



KNOWLEDGE TRANSFER TO IMPROVE MARINE ECONOMY
IN REGIONS FROM THE ATLANTIC AREA



TRADITIONAL KNOWLEDGE IN ATLANTIC AREA TO SUPPORT MARINE SCIENCES

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Revised by KIMERAA partners.

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Maritime activity sustains the livelihoods, food, culture and identity of many citizens who inhabit the Atlantic Area. **KIMERAA – Knowledge transfer to Improve Marine Economy in Regions from the Atlantic Area** (www.kimeraa.eu) is a European project approved in 2009 by the Atlantic Area Programme, co-financed by the European Regional Development Fund (ERDF). The six partners represent four European countries, with varied histories of traditional knowledge in the maritime economy. Within this partnership, the significance of traditional knowledge areas was examined and presented in the publication 'Maritime Clusters Institutions and Innovation Actors in the Atlantic Area'.

This research was disseminated through the Transnational Event held on 17th March 2011 at Cardiff University entitled Maritime Clusters: Institutions and Innovation Actors in the Atlantic Area. This report, as part of the broader KIMERAA project and in support of this Transnational Event, seeks to provide insight into how traditional knowledge areas are able to support the Marine Sciences and lead to cluster consolidation.

OVERALL CONTEXT

Traditional knowledge areas can be considered as those that are socio-economically significant to a region, and can include shipbuilding, coastal tourism and fishing. Utilising data from the KIMERAA Maritime Clusters document “Maritime clusters: Institutions and innovation actors in the Atlantic Area” it is possible to collate an overview of the active traditional knowledge sectors in the regions of the KIMERAA partnership. See Table 1.

Table 1: Overview of Active Sectors in Partners’ Regions

Active Sectors in Region (up to and including cluster level)											
	Shipping	Ship building	Marine Equip.	Sea ports	Yacht building	Fishing	Navy/ Coastguard	Inland Water	Dredging	Coastal Tourism	Food
MIK	X	X	X	X		X	X	X	X	X	X
Huelva	X	X		X	X	X				X	X
WESTBIC											X
CASS	X		X		X	X	X	X		X	X
UPIN	X	X	X	X		X				X	X
CRIA		X	X	X		X	X		X	X	

This table illustrates clearly that traditional knowledge areas such as shipbuilding, marine equipment, seaports, coastal tourism and food feature widely in all of the regions. However, over the last decade, the global recession, climate change and peak oil have impacted upon the countries in the Atlantic Area in a significant manner, particularly in these socio-economically significant areas. As a result, Governments and researchers alike have increasingly been focusing on how to ensure the continuation of such industries, which often are the cornerstone of a cluster. The presence of a cluster is important to the competitive advantage of a region; Porter (1990) found that location characteristics play an important role in the success of a region's industries. Instead of focusing on factors inside the company, the industry cluster approach suggests "that a good deal of competitive advantage lies outside companies and even outside their industries, residing instead in the locations at which their business units are based." (Porter, 2000, p.16)

In the document Maritime Clusters: Institutions and Innovation Actors in the Atlantic Area, KIMERAA partners identified sectors that were socio-economically significant to the region and those that exemplified growth potential. See Table 2.

Table 2: Partner Cluster Identification

Maritime Sectors	Huelva	Basque Country	BMW	Wales	Norte	Algarve
Shipping						
Shipbuilding		●●				
Marine Equipment						
Seaports						
Maritime Services					●	●
Yacht building						
Offshore services			●	●		
Fishing	●					
Navy/Coastguard						
Inland Waterways						
Dredging&Waterworks						
Coastal Tourism	●●	●		●●		●●
Other ¹			●●		●●	

Legend: ● Growth potential sector ●● Socioeconomic significance sector

Table 1 and 2 can perhaps suggest a profile of the regions that form the KIMERAA project. Whilst all regions feature traditional knowledge industries and marine sciences, the choice that partners made in cluster selection could be seen to show a tendency towards traditional knowledge industries in Huelva and MIK, a tendency towards marine sciences in Westbic, and an even representation in Cardiff, UPIN and CRIA. Interestingly, the Basque Country and Huelva selected what would be considered a traditional knowledge sector as their chosen cluster with growth potential. KIMERAA research illustrated that this was to be achieved through Governmental support and extensive research to ensure the continuing success of these industries.

The interplay between traditional knowledge and marine science is of particular interest in this report, which will continue as follows: the next section will explore through literature review the relevance of traditional knowledge to maritime cluster consolidation in the context of the KIMERAA research. It will discuss how traditional knowledge and research can coalesce to further science and reinforce the existing cluster, particularly following the significant economic shock. Following this, the findings of the transnational event will be presented and finally conclusions will be drawn and indicative lines of action noted.

¹ Westbic 'other for socio-economic example is seaweed based products (beauty & cosmetics); Porto 'other' for socio-economic example is fisheries including fish processing

Relevance of traditional knowledge to maritime clusters consolidation.

This section will look to explore the relevance of traditional knowledge in the consolidation of maritime clusters. In order to ascertain how traditional knowledge can support the consolidation of maritime clusters, it is first important to consider how knowledge is created. Knowledge creation is an activity with a basic element of uncertainty and with an absence of the necessary relevant information to facilitate rational decision-making (Dosi and Orsenigo, 1988). Firms often overcome these uncertainties and absences by developing internal routines and procedures through which they search for possible solutions. These behaviours come as a result of successful courses of action taken in the past, and they will continue to be reproduced and reinforced as long as they seem reasonably efficacious (Nelson and Winter, 1982). These pathways of learning can be viewed as knowledge trajectories.

As a result of these trajectories, a system can become locked in to a path that without a significant external force will not be de-locked and a new path created (David, 2005). In other words, the firm continues to build and consolidate their particular way of operating within their industry. This becomes relevant to the consolidation of regional clusters when we consider that often in marine economy regions there can be a natural resource that is comparatively advantageous. The area may be particularly abundant in fish, or suitable for a large port. However, not all firms within that industry cluster will have the same mode of operation, or have experienced past successes with the same behaviours as others.

Porter (1990) suggested that competitive advantages are created in the interplay between company rivalry, factor conditions, demanding customers, and the quality of related and supporting sectors. Therefore the underpinning of an industrial cluster is the existence of several players in the same or related industries that over time develop strong relations and interdependencies. The simultaneous existence of competition and cooperation is important. (Malmberg and Maskell 1999).

This is evidenced in the research conducted as part of the KIMERAA project by the University of Huelva. A significant socioeconomic sector in the region of Huelva is that of coastal tourism; however, fishing is also a sector of some note that has been identified as an area with growth potential. Research found that the areas that were significant to the fishing cluster in the region were also important to the tourism cluster. The coastal tourism sector, due to its socioeconomic significance is structured in a top-down fashion, with many schemes initiated by Government and Universities in order to facilitate knowledge transfer. This has led to many initiatives that enable knowledge transfer within the coastal tourism sector and supports marine sciences and research. Further to this, it has been identified that many of the actors that are instrumental in the Coastal Tourism sector are also significant within the fishing sector. This has led to a high level of inter-cluster collaboration, with many actors realising that Tourism and Gastronomy are interconnected. In Huelva, gastronomy is based in fishing. As a result of the economic shock, some enterprises are diversifying and working in both sectors.

Polanyi suggests that a great deal of knowledge remains almost exclusively in a tacit form within the individual, the group or the whole organisation (Polanyi, 1962, 1966; Bartlett et al., 1990). However, empirical evidence suggests that at a local level, where firms share the same values, background and understanding of technical and commercial problems, a certain interchange of tacit knowledge does in fact take place (Von Hippel, 1988). Such ability to interchange otherwise purely internal information constitutes an important part of the competitive advantage of spatial agglomerations of related firms and industries (Maskell and Malmberg, 1999). Equally, an underpinning of traditional

knowledge is essential as certain types of knowledge can only be learned through experience (Arrow, 1962) and such knowledge is almost always required before new users are able to utilise any codified knowledge obtained in the market (Foray, 1992).

In this way, two industries that are considered to be traditional knowledge sectors have contributed to the consolidation and continuing success of the maritime cluster in the Huelva region. With reference to Nelson and Winter (1982) the knowledge trajectories of both clusters have encountered the same external shock, the economic downturn, and this has spurred the inter-cluster transfer of tacit knowledge. It could be considered that this shock has supported the marine sciences in Huelva as institutions work collaboratively to ensure the success of the region's new co-evolutionary pathway.

The consolidation of clusters is important to the generation of new knowledge, as some types of knowledge creation depend on a particularly tight relationship between suppliers and customers. This can ensure the necessary smooth exchange of complex information which could be conducted long distance, but in many cases it is less expensive, more reliable and easier to do so locally (Becattini, 1990).

This is further illustrated through the research conducted into coastal tourism in Pembrokeshire, where many of the tourists are British. The local actors have realised that the majority of tourists come to West Wales due to the scenic coastline and the natural environment. As a result, actors in the cluster are interested in conserving the local environment to ensure continued, sustainable business based on the natural assets of the area. This is often done in co-operation with actors that would be considered competitors. Further to this, as part of the Marine Code Group that has been initiated, using local knowledge of the area, members will act for the long-term benefit of the region. One example of this is suspending use of an area when birds are nesting in that particular location.

This sustainable mode of operation had been adopted before the economic crisis. As a result of this the institutions, collaborations and knowledge sharing were already embedded in the cluster with National Government and research institutions facilitating information sharing and learning. This has meant that tourism in the region has been steadily increasing in recent years as local companies have been early adopters and providers of sustainable, natural holidays. In recent years a luxury sustainable Holiday Park was developed that contains state of the art accommodation and is powered predominantly by renewable sources. This park is notable for generating the heat for some of the facilities in an on-site energy centre, which houses two 28-tonne boilers which burn a blend of energy crops grown by local farmers, and woodchip. This biomass is locally sourced and supports the Pembrokeshire farming community in the range of tens of thousands of pounds every month. (Bluestone Website) Further to this, due to previous intensive farming the site was described by a team of botanists from Cardiff University as an 'ecological desert'. There has been a planting scheme which represents a considerable investment in the creation and enhancement of habitats in the local community, which would not have been realised without the development of this Holiday Park.

The increase in visitors has been further consolidated following the recession as more British tourists seek to holiday at home. As a result of this early adoption and increasing tourist numbers, local actors are now in a strategic position to offer training and awareness-raising on the value of conservation and 'green' tourism. Commercial tourism brings in an estimated £350m per year to the region (Visit Wales, 2009) Therefore, whilst much like Huelva, where changes have come about as a result of the economic shock, in West Wales it has served merely to strengthen the chosen knowledge trajectory rather than break a path.

In terms of cluster development, with the aim of conservation, the Pembrokeshire Coastal Forum was created, which is co-funded by both private and public ventures. Significantly, there is a representation of firms involved in the production of both renewable and non-renewable energy. It could be advanced that the traditional knowledge sector of coastal tourism, supported by the marine sciences has brought about further cluster consolidation.

Porter (1990) also called attention to the significance of close contact with a group of demanding and advanced public or private customers. Their needs wholly or partly anticipate the development of the global market with demand primarily functioning as a qualitative factor. It is the contact with advanced customers, expressing sophisticated demands, that is of value in knowledge creation, rather than the quantitative element of easy access to a large market per se. Such advanced customers often tend to be located in the same region as the firm itself (Håkansson, 1982; Lotz, 1993; Dalum, 1995; Karnøe, 1995; Asheim, 1997.)

These customers can be considered to be any of the local actors; the firms themselves as a result of demand for resources or marine research organisations that are asked to create new knowledge to support industry in their region. This was illustrated through the development of aquaculture in Western Ireland. It was identified that following an increasing demand for fish and shellfish, traditional methods were unable to respond to high levels of demand. As a result research was conducted into the development of a desktop computer system that supports operational aspects of aquaculture. Aquaculture is subject to many risks as organisms respond differently to their environment. The computer system enabled growers to access the knowledge of international experts in the field and to run test models of their scenario, eliminating associated risks.

Maskell and Malmberg (1999) argue that these sophisticated demands can even lead to Schumpeterian proportions and 'reforms or revolutionises the pattern of production by exploiting an invention or, more generally, an untried technological possibility for producing a new commodity or producing an old one in a new way, by opening up a new source of supply of materials or a new outlet for products by reorganising an industry' (Schumpeter, 1912 pp. 82 - 83) Indeed, another example of traditional industries or natural assets contributing to marine science can be found in Ireland. In addition to developments in the aquaculture sector, seaweed is being utilised to produce cosmetics, with Research and Development of the products being conducted locally in the Irish Seaweed Centre.

Friedrichs (1993) in proposing a theory of urban decline gives several examples of how a resistance to change on the part of corporate management and trade unions when previously dominating industries are in decline can prolong the period of crisis. Therefore the ability of traditional knowledge sectors to support the marine sciences can have a significant impact on the consolidation and continuation of a regional cluster.

Findings from Transnational Event

The transnational event at Cardiff University provided a platform for the KIMERAA partners to disseminate their research to the wider audience of academics, policymakers and key stakeholders in Wales. Dissemination of research on traditional knowledge was completed during the first session of the event with the marine services content being the focus of the second session. The event was opened by Professor Philip Cooke, Cardiff University, who presented an overview of the KIMERAA maritime clusters. Professor Cooke's presentation entitled 'Maritime Clusters and Knowledge Transfer: An overview of the Atlantic Area', highlighted the global stressors on the maritime economy in the Atlantic Area alongside the positive responses to these 'stressors'. These stressors encountered by the maritime economy included the global recession, reliance on peak oil and climate change. His presentation took

these stressors and, with the background information provided by the maritime clusters report, turned them into areas for increased policy development. The main findings for policymakers was the emphasis on increased knowledge transfer between Universities and the maritime economy as well as the need for further links developed between the traditional and marine sciences.

Beyond Professor Cooke's opening presentation, the presentations given in the 'Traditional Knowledge in the Atlantic Area to Support the Marine Sciences' used the research conducted for the maritime cluster report, mainly for the socioeconomically significant example, to highlight any ongoing or potential collaboration between the traditional sectors and the marine science sectors. The remainder of the section will review the presentations given in this session.

1. 'Storytelling as a Tool to Manage Tacit Knowledge from Fisherman in the Marine Sector' by the MIK Partners

Storytelling can be used as a narrative to share tacit knowledge transfer encounters. Storytelling combines techniques to involve, to compromise and to inspire people using a more authentic knowledge: powerful to transmit the meaning of concepts without committing the error of defining them.

Most of the experiences in the marine sector over the last century are contained within the individuals working in the sector, such as fishermen in the Basque region of Spain. The best practice to capture tacit knowledge from people is the master-apprentice figure. Unfortunately, this type of practice involves a huge amount of resources. This is where the narratives or storytelling technique makes sense to explain the events occurring in the sector. We can have people with key and relevant knowledge from the marine sector sharing, socializing and creating knowledge within a reasonable cost/benefit ratio, and this way avoiding the risk of escaping knowledge of the sector.

2. 'The Important of the Sea in the Littoral Localities Economy: The concrete case of the relation between the Atlantic Ocean and Huelva' by the University of Huelva Partners

Relating to the main aim of the KIMERAA project- *Knowledge transfer to Improve Marine Economy in Regions of the Atlantic Area*, the University of Huelva has conducted intensive research in relation to the marine economy in the Province, a littoral region with more than 120 km of coast, to find the most important economical activities in relation to the sea. We continue to contribute to the progress of the regional economy in a region like the Atlantic Area, transferring knowledge, apart from finding innovation actors to create linkages between firms and scientific communities, focusing in marine sciences in scientific and technological networks.

We have to stress that we have found that the economy in Huelva is extremely connected to the sea through the different marine clusters: fishing, coastal tourism, seaports, shipping, shipbuilding, canned and salted fish industry, fish farms, research, education, industry, marinas, maritime sports, salt mines; however, only in fishing and coastal tourism was their significant knowledge transfer amongst the actors in the maritime economy.

3. 'Structuring a Sea Cluster in the Algarve: Contributions from the Innovation Actors Interviews' by the University of the Algarve Partners

This presentation was dissemination of research carried out at the University of the Algarve on the knowledge transfer between the innovation actors in the region for the KIMERAA report. While the data collected for the KIMERAA report was used extensively in the report, the basis for this presentation was advanced analyses of this data explaining the knowledge transfer amongst the actors through social network theory and analysis.

This session of the event finished with the signing of the ENKTAA agreements by the representatives from each of the partner organisations within KIMERAA.

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