appropriate legal framework to strengthen maritime activities in the Balearic Islands
- Promote cooperation with other Regional Maritime Clusters of Spain and foreign countries as well as in the Spanish Maritime Cluster–CME,
- Contribute to the European Association of National Maritime Clusters-ENMC.

The cluster operates in a variety of subsectors of the maritime sector, including, but not limited to: maritime transport, shipbuilding and repair, marine research, desalination, aquaculture and fisheries, marine energy ect.

Federazione del Mare - Italy

General Information

The cluster that was presented in the Italian mapping activity is the **Federazione del Mare**. It is much older that the Spanish ones, as it was founded in 1994 and brings together 17 maritime organizations as stakeholders, out of which, 1 is public and 16 private. The cluster consists of a large number of enterprises. More specifically, it has 2.000 large companies and 177.000 SMEs. Unlikely Spanish clusters, the Italian does not have direct presence or cooperation with Universities. However, CONS.A.R. and CETENA are the two research centers associated with the cluster. There is lack of Research and Development training within the members, but there is a series of Joint R&D projects involving the R&D facilities owned and managed by the cluster. All maritime related actors associated to the cluster are investing in green and eco-friendly solutions. Some of the services that are offered to the members are maritime transport, movement of cargo, logistic cycle of cargo between the land and the sea, technical-nautical services, financial services and specialized insurance services.

Characteristics

The cluster operates mainly in the shipping, port logistics and services, shipbuilding, yachting, nautical and cruise tourism, fishing and other institutional activities such as navy, coast guard, port authorities ect. It is a world leader in: Ro-Ro fleet (150 ships, 2.4 million GT), Cruise shipbuilding and Motor-yachts building. The cluster contains a system of intrinsically flexible networks that take on different forms, ranging from production districts to transport routes. The Cluster is a member of the European Network Maritime Clusters. Federazione del Mare can generate:

- effects on income
- the development of financial circuits
- contributions to development of the labour factor
- processes supporting the opening up of the country to international trade
- a modernization of the national supply of logistics
- contributions to maintain the competitive strength of the national production system

Potential Cluster of Cyprus

General Information

At present, Cyprus does not have an existing maritime cluster and therefore a potential cluster that a series of organizations design to develop is being examined. The Cluster will constitute a powerful engine of economic growth and a driver of innovation, providing a fertile business environment for companies, particularly small and medium-sized enterprises (SMEs), which will facilitate cooperation with research and academic institutions, the public sector, the civic society, suppliers, customers and competitors of the wider region and will allow synergistic actions based on their own competitive advantages. Contributing each one on its own field of expertise and complementing each other with resources, technology, people, know-how, facilities, infrastructure, fleets, will secure the "critical mass" for the operation of an effective, competitive and integrated Regional Cluster with multifold benefits for the whole region. The formulation of the cluster will also create the necessary preconditions for the implementation and operation of a stable Framework of Intra-regional Business Cooperation, which will gradually attract new investments and common business activities, leading through the Blue Growth to the overall economic development of the Eastern Mediterranean region.

Characteristics

The sectors that are very promising regarding maritime in Cyprus, and would be beneficial to be target sectors for the development of the cluster, are the following:

- Maritime Transport (Shipping, Ports and Services)
- Shipbuilding - Ship Repair (Shipyards, Suppliers, Equipment)
- Surveillance and New Technologies
- Offshore Oil & Gas
- Tourism (Coastal Tourism, Cruise Tourism, Yachting/Marinas, Water Sports, Diving Tourism)
- Aquaculture (Farming of Fish, Shellfish, Fisheries)

Potential Cluster of Greece

General Information

Greece does not have any organized maritime cluster. However there are some initiatives to develop partnerships in the framework of specific maritime sectors that could potentially lead to the creation of maritime clusters. Two business partnerships exist in Greece and specifically in Piraeus, which seem to be able to be at the core of creating cluster shipbuilding - Maritime:

- the "VI.PA.S." (Schisto Industrial Park) and
- the consortium "TRITON".

The current conditions in Greece are mostly favorable towards the creation of a Greek maritime cluster, the physical infrastructure exists and cooperation with research and educational institutions exists, as well as competition and integrated experience and expertise.

Characteristics

The potential cluster is proposed to be mainly focused on shipbuilding – port - maritime sectors. Greece has a very strong competitive advantage in the wider maritime sector, coastal tourism and fisheries and the development of a maritime cluster addressing these sectors would be highly beneficial for the whole country regarding employment and economic growth. An important prerequisite is to have significant cooperation among Business - State - Local Authorities in order to establish a joint strategic plan in this direction.

From the success of this cluster, besides the above, we see even three major prospects for the industry. A successful shipbuilding - maritime cluster can enter our country in three new markets (so far untapped by Greek enterprises) but markets extremely of foreign currency:

- manufacturing of marine equipment,
- 'green' yards and
- "green" ship dismantling (scrap)

Similarities and Differences

Among the existing maritime clusters operating in Spain and Italy, as well as the potential clusters in the areas of Greece and Cyprus, many similarities and differences can be identified; an analysis of which is given in the following table.

Firstly, regarding the presence of the public sector in the cluster, the Cluster of Murcia appears to have the higher percentage of public entities, followed by the Cluster of the Balearic Islands. The public sector on Italian Cluster, on the other hand, has very limited presence. As far as Research performance is concerned, the Cluster of Murcia has established strong linkages and collaborations with Research Organizations and Institutions. Less strong appear to be the collaborations in the Cluster of Balearic Islands and even less the ones in Federazione del Mare. The Greek Cluster appears to have strong potential in cooperation with Research Organizations, as soon as it is created.

As for the importance of the clusters' performances in terms of GDP, the cluster if Balearic Islands scores 88% of the country's region GDP. Significantly lower importance score the Italian cluster and the Cluster of Murcia, and the Cluster of Cyprus is estimated to contribute a relatively smart percentage in the country's GDP. Greece's Cluster on the other hand, taking into account the high contribution of the wider maritime sectors in the country's GDP, is estimated to have a relatively high contribution. Regarding SMEs and companies participation, the Italian is by far the bigger one so far across the three existing clusters, consisting of around 180.000 companies. The Greece and Cypriot clusters are estimated to have significant lower companies participating.

Finally, the Italian cluster is operating for the longest period of time and has the highest networking potential among the existing clusters, since it is a member of the European Network Maritime Clusters. All clusters offer related services, with some offering a wider, but not significantly so, variety (Cluster of Balearic Islands).

SIMILARITIES AND DIFFERENCES BETWEEN MED CLUSTERS	SPAIN		ITALY	GREECE	CYPRUS
	Region of Murcia Maritime Cluster	Maritime Cluster of Balearic Islands	Federazione del Mare	Potential Greek Maritime Cluster	Maritime Cluster of Eastern Mediterranean
Limited Public Presence	X	XXX	XX	-	-
Strong Collaboration with Research Organizations	XXX	XX	X	XXX (potential)	-
High Importance in GDP	X	XXX	X	XX (potential)	X (potential)
SMEs and Companies Participation	X	XX	XXX	X (potential)	X (potential)
Variety of Offered Services	X	XX	X	-	-
Years of Operation / Experience	X	X	XX	-	-
Networking Potential	X	X	XX	X(potential)	X (potential)

Memorandum: X: Low, XX: Medium, XXX: High, - : Unknown

Obstacles and Positive Aspects

The 3 existing MED maritime clusters face various restrictions and obstacles in today's economy and general situation, mainly identified on investments, funding and legislations' level. In parallel, positive aspects in their operation also exist balancing out the situation. The most prominent obstacles and positive aspects are analyzed and evaluated in the following table.

The major obstacle identified regards the access to funding. Both the Italian Cluster and the Cluster of Murcia appear to have low access to funding in terms of investment funds and business angels networks. The Cluster of the Balearic Islands seems to be in a slightly better position, while for the Greek and Cypriot potential clusters there is not available information.

Both Spanish Clusters appear to value staff training, while Federazione del Mare provides limited training to its staff. With regards to supporting legislation the Italian Cluster, the Cluster of Balearic Islands and the potential cluster of Cyprus appear to stand in a more favorable position, in contrast with the Cluster of Murcia and the potential Greek Cluster. The Federazione del Mare performs dissemination and diffusion activities with high intensity, closely followed by the Maritime Cluster of Balearic Islands.

Among the existing clusters and the two potential of Greece and Cyprus, the estimation of economic growth related to the maritime sectors appears to be low in general, while the Italian Cluster seems to stand in a slightly better place.

POSITIVE ASPECTS AND OBSTACLES MED CLUSTERS FACE	SPAIN		ITALY	GREECE	CYPRUS
	Region of Murcia Maritime Cluster	Maritime Cluster of Balearic Islands	Federazione del Mare	Potential Greek Maritime Cluster	Maritime Cluster of Eastern Mediterranean
Public Investments in R&D in Maritime Sector	X	X	-	-	-
Maritime Staff Training	XX	XX	X	-	-
Supporting Legislation	X	XX	XX	X	XX
Intensity in Marketing and Dissemination Activities	X	XX	XXX	-	-
Access to Funding	X	XX	X	-	-
Estimated Growth in Operating Sectors	X	X	XX	X	X

Memorandum: X: Low, XX: Medium, XXX: High, - : Unknown

International Successful maritime clusters

Across the European Area, as well as worldwide, a number of clusters and practices have been identified as successful. Clustering can offer various advantages to SMEs and companies which constitute it. First and foremost they can enhance competitiveness and generate productivity as well as foster innovation across its members. Knowledge transfer (knowledge spillovers) and other complementarities amount also as benefits for the members of the clusters. The most successful clusters identified, were the following:

- Norwegian maritime cluster
- Danish maritime cluster
- German maritime cluster
- Dutch maritime cluster
- Maritime cluster of Japan

Below, a brief overview of the selected international clusters is presented.

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Projet cofinancé par le Fonds Européen de Développement Régional (FEDER)
Project cofinanced by the European Regional Development Fund (ERDF)

Norwegian maritime cluster – Norway

General Information

The Norwegian Blue Maritime Cluster is among the very few complete maritime clusters in the world. It consists of 20 shipping and 13 design companies, 14 shipyards and 169 equipment suppliers that employ over 80.000 people and had a turnover of about 4 billion € in 2001 (8% of total country value creation and 3% share of GDP). The cluster accounts of 40% of the world's modern fleet. The Norwegian maritime industry consists of 4,053 companies in total in various maritime sectors. The Industry is dominated by the shipping sector. The Norwegian Cluster aims to enhance the global competitiveness of the businesses and encourage regional skills development. The analysis for 2013 shows that the maritime cluster is experiencing continual growth.

Characteristics

The maritime cluster of Norway is in fact quite fragmented into several smaller regional clusters. Specifically, the cluster consists of seven regional clusters along the whole coastline, the largest actors located around the capital city. The most important characteristic of the cluster is the efficient co-operation between the Shipping companies (majority of members) and the rest of the maritime sector, which helps to create innovations and commercial competitiveness. Significant synergies are also identified between shipyards and research institutions, which together have developed know-how and new solutions to the market. Furthermore, the cluster shows specialization in oil transportation (carries out 15% of the global oil exploration activities in the nearshore).

The main components of the Cluster are: Maritime Shipping, Marine Equipment Suppliers (mainly offshore oil and natural gas), Maritime Services (finance, insurance, brokering, maritime law, ship classification and certification, port services), shipbuilding and fisheries. Regarding R&D, the cluster seems to be attractive for investments, and although the amounts of spending are lower than in other countries the innovation level is very high, a fact which indicates that Norway gets high returns from the investments.

Danish maritime cluster - Denmark

General Information

The Danish maritime cluster constitutes an economically important component of the Danish economy. According to studies (2003), the Danish Maritime cluster appears to contribute more than 6% to the Danish economy, or about 4,5% of the GDP. The major operating sectors are considered to be shipping and water transport, and the cluster employees directly about 81.000 people and indirectly around 119.000 additional people. Overall, the cluster is built around the water transport and maritime services industries, which purportedly exhibit strong preferential trade linkages with each other.

Characteristics

The strong focus on shipping, at a government level, is a strength of the Danish Maritime Cluster, as well as the developments made in the area of renewing the educational system, accounting to stable framework conditions and efficient administrative and management structures. The Danish cluster prioritizes growth as based on quality shipping, related with high standards of safety and social and well-being conditions, as well as protecting the environment. The cluster involves a number of universities and research institutions. The recent Danish maritime cluster project plays an important role in the cluster governance definition and implementation.

General Information

The Maritime Cluster has been operating in Schleswig-Holstein since 2005. With an annual turnover of €8.5 bn, nearly 1,700 businesses employing some 47,000 people and at least 15 educational and research establishments, the maritime economy in Schleswig-Holstein is a significant economic factor with outstanding growth potential. The cluster's components include: port industry, maritime logistics, shipping companies, shipbuilding and engineering services, marine equipment suppliers, maritime services, offshore technology, oceanography and university marine science laboratories, marine and coast protection, blue biotechnology, fishing, aquaculture and marine tourism. Shipping, marine equipment, shipbuilding and marine tourism together accounted for a turnover of 7,5 billion € in 2006, representing the most important sectors of the cluster.

Characteristics

The main objectives of the German cluster are:

- Strengthening the position of Northern Germany as a maritime location – nationally and internationally
- Strengthening the competitive position of maritime companies
- Promoting technology transfer between science and companies
- Generating innovative projects
- Extending the membership base

There's a high intensity of RDI by firms, especially by those belonging to the suppliers of equipment and components for shipbuilding sectors, mainly in the areas of energy efficiency, environment, maritime safety and offshore energy.

	Dutch maritime cluster - Holland

General Information

The Dutch maritime cluster includes 11 sectors and 11.850 companies. The operating sectors are namely: Inland shipping, Shipping, Ports, Maritime Services, Shipbuilding, Marine Equipment, Yachting, Fishing, Dredging, Offshore and royal navy. In 2002, the Dutch Maritime cluster amounted for 2,9% of the country's GDP. The employment in the same year for the cluster reached about 190.000 persons. The most prominent sectors for the Dutch economy are port sector (20%), shipping sector (15%) and offshore sector (14%).

Characteristics

Strong technological interdependences, the movement of labor from one cluster sector to another, the favorable location in Europe, the advanced shipping policy scheme and the varying education and training system, are some of the most protrusive characteristics of the Dutch Maritime cluster. The Dutch maritime business communities involved in the cluster, are organized in trade organizations, who in turn participate in the Dutch Maritime Network or in the Maritime Knowledge Center.

The Dutch government has created a number of generic instruments to stimulate innovative behavior and the innovative capacity of people and companies. A Maritime Innovation Forum was created to strengthen the innovation networks between the sectors and the maritime cluster as a whole. In this Forum the participating trade organizations co-operate and initiate cross-sector innovation projects.

Maritime cluster of Japan - Japan

General Information

The maritime industry in Japan has had a significant influence on the country's history and economic development. 96% of the supplies entering and leaving the country are carried by maritime transport, as of 2011 data.

Japan has been a global leader in the shipbuilding industry, in specific.

The Japanese maritime cluster is internationally significant even though it is losing its market share to China and South-Korea. A major challenge for the cluster is the decline in skilled workers during the next ten years, along with an overall ageing workforce. In the context of analysis of the Japanese maritime cluster, business networking, especially long-term relationship between firms, and the long-term co-working spirit are identified as vital for the development of successful cluster in maritime sector.

Characteristics

The Maritime Cluster of Japan is composed of three major groups, namely shipping companies and ship owners, shipbuilding companies and shippers/manufacturers. The maritime cluster has close cooperation with the country's banking system. Ports and port services is another part of the Japanese maritime cluster where the competitiveness has declined.

The Japanese maritime industry plans to reposition itself towards more sustainable activities with concerted efforts to increase international cooperation, investments in research and development projects for green technology and also development of the port sector by fostering investments in country's port hubs.

2. Identified Best Practices coming from International clusters

Definition of the **characteristics/practices that could be applied to MED** maritime clusters

The mapping and analysis of five, successful, international maritime clusters resulted in the identification of characteristics and practices that could be applied to the existing or potential MED maritime clusters in order to foster their growth and development and enhance the economic growth in the respective regions.

In order to conclude to the best practices of the international maritime clusters selected, the table below presents the strengths or key dimensions identified during the analysis of each cluster.

Taking into account the strengths and key characteristics of the clusters and after analyzing them, the best practices to be applied at MED level can be identified and grouped in 5 main categories. According to that classification, brief recommendations have been at MED level.

International Maritime Clusters Key Dimensions Overview				
Norwegian maritime cluster	**Danish maritime cluster**	**German maritime cluster**	**Dutch maritime cluster**	**Maritime cluster of Japan**
The shipping companies are the most central actors in the maritime industry. They are strongly related to most industries of the maritime sector.	The cluster contributes to the Danish economy and the country's employment.	The cluster is geographically focused and various maritime activities take place in the region the cluster is established.	The core of the maritime cluster is that all activities have to do with the building and operation of ships.	Business networking, especially long-term relationship between firms, and the long-term co-working spirit is essential.
The cluster contributed in the value generated in the economy, in the country's employment. The cluster's operation represents the entire maritime value chain.	The major operating sectors are considered to be shipping and water transport, which purportedly exhibit strong preferential trade linkages with each other. The strong focus on shipping, at a government level, is the strength of the Cluster.	A management entity for the cluster has been formally constituted which includes important partners. A mutual Cluster management venue has been established with the aim to strengthen the competitiveness of the cluster.	The cluster comprises 11 different, yet complementary sectors with close cooperation on innovation and production. A long-term innovation programme is being implemented involving the government, academia and private sector.	The cluster concentrates in 3 major sectors, shipping companies and ship owners, shipbuilding companies and shippers/manufacturers.
There is high cooperation among firms around R&D and the relationships between the industries are strong.	The cluster involves a number of universities and research institutions enhancing cooperation and networking potential.	The cluster is base for a large number of companies in the maritime industry, with a high turnover and employment level. Important Scientific Maritime Institutions are part of the Cluster.	A Maritime Innovation Forum was created to strengthen the innovation networks between the sectors and the cluster.	The maritime cluster has close cooperation with the country's banking system.
The maritime cluster is composed of three main groups: shipping, maritime services and ship industry.	The Danish maritime cluster project plays an important role for the cluster.	The cluster operates in various maritime sectors.	The Dutch Maritime Network and the Dutch Maritime Knowledge Centre have been established.	
Very high innovation potential although lower investments are made compared to other EU countries which indicates high investment return rate.		High Intensity to R&D in the cluster		

The Best Practices identified on international level are presented in the table below:

International Best Practices Identified

Category 1: Geographical Concentration

Geographical concentration regards the exact location of the companies which constitute the maritime cluster. The best practice suggests that the more closely located the members are, the more successful the cluster's performance would be.

Category 2: Specialization in Activities

Whether the cluster focuses solely on a maritime subsector or operates in a variety of sectors, the international best practice indicates that strong complementarities should exist or be formed between the subsectors to ensure maximum performances.

Category 3: Actors Involved

A variety of relevant actors should be involved in the operation of the cluster in order to ensure cooperation with all actors of the triple helix model. The more relevant actors are engaged in its operation the most efficient its performance will be as indicated by the international best practice.

Category 4: Competition and Cooperation

Cooperation with stakeholders is considered essential as is a healthy level of competition across the cluster's members.

Category 5: Critical Mass and Inner Dynamics

The economic Performance of the Cluster is vital to be analyzed and considered regarding its operation. The number of companies participating in the cluster should be high enough in order to ensure complementarities, synergies and economies of scale.

Category 6: Cluster Life Cycle

With regards to the cluster life cycle, international maritime clusters indicate that managing entities are considered essential for the future viability of the cluster.

Category 7: Innovation, R&D Potential

Innovation potential regards the R&D investments made in the context of the clusters. The higher the R&D spendings are, there are more possibilities to ensure innovation activities and outputs. While the amount of spendings is important, most vital is to ensure a high return rate of investment in order to gain maximum outputs out of the same level of investments.

3. Similarities and differences among MED and International maritime clusters

With regards to the analysis of the MED and International Clusters provided in the previous sections of the report, several similarities and differences have been distinguished to exist among the clusters, which are presented and listed below.

Similarities / Differences:

- The majority of both MED and International Clusters operate in more or less the same subsectors of the maritime industry. Only the Norwegian Cluster is singled out with one dominating sector – shipping.
- All clusters offer a portfolio of various services within their operating context.
- Differences occur between the clusters with regards to the number of participating companies as well as the ratio of the public/private participation in the clusters.
- At MED level, no cooperation with the banking system has been identified as opposed to the Japan Maritime Cluster.
- Out of the 5 MED maritime clusters only the Italian one – Federazione del Mare – appears to participate in projects enhancing the performance of the clusters. On the contrary, this appears to be the most common practice on International level.
- Cooperation with Research Institutes is sought both by MED and International clusters – in some more intensively than others.
- Only the Cluster of Balearic Islands and the one of Italy (both MED clusters) are concerned with environmental issues.
- All clusters appear to be interested in networking and marketing activities, some at a higher level than others. Networking potential is considered essential by all clusters.

- At MED level R&D investments seem to be rather low in contrast with the selected international clusters. Among international clusters, and specifically for the Norwegian Cluster, although the R&D spending is limited, the return rate of investment is relatively high.

- Establishing managing entities to ensure the long-term sustainability of the Clusters appears to be a very common practice among the selected successful, international clusters. At MED level on the opposite, such thing hasn't been implemented or considered yet.

4. SWOT analysis of MED clusters

The distance between the international clusters with the MED clusters has been analyzed with regards to the international best practices identified, and a SWOT analysis was conducted for each of the existing/ potential MED maritime Clusters of CoRINThos project.

Overall, the regional MED existing clusters are already in line with some of the practices of the international maritime clusters more or less. Regarding the best practices identified, all MED clusters are geographically concentrated, operate in a series of maritime subsectors and involve or try to involve many concerned actors in all triple helix levels (academia, industry, government). Naturally, those steps should be taken by the potential MED clusters as well in order to be successful.

More distance is identified regarding the innovation and R&D activities; the R&D spendings are mainly considered as low, thus providing small innovation outputs. Higher R&D investments are highly proposed.

As far as the plans to assure sustainability of the clusters operation are concerned, steps have not been taken by the regional clusters so far. The MED maritime clusters should aim to formulate management entities or networks in order to take the necessary steps for ensuring the long-term operation of the clusters. Finally, regarding the size of the clusters, emphasis should be put in the formation of the potential MED clusters, namely the Greek and Cypriot, in order to ensure maximum participation of companies.

SWOT Analysis				
	Region of Murcia Maritime Cluster	**Maritime Cluster of Balearic Islands**	**Federazione del Mare**	**Potential Greek Maritime Cluster**	**Potential Cyprus Maritime Cluster**
Strengths	• Trained Staff • Strong collaboration with Research Institutions	• Access to funds • Trained Staff • Deals with environmental issues	• Member of the European Network Maritime Clusters • High SMEs participation • Experience deriving from the years of operation • Participation in projects enhancing its performance • Deals with environmental issues	• Strong collaboration with Research Institutions • Solid know-how in maritime industry • Favorable strategic location	• Favorable location
Weaknesses	• No relations to the banking systems		• No direct cooperation with Research Institutes • Lack of R&D training • No relations to the banking systems • Low to zero R&D investments	• Lack of appropriate educational background of workforce • No relations to the banking systems • Low to zero R&D investments •	• No relations to the banking systems • Low to zero R&D investments
Opportunities	• Public Investments in R&D • Not existing direct competition • Growing Global Maritime Sector	• Supporting Policy Schemes and legislation • Public Investments in R&D • Growing Global Maritime Sector	• Growing Global Maritime Sector • Supporting Policy Schemes and legislation	• Favorable conditions for the creation of a maritime cluster • Strong maritime sector and economy • Existing infrastructure • Growing Global Maritime Sector	• Supporting Policy Schemes and legislation • Existing scheme of cooperation with dynamics to form a cluster • Growing Global Maritime Sector
Threats		• Competition from other clusters	• Competition from other clusters	• Not favorable legislation framework • Competition from other clusters	• Competition from other clusters

5. Identification of the prerequisites for successful maritime clusters focusing on R&D activities

In order to identify and conclude the prerequisites for successful MED maritime clusters, each of the best practices identified on international level has been further analyzed. The main best practices are summarized below.

- Geographical concentration
- Specialization in Activities
- Actors Involved
- Competition and Cooperation
- Critical Mass and Inner Dynamics
- Cluster Life Cycle
- Innovation, R&D Potential

For each best practice identified, some suggestions or recommendations are provided.

1. Geographical concentration

Recommendation for MED Clusters: Most successful international clusters operate in a variety of maritime sectors which are although strongly interrelated with each other, or are operating in selected sectors building up on their know-how. In both cases emphasis is put on relations and complementarities between the sectors in order to ensure best operation and performance results.

2. Specialization in Activities

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3. Actors Involved

Recommendation for MED Clusters: The MED Clusters should aim to involve important actors across the triple helix model (academia, industry, government) in order to facilitate information flow and ensure efficient cooperation between the cluster members.

4. Competition and Cooperation

Recommendation for MED Clusters: Strong cooperations with important actors and stakeholders across the involved maritime sectors should be sought at MED level.

5. Critical Mass and Inner Dynamics

Recommendation for MED Clusters: The MED Clusters are recommended to involve large number of companies and employees in order to be successful. Focus should be put in the clusters' turnover performances as a percentage of GDP so as to ensure the clusters' sustainability and importance for the regional economies.

6. Cluster Life Cycle

Recommendation for MED Clusters: Entities supporting the management of the clusters would be beneficial to be established in order to ensure the successful and long-term operation of each cluster. Networking entities would serve to the same purpose as well.

7. Innovation, R&D Potential

Recommendation for MED Clusters: Clusters should put emphasis on R&D activities and investments in order to enhance innovation potential within the participating companies and therefore the cluster as a whole entity. Important point is to try to maximize the return rate of investments on R&D (Norwegian Cluster) rather than increasing the investments amounts.

6. Conclusions

The aim of the present report was to present the characteristics of the mapped maritime clusters that have been identified in the participating countries (Spain, Italy, Greece, Cyprus) and compare them to some of the most successful ones at international level (Norway, Denmark, Germany, Japan). Through the analysis, the consortium identified the best practices on international level regarding maritime clusters and defined the prerequisites and the conditions that can lead to successful maritime clusters.

As main benefits of the maritime clusters have been identified the increase in efficiency, the increased level of business formations and, the higher level of research, development and innovation. In order to ensure that those benefits are fully exploited 7 international best practices have been recorded and examined with regards to the current practices the MED regional maritime clusters are performing. Those practices mainly address the geographical scope, the networking dynamics and the budget resources (R&D spendings). However, all practices should be adapted to local conditions, economic data and political environment.