



SELECTED PROCEEDINGS

THE PARTLY FORGOTTEN HINTERLAND LOOK OF THE “WITHIN THE COLUMNS” SEA PORTS

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ABSTRACT

Since the ancient times, the ports of the Mediterranean (the “Middle Sea” for the ancient Egyptians or the “Sea within the columns” for the Romans) have played a major role in the development of regional and intra-regional trade. Early examples of their gateway role, and the main characteristics required for sustaining such a role, can be found in the works of the Greek historian, philosopher and geographer, Strabon. With the emergence of globalisation and the evolution of containerisation, for many Mediterranean Ports (Med ports) the gateway function took a second role in their agenda, with their main focus directed towards intercontinental and transshipment maritime flows. However, the ongoing financial crisis is urgently forcing Med countries to reassess their export strategies, using ports as a major leverage. Within this environment, the present article reports on the findings of the MED Backgrounds project, aimed at identifying key obstacles and providing strategies and tools for facilitating the integration of production clusters around Med ports, to the global markets.

The methodology employed comprises of four interconnected components:

- the empirical investigation, incorporating studies, surveys, case studies, work shops and experts meetings, related to the regional production clusters and the Med ports serving them (e.g. current level of integration, customer

requirements, obstacles, export destinations, maritime/port services’ supply vs demand, etc.);

- the Med trade-transport data integration, incorporating fragmented trade and transport information and facilitating transport mode/route decision making;
- the macro-corridor modelling, identifying major currently used corridors for Med exports, and proposing alternative ones based on the total cost concept and the environmental footprint assessment;

The data on which the results of this paper are based, are derived from 5 Med countries and from the active participation of 7 major ports and several port-using organisations.

The results of the project take into account the variety of port – hinterland integration levels, business needs, and operational capabilities along the Mediterranean coast. This variety is addressed by the Backgrounds project through:

- the provision of actor-validated proposals for achieving better integration between Med ports and their regional production clusters, involving actions in relation to port governance, maritime-rail organisational/operational integration, and information technology employment
- the provision of a GIS tool, incorporating fragmented trade and transport information along the Med and facilitating transport mode/route decision making.

The analysis undertaken indicates that a large part of the obstacles experienced in integrating Med ports to their regional production clusters have a strong policy denominator. The same applies to the Med countries’ needs for facilitating exports and strengthening their regional economies especially under the current critical - due to the financial crisis - circumstances. The list of initiatives proposed in this article, highlights quite vividly the areas of maritime/ports policy where significant gaps still exist between East and West Med and also between the Med and Northern Europe (N.EU). These are the areas where additional efforts should be directed to.

Keywords: Mediterranean Ports, port competitiveness, production clusters

INTRODUCTION

Mediterranean Ports: a view from within

Since the ancient times, the ports of the Mediterranean Sea have played a catalytic role in the development of regional trade. The Mediterranean Sea (the “Middle Sea” for the ancient Egyptians or later the “within the columns Sea” for the Romans), being a prosperous basin located at the crossroad of Europe, Asia and Africa, offered great opportunities for developing trade activity among coastal countries. As G.W.F.Hegel in “The Philosophy of History” characteristically mentions, *“for the three quarters of the globe, the Mediterranean Sea is similarly the uniting element and the centre of World History”* [Georg Wilhelm Friedrich Hegel, 1st ed. 1899]. Thereby the development of major Mediterranean cities is substantially linked to the development of the corresponding sea ports since the latter traditionally represented focal points for the exchange of goods, services, ideas and cultural heritage.

Over the years, the world trade profile changed. With the emergence of globalization and the evolution of containerization, Med Ports started changing their orientation and from gateways of local trade started focusing on the global supply chain. In several cases this modification lacked of a rational development plan based on their real strengths and weaknesses and often even neglected in a sense the initial role of their establishment namely to serve local production clusters needs. On the other side, the Northern European Ports, having realized earlier the changes underway in the global maritime sector (e.g, the future impact of containerisation) started investing heavily in creating a powerful transportation channel consisting of both efficient operating hubs and excellent hinterland connections [Giovanni Ridolfi, 1999]. They actually managed to attract even the lines serving the Asia – Europe trade by creating a powerful and reliable profile in the operators’ eyes.

The above advantages of N.EU ports were further supported by the Mediterranean ports appearing far from being competitive due to a series of constraints. Operational, managerial and institutional issues led to critical situations in Med Ports [Giovanni Ridolfi, 1999] deterring them from being flexible and adaptable. Some of the Med ports’ major drawbacks were (and unfortunately to some extent still are) linked to the strong involvement of the public sector in their operation and management translated into lack of adequate business orientation, respectively low quality of technical equipment, ineffective port – hinterland connections limited penetration of new technologies in ports’ operations [Giovanni Ridolfi, 1999]. Further to the above, the increased traffic among a reduced number of ports, administrative related delays, overcomplicated regulations concerning port services, time loss due to the involvement of different agents and so much more created a picture of instability and inefficiency regarding Med Ports degrading their role within the global transport and trade network in the period prior to 1990’s [Giovanni Ridolfi, 1999].

The radical changes over the past decades in the global scene and the emergence of new economies and industrial powerhouses such as China (Figure 1), India, Korea and Taiwan, opened the floor to new opportunities for Med ports in improving their competitive position towards the N.EU ports and capturing larger market shares.

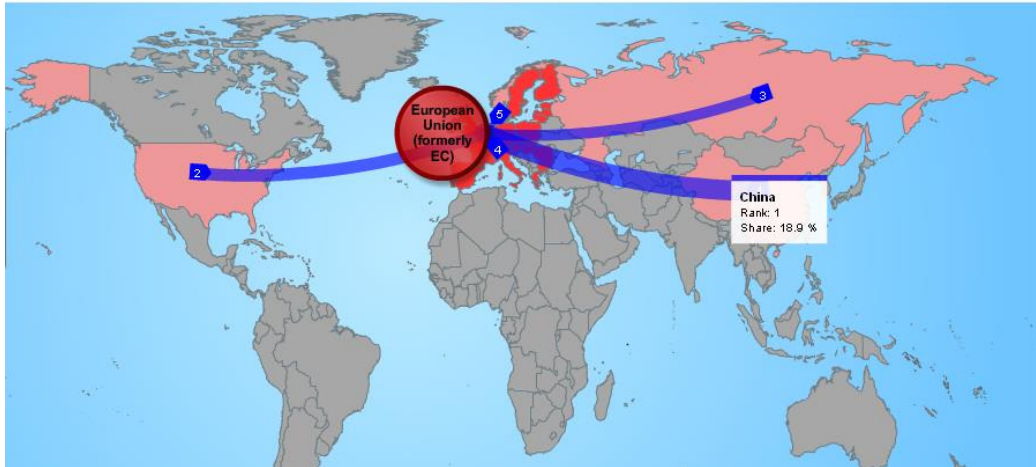


Figure 1: Top 5 trading partners of Europe (1. China, 2. USA, 3. Russia, 4. Switzerland, 5. Norway), WTO

Reshaping however the current situation seems today difficult, considering also the foreseen trends, although not impossible. According to the recent study of NEA's [NEA Report, October 2011], only the 25% of the total cargo volume is unloaded in Med Ports, trend that, based on the same study, is expected to continue also in the future. To confront this situation the Mediterranean basin must gain a new dynamic and be transformed into a significant link of global transport and supply networks.

Taking advantage of the support that European Union places at Med regional development, the involved actors in transport and maritime sector have to enter dynamically the world trade arena. Maritime transport plays a pivotal role in European economic development and investments in ports enhancement are considered necessary in order to achieve an effective transit from sea to inland transportation [Maria Helena Martins & Ana Filipa Prata, 2010]. Trying to broaden European's policy for enhancing maritime transport sector also to the Mediterranean basin, EU launched at 1995 the Barcelona Process aiming to pose the foundations of a strong cooperation between core European countries and Mediterranean ones so as to achieve mutual benefits for both sides [the so- called “Barcelona declaration”¹]. Barcelona Process gave place to the Euro-Mediterranean and the Union for Mediterranean (UfM) [Euro-Mediterranean Partnership (EUROMED)] continuing the initial purpose of promoting economic development and improving prosperity in Med countries. In parallel initiatives such as the Euro-Mediterranean Free Trade

¹ Barcelona declaration was adopted at the Euro-Mediterranean Conference - 27-28/11/95. It is the founding act of a comprehensive partnership between the European Union (EU) and twelve countries in the Southern Mediterranean aiming to turn the Mediterranean into a common area of peace, stability and prosperity through the reinforcement of political dialogue, security, and economic, financial, social and cultural cooperation.

Agreement (EMFTA) highlighted the importance of the area for the EU external trade trying to further support the already established relations supporting free movement of goods, services, and capital within special developed free trade areas. The EU continues to support Med area development throughout initiatives such as the Motorways of the Sea, the development of TEN-T network including key Med ports as well as EU funded research through programmes such as the INTERREG MED, ENPI MED, FP7, Marco Polo etc.

The above can set the scene for a new dynamic of Mediterranean that currently witnesses the marks of an intense economic crisis encountered in most Med countries. Turning this weakness into strength is a challenging and well promising task.

Scope of the paper

The objective of this paper is to examine the key obstacles deterring the development of Med Ports in serving local trade needs and their further integration in the global trade setting.

The analysis is based on the results of the Interregional Cooperation research project Backgrounds “Improving Production Clusters Accessibility to Global Market” which through a dedicated set of surveys, analysis and also the development and exploitation of IT tools, examined solutions targeting to a better integration of existing market poles with their own territories and the relevant production clusters, though the increased use of Med ports.

The key issues discussed in the next paragraphs are based on a dedicated analysis of a wide range of Mediterranean Ports that varies from well established gateway ports such as the ports of Marseilles, Valencia and Liguria, to smaller ports serving dedicated routes and cargo categories (such as the Ports of Palermo, Patras) and on their respective hinterland / catchments areas².

Starting from an in depth analysis of the current trade and transport profiles, the current status of ports is assessed in terms of hinterland accessibility and maritime connectivity. Based on dedicated surveys to the main productive clusters established within the examined ports catchments areas, the paper presents the major constraints hindering the development of Med ports both in terms of their integration to global transport chains as well as their role within the regional transport networks. Moving one step further, and through the exploitation of dedicated IT tools, the research concludes to a set of proposed solutions and policy recommendations to

² *As ports hinterland area or Catchment Area was defined the area that covers a radius of around 200km from the examined port*

reverse the existing situation and move forward to the better integration of Med ports into the existing regional as well as global supply chains.

METHODOLOGY AND PAPER STRUCTURE

The analysis was based on a three step methodology starting from a mapping of the current situation in Med ports (Figure 2) and focusing on the identification of the major criticalities and recorded needs of Med ports towards serving local production needs and increasing their penetration into the globalised supply chains.

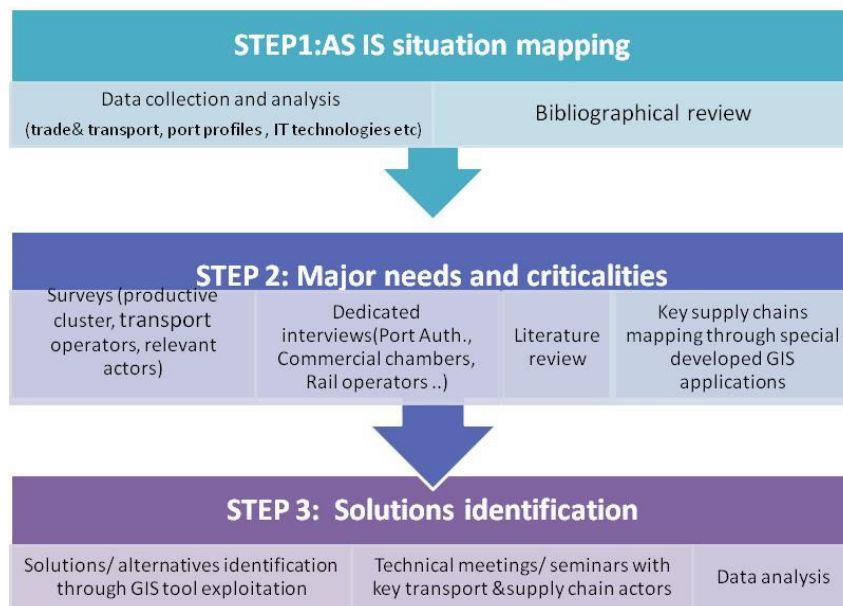


Figure 2: Methodological Approach

The mapping of the current situation was based on the Porter’s 5 competitive forces model [Michael E. Porter] adjusted for the needs of the current research. To this end, the AS IS situation was examined around 5 key elements – forces (Figure 3) that deter the attractiveness of the Mediterranean Ports.

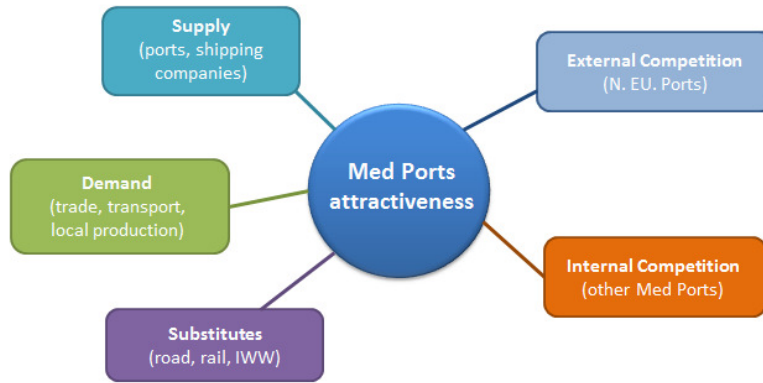


Figure 3: Key competition forces in Med ports

Source, [Michael E. Porter], adjusted for the research needs

The above figure depicts a categorisation of the major forces that affect the attractiveness of a port. In more detail:

- The policy followed by each port, its internal characteristics (size, depths, possibilities for inland expansion, geographical position, level of hinterland accessibility, ICT exploitation etc), development plans, bilateral agreements with shipping companies – form the “supply” force. For the Mediterranean ports network, the supply side was examined in terms of nodes (namely ports and their related service profiles) and links referring to maritime as well as hinterland network connecting ports among them and with their catchments areas
- The “demand” force affecting port’s attractiveness is defined by the trade needs and the general setting of the global supply chain. In the specific case demand was examined in terms of current trade relations among the examined countries and also through the identification of the local production needs revealing an existing market that is currently not served by the ports due to a series of constraints / bottlenecks.
- The competition from other modes of transport that can “substitute” maritime transportation (e.g. road transportation instead of SSS). Within the analysis framework, the available hinterland transport networks were assessed in terms of the individual strengths and also weaknesses of each transport mode (road, rail)
- The internal competition that refers to the competition among Ports in the Mediterranean Basin and/or
- The external competition, which in the examined case is mainly caused by the N.EU Ports that are currently the main poles attracting global flows of maritime trade.

To identify the main constraints and bottlenecks in increasing the attractiveness of Med ports a focused approach was followed through a series of targeted actions such as surveys, experts meetings, dedicated interviews etc aiming to capture the

views of the different stakeholders involved in local trade (eg local production clusters, ports, transport operators, businesses associations, shipping companies etc). The results of the first two steps are presented in the next chapter.

Finally, the last step was dedicated to the identification of different scenarios and policy proposals to overcome the identified constraints and strengthen Med ports competitive position, developed through the exploitation of ICT tools, analysis and strong participation of key trade and transport stakeholders. These, along with some main policy recommendations resulting from the assessment of the scenarios developed through dedicated technical meetings with key actors/ stakeholders are presented in the final chapter of the paper.

IDENTIFYING THE DRAWBACKS IN MED PORTS

As already stated in the introductory chapter, the main research question that this paper addresses concerns the identification of the key bottlenecks for increasing the integration of the Med ports to its surrounding production clusters and thus, enhancing their attractiveness and further development. In order to identify the major parameters deterring the use of Med Ports from local exporters the following methodological components were employed:

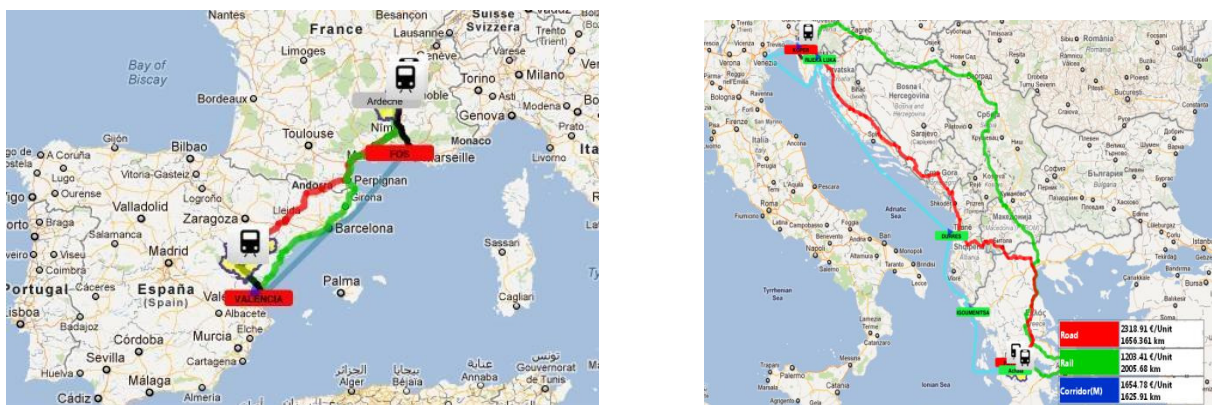
- empirical investigation, incorporating studies, surveys, case studies, work shops and experts meetings, focused on the regional production clusters and the Med ports serving them (e.g. current level of integration, customer requirements, obstacles, export destinations, maritime/port services' supply vs demand, etc.);
- Med trade-transport data integration, incorporating fragmented trade and transport information and facilitating transport mode/route decision making;
- macro-corridor modelling, identifying major currently used corridors for Med exports, and proposing alternative ones based on the total cost concept

Main outcomes of the empirical investigation

The empirical investigation was implemented through a series of surveys to the production clusters and the main transport and trade actors operating within the catchment areas of the 7 ports under examination. Local exporters, production clusters and transport operators, representing the demand side, were the first approached, since they could depict the real weaknesses and needs of Med Ports. Following this, representatives from Port Terminals, Port Authorities and other relevant bodies (e.g. Chambers of Commerce, Railway Operators, Shipping agents etc) were interviewed so as to capture their perception about threats and

*The Partly forgotten hinterland look of the “within the columns” Sea Ports
GAGATSI, Eliza; MYROVALI, Glykeria; AIFADOPOULOU, Georgia; HALATSIS, Aristos*

opportunities and their future plans that could alleviate existing problems at the current Ports – Customers relationships. The key question posed to the respective groups concerned the reasons they prefer or not the use of a specific Med port for exporting their cargo. The research focused on products originated from the catchment areas of the 7 examined ports and, further to the above key question, also examined the whole supply chain structure in terms of different transport modes used, most preferred transport alternatives and key characteristics such as transport cost, type of vehicle used etc. The information collected was elaborated through a special developed GIS based application³ that was used to identify the currently existing and potential macro – corridors, defined as the alternative ways (both unimodal and intermodal corridors) to export cargo from an origin to a cluster of neighbouring destinations.



Figures 4: Examples of existing and potential macro-corridors for products originated in the Catchment Areas of the ports of Marseilles (France) and Patras (Greece)

Source, Backgrounds project, GIS tool

Examining a wide range of Med Ports, from the largest and most advanced to the smaller ones offering more dedicated services, the research confirmed that in several cases, the ports do not attract the majority of the exported cargo from their catchment areas due to the following reasons:

- a) The **wide use of road transportation** even in the cases where maritime alternatives exist. Road transportation is preferred due to a series of reasons such as the door to door delivery of goods, the seamless transportation, the service flexibility and also the short travel duration. Maritime transportation, although in many cases proven advantageous in terms of cost and environmental impacts, was insufficient in reversing this situation, due to the longer total trip duration, as a consequence of the long transshipment process and the low frequencies of the maritime services. A characteristic example is the connection between the ports of Genova and Valencia. The duration of this trip varies from 20 hours (estimated duration for road transportation) to 48 hours (by sea) while the estimated cost for the same trip varies from 1660 € to

³ <http://www.backgrounds.imet.gr/>

834 € respectively [Backgrounds project⁴]. The cost advantage of maritime transportation is obviously not enough to counteract the longer lead time. As far as the environmental cost is concerned, this hardly enters the equation. As it is obvious from Figure 5, the environmental costs (in terms of CO2 emissions) for one TEU transportation from Thessaloniki’s to Ravenna’s Port are significantly reduced in the case of maritime transportation compared with the monoroad alternative. [Backgrounds project⁵]

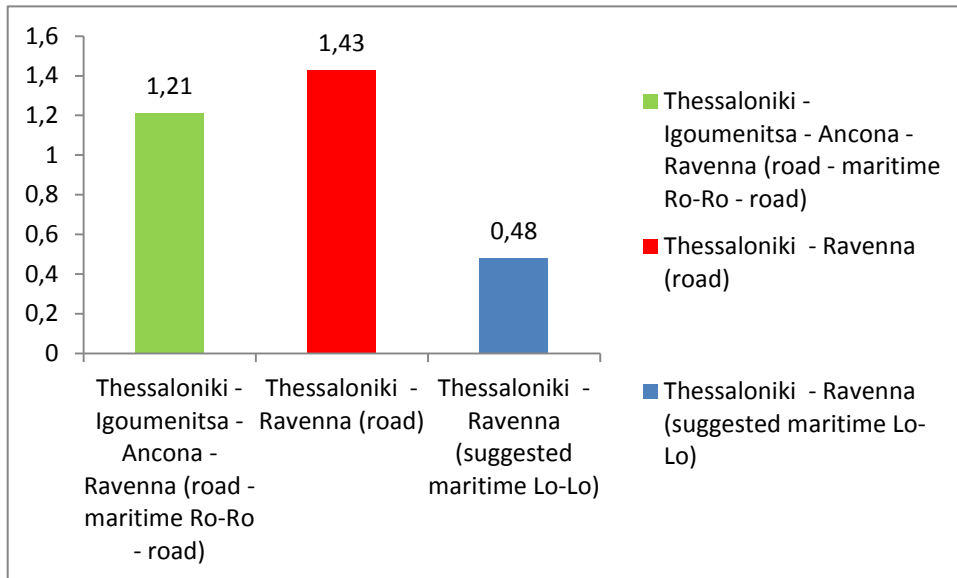


Figure 5: CO2 emissions (tn/route for 1 ISO container), 1 TEU transported from Thessaloniki’s Port to Ravenna. (calculated with CORINAIR/EMEP 7 methodology)

- b) Additional reason for selecting road instead of maritime transportation is the well developed road network of the ports hinterland areas and their good access to international road networks. For example, in the case of the Port of Marseille Catchment Area, most of the CA exports are not performed via existing maritime connections; only 1/3 of the exported cargo to Spain is transported through the port of Marseille since, due to the vicinity of the regions, road transportation is preferred. [Backgrounds project, HIT’s Final Report of Component 4]
- c) The constraints posed by the **limited maritime connectivity** as concerns the connections among West and East Mediterranean Ports. There are major differentiations among the West and East Med Ports regarding the number of direct maritime connections. The connectivity between West Med Ports (such as Genova, Valencia and Marseille) is significantly better compared to the one of their Eastern counterparts (Thessaloniki, Patras, Koper, Palermo). Following the connectivity analysis implemented for the scope of the research, Genova is ranked first on the number of connection, a trend that has not been

⁴“Establishment of a Network model of Sea Roads and Intermodal Interconnections with the involved territories” , D4.1-4.4, Project BACKGROUNDS, CERTH-HIT

⁵ “Evaluation of possible scenarios for intermodal systems testing the development models” , D5.5, Project BACKGROUNDS, CERTH-HIT

changed since 2006. According to the data integrated within the Backgrounds GIS tool (2011) Genova, Marseille and Valencia attract most of the maritime connection within the examined area.

The second important outcome of the analysis concerns the way that trade within the examined area currently takes place. According to the macro-corridors analysis, the transport chains mainly used between the catchments areas of the examined Ports and other European destinations are not always the most efficient ones, even if maritime transport is employed. An indicative example is the currently used maritime based intermodal corridor for connecting North Greece with France. In the specific example the identified macro-corridor for connecting a certain production originated within Thessaloniki's port catchments area and a destination in France was a long maritime route that crosses all the Mediterranean basin, passes through Gibraltar and reaches the final destination through one of the large North European ports-terminals (eg Zeeburgee, Rotterdam). The average travel time of this route was around 7 days trip by sea and half day land transport. [Backgrounds project, HIT's Final Report of Component 4]. In the case where the port of Marseille was used instead of Zeeburgee or Rotterdam, a more rational intermodal transport option could be adopted requiring a 3 days trip by sea and half day land transport until final destination.

The macro-corridor analysis also confirmed that in many cases, the negative impacts on serving the export needs of the local companies was related to **problems identified in railway services and infrastructures**. Such problems are met even in the cases of the large and well developed Western Mediterranean Ports (Ports of Valencia, Genova etc). In the case of Thessaloniki Port several enterprises connected to the port via rail network, reported no use of intermodal rail-maritime transport solutions due to the low quality of the existing railway service [G. Aifandopoulou, E. Gagatsi, G. Myrovali, 2012]. And this, at the same time that road congestion incidents are common phenomena in almost all ports, among which large ones such as Valencia, Marseilles and Genoa.

Furthermore, the research confirmed once again the fact that global flows are mainly attracted by the N.EU Ports. For example, according to the surveys undertaken at the production clusters established in the catchment area of the port of Marseilles, the Northern European Ports are preferred by the exporters since they serve more destinations primarily in America and even in Asia, they offer higher quality of service, and they provide developed logistic services based on a trimodal hinterland distribution network (fluvial, road and rail). [Backgrounds project, Survey results, Report on Component 5]

Another important category of problems identified, is related to the low cooperation among relevant stakeholders in the supply chain (e.g. lack of synergies between production clusters and Port Authorities, low cooperation among exporters in order to

achieve economies of scale, low cooperation also between Port Authorities and Rail Operators that serve ports).

Last but not least, administrative constraints and low exploitation of innovative systems (such as complex custom procedures, lack of single windows exploitation and inexistence of cooperative IT platforms that facilitate procedures) were mentioned by major Med Ports (Marseilles, Genoa, Valencia, Koper, Thessaloniki) as common missing components to their efficient operation.

READJUSTING THE HINTERLAND LOOK OF THE MED PORTS

The critical assessment of the aforementioned parameters hindering Med Ports' integration to their regional production clusters was used to formulate a series of key proposals for reversing the situation. The results of the research, presented in the form of proposals in the next paragraphs take into account the variety of port–hinterland integration levels, business needs, and operational capabilities along the Mediterranean coast. This variety was addressed by the Backgrounds project through:

- the provision of actor-validated proposals for achieving better integration between Med ports and their regional production clusters, involving actions in relation to port governance, maritime-rail organisational/operational integration, and information technology employment and
- the provision of a GIS tool, incorporating fragmented trade and transport information across the Med and facilitating transport mode/route decision making.

Following the above, four main categories of proposals were formulated for the examined cases of the 7 Mediterranean port- catchment areas systems, focusing on:

- IT exploitation for alleviating current constraints
- new maritime services within the Mediterranean for increasing chain efficiency and strengthen Med ports compared to their competitors, N.EU terminals
- cooperation schemes among stakeholders in the supply chain and development of synergies
- new infrastructure development / existing infrastructure upgrade

Each of the above proposals aims to address one or more groups of main criticalities/ constraints identified at the previous phase of the analysis. Table 1 below, presents the key criticalities/ constraints that each proposal (proposed solution) aims to address, while Table 2 interrelates each proposal to the Med ports under examination.

Table 1: Major criticalities and proposed solutions

*The Partly forgotten hinterland look of the “within the columns” Sea Ports
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Proposed solutions / Criticalities	IT exploitation	New maritime services (more destinations served)	Cooperation schemes and development of synergies	New infrastructures development
Road dominance even in cases there are maritime alternatives			✓	
Limited connectivity between East and West Mediterranean		✓		
Road congestion at ports' gates	✓			
Missing or low quality of ports' rail service	✓		✓	✓
Competition from Northern European Ports	✓	✓	✓	✓
Low cooperation among involved parties	✓		✓	
Low use of new technologies	✓			
Administrative constraints	✓			

Table 2: Proposed solutions per port

Proposed solutions / Ports	IT exploitation	New maritime services (more destinations served)	Cooperation schemes / Organizational interventions	New infrastructures development
Port of Thessaloniki		✓	✓	✓
Port of Patras		✓	✓	✓
Port of Palermo	✓	✓		✓
The Liguria port system of (Genova, Savona and La Spezia)	✓		✓	✓
Port of Koper	✓		✓	
Port of Marseille	✓			✓
Ports of Valencia	✓			

Source: [Backgrounds project, Survey results, Report on Component 5]

The exploitation of IT systems is considered among the most important measures to be taken by Med Port Authorities in order to improve, facilitate and accelerate port's daily operations.

The 4 main categories of proposals are described in the next paragraphs.

Investing in Technology

The exploitation of ICT systems appears as one of the most promising solutions able to confront more than one criticalities, mainly related to congestion at the examined ports and, to facilitate the effective organization of the intermodal supply chains inside the catchment areas. The proposed solutions of five out of the seven examined ports-catchment areas (namely the ports of Palermo, Genoa, Koper, Marseille and Valencia) were Information and Communications Technology (ICT) oriented concerning:

- ICT technology for alleviating congestion, though improved planning and management of the different port operations. Indicative example were the ports of Koper and Genoa, where congestion at the port gates is a common issue. In this case, ICT tool for planning truck loading / unloading (such as the employment of a truck appointment system) was identified as a promising alternative. Taking into consideration theoretical models and ICT solutions already implemented in other ports around the world to address port congestion issues, the research proposed two conceptual models, both at the basis of a port community system which is a real-time Internet-based system integrating the various port stakeholders (freight forwarders, maritime transport operators, customs, rail operators, dry ports/inland terminals, managers of the road network, etc.) with the ultimate objective of reducing port congestion.
- ICT applications for cargo tracking and tracing facilitation (in maritime transportation as well as in cooperative systems eg ICT for managing rail-port operations) and administrative processes simplification (port single windows, e-platforms etc).
- ICT based systems supporting the coordination of export activities. Through the development of platforms or the enhancement of already existing ones (such as the B2B marketplace initiative developed by the Northern Greek Exporters Association – SEVE that coordinates in a sense Greek exporting activities), producers can create a strong network whereby can support cargo clustering and achieve economies of scale in their activities. Critical mass can be achieved, something quite important for the enhancement of maritime transport and the negotiation of lower transport rates from freight forwarders, for the benefit of producers.
- ICT port-rail integration, by developing an ICT application for electronically sharing pre-announcement information, on containers to use the combined port-rail service, among the shipping agent, the port, and the railways. In this way the port will be able to better manage its resources (e.g. personnel and

equipment for internal container movements) and the railways will be able to ensure rolling stock availability.

Strengthening maritime connectivity within the Mediterranean

The second type of proposals was oriented towards strengthening maritime connectivity in the Mediterranean basin through the establishment of new maritime connections.

One of the reasons that N.EU Ports are more preferred than Med Ports, as identified from the surveys, is their high integration to the global maritime networks. The entrance of Med Ports in global routes (via new maritime links) will undoubtedly upgrade their profile and attract more customers. From the other side, the maritime connectivity within the Mediterranean has to be enhanced; East and West Med are not strongly connected, a fact that results in selecting road transportation when exporters from the one side of the Med want to ship their products to the other side.

The lack of East – West Med direct connections was one of the main reasons leading to the previously mentioned inefficient -in terms of duration- macro-corridor for connecting Thessaloniki to France. To the specific example, the identified macro-corridor for connecting a certain production originated within Thessaloniki’s port catchements area and a destination in France was a long maritime route that crosses all the Mediterranean basin, passes through Gibraltar and reaches the final destination through one of the large N.EU ports-terminals (eg Zeeburgee, Rotterdam). The average travel time of this route was around 7 days trip by sea and half day land transport.

To address this issue, the establishment of a direct maritime service connecting the ports of Thessaloniki and Marseilles was proposed, aiming to examine whether such solution could comprise a feasible and viable maritime based alternative that could reduce trip duration and increase the use of Med ports (eg the port of Marseilles) instead of N.EU terminals.

Improved cooperation among main supply chain actors

The need for improved cooperation among the different supply chain actors is one of the messages derived in different phases of the analysis. Different types of cooperation schemes were proposed, among them:

- cooperation schemes among local producers / exporters such as the cargo clustering concept, set to achieve better conditions for cargo transportation including reduced tariffs or exploitation of alternative, to road transport, intermodal options for exports. One of the most crucial elements for the

selection of the transport modes used within the final chain, is the total cost of each unimodal/ intermodal alternative. The survey to the local production clusters revealed that in most of the cases *the companies do not have the full control of their transport chains* since they are *strongly dependent upon the Logistic Services Providers (LSP’s)* which usually undertake the implementation of transportation. This leads to additional costs and lack of flexibility concerning the selected modes of transport. *A more active role of the SMEs* could play a catalytic role in identifying the main bottlenecks towards using the local sea gates as export points and lead to more cost effective solutions. Cargo clustering among companies with neighbouring exporting destinations might also comprise a promising alternative for achieving lower transportation costs.

- cooperation schemes among ports and regional business structures (eg Chambers of Commerce or production clusters’ representatives) for improving interaction of local demand (export companies) and supply (ports and maritime connections) and lifting existing barriers that limit the use of ports as regional export gateways. The research revealed that, in many cases, the ports’ development plans do not sufficiently take into consideration the local production needs as well as the export potential. In the case of the Greek ports for example, the main priority concerns to *the development of large investment projects* (such as the construction of the 6th pier at ThPA) expected to attract global flows and upgrade the port’s role. However, local production and export clusters have different priorities and expectations from the regional sea gates. Indicative examples comprise the provision of specialised services (eg frozen goods storage etc), high reliability and continuity of services (eg 24hours custom operations, no strikes etc) and reduced tariffs. To this end, the port community needs to come to an open discussion with the local production clusters with ultimate aim to strengthen the existing co-operation and address the key factors hindering ports from becoming local trade gates.
- cooperation also refers to bilateral agreements between ports and transport services’ providers with special emphasis on the railway transportation that was clearly highlighted as the missing or weak link in almost all cases.

Further to the above, the implementation of a common policy framework supporting the cooperation among stakeholders in the Mediterranean basin and the development of synergies among Port Authorities and between exporters as well, can promote maritime transport (and limit the role of road transportation that presents large external costs) and upgrade Med Ports’ status.

As verified also by the current research, Mediterranean Ports do not present high level of specialization; thus all ports serve a grand variety of cargo categories (Ro-Ro, containers, bulk and general cargo and either passenger traffic). However, this concept of “*all purposes ports*” may act as a deterrent factor for further development in the special case of Med Ports mainly due to the very dense port network and to the turbid regime of policy making decisions in Med countries. Serving all types of cargo without following a consistent development policy based on the real strengths of each

port individually would probably result in an unnecessary waste of funds and of productive resources.

Investing in infrastructure development/upgrade

An additional set of proposals concerned port-related infrastructural projects (such as the construction of new piers able to serve bigger vessels, logistics areas, warehouses etc) and port hinterland connections, with main point of reference the improvement of railway accessibility.

The poor characteristics and operational inefficiencies of the rail network in almost all cases hinders the actual implementation of intermodal solutions. According to the research results, the large Western and Central Med ports (namely Genoa, Valencia and Marseille) are better connected with the national railway networks than the Eastern Med ports. However, in all cases, different problems are reported concerning rail transport (related either to lack of infrastructures or to the low quality of the services provided). Investing in new infrastructure is considered a key priority for almost all cases examined, although the current economic conditions cannot support such decisions. This was also the common sense among the experts mobilized for the evaluation of scenarios proposed. For the time being, the development of cooperation schemes and the exploitation of ICT systems facilitating daily procedures in ports operation and also in exporters' coordination are considered as the most viable measures for the strengthening of the exporting activity via Med Ports.

Implications for further research

The work undertaken in the Backgrounds project has triggered a need for further research in the following areas.

First, during the project it became evident that the environmental impacts still play a very limited role in selecting transportation (uni- and inter-modal) solutions in the Med. As this role gradually becomes more profound, one can expect to affect the level of integration between the Med ports and its local production clusters. The GIS tool developed within the Backgrounds project, besides the monetary cost of alternative macro-corridors, is able to calculate an overall environmental cost for each one based on average emissions standards. Further research however is required for adapting and incorporating into the GIS tool emerging approaches for the estimation of this environmental impact.

Secondly, the development of the GIS tool that consolidates all trade and transport data from the Mediterranean basin proved the need for establishing a Mediterranean

Observatory. Such an observatory will collect and analyzing trade and transport data, providing a solid base to exports-related policy making.

Thirdly, the research undertaken indicates that a large part of the obstacles experienced in integrating Med ports to their regional productive clusters have a strong policy denominator. The same applies to the Med countries' needs for facilitating exports and strengthening their regional economies. Identifying ways by which, further integration of these policies could be achieved, is also an important target of further research.

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