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SWOP REPORT WITH MAIN FINDINGS AND RECOMMENDATIONS ON INTEROPERABILITY

October 2004
INDEX

0. INTRODUCTION .......................................................................................................................... 3
1. SHORT REVIEW OF THE RELEVANT LITERATURE ................................................................. 5
2. METHODOLOGY ........................................................................................................................ 9
3. DESCRIPTION OF THE MODEL .................................................................................................. 11
4. THE EXTERNAL ENVIRONMENT: OPPORTUNITIES AND THREATS FOR THE MAGHREB COUNTRIES ........................................................................................................ 13
   4.1. THE BARCELONA PROCESS AND THE TRANSPORT POLICY ............................................. 13
   4.2. THE ARAB MAGHREB UNION (AMU) ............................................................................. 16
   4.3. THE MAGHREB TRANSPORT SYSTEM ............................................................................ 17
      4.3.1. Maritime traffic characteristics .................................................................................. 18
      4.3.2. Ports and maritime transport ..................................................................................... 19
      4.3.3. Customs procedures ................................................................................................... 21
      4.3.4. Shipping services ....................................................................................................... 22
      4.3.5. Land transport characteristics .................................................................................. 24
   4.4. DEVELOPMENT PERSPECTIVES OF THE MAGHREB TRANSPORT SYSTEM ............. 30
5. THE STRENGTHS AND WEAKNESSES OF THE TRANSPORT CHAINS: THE EMPirical ANALYSIS .................................................................................................................. 35
   5.1. THE CITRUS FRUIT TRANSPORT CHAIN ........................................................................ 35
      5.1.1. The citrus fruit supply chain structure ...................................................................... 37
      5.1.2. Citrus fruit transport chain interoperability: the case of Morocco’s export to France ................................. 38
   5.2. BULK TRANSPORT CHAINS IN ALGERIA ..................................................................... 40
      5.2.1. The cereal transport chain ......................................................................................... 40
      5.2.2. The cement transport chain ...................................................................................... 42
      5.2.3. The sugar transport chain .......................................................................................... 45
      5.2.4. Bulk transport chains interoperability ...................................................................... 46
   5.3. TEXTILE AND CLOTHING TRANSPORT CHAIN ............................................................... 48
      5.3.1. The case of Morocco and Spain ............................................................................... 49
      5.3.2. The case of Tunisia and Italy ................................................................................... 51
      5.3.3. The textile transport chain interoperability: the case of Spain–Morocco ....................... 55
6. CONCLUSIONS AND RECOMMENDATIONS ON INTEROPERABILITY ............................. 57
7. REFERENCES ............................................................................................................................... 61

ANNEX I – The questionnaire ........................................................................................................ 63
0. INTRODUCTION

The main objective of WP4 is to study the multimodal chains and transport interoperability between Maghreb countries and between each country of this region and Mediterranean countries of the EU. To this aim, WP4’s activities have been organised into two macro areas of research:

- First, the identification of current transport chains affecting the Maghreb countries; and
- Subsequently, the assessment of the level of interoperability in some representative transport chains of goods, by means of a SWOP analysis.

This report deals with the second macro area of research. The interoperability level within the transport chains under examination can be affected by several factors - among which the structural characteristics of the Maghreb transport system - and by the specific constraints of the chain. These have been identified through an empirical analysis carried out by means of a questionnaire. The main findings of said survey have also been complemented by:

- information coming from REG-MED workshops;
- the results of WP3;
- other sources, such as papers, books, conferences and internet.

After a short review of the relevant literature on the key concepts and methodologies suitable for the development of the research (chapter 1), the methodology adopted (chapter 2) and the description of the SWOP model (chapter 3), the main results and findings of the survey are presented. These have been organised in two main parts:

- The first one deals with the structural characteristics of Magreb transport system, meant as a proxy of the external environment in which the transport chains can exploit their resources or capabilities (chapter 4).
- The second one highlights the weaknesses and strengths of each transport chain examined (chapter 5).

To conclude, some important recommendations are given in order to improve the interoperability of the transport chains within the region (chapter 6).
1. SHORT REVIEW OF THE RELEVANT LITERATURE

The aim of this literature review has been twofold:
- to define the concept of multimodality, intermodality and combined transport; and
- to highlight the distinctive characteristics (both quantitative and qualitative) of intermodality.

1.1 MULTIMODAL, INTERMODAL AND COMBINED TRANSPORT

The concepts of multimodality, intermodality and combined transport may be considered as a subset of the transport chain concept.

The transport chain is a sequence of transport modes used to carry certain quantity of goods from its origin to its final destination. Every single consignment is realised by a specific transport chain and can follow the shortest or the fastest path to its final destination. Depending on economic, technical and legal features, the transport chain can be unimodal, multimodal or intermodal.

Multimodality is a characteristic of a transport network in which at least two modes compete for making trips in the same corridors (Eurosil, 2000). It provides independent alternative means of travel and therefore more transport options and more capacity in particular corridors. As such, multimodality influences transport efficiency.

The key element of the intermodal transport concept is instead the integration of shipments across modes. The literature on the concept of intermodality has given great attention to the advantages of modal integration for both transport chain efficiency and the associated advantages resulting to the various stakeholders (transport operators - both decision makers and executives -, transport clients – the intermediary between demand and transport supply -, final customers and Public Institutions).

Nevertheless, it must be acknowledge that, until the recent years, the emphasis was placed on the operational and technical integration of intermodal transport, as well as the shipper and global carriers expectations and requirements.

What has evidently received less attention is the economic integration, e.g. the organisations involved in management, administration and decision-making relating to intermodal transport and contributing to its economic success (Panayides, 2002).

Most intermodality terms can be located between two extremes ranging from very broad to very narrow definitions:
- “Intermodalism is the carriage or transport of goods between two points by two or more modes or means of transport (such as air, sea, rail and road or inland waterway)” (Muller and Gerhardt, 1989).
- “Intermodal transport is the movement of goods in one loading unit, which uses successively several modes of transport without handling the goods themselves in changing modes” (CEN, 1997).
- “The movement of goods whereby at least two different modes (road, rail, water, air) are used in a door-to-door transport chain” (European Commission, 1997).
- “Intermodal transport may be defined as being those integrated movements involving at least two different modes of transport under a single through rate” (Slack, 2001).

The first is a very broad definition of intermodality; the only condition is that goods are shipped by two or more modes or means of transport. The others increasingly found it to be logical, cost effective and time saving transportation systems which can be the factor facilitating the commerce between the point of origin to the final destination.
The definition proposed by the European Conference of Ministers of Transport (CEN, 1997) put a further condition to the intermodal transport - the loading unit - and therefore restricts the term to unitised transport.

Somewhere in-between is the Commission’s definition. Intermodality is a quality indicator of the level of integration between different modes. The economic basis for intermodality is that transport modes can be integrated into a door-to-door transport chain in order to improve the overall efficiency of the transport system.

Finally, a global understanding of issues concerning both technical and economic integration can be found in the last definition. According to Slack (2001), intermodal transport has two basic components:
- the transferability of the items transported;
- the provision of door-to-door service.

The first one, e.g. the transferability, deals with technical solutions to overcome bottlenecks at the transfer points and to reduce the relating high terminal costs. The second one, e.g. the provision of door-to-door services, concerns the organisational structure necessary to provide integrated transport services under a single liability. Generally, it is easier to overcome technical problems than the organisational difficulties, which frequently involve regulatory restrictions. Several of these difficulties relate to documentation and liability issues, and others are derived from problems of co-ordination between the modes.

The concept of combined transport was defined in a 1992 directive of the European Council aimed at reducing the overall dominance of the road transport sector by encouraging a shift to other modes with spare and under-exploited capacity. Under its terms, combined transport is defined as: “The intermodal transport where the major part of the journey is by rail, inland waterways or sea and any initial and/or final legs carried out by road is as short as possible”.

In other words, while intermodality is aimed at achieving the integration between different modes in order to provide a seamless transport system from point of origin to the final destination, combined transport encourages the shift from road to less environmentally intrusive modes.

1.2 TRANSPORT CHAIN INTEROPERABILITY

Interoperability is generally defined as a process where at least two different operating parties or systems work together effectively. Within the transport sector, interoperability allows the interaction between two or more transport systems, offering harmonised interfaces and thus easy access to operators for the provision of intermodal services (Eurosil, 2000).

Interoperability is the prerequisite for intermodality as it influences the quality of the transport system as a whole. The purpose of interoperability is to improve the integration between modes of transport by promoting the use of compatible technological systems and the cooperation between different actors, and by reducing the political and cultural barriers, thus allowing for intermodal transport services at a sustainable level (EU Extra Project, 2001a).

As a concept, interoperability can be distinguished by different dimensions (technical, corporate, juridical and cultural), levels (horizontal, vertical and multi-modal) and scales (European, sector and company).

Technical interoperability deals mainly with operational efficiency at levels of infrastructures, transport means and loading units. The lack of infrastructures or links between modes can hamper the integration between transport modes and generate friction costs\(^1\) on operators. In

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\(^1\) Friction costs are a measurement of the inefficiency of a transport operation. They are expressed in the form of: higher prices; longer journeys, more delays, or less reliability on time; lower availability of quality services;
addition, individual operators have a tendency to acquire rolling stock and/or vehicles which suit their operations and choice of loading unit. The presence of a variety of vehicles types for different operators is a source of congestion at terminals and causes inefficiency in the intermodal transport chain. Finally, the wide variety of loading unit dimensions across modes is another factor which reduces interoperability between modes (Peterlini, 2001).

The concept of interoperability

<table>
<thead>
<tr>
<th>Dimensions</th>
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<tbody>
<tr>
<td>Technical</td>
<td>Links between different transport systems through similar and compatible technologies</td>
</tr>
<tr>
<td>Corporate</td>
<td>Co-operation between different organisations for the provision of transport services</td>
</tr>
<tr>
<td>Juridical</td>
<td>Harmonisation of different regulatory frameworks</td>
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<tr>
<td>Cultural</td>
<td>Reductions of regional or national linguistic or cultural barriers</td>
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<th>Levels</th>
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<tr>
<td>Horizontal</td>
<td>Within individual transport markets (operations, telematics, and infrastructure)</td>
</tr>
<tr>
<td>Vertical</td>
<td>Between different transport markets (e.g. between infrastructure and operations)</td>
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<th>Scales</th>
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<tr>
<td>Company</td>
<td>Within individual companies</td>
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<tr>
<td>Sector</td>
<td>Between companies using the same mode in the same or different countries</td>
</tr>
<tr>
<td>Geographical</td>
<td>Between companies from different modes within a certain region</td>
</tr>
</tbody>
</table>

Source: EU Extra Project, 2001a

The second dimension, corporate interoperability, occurs when one or more organisations are willing and able to co-operate in the provision of transport services for the users. Many transport firms progressively extended their business from providing an undifferentiated point to point service, by providing more complex service packages. This has strongly encouraged the search for an optimal governance structure between market (strategic alliances) and hierarchy (internal governance).

The third dimension of interoperability, juridical, comes from the need to harmonise transport documents, safety and labour rules, and regulation in international trade. Currently, it is difficult for intermodal transport users to determine who is responsible for the shipments (that may be handled by different carriers), given that international transport in Europe is regulated by different regulations and liability conventions. Moreover, technical specifications for transport means are often regulated differently by Countries and modes, which also raises further problems in the process of modal integration within the transport chain and between different transport systems.

With regard to the last dimension, cultural interoperability, it stresses the importance of reducing linguistic and cultural barriers, as they can condition the smooth interaction between the actors of the transport chain.

These four dimensions are all important for the realisation of an intermodal transport but depending on the specific context of application, one dimension may be the priority to be taken in to account. For example, the European Transport Policy has paid great attention to technical interoperability, e.g. to the quality issue of links and nodes (especially harbours and inland terminals) as obstacles to an integrated trans-European transport network. Or, at a micro level, the issue of internal growth or strategic alliances (corporate interoperability) determine the qualitative attributes of the intermodal services supply. These considerations highlight – on one hand - a tight relation between the four dimensions of interoperability and stress – on the other hand - the need of a clear understanding of the contribution of Public bodies and private operators in enhancing the efficiency and effectiveness of intermodal transport (Betak et al., 1998).

limitations on the type of goods; higher risk of damage to the cargo and more complex administrative procedures (European Commission, 1999b).
Interoperability is \textit{horizontal} if there is compatibility or interconnectivity between transport infrastructures, means or ICT within the same transport system. It can be considered \textit{vertical} if the compatibility or interconnectivity deals with different transport markets.

Finally, interoperability can be distinguished on the basis of the geographical context or scale:

- The \textbf{Company} scale, which simply examines the interoperability which individual companies experience;
- The \textbf{Sector} scale, which only includes the interoperability between companies using the same mode in the same or different countries;
- The \textbf{Geographical} scale which encompasses the interoperability between companies from different modes within a certain Region.

To the aims of WP4, we will focus mainly on technical, corporate and juridical interoperability, at vertical level (e.g. the focus will be on the coordination between at least two modes of transport). The geographical context of the analysis will be Europe and the Mediterranean area.
2. METHODOLOGY

The main feature of WP4 for the analysis of the selected representative transport chains between Maghreb and Western Europe countries is the adoption of an integrated system perspective: rather than focusing on each stage of the transport chain as an independent activity, the study takes a holistic approach. It seeks to analyse the interactions between all the key elements of a transport chain, including different transport systems, terminals, and the strategies of the operators involved.

To this end, each chain being analysed is investigated at a double level:

1. **Structure**, e.g. the identification of legs and nodes, transportation means and the other stages of the transport chain;

2. **Strategy**, e.g. the transport operators’ governance structure in the supply of logistic and transport services.

Concerning (1), e.g. the identification of the transport chain structure, origin and destination of the goods flows are only the traditional elements. Information on transport modes, loading units used and other stages of transport chain (infrastructures involved and interchange points such as seaports, land intermodal yards and terminals) are also needed. Accordingly, what is really new in the identification of transport chains is represented by the supply chains in which they are involved. Each of these supply chains represents specialised segments of the transport market which require different handling techniques and specific logistics and transport services. In other words, these specialised segments of the transport market are the service systems required for the procurement of raw materials and intermediary products or components of a single manufacturing sector (i.e. automotive, etc.) and for the distribution of the final product to the market. The global transport market is the sum of the single supply chain, i.e. of the single specialised transport segments.

Regarding (2), i.e. the strategies undertaken by transport operators for the effective and efficient management of transport chains, the focus is on:

- structure of the market in each segments of the transport chain;
- scope of transport & logistics services range supplied by several operators;
- make or buy strategies;
- the use of ICT for the information sharing along the transport chain.

Both issues, e.g. the structure and the strategy, have been taken into account when elaborating the questionnaire for the empirical survey. In particular the questionnaire has been structured in three parts (see Annex I).

In the first part of the questionnaire, related to the identification and reconstruction of the transport chains affecting Maghreb Countries, those chains related to the export and import flows of the Maghreb countries have been differentiated.

The second part, concerning the strategic choices of the firms involved in them, was aimed at obtaining further elements on the level of integration along the most representative transport chains.

The third part of the questionnaire is mainly dedicated to the assessment of the interoperability of transport chains previously analysed. This part will be dealt within depth in the report on interoperability.
3. DESCRIPTION OF THE MODEL

The SWOP analysis seeks to address the question of strategy formation from a two-fold perspective: from an external appraisal (of problems and opportunities in an environment) and from an internal appraisal (of strengths and weaknesses in an organisation).

The model, originally stemmed from the business management literature, is intended to shed light on outside opportunities and threats that can affect the future of a business, thereby suggesting some possible remedial actions that might be appropriate in certain circumstances. The internal analysis of a company’s strengths and weaknesses is in turn intended to highlight the current capabilities and resources (or deficiencies) that an organisation can exploit within its environment (Kotler, 2002).

MODEL APPLICATION TO TRANSPORT CHAINS ANALYSIS

With reference to the field of application – e.g. the transport chain - the SWOP analysis can be an instrument to highlight the current strengths and weaknesses concerning the interoperability and to propose the possible ways to increase the former and to reduce the latter as a consequence of opportunities and problems of the external environment.

<table>
<thead>
<tr>
<th>SWOP model applied to the transport chain</th>
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<tbody>
<tr>
<td><strong>A strength</strong> = a resource or capacity the transport chain can use effectively to achieve interoperability</td>
</tr>
<tr>
<td><strong>A weakness</strong> = a limitation, fault or defect in the transport chain that will keep it from achieving interoperability</td>
</tr>
<tr>
<td><strong>An opportunity</strong> = any situation in the external environment which can potentially affect in a positive way the interoperability of the transport chain</td>
</tr>
<tr>
<td><strong>A problem</strong> = any situation in the external environment which can potentially affect in a negative way the interoperability of the transport chain</td>
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</table>

As previously highlighted, interoperability is generally defined as a process where at least two different operating parties or systems work together effectively. Within the transport sector, interoperability allows the interaction between two or more transport system, offering harmonised interfaces and thus easy access to operators for the provision of intermodal services.

The purpose of interoperability is to improve the integration between modes of transport by promoting the use of compatible technological systems and the cooperation between different actors, and by reducing the political and cultural barriers, thus allowing for intermodal transport services at a sustainable level (EU Extra Project, 2001a).

As such, the level of interoperability of the transport chains can be assessed by considering its four dimensions: technical, corporate, juridical and cultural. Accordingly, we use the following macro attributes for each of the interoperability dimensions.

- **Technical interoperability:**
  - Compatibility of transport means, equipment and infrastructures (e.g. tunnel, bridge and rail gauges, differences in voltage, etc.);
  - Standardisation of loading units (containers, swap bodies, semi-trailers) and operating procedures (e.g. ICT systems);
  - Availability of required infrastructures (terminals, access roads, rail services, etc.).

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2 The concept of interoperability within the transport sector has been dealt with in-depth in the report on the organisation and strategies of the most representative transport chains.
- Organisational aspects (co-ordination of transport timetable, etc).

**Corporate interoperability:**
- Governance structure (make or buy strategies) undertaken by the operators involved in the transport chain.
- Suppliers markets structure (e.g. monopoly or free competition) and relative entry barriers.
- Other transport operators’ strategic options.

**Juridical interoperability:**
Includes all the issue related to harmonisation of:
- Regulation.
- Document.
- Liability in the transport chain.

**Cultural interoperability:**
This will not be considered in detail because it produces effects in the long run.

All the aforementioned macro attributes can be distinguish between those affected by logistics and service providers and those by Public Authority. For example, the juridical interoperability, the compatibility or the availability of the required infrastructures (macro variables of the technical interoperability) are Public Authority’s matter while the governance structure, the operating procedures and the organisational aspects of the transport chain depend on the strategic choices of the logistics and services providers.

Each of the above macro-attributes characterising the interoperability dimensions, has been split into several analytical questions which constitute the last part of the questionnaire (see Annex I).
4. THE EXTERNAL ENVIRONMENT: OPPORTUNITIES AND THREATS FOR THE MAGHREB COUNTRIES

4.1 THE BARCELONA PROCESS AND THE TRANSPORT POLICY

The Barcelona Process, established in 1995, is the means through which the EU supports building a closer Europe-Mediterranean partnership. The three main goals of EU Mediterranean policy are set out in the Barcelona Declaration that can be summarized as follows:

- The creation of an area of peace and stability based on fundamental principles, including respect for human rights and democracy.
- The creation of an area of shared prosperity through sustainable and balanced economic and social development, and especially the gradual establishment of free trade between the EU and its partners and among the partners themselves.
- The improvement of mutual understanding among the peoples of the region and the development of an active civil society.

As stated in the Barcelona Declaration and in the accompanying work programme, transport is a major priority to achieve the of Euro–Mediterranean partnership. The work programme in the annex to the Declaration provides for cooperation in the transport sector focusing on (EU Communication, 2001):

- "Development of an efficient trans-Mediterranean multimodal combined sea and air transport system, through the improvement and modernisation of ports and airports, the suppression of unwarranted restrictions, the simplification of procedures, the improvement of maritime and air safety, the harmonisation of environmental standards at a high level including more efficient monitoring of maritime pollution, and the development of harmonised traffic management systems;
- Development of east-west land links on the southern and eastern shores of the Mediterranean; and
- Connection of Mediterranean transport networks to the trans-European network in order to ensure their interoperability."

Accordingly, the key points of the Barcelona mandate for the transport sector are: infrastructures; organisation of transport operations and freedom to provide international transport services; safety and environmental protection.

As a concrete step to implement the Barcelona Process, the Declaration establishes the objective to form a Euro-Mediterranean Partnership between the European Union and their 12 Mediterranean Partners (MPs)

The cornerstones of the partnership are bilateral Association Agreements between the EU and each of the MPs; a multilateral Free Trade Area (FTA) to be completed by around 2010; and financial support of social and economic adjustment (the MEDA budget line).

The mechanism established by the European Commission to implement this endeavour was the conduct of Association Agreements with the Mediterranean partners. The new generation of Euro-Mediterranean Association Agreements provides for the gradual implementation of bilateral free trade. The agreements entail, on the part of the EU, immediate free access to industrial products originating in the Mediterranean partner countries while gradually dismantling tariffs in these countries for the EU products. Trade in agricultural products will move to free trade in a slower manner.

Undoubtedly, for obvious and different considerations, the Maghreb is and will remain an important region to the European Union. Nonetheless, today’s EU-Maghreb relations are still based on a classic multi-bilateral scheme relating the European Union separately to each of the Maghreb countries according to distinct and individual contractual frameworks. Thus, intra-
Maghreb economic integration is not progressing at the same pace among the Maghreb countries. The present situation is far from being homogeneous: the association agreements with the EU were signed first by Tunisia in 1995, then by Morocco in 1996 and lastly by Algeria in 2002.

Tunisia and Morocco have come a long way with the implementation of their association agreements and the related customs dismantling schemes, whereas Algeria, after ratifying the association agreement, is still waiting for the completion of the ratification process by European countries.

These challenges are mainly the result of customs dismantling and the upgrading of the productive system.

These strains are growing stronger as the full implementation of the program of total dismantling of duties and equivalent taxes applied to the European Union products draws to an end.

As for industry upgrading, it has been initiated with the institution of support mechanisms for industry, particularly the modernisation of more than 2000 enterprises, the reinforcement of basic and technological infrastructure as well as the improvement of the intervention of support organisms.

Among the Maghreb Countries, Tunisia and Morocco have strong trade links with the European Union. Their trade integration, notably with the EU and the dismantling by 2005 of the Multi Fiber agreements, is expected to intensify in the years to come, supporting risks but also large opportunities for both countries.

The increasing integration is also synonymous with risks, especially for Tunisia and Morocco as their export sectors are highly subject to competition from Eastern European countries and China. However, there are two mitigating factors: the textile sector is partly protected in Tunisia by the fact that products are relatively value-added and not directly in competition with Chinese products. Moreover, labour costs are increasing faster in Eastern Europe than in Tunisia and Morocco, especially in countries accessing the European Union.

Due to this sharp competition, the biggest risk lies in the question of whether or not Maghreb firms will be resistant enough. Many firms, notably those family-owned, are vulnerable and remain dependent on government protection and aid. Competitiveness is the key to consolidating economic growth but also to maintaining an adequate level of employment. Otherwise, the government may have to increase the role of the public sector, through supplementary jobs for young people, in order to keep social tensions in check. This would further erode public finances.

This situation is, however, complicated by a major development that is the enlargement of the European Union. The 1st of May enlargement, is undoubtedly unequalled in scope because of the great number of countries joining the largest grouping in the world, the considerable expansion of the European space and the substantial increase of the Community population.

Nonetheless, the 2004 enlargement will undoubtedly confront the EU as well as to its Maghreb partners with many challenges.

**The MEDA program and others initiatives**

With reference to the transport sector reform in the Southern Mediterranean, a number of policy instruments designed for the implementation of the Euro-Mediterranean Partnership are available. The most important instrument is the MEDA budget line.

It is aimed at facilitating the economic transition towards the open economy and supporting the reform process in the Mediterranean Countries in the view of a Euro-Mediterranean free trade area. In the period 1995-1999 it achieved a satisfactory performance in terms of
budgetary execution since € 3,400 million out of the € 4.685 million budget have been committed and allocated to MEDA Partners.

However, in the 5 years of MEDA I (1995 to 2000) less than 1% of the total budget was allocated to the transport sector reform (Muller-Jentsch, 2002). Exceptions were customs project in Tunisia, which was not completed, and a transport component in the public sector reform for Lebanon. A regional maritime project was also identified, but its focus was on technical issues such as port dredging and navigation, and not on sector policy.

Nevertheless, in order to increase its effectiveness, improving the programming and implementation of the aid, a new Regulation on MEDA was approved in November 2000. MEDA II is expected to "better define the objectives, promote greater concentration of the action and render them more impact-centred, achieve tangible results and increase the synergy between regional and bilateral cooperation".

With regard to this, MEDA II is based on the three following principles:
1) Rationalisation of the decision making process,
2) Improvement for programming and implementation,
3) Simplification and shortening of procedures.

The budget has been increased from € 3.4 billion for the period 1995-1999 to € 5.35 billion for the 2000-2006 budget exercise.

A part from its effort to increase support to transport reform under the ongoing MEDA II program, the Commission is preparing a regional transport policy project. Since most reforms will have to take place at the country-level, however, several national MEDA projects in the transport sector have been included in the National Indicative Program for 2002 to 2004, such as Technical Assistance projects.

The MEDA Programme supports the public sector side of private/public partnership in infrastructure by funding technical assistance to public bodies. Technical assistance comprises training administrations in the management of complex private/public partnerships (PPP) in infrastructure and the provision of legal, financial and sectoral specialists to Ministries and regulators on a long-term basis. Support for private participation in infrastructure is in line with the free market-oriented philosophy of the Euro-Mediterranean Partnership: creating and enabling environment for sustainable economic growth within the region and adapting public sector institutions to their new role of facilitator rather than market player. Private Participation in Infrastructure represents a way for Maghreb countries to meet the huge growth in infrastructure needed to keep pace with their development. PPP can bring increased efficiency in construction and operation. It also reduces financial and management burdens on public sector institutions. Furthermore, it is expected that these technical assistance programmes will encourage private financing of the Mediterranean infrastructures. In this respect, the role of MEDA is bound to remain secondary to the mobilisation of private capital flows.

Other important initiatives that should be factored into the Euro-Mediterranean transport partnership are those of the European Conference of Ministers of Transport (ECMT). The ECMT seeks to harmonize transport policies in an enlarged Europe through sector analysis, policy dialogue, and multilateral agreements. Resolutions and agreements cover subjects such as border crossings, the allocation of infrastructure costs, dimensions of loading units, combined transport, rules for international road freight, technical standards for equipment and the streamlining of custom procedures. This overlaps with the work of the Transport Division of the UN Economic Commission for Europe, whose main focus is on the implementation of the UN transport facilitation conventions. The 15 EU countries have ratified most of these conventions, but the Mediterranean partners are still lagging considerably; of the 16 UN conventions, for instance, Italy ratified all 16, France 15, Portugal 13 while Algeria has only signed 4, Tunisia 5 and Morocco 6 (Magold, 2001).
Apart from these European initiatives, several international organisations are also involved in trade facilitation. The implementation of simplified customs procedures coded by the Kyoto Convention of the World Custom Organisation (WCO) is one example. Others examples are the International Convention for carriage by air of the International Civil Aviation Organisation (ICAO) or the Agreement on Pre-shipment Inspection by the World Trade Organisation (WTO).

The Convention on Facilitation of Maritime Traffic by the International Maritime Organisation (IMO) has been ratified by the vast majority of its members and the Commission actually plans to use it as a basis for an EU directive on the harmonisation of documents in ports.

### 4.2 The Arab Maghreb Union (AMU)

In July 1990, AMU member countries adopted a common strategy for development that defines the basis of economic solidarity within the region with the aim of creating: a) a free trade area for all products and services originating from the region; b) a customs union and a common market, and finally c) an economic union being the last stage of the integration process.

Accordingly, AMU adopted conventions relating to surface transport and transit insurance/reinsurance. These consist of various programmes in basic infrastructures aimed at reinforcing transport and communication systems in the region. In 1991 UMA adopted a Convention on tariffs, which recommends the application of rules of the free trade for products originating within the region.

The implementation of appropriate transport networks represents a prerequisite for the cohesion and harmonious development of the AMU region. The transport sector is undoubtedly a key priority area as far as a better physical integration of the region is concerned. Furthermore, it contributes to the reduction of social and economic disparities, the attraction of FDI and the competitiveness of the region, given that transport costs represent a remarkable component of the total production costs.

A report on the World’s development, published by the World Bank in 1994, stresses the role of transport infrastructures for the improvement of life conditions. The studies carried out in this field confirm that “infrastructures are crucial for economic growth, the struggle against poverty and the preservation of the environment and that, in a global scenario characterised by free competition, reliable and effective transport networks are increasingly needed”.

The upgrading and development of transport infrastructures are crucial for UMA countries’ integration and undoubtedly constitute the prerequisite for the creation of an integrated economic area and a closer cooperation with other African and European countries.

In this perspective, AMU member countries should jointly set up effective policies in the transport field, with a global vision and a regional dialogue in consideration of the remarkable interdependence between the transport sector and the economic development.

**Overview of AMU’s action programme in the transport field**

During different meetings, the Ministerial Commission for basic infrastructures elaborated an ambitious programme aiming at the physical integration of the entire region, the facilitation of the movement of goods, services and people and a closer cooperation among UMA countries with regard to the exploitation of transport systems in the region. The priority actions defined in this framework are the following:

- **Roads and road transport:**
  - Development of the highways of the Maghreb Union;
  - Development of the Maghreb network;
  - Maintenance of existing networks;
  - Implementation of the agreement for passenger and freight transport and for traffic across borders;
The external environment: opportunities and threats for the Maghreb countries

- Implementation of a unified regulatory framework for the transport of dangerous goods;
- Mutual recognition of driving licenses and unification of the procedures related to training and examination;
- Unification of traffic codes;
- Creation of a common programme for the fight against road accidents;
- Unification of vehicle control procedures.

**Railway network:**
- Improvement of Trans-Maghreb train services;
- Preliminary study for the Train à Grande Vitesse (TGV) in the Maghreb;
- Link Tunis – Tripoli via Sfax and Ras Jedir;
- Reactivation of railways industrialisation in the Maghreb.

**Maritime transport:**
- Common exploitation of the sea routes linking AMU to West Africa and Middle East;
- Implementation of the programmes of the Union of North African Ports;
- Creation of a system for the safeguard of the environment and the fight against pollution;
- Creation of a Regional Maritime Office as common representative in the international specialised organisations;
- Creation of an association for maritime training institutions in the Maghreb;
- Implementation of a vessel control system;
- Creation of a ship-owners association;
- Implementation of a system for information and data exchange.

**Air transport:**
- Collection of insurance contracts for air fleets, aiming at minimizing insurance premium;
- Possibilities of granting freedom of transport in the air space to national companies.

Regional projects, identified in AMU’s action plan, are aimed at economic development, reinforcement of international trade and integration of Maghreb countries. They have been adopted by concerned countries and their realisation started in the last decade.

International trade of the Maghreb countries is essentially directed towards Europe, which accounts for more than 65% of their commercial exchanges. Currently, intra-Maghreb exchanges are quite scarce, given the administrative and physical (closing of borders between Morocco and Algeria) obstacles. On average, they amount on average to 4-5%. Nevertheless, perspectives of cooperation among Maghreb countries are optimistic, given the high complementarity of their economic structures. In particular, it is estimated that intra-Maghreb commercial flows will grow at an annual rate of 7-8%. Starting from this scenario, member countries will have to define the infrastructural projects to be implemented to meet current needs.

### 4.3 The Maghreb Transport System

In Maghreb countries, the road ensures about the totality of passenger and freight transport, except of oil and mineral products which are transported by rail. The road network of Maghreb is constituted by more than 224,000 km, of which 86% covered, that serve almost all the regions of UMA countries except Mauritania. It represents the best means for reinforcing economic and political union of the five UMA countries, which will constitute by 2010 a socio-economic integrated area extending on an area of 6 millions of km and with a population of 110 millions inhabitants. In consideration of the efforts needed to meet the increase in transport demand, the Maghreb countries have given priority to road transport development suggesting the building of the Motorway of Maghreb Union.
The external environment: opportunities and threats for the Maghreb countries

The Maghreb railways are constituted by an integrated network within Morocco, Algeria and Tunisia, with a total length of 8,383 km as well as a 652 km link between the iron deposit of Zouerat and the port of Nouadhibou in Mauritania. In Libya there is not yet a railway.

Maritime transport has a major role for international trade of Maghreb countries, ensuring more than 95% of external traffic. It supports UMA’s main trade exchanges with foreign countries, namely Europe, which accounts for more than 65% of Maghreb countries’ commercial traffic. It also reveals the weakness of intra-Maghreb traffic, which amounts for 4-5%. Nevertheless, these traffic are expected to reach 7-8% per year after the effective re-launch of UMA’s activities, given the complementarities of the economic structures of its member countries and their privileged geographic position.

Air transport in the Maghreb plays an important role for traffic of passengers with foreign countries, particularly Europe (more than 80% of traffic).

Given the increasing awareness of the potential positive effects of an integrated transport within the region, other key points for transport improvement in AMU countries are the following:

- The introduction of an ambitious programme for the development of the motorway of the Maghreb Union, namely in Morocco, Tunisia, Algeria and Mauritania, through the building of a link with other countries in the Maghreb region.
- The progressive improvement of the management of the sector, with particular reference to public institutions, leading to enhancement of financial revenues.
- The financing policy for motorways based on tolls, implemented in Morocco and Tunisia, allows the continuous realisation of development programmes for the improvement of motorways.
- The concession for the building and exploitation of specific transport and communication infrastructures in which Morocco, Tunisia and Algeria are involved, is progressively consolidating. It allows to relieve public budgets as well as to improve infrastructures management.
- The introduction of facilitation measures for customs and administrative procedures in Tunisia, Morocco and Algeria.

4.3.1 Maritime traffic characteristics

The vast majority of cross-border trade in the Magreb Countries is seaborne. The predominance of maritime transport in trade is due to the fact that several land borders remain closed for political reasons and little trade takes place between neighbouring countries.

In Morocco, Tunisia and Algeria, imbalances between import (mainly processed goods and consumer products) and export (often commodities) are reflected in the lop-sidedness of maritime transport flows. In countries with strong commodity exports such as phosphates in Morocco and oil in Algeria, the weight of the exports tends to be significantly higher than that of imports. Such imbalances lead to considerable unused capacity as well as to differences between outbound and inbound fares, depending on vessel type and direction.

In general, maritime traffic is heavily concentrated in a few key ports per country. This is due to the economies of scale of the transport services providers (especially shipping companies) as well as the geographical concentration of industry and population. In Algeria, about two-thirds of maritime traffic in non-petroleum products flow through the ports of Algiers, Oran and Annaba, while three specialised ports handle the exports of hydrocarbons (Arzew, Skikda and Bejaia). Tunisia has eight international ports along a rather short coastline; Radès and La Goulette near Tunis account for about 50% of general cargo and 90% of unitised cargo.

A form of unitised cargo that plays an important role for maritime traffic in the region, are trucks carried by Ro/Ro ferries. Moroccan ports, for instance, counted 885,000 Ro/Ro units in 2000 (Muller-Jentsch, 2002). The advantage of Ro/Ro traffic, in comparison with container
The external environment: opportunities and threats for the Maghreb countries

Traffic in cellular vessels (many Ro/Ro trucks carry containers), is that it provides an efficient mean for multimodal transport without the need for large and modern facilities. Especially on journeys where the sea-leg is relatively short compared to the land-legs, Ro/Ro is widely used.

Transport flows to and from European Union countries dominate maritime traffic in the region while domestic maritime traffic in the Magreb countries is quite negligible.

4.3.2 Ports and maritime transport

The majority of Magreb ports are public owned and strongly protected by public monopoly.

Algeria

In Algeria, ports used to have the status of autonomous public enterprises, overseen by a state holding company. These port enterprises were the monopolistic providers of all port services and neither private participation nor competition were permitted in Algerian ports. In principle, a new maritime sector law (98/05 of June 1998, modifying the law from 1976) opened commercial activities to private participants, while delegating regulatory functions to the port authorities. Three regional port authorities were created by decree in 1999. The provisions of the new law, however, have not been fully implemented through detailed regulations and institutional reforms.

Algeria heavily relies on maritime transport for its commercial exchanges. In fact, almost the totality of its external trade, estimated in 2001 at 100 millions tons of which 19 millions tons of commodities, is shipped. In other terms, this mode plays a major role for the economic development of the country, given its financial incidence (10% of imports value on average) on the commercial balance.

The main ports are: Arzew-Béthioua, Skikda, Béjaïa, Algiers, Annaba, Oran, Djén Djen and Mostaganem. These ports have a potential capacity for almost 25 millions tons of freight per year (except of Hydrocarbons). Currently, they operate at 19 millions tons per year from 2000, which is three quarters of their maximum capacity.

In 2001, imports - mainly commodities - have been ensured by five ports which represented 83% of this traffic: Algiers (30%), Béjaïa (16%), Oran (16%), Annaba (11%) and Skikda (10%). Imports constitute for 50% by agricultural products and food.

Exports, mainly hydrocarbons, have been realised by the three main ports specialised in oil: Arzew-Béthioua, Skikda and Béjaïa. Hydrocarbons represent 82% of total tonnage in transit from ports and 97% of exports. National shipping companies ensure almost 22% of maritime traffic. The Compagnie Nationale Algérienne de Navigation holds 23% of commodities traffic, while the Société Nationale de Transport Maritime des Hydrocarbures et des Produits Chimiques SNTM/HYPROC holds 22% of hydrocarbons traffic.

Containerisation rate quadrupled during the last decade, shifting from 5% to 23% in 2001. Containerised traffic reached 2 millions tons in 2001. The port of Algiers receives 70% of containerised traffic from the import side, most of these containers being directed to the region of Algiers.

In 2001, passenger traffics reached 614 thousand passengers, served by the port of Oran and the port of Algiers respectively for 43% and 42%. The other three passenger ports - Béjaïa, Ghazaouet and Annaba - together ensure the rest of traffics.

In consideration of the role played by maritime transport and of the increasing intensification of trade, actions planned in the field of maritime infrastructures are concerned with preservation and adaptation to modern standards. In particular, the sector will benefit from actions related to the dredging of many ports and the launch of a programme aimed at creating additional capability for commercial ports in the central region of the country; the
latter is concerned with the construction of a new terminal in Algiers, the development of a transhipment terminal of Djen Djen and extension of the terminal of Oran.

Morocco

In Morocco, both regulatory and operational functions are essentially carried out by the same public entity, the Office d’Exploitation des Ports (ODEP), even though by law they are formally separated. Private participation in port operations and management is limited. As in Tunisia, private stevedores operate on board ships, but depend largely on the equipment of ODEP. On land, ODEP has the monopoly for the main cargo handling operations.

Given its geographic position and the length of its coasts, Morocco is aware of the importance of maritime transport for the national integration process. Currently, the country has a modern port system, consisting of 30 ports - 11 multifunctional ports (trade, fishing, Royal Navy), 14 regional ports for local traffics and fishing and 5 ports of smaller dimensions - equally distributed along its coasts, in order to integrate the different regions and stimulate their development.

In order to let the ports play their role in the integration and economic development processes, national authorities, which are in charge of their management and maintenance, have implemented ad-hoc structures for the commercial management of traffics. Thus, from 1985, this task has been submitted to the Ports Exploitation Office (Office d’Exploitation des Ports - ODEP), a public body of commercial vocation endowed with technical and financial independence, which is also in charge of the maintenance of docks and dredging of managed ports. In order to effectively answer operators’ needs, this institution has implemented a modern information system, which support the efficient management of port operations.

Aiming at achieving economic development of provinces in the north of the country, Morocco has undertaken an integrated project “Tanger-Méditerranée”, which includes the construction of a port for container transhipment and other commodities. In this direction, it has also been planned to build rail and road links. The new port will lead to the decongestion of the existing port of Tanger and, above all, it will draw traffics from and to the Mediterranean basin and along maritime routes linking America to East and Middle East countries.

Moreover, in line with its attention to the safeguard of marine environment the government built, with an investment of 15 millions dollars, a centre supporting coastal navigation in Tanger, in order to guarantee a smooth traffic flow and improve the security of maritime traffics across the Straits of Gibraltar, one of the most dense routes with almost 65.000 vessels (also oil-tankers) per year.

Tunisia

In Tunisia, the new sector law – Code des Ports Maritimes de Commerce – foresees the creation of two consultative bodies for port users and provides a basis for the award of concessions. This new legal framework permits the creation of landlord ports and the introduction of private participation. The Office de la Marine Marchande et des Ports (OMMP), created in 1998, owns and develops country’s ports.

OMMP has the monopoly for pilotage and towage, and still owns and operates the vast majority of cranes within Tunisian ports. Cargo handling is open to private companies in secondary ports, but a public enterprise has a monopoly in Radès and La Goulette – which accounts for most of Tunisia’s general cargo.

Commercial exchanges, mainly conducted with Europe, especially France, Italy and Germany, heavily rely on maritime transport. It is currently estimated that 96% of Tunisia exchanges are carried out by sea and that only 20% are operated by national shipping companies, dominated by the Compagnie Tunisienne de Navigation, CTN.

The country’s port system consists of 8 main platforms: Tunis, Bizerte, Sousse (commodities), Sfax (polyvalent), Gabès (for chemical products), Zarzis, Radès and Skhira (for oil).
The external environment: opportunities and threats for the Maghreb countries

The platform of Tunis-Goulette-Radès is constituted by the port of Tunis-Goulette - specialised in passenger traffics and cruises – and the port of Radès - which is the main container port of Tunisia -.

The platform of Bizerte is constituted by the port of Bizerte, specialised in oil, and the port of Menzel Bourguiba, which serves shipyards and an iron factory. The port of Skhira, located at 50 km from Sfax, is managed by a national oil company, TRAPSA.

Maintenance operations in the ports of Tunis, La Goulette and Radès is ensured by the Société Nationale d’Acconage et de Manutention (STAM), with relatively lower efficiency in comparison to those ports in which maintenance is operated by private companies.

4.3.3 Customs procedures

Together with the monopoly of port services, which tends to increase the cost of imports and determine a generally unfriendly trade environment, customs clearing procedures is another factor affecting negatively the cross-border flows.

The Kyoto Convention (International Convention on the simplification and harmonization of Customs procedures) is an international instrument on the harmonization of Customs techniques which covers all aspects of Customs legislation. It was done at Kyoto, Japan, on 18 May 1973 and entered into force in 1974. Since then the growth in international cargo, developments in information technology and a highly competitive international business environment have created conflict with traditional Customs methods and procedures. World Customs Organization (WCO) has therefore revised and updated the Kyoto Convention to ensure that it meets the current demands of international trade. The WCO Council adopted the revised Kyoto Convention in June 1999 as the blueprint for modern and efficient Customs procedures in the 21st century.

Among the Maghreb countries, Tunisia is the only one that has not ratified the Convention yet.

The Kyoto Convention (Revised) has incorporated important modern concepts, such as the application of new technology, the implementation of new philosophies on Customs control, and the willingness of private sector partners to engage with Customs in mutually beneficial alliances. It contains new and obligatory rules for its application which all Contracting Parties must accept without reservation.

The Revised Kyoto also complements U.S. and global security initiatives. It promotes the use of risk management procedures and pre-arrival information for screening and other purposes, enabling customs administrations to more effectively identify and target higher risk transactions. Customs administrations must also commit to the employment of automated systems, which are inherently more reliable and secure.

Currently, the three Maghreb countries are using the following information technologies:

- The SADOC (Système de l’Administration des Douanes et de l’Office des Changes) in Morocco ;
- The SIGAD (Système d’Information et de Gestion Automatisée de Douanes in Algeria ;
- The SINDA (Système d’Information Douanier) in Tunisia.

Concerning the harmonisation and simplification of freight declaration, Morocco has defined a single document called “Declaration Unique des Marchandises” (DUM), on the basis of OMD’s recommendations. In Tunisia, the declaration is consistent with the DAU model of the European Union. Finally, Algeria has also adopted a single customs declaration.

In Tunisia, after its adhesion to the GATT, customs taxation was marked by a considerable change consisting of a general and progressive decrease in tariff protection.
Imported goods are also subjected to VAT whose rate varies according to the nature of the product. Some goods such as capital goods not locally manufactured are exempted from the VAT.

Tunisia has recently signed an association agreement with the European Union which provides for the setting up of a Free Trade Area in which almost all the industrial products exchanged between both parties will benefit from a total exemption from customs duties. Likewise, tariff conventions between Tunisia and some Islamic countries provide total or partial import duties and taxes. Tunisia has also provided a progressive reduction of customs duties and notably a decrease in the highest custom duty by 25%, which will be implemented soon. However, significant progress has been realised in obtaining faster and more efficient inspection and clearing procedures.

Also Morocco, after its adhesion to the GATT, introduced modifications to its customs taxation consisting of general reduction of tariff barriers. The new agreement on the Free Trade Area between Morocco and the European Union has provided the total abolition of tariff barriers between both parties. Likewise, tariff conventions between Morocco and some Islamic countries provide for total or partial exemptions from customs duties.

Finally, concerning Algeria, the applicable duties and taxes are the following:
- Ad valorem duties are assessed on a CIF basis that includes wholesale value of goods in the country of origin, transport charges, export duties, insurance, commissions, freight, and all other costs incurred before the goods reach Algerian customs control. Customs duties and warehouse charges are not included in the dutiable value.
- There are preferential duties between Algeria and the European Union countries that are similar to those included within the framework of the EU's convention with African, Caribbean and Pacific developing countries. There are also preferential duties with the Arab Magreb Union countries Libya, Morocco, Mauritania and Tunisia). The imports of products originating in the AMU countries are exempted from customs duties.
- Finally, a basic standard tariff (tariff de droit commun) is levied on goods originating in all countries that accord Algeria most-favoured nation treatment (MFN). Customs duties are higher on luxury goods. Strategic and vital products are exempted from customs duties.

### 4.3.4 Shipping services

Among the Maghreb countries, Algeria has the highest number of regular services with the European Union: 650 calls per month. Tunisia and Morocco present, respectively, 410 and 360 calls per month (Compte, 2003).

The traffic is concentrated in a few ports in each of the Magreb country: the TGR (Tunis – La Goulette – Radés) has 350 calls per month while Alger and Casablanca have 250 calls.

The most important European port is Marseille–Fos with 200 calls per month, especially with Algeria. Genoa has mainly connections with Tunisia. The port of Cadix has regular Ro/Ro services with Tanger and Casablanca

Maritime activities (and transport in general) usually belong to the public sector. The shipping companies operating in the Maghreb are hampered by regulations, which favour public national transporters and limit the private companies' access to port services.

Vessels for bulk cargo are usually purpose-built to carry specific unpacked products such as dry bulk (e.g. grain, phosphate, coal), petroleum (e.g. crude oil or refined products), liquefied natural gas or liquid chemicals. Scheduled services are rare and charter is the norm. In contrast to the bulk sector, the liner shipping sector provides scheduled services for general cargo between advertised ports on common carrier basis, whereby any customer has access to capacity at a given price.
An important cargo segment of maritime traffic in the Magreb is Ro/Ro traffic. Most of the trucks carried by special Ro/Ro vessels transport general cargo and containers. The advantage of Ro/Ro is that it requires minimal port facilities and allows easy and smooth modal transfer.

Unlike the European Union, where all former state-owned shipping companies have either disappeared or are withering away, in the Magreb several shipping companies are still state-owned.

More specifically, regular services between Morocco and EU are realised by 5 national shipping companies: COMANAV, IMTC, COMARIT, LIMADET and ATLAS.

COMANAV is a public company, currently undertaken a reorganisation process (increase of the capital thank to the participation of the French financial society) with the aim to modernise the fleet. This company offer the following services between Morocco and Europe:

- Container and Ro/Ro services between Casablanca and the main ports of the Atlantic (Lisbon, Rouen, Le Havre, Dunkerque, Rotterdam Antwerp, etc.);
- Container, Ro/Ro and conventional between Casablanca and Tanger and the main Western Mediterranean ports such as Marseille, Séte, Genoa, La Spezia, Barcelona and Valencia.

The IMTC (International Maritime Transport Corporation) is the main private Moroccan operator in terms of capacity. The company offers the following services:

- Container between Casablanca and Barcelona, Marseille-Fos and some Italian ports;
- Ro/Ro between Casablanca and Cadiz, and between Tanger and Cadiz;
- Car/ferry between Tanger and Algesiras.

With reference to Algeria, the main European ports are those of France and Spain that absorb 60% of the traffic. In particular, the port of Alger has regular lines with the port of Marseille–Fos (Ro-Ro and container services), while the port of Oran has container services with Marseille–Fos, Barcelona and Valencia.

The main national shipping company, CNAN (Compagnie National Algérienne de Navigation), has undertaken an important process of re-organisation ending with the creation of a new company SNTM/CNAN (Société National Transport Maritime). In the past CNAN was involved in the hydrocarbon transport and in the towing activity. Currently SNTM/CNAN supply general conventional cargo, container and ro/ro services mainly between the port of Alger and Marseille–Fos, Barcelona and Valencia.

CALTRAM is a Lybio-Algerian company supplying general cargo and Ro/Ro services, while ENTMV (Entreprise Nationale de Transport Maritime de Voyages) founded in 1987, is specialised in the passenger and vehicles transport, mainly to France (Marseille–Fos).

Finally, with regard to Tunisia, the national private shipping companies are the followings: TSTC, HMT, COGEMAR, GMT, GM, PETRONAV and Tunisie Sea Ways. Nevertheless, the regular services are under the monopoly of CTN (Compagnie Tunisienne de Navigation), the only public operator (together with SONOTRAK that is only involved in the transport between the isle of Kerkennah and the port of Sfax). CTN supplies the following services:

- Container – Ro/Ro services between Radés – Marseille;
- Ro/Ro between services between Tunis-Genoa-Barcelona-Tunis;
- Container and conventional between Radès and Leghorn;
- Ro-Passenger between Tunis-Marseille-Genoa.

Finally, with the openness of the shipping market to the foreign companies, CMA/CGM supplies weekly container services between Marseille and Alger, and between Marseille and Oran (with a call in Barcelona). Moreover, it offers the following weekly service: Marseille-Bejaia-Skikda-Genoa-Marseille. It also supplies round the world services from Maghreb via Malta. With reference to Morocco, it calls at the port of Casablanca. There is also a service called Maghreb-
Mashrek with the following ports: Mersin, Latakia, Beyrouth, Alexandrria, Tripoli, Skikda, Alger, Marseille.

SAFINA, an Algerian–French company, offers container services between Alger and Marseille and Ro/Ro between Oran, Bejaia, Skikda and Mostaganem.

The connections between Italy and Maghreb are provided by Grimaldi Group and Tarros. More specifically, Grimaldi supplies the following services:
- Algeria. Container (weekly) Genoa-Valencia-Oran-Alger
- Morocco. Weekly service between Genoa and Casablanca

Tarros, weekly services between La Spezia-Marseille-Alger and regular services between Spain, France and Tunisia

Finally, Transmediterranea is a company involved in the maritime transport between Spain and Morocco (Gibraltar – Ceuta and Melilla). It also supplies services between Spain and Algeria.

4.3.5 Land transport characteristics

Land-based modes only account for a small fraction of the cross-border transport flows in the Maghreb. This is due to: the closure of several borders for political reasons; the low volume of intra-regional trade and the obvious geographical separation of Maghreb countries from their main trading partners by the sea.

However, even though the vast majority of the trade is processed by ports, road and rail transport are needed for door-to-door delivery. The efficiency of the land-leg is important for the overall efficiency of the door-to-door transport chains. For example, in Tunisia the port of Radès – close to the capital Tunis and the county’s main container terminal – was finally connected to the rail network in 2001, but for unknown reasons it was not still being used a year later.

4.3.5.1 Roads and trucking

Throughout the Maghreb, the road haulage is the dominant form of land-based transport. A variety of policy issues arise in the road sector with regards to services, physical infrastructures and border crossings.

As far as the domestic liberalisation of road haulage is concerned, the Magreb Countries made progress in the recent years.

In Tunisia the sector was privatised and liberalised in the 90’s. Tariffs were deregulated, legal barriers to market entry removed and government-owned trucking companies sold.

Under a loan agreement with World Bank, Morocco has committed itself to abolish the truck-forwarding monopoly of the Official National De Transport (ONT)3.

Beside the liberalisation of the market, these last years have witnessed a number of National and International initiatives4. A variety of intra-Maghreb agreements have been set up in order

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3 Traditionally, ONT regulated and coordinated all domestic shipments by vehicles weighing more than eight tons. No vehicle could travel without the ONT road permit (feuille de route), costing 5% of the value of the freight or a receipt for payment of an additional 4.5 to 5% coordination tax. Beyond this 10% excess cost, ONT rigidities seldom allowed the loading of backhaul shipments, so vehicles returned empty most of the time.

4 The TIR Convention is one of such international conventions which ensures, in principle, that cargo does not need to be inspected at the port at all, that only documentary checking is enough. Of course, in some cases, customs makes checks when certain goods come from certain countries.
to favour the free circulation of hauliers. Furthermore there are many bilateral agreements between each Magreb country and at least one European country, which are aimed at smoothing the transport flows between parties.

Another set of policies arise with regard to the financing and management of the road network. In many Southern Mediterranean countries, traffic growth and years of under-investment have lead to a backlog of capacity expansions (e.g. highway construction) and insufficient maintenance and operation of the existing roads. In some case, the solution has been to outsource the construction and maintenance activities to private contractors. In Algeria, for instance, the Government has decided to hand all civil works to the private sector through public tenders.

The road transport sector in Magreb countries is finally characterised by a multitude of small operators that are not ready to compete internationally due to: lack of qualified and specialised personnel, management with short-term development perspective, and inadequacy of transport equipments.

In Tunisia, there are different public sector operators in the road sector: namely, SNTRI (Inter Arban National Transport Company), the SNT (National Transport Company), and regional transport companies (STRG). There are also 30 Tunisian companies which are operating within the framework of Transport International Routier (TIR).

In summary, road services present a high heterogeneity in terms of service availability and quality, border crossing procedures and market liberalisation. In most of the countries, the road network interconnections with other modes of transport are also missing.

**Algerian road network**

The country’s road network system is relatively well developed. At the end of 2001, it reached a total length of 104,670 km and it consisted of three main typologies of roads:

- National roads: 27,376 km (85% paved)
- Departmental roads (Wilayas): 23,375 km (87% paved)
- Local roads: 53,319 km (55% paved)

Most of the national and departmental roads (Wilayas) as well as more than half of the local roads are paved. Significant efforts have been directed to link local roads.

With a length of 25,500 km, the main Algerian road network consists of:

- National roads: 23.065 Km (90% of national road);
- Departmental roads: 264 Km (10% of departmental roads);
- Non classified highway axis: 124 Km;
- Roads of major towns: 48 Km

This network is articulated around six strategic axis:

- The three south/west ring-roads:
  1. El Tarf - Tlemcen via Annaba – Constantine – Algiers- Oran (1194 Km) in the North range;
  2. Tébessa – Tlemcen via M’Sila et Tiaret (1053 Km) in the North of High Plateau;
  3. Tébessa – Bougthor via Djelfa et El Bayadh (900 Km) in the South of High Plateau;
- The three main roads linking North-South:
  5. Algiers-Ain Guezzam via Medea, Ghardaïa et Tamanrasset (2200 Km) in the centre;
  6. Oran – Tindouf via Saida and Bechar (1367 Km) in the West.

In the field of road infrastructures, the competent Ministry carried out a study on roads and motorway developments during the period 2002-2010, which are currently in progress.

The 24 departments (Wilayas) in the North of the country represent 41% of the total territory and host 70% of the national population. They are served by a relatively dense road network,
7500 km of which support more than 60% of national road transport (in terms of vehicles x km) and the half of which only through Annaba-Constatine-Algiers-Oran-Tlemcen axis, mainly constituted by national roads. These roads are highly saturated in most of their trunks and in particular in correspondence of big agglomerations entry. The problems deriving from road saturation, which are expected to worsen if not immediately solved, are the main object of ongoing programmes related to agglomerations’ decongestion.

All the studies and in particular those conducted by Motorways National Agency have stressed the need for the building in this route of a separated motorway to be linked to the Maghreb motorway. This project is currently under scrutiny by the Government but the related budget seems to be too optimist, unless there is an allocation of extraordinary resources.

The development programme for the main road network mainly consists of reinforcement and upgrading of existing roads as well as of doubling of some axis. In the South it is concerned with the building of new links with existing roads, including the Trans-Saharan road.

The government is financially responsible for the investment related to building and maintenance of roads. The total resources allocated to the road network system during the 90s represented about 1% of GDP; this percentage appears insufficient if compared with international dispositions according to which the ratio should be approximately about 1,5% of GDP. The resources devoted to road maintenance are not sufficient: they only allow maintaining 500 km of national roads annually, that is to say about 2% of the main network.

As far as the financing of roads and motorways construction is concerned, the government pursues the participation of the local or foreign private sector. A first attempt concerning the private sector financing for the East-West motorway has not been successful; thus, the realisation of this programme will be entirely undertaken by the government.

In order to overcome problems related to the financing of the road network development and maintenance the government plans to create a fund, which will be constituted by the fees paid by road users.

**Moroccan road network**

Morocco has been strongly committed in the development of its road network, which represents a key factor for the improvement and integration of its regions. In this direction, it has doubled its network within 40 years, shifting from 15.800 km in 1960 to 32.085 km of covered roads in January 2001 of a total of 63.453 km. This network consists of:

- National roads : 11.288 Km (85% paved);
- Regional roads: 10.152 Km (84% paved);
- Provincial roads: 14.014 Km (39% paved);
- Local roads: 3.226 Km (management of this type of roads is reserved to towns after the new classification introduced in 1997).

Among the most remarkable interventions of the last decades, it is important to mention the construction of a structured network of 2.750 km length in the South region and the implementation of the National Programme for the Construction of Rural Roads from 1995, aiming at the development of rural regions. This programme intends to build a 11.200 km road network by year 2004 (5.100 km of new paved roads and 6.100 of rebuilt unpaved roads) in these regions.

At the same time, the ongoing construction of a ring-road along Mediterranean coast, linking Tanger to the Moroccan-Algerian border, will constitute a transversal base for a number of activities within an economic development strategy for the North area.

Furthermore, in order to play an increasing role in international trade, the government has planned the construction of a 1500 km-length motorway to be accomplished within 2010, with
a pace of 100 km per year. To date, 512 have already been completed and 183 km are under construction.

The total (gross) investment required for the development of this network, estimated at 3 billions dollars, cannot exclusively rely on the public budget and the mobilisation of alternative financing has become necessary. It is for this reason that tolls have been introduced as means to make road users contribute to the investment efforts in compensation of the benefits of speed and security offered by the motorway. In order to consolidate this new financing policy, the government created, in 1989, the National Company for Moroccan Motorways (Société Nationale des Autoroutes du Maroc), which benefits from special loans and concessions granted by financing institutions in the framework of the development aid.

The motorway network is constituted by the structural axis linking north to south and east to west. These axis are at the same time the main sections of the motorway of the Maghreb Union and trans-African axis at its continuation. They facilitate Morocco’s openness to the rest of the world, which will be reinforced thanks to the future construction of the Europe-Africa link through the Straits of Gibraltar.

The national fleet reached a number of 1.740.178 vehicles in 2001, 4.392 of which for goods transport with a total capacity of 95.596 tons; an increase of 2.8% in compare with the previous year was registered.

**Tunisian road network**

In Tunisia, there are different public sector operators in the road sector: namely, SNTRI (Inter Urban National Transport Company), the SNT (National Transport Company), and regional transport companies (STRG). There are moreover 30 Tunisian companies which are operating within the framework of Transport International Routier (TIR).

The road network of the country is 20.000 km long and three quarters of covered roads. The network covers the entire territory with a higher density in the north and along the coast, where most of economic activities concentrate. The main axis of the network ensure the link among the principal towns in the region as well as among the principal production poles.

Two are the motorways: Tunis-M’Saken (Sousse) for 150 km and Tunis-Bizerte for 60 km (activated from 2002).

Freight transport was liberalised for vehicles under 12 tons. At the same time, private freight transport is not subject to any kind of authorisation. This policy facilitated the development of the private freight sector, mainly constituted by small operators.

Recent years have been characterised by a rapid evolution of the sector, which has seen an increase of this mode in comparison to rail, as well as a constant reduction of public transport in comparison to private transport.

**4.3.5.2 Rail transport**

Unlike trucks, railways have a potential cost advantage for long-haul traffic, approximately over 500 kilometres. In the multimodal system of Magreb countries, railways seem well suited to carry long-distance freight between neighbouring countries and to provide efficient hinterland connections for ports – especially for containerised and bulk cargo.

The recent reform aims to restructure the state-owned company, to introduce the private participation and to facilitate cross-board traffic. In fact, railways in Magreb are moving from a monopolistic company status to various schemes allowing for more administrative and financial autonomy and leading to at least a partition between infrastructures and operation accounting systems.
Algerian railways network

The Algerian railway network is run by the Société Nationale des Transports Ferroviaires (SNTF). It consists of 3.973 kilometres of tracks, of which almost 2.888 kilometres are of standard gauge (2.435 mm) and the rest (1.085 kilometres) of narrow gauge (1.055 mm). This network is the second in Africa, but it is scarcely performing when considering Algeria’s economic needs. Mostly inherited from the colonial period, it is mainly constituted by standard-gauge and narrow-gauge trunks, only one of which is electrified, linking the mines of Ouenza to Annaba (300 km).

The network is characterized by 400 km of doubled links in correspondence of the ring-roads surrounding Algiers, Oran, Constatine and Chlef.

The network structure followed the development and localisation of the population, industries and mining sources. The main route links East to West and serves all the major towns. All the main ports (Annaba, Skikda, Béjaia, Algiers, Mostaganem, Arzew, Oran, Djen Djen and Ghazaouet) are served by different links.

The current network is constituted by sections with high declivity, reaching 26-32%, and short radius curves, sometimes less than 250 m. Intersections in the stations are short and do not allow for the movement of long trains and signalling and communication systems are obsolete.

Ongoing projects require investments for a total amount of 1,14 billions dollars and are concerned with the design of new routes, regional railways development planning, improvement in the transport capacity, building of stations and renewal of rails.

The territorial planning policy considers the development of socio-economic activities in the upper plateau area; it has been planned to create industrial areas, which could justify the existence of a railway. The project presents the following route:

- Ain Touta - M’sila - Ain Oussera – Tiaret – Saida - Moulay Slissen with a connection to the rest of the existing railway network through three main links: 1) link Bordj Bou-Arreridj – M’sila ; (2) link Boumedfa – Ain Oussera – Djelfa ; and (3) link Relizane – Tiaret.

The guidelines for territory development in the regions of Algiers and Constantine include the restructuring and modernisation of railways. The signalling system in most of the network, except for some sections which benefit from modern installations, needs to be upgraded. The related ongoing project considers the set up of 250 stations across the network.

Furthermore, a project for the modernisation of signalling and telecommunication system is scheduled, which is concerned with the improvement of the signalling system in 44 stations, the installation of telecommunication lines for 900 km, and the development of a “radio sol-train system”.

This programme will complement the one started in the 80’s, which is mainly concerned with the modernisation and the upgrading of transport capacity and the geographical extension of the network. This programme has allowed the realisation of the following interventions:

- New links:
  1. Jijel / Ramdane-Djamel (140 km) ;
  2. Services for cement factories of Beni-Saf (23 km) ;
  3. Saida (23km) and Ain-Touta (15 km).
- Total renewal of a major part of the network for a total of 1400 km.
- Doubling of trunks in the North ring-road (200 km).
- Modernisation and reconstruction of stations across the network.
- Improvement of railways in the regions of Annaba and Algiers (partially).

Algeria has planned to open rail transport to the private sector through allowing concessions. It has been planned to end the monopoly of SNTF in the rail transport sector, given that road transport was opened to the private sector in 1988 and the maritime and air sectors in 1998. Thus, the government will be able to grant concessions to one or many firms for the...
exploitation of the railway network, which includes the technical and commercial exploitation of rail transport services, the maintenance and the management of regulatory and security systems. Concessions will also include the improvement of rail infrastructures through the building of new ones.

Opening rail transport to competition is justified by the fact that the State monopoly “implied a constant reduction of performance of this transport mode and a systematic appeal to public treasury for its financing”. The private sector will be in charge of the improvement and development of the railway network.

**Moroccan railways network**

Morocco can be considered as a model for the restructuring of state-owned railway companies for the other southern Mediterranean countries. With the support from the World Bank, the government launched an ambitious reform program in 1995 to convert Office National des Chemins de Fer (ONCF) into a joint stock company that will operate the existing network under a concession agreement. An ongoing investment program to modernise tracks and rolling stock is being supported by several donors, including the World Bank, the EIB and the African Development Bank.

In Morocco railways are managed by the Office National des Chemins de Fer (ONCF), a public institution with financial independence. The ONCF exploits 1,907 km of the lines constituting the national network, 1,003 km of which are electrified and 370 km are double way. This network links Marrakech in the south to Oujda at the Moroccan-Algerian border, with some branches towards Tanger in the north as well as towards the phosphates exploitation areas and some major ports.

The fleet, consisting of 206 locomotives and 6,583 cargo wagons, transported 13,6 millions passengers with an increase of 3,1% compared to previous year, 7,3 millions tons of goods and 20,2 millions tons of phosphates.

At the end of 80’s, the ONCF undertook an ambitious programme for the modernisation of the network, which is concerned with the modernisation of some stations and the implementation of telecommunications and signalling systems, all aimed at offering a quality service to its customers. The encouraging results registered at the financial level from 1996 have allowed the ONCF to implement those development projects, which were suspended because of financial problems.

This is the case of the doubling and electrification of the 65 km link Kénitra-Sidi Slimane, which reached saturation after the activation of the double link Casablanca-Rabat-Kenitra, as well as the electrification of the 53 km link Sidi Kacem-Meknes.

Among other planned projects are: the construction of the 120 km link Taourirt-Nador, the electrification of the link Fes-Oujda and the construction of the link Marrakech-Agadir.

**Tunisian railways network**

In Tunisia, the railway transport extends over 2,168 km, of which 135 km are two track railway lines and 65 km are electrified railway lines. The railway network is operated mainly by the public sector company called SNCF of Tunisia (SNCFT) and a light metro railway line company of Tunisia SMLT, specialised in the urban railway transport in the big city of Tunis. Some trunk lines belong to Compagnie des Phosphates de Gafsa and to Network of Electricity and Transport. The railway line called Tunis-Borj-Cédria is the main line. There is another line called Tunis-Sousse-Sfax-Gabés which is being electrified.

The railway network is constituted by four main groups of axis:

- North-south coastal axis, which ensures the connection among Tunis, Sousse, Sfax and Gâbès, with branches serving the towns of Nabeul and Sahel (Monastir-Mahdia);
- East-west axis between Tunis and Ghardimaou, which is part of the trans-Maghreb network and which connects to Algerian and Moroccan networks. Two branches serve the region of Bizerte and the coastal area of Tabarka;
- Tunis-Kalaa Kasbah axis, which serves the north-west and in the west;
- Axis which link the Gafsa region to ports and to industrial centres of Sfax and Gabes, and which are specialised in transportation of phosphates.

**Intra-Maghreb connections**

Finally, the intra-Maghreb connections are characterised by the following situations:
- Algeria (SNTF)–Morocco (ONCF): connection under operation;
- Algeria (SNTF)–Tunisia (SNCFT): existing bilateral connections but not in operation;
- Morocco (ONCF) - Tunisia (SNCFT): existing connections but not in operation.

### 4.4 Development perspectives of the Maghreb transport system

All the aforementioned characteristics of the Maghreb transport system have been summarised in the table below. The information has been regrouped on the basis of the three dimensions of the interoperability with the aim to highlight the external environment in which the transport chains can exploit their resources or capabilities.

<table>
<thead>
<tr>
<th>Interoperability</th>
<th>Maritime/Port</th>
<th>Railways</th>
<th>Road</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical/Operational</td>
<td>– Low interconnection with land network (especially railways)</td>
<td>– Capacity constraints (single track)</td>
<td>– Low quality of road infrastructures (especially with regard to the interfaces with the others transport modes)</td>
</tr>
<tr>
<td></td>
<td>– Infrastructures old and not suitable for container traffic</td>
<td>– Inadequacy of railways lines within ports</td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Lack of infrastructure for ICT</td>
<td>– Insufficient network configuration</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>– Lack of dedicated railways terminals within ports</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>– Lack of interconnection with the major seaports</td>
<td></td>
</tr>
<tr>
<td>Corporate</td>
<td>– Inadequate entrepreneurial culture</td>
<td>– Difficulties to face the structure of the market (still under monopoly)</td>
<td>– Low quality of the services (reliability, frequency and customerisation)</td>
</tr>
<tr>
<td></td>
<td>– Lack of specialised and trained personnel</td>
<td>– Lack of customer oriented strategy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Difficulties to face the restrictions connected to the structure of Maritime and port services market</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juridical</td>
<td>– Custom procedures and taxation</td>
<td>- Monopoly</td>
<td>– Border crossing procedures</td>
</tr>
<tr>
<td></td>
<td>– Import/Export regulations</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Labour regulation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Own elaboration

In the following paragraphs the development perspectives of the Maghreb transport system is reviewed.
The programmes defined by the Government in the field of transport infrastructures are aimed at meeting the increasing transport demand, through the modernisation of the current infrastructures and the building of new ones, the reorganisation of the transport system dominated by road transport and the redeployment of economic activities toward internal regions.

Planned management and regulatory measures are concerned with:
- The reorganisation of activities carried by the national railway company in specialised divisions and the separation of railway exploitation functions through the creation of the Agence Nationale d’Etudes et de la Réalisation des Investissements Ferroviaires (ANESRIF);
- The creation of airport regional network;
- The total opening of road transport of passengers and goods to competition;
- The possibility for foreign operators to take up the realisation and management of road infrastructures; and
- The adoption of a maritime and air code (for the opening to competition of air space and for the management of port infrastructures).
- As far as road infrastructures are concerned, the programme to be realised within 2010 will focus on:
  - The building of east-west motorway, which extends within Algerian, Moroccan and Tunisian borders across the big agglomerations (Annaba, Constantine, Setif, Blida, Oran, Sidi Belabbes), for 1.205 km;
  - The development of the east-west axis in the high plateau across Tébessa, Khenchla, Batna, Msila, Tiaret and Saida;
  - The development of the east-west axis from Lybian borders to Ghadamès across Hassi Massoud et Ourgla.

As far as rail infrastructures are concerned, two main actions have been planned: on one hand the modernisation of the Annaba–Tlemcen highway; on the other hand the extension of the network through the continuation of the high plateau highway for 1200 km:
- Moulay Slissen–Saida for 170 km;
- Saida–Tiaret for 146 km;
- Relizane–Tiaret for 140 km;
- Tiaret–Ain Oussera for 153 km;
- Ain Oussera–M’Sila for 156 km;
- M’Sila–Ain Touta for 130 km;
- Railway Bouchegout–Kharoub for 148 km.

Concerning port and airport infrastructures, the development programme sees the reinforcement of existing infrastructures (construction of another airport track at Oran, adaptation of ro-ro traffic at Algiers, Annaba and Oran, increase of capacity at Algiers and Bejaïa, etc.).

Morocco

The development programme for road infrastructures focuses of five main points:
- The maintenance of the road network, which constitutes a priority as it absorbs 70% of budget allocated to road investments;
- The improvement of road security and the modernisation of the sector in order to face the increase of traffics;
- The implementation of the national programme for the building of rural roads;
- The building of the highway linking Tanger to Saida along Moroccan-Algerian border for 560 km;
- The development of the toll motorways along the two axis north-south and east-west.
The reform for the liberalisation of freight road transport is in force. It is aimed at the abolition of the public control system on the totality of freight and it will allow transport operators to contact customers without any intermediary (which previously was the Office National des Transports, ONT).

For the development of the motorway of the Maghreb Union, Morocco plans to build 1500 km within 2010, linking the main axis of the motorway. Among the short-term projects there are:
- Marrakech-Settat for 146 km
- Marrakech–Agadir for 273 km
- Asilah–Tanger for 30 km
- Fès–Taza–Oujda for 120 +223=343 km
- Casablanca–El Jadida for 110 km ;
- The highway linking Tanger to the Algerian border for 560 km.

As far as the railway network is concerned, the development programmes include the modernisation of existing infrastructures. The improvement of the network will be carried out through the doubling of the track between Kénitra and Fès and the electrification of the trunk Fès–Oujda. Its extension will concern the axes Taourirt-Nador for 120 km and Marrakech-Agadir.

The fixed link across the Straits of Gibraltar will allow serving ordinary passengers and freight traffics. Studies for its development are based on an agreement signed by the Moroccan and the Spanish governments in 1980, which was later further developed with an additional agreement in 1989. These studies are currently in their last stages, concerning investigations of submarine geology.

Regarding the maritime transport, the rapid evolution of the national and international contexts, as well as the importance of sea transport for Moroccan commercial exchanges, impose a new strategic vision aiming at endowing the country with effective ports. ODEP, which plays a function of port exploitation, will be divided into two bodies:
- A national port authority agency, which will work on the Government’s behalf, a regulatory function;
- A port exploitation company, which will be in charge of commercial activities.

The Government will be in charge of the development of ports, the investment plans and the development of a regulatory framework for port activities.

Port infrastructures will be reinforced by the construction of a new port «Tanger Méditerranée», allowing the decongestion of the existing port. As a matter of fact, this port will be subject to saturation, given the annual increase of traffics (12% on average). Studies for the new port development have been finished and works have already begun.

**Tunisia**

From the end of 80’s, the Government adopted an economic policy based on free competition and openness. In the field of transport, regulatory measures were introduced in 1989. Road freight transport is the most liberalised sector. Its deregulation started with a law opening urban transport of goods to private operators. This initiative was positive, but the competition lead to serious financial problems in public transport firms.

Previously, there were 12 public operators for freight and passenger transport at a regional level. After the liberalisation, these two kinds of transport activities were separated and in 1997 the freight road transport was totally ensured by private operators.

The objectives of the transport policy deal with the increase of transport systems efficiency leading to production gains for local factories. Regulatory and management initiatives are all concerned with the claim of private investments for infrastructures development as well as the abolition of entry barriers for private transport operators in the sector.
With regard to road infrastructures, priority is assigned to the roads surrounding the cities of Jendouba, Kairouan, Gabès and Zaghouan as well as the improvement of urban-interurban links. The construction of two motorway trunks is also scheduled: M’Saken–El Jem for 47 km and Tunis-Medjez El Bab for 55 km.

As far as port and airport infrastructures are concerned, initiatives focus on increasing the capacity of Tunis and Jerba airports and investments in some ports (Radès, Bizerte, etc.) concerning the implementation of modern appliances and the improvement of port operations fluidity. The construction of a container terminal in Radès has been planned.

In the maritime transport sector, actions are directed towards the reorganisation of the CTN in independent divisions, on the association with foreign ship-owners and on the privatisation of the firm.

Rail transport is progressively specialising in phosphates and bulk (cereals and cement) and in passengers transport along the main axis. The Government has planned the modernisation, the reinforcement and the electrification of the trunks linking Tunis–Gabès and Tunis–Ghardimaou.
5. THE STRENGTHS AND WEAKNESSES OF THE TRANSPORT CHAINS: 
THE EMPIRICAL ANALYSIS

5.1 THE CITRUS FRUIT TRANSPORT CHAIN

Citrus fruits are usually characterized by their perishable nature, the degree of which varies from one product to another. Their conservation requires sufficient and appropriate storing infrastructure, preferably in the production zones, to insure a better control of the supply and demand.

A simplified representation of the citrus fruit supply chain, identifying the major agents in the chain, is shown in the following chart (figure 5.1). After the harvest, citrus fruits may go to the fresh fruit market, or they may enter the processing industry, for the production of orange juice (mainly in the form of Frozen Concentrated Orange Juice, FCOJ, for ease of transport in international trade) and other by-products.

![Figure 5.1: The citrus fruit supply chain](image)

More specifically, before arriving in the foreign consumers’ hands, the citrus fruits go through a long process, that can be summed up in the following steps:
- harvest;
- transport to conditioning stations;
- conditioning (washing and treatment);
- transport from stations to loading ports;
- discharging at port of destination;
- transport to the distributors (that may be either wholesaler or retailer).

The geographical context of the analysis of the citrus fruit transport chain is Morocco and France, given the outstanding weight of these products in Morocco’s exportation.

There are three major citrus production areas in Morocco (ranked by production volume): the Souss Valley, the Central area, and the Oriental region figure 5.2).
Citrus production areas are localized due to climate, topography, and water availability. The Central area is humid, has some of the oldest citrus groves, and used to be the largest citrus-producing area in Morocco. In recent years, however, the Souss Valley has surpassed the Central area in production. The Souss Valley is the southernmost citrus production area of Morocco. More specifically, the Souss-Massa region covers 50% of total agricultural exportation (fruit and firstlings) in Morocco.

Within the Mediterranean area, the export flows to France are the most significant in terms of volume within the Western Mediterranean area (about 471.981 tons in 2001).

The starting point of the analysis carried out is the definition of the transport chain structure, e.g. the different activities and the actors involved in the process of product delivery from origin to destination.

In detail, as Morocco is an exporter of citrus fruit, the operators identified are those participating to the upstream process of the supply chain, e.g. from the growing and harvest to the delivery to the importer.

### The structure of the citrus fruit supply chain in the Souss–Massa region

<table>
<thead>
<tr>
<th>Stages</th>
<th>Actors</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvest and collection</td>
<td>Producers Cooperatives and groups of producers Exports’ Groups</td>
<td>Washing and pre-drying; quality control; selection and weighing; packaging; conditioning in pallets</td>
</tr>
<tr>
<td>Inland Transport</td>
<td>Local hauliers</td>
<td>Transport to the conditioning centre and from there (after processing) directly to the ports. TIR (Road International Transport).</td>
</tr>
<tr>
<td>Load Port</td>
<td>Agadir</td>
<td>Control of the good by EACCE and Authority. Handling and storage.</td>
</tr>
<tr>
<td>Maritime Transport</td>
<td>COMANAV</td>
<td>Only transport by conventional cargoes (pallets) to the port of Marseille – Fos</td>
</tr>
</tbody>
</table>

Source: Own elaboration
5.1.1 The citrus fruit supply chain structure

The organisation of the citrus fruit chain is described in terms of the players involved and the relevant activities carried out. The main players in the chain are:
- the producers;
- cooperatives and groups of producers;
- export groups;
- the Autonomous Establishment for the Control and Coordination of Exports (EACCE); and
- transport operators.

Producers

Moroccan fruit production is characterised by the existence of two types of producers:
- The small farms, whose production is generally consumed by the family and/or sold on domestic markets;
- Small and medium-sized farms, whose production is export oriented. Some of them have their own packaging and storage facilities. Others sell their products to a larger organisation or subcontract for post-harvest and marketing services they are unable to provide themselves, such as packaging, freezing, storage and transportation;

Cooperative and groups of producers

The intermediary activity (between the producers and retailers) is managed by the cooperative or groups of producers. Their role is mainly the gathering of the products from the cooperative’s members and the products’ quality control, given that most of the producers do not have the financial resources to carry out all the logistic activities needed for the export. Besides the role they play in the selection of products and in the answer to the consumer’s requirements (retailers), the cooperatives also supply product conditioning and packaging at the conditioning stations.

At this level, the following operations are carried out:
- receipt of merchandise;
- washing and pre-drying;
- selection and weighing per weight;
- conditioning in pallets;
- weighting.

Groups of exporters

The commercial relation with the importer/wholesalers is mainly managed by groups of exporters. Apart from defending the interests of associate members, their role is to group consignments together in order to define a single marketing strategy.

These groups ensure the provision of logistic and transit services which is for the benefit of the sites to which they are affiliated. In particular, they manage the export flows by defining:
- list of products authorised for exportation and packaging type, their name and code according to their variety;
- packaging tables with shorthand and list of different periods;
- general information notice;
- weekly exportation program to be then sent to the conditioning stations. The program contains the following information:
  · weekly export forecasts;
  · commercial program according to port and variety;
  · note clarifying desired weight and colour.

In this way commercial information concerning average price per brand and weight, quantity available on the market and etc, is reported every day by phone or weekly by fax.
EACCE

The EACCE is a public establishment under the aegis of the Ministry of Agriculture which is responsible for ensuring a qualitative and quantitative follow-up of exports of fruit and vegetables. Following the liberalisation of external trade, the EACCE is acting in a framework organised for the regulation of Moroccan exports of fruit and vegetables. This regulation is both qualitative and quantitative, as it concerns the prevention of effects which would be prejudicial for the profitability and the competitiveness of Moroccan exporters.

The main activities of the EACCE are related to:
- definition of minimal rules for quality and presentation;
- preparation, application and control of regulations relating to norms;
- control and advice for production and packaging;
- coordination of exports’ activities in relation to supply to the market;
- promotion abroad of Moroccan goods.

The control is generally carried out at ports (before the exportation) and at the packaging sites where they are sent by road transport.

Shipping company

The main port involved in the citrus fruit exportation from the Souss – Massa region is the port of Agadir. The main maritime operator is COMANAV (Moroccan Navigation Company). COMANAV has currently undertaken a reorganisation process (increase of the capital thank to the participation of the French financial society) with the aim to modernise the fleet.

The conditioning modes for the maritime transport to France (port of Marseille) is mostly by conventional cargoes (pallets), a small quantity by refrigerated lorries (Ro/Ro) and an increasing share in container. In effect, the use of pallet is a consequence of the technical characteristics of road trailer, not yet adequate for the transport of ISO containers.

Road transport operators

After treatment and conditioning operations, the products are sent to the ports. Citrus fruits and firstlings transport to the ports in the Souss-Massa region is carried out exclusively by road, as there are no railway connections.

The road transport concerns:
- Citrus fruit transport to the conditioning centre and from there (after processing) directly to the ports. This activity is generally performed by the producers;
- The Transport International Routier (TIR) which is characterized by an increasing involvement of French and Spanish transporters; these last have strengthened their presence since the signature of agreements on the agricultural products transit by road.

5.1.2 Citrus fruit transport chain interoperability: the case of Morocco’s export to France

Morocco's citrus export trade consists almost exclusively of its Souss-Massa variety oranges, nearly all of which are shipped to France through Marseilles. Even today this traffic follows its traditional route; it is centred on the Marseilles fruit exchange and is based on long established Franco-Moroccan commercial relations.

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5 With reference to the road transport, before the application in 2003 of the law 16.99, the regulations distinguish two kinds of transport: transport on own account and transport on behalf of others. For each kind of transport, rules have been defined according to the total weight and freight of lorries:
- On own account: transport has been free for lorries of less those 8 tons. On the contrary a transit permit was compulsory for lorries of more that 8 tons.
- On behalf of others: for lorries whose tonnage is between 20 and 40 tons, a permit from ONT has been necessary and freights must pass through ONT.
With reference to the chain analysed in the first Report, the main weaknesses pointed out are presented in this table:

<table>
<thead>
<tr>
<th>Interoperability</th>
<th>Weaknesses</th>
</tr>
</thead>
</table>
| Technical/Operational | - Long transit time at ports (especially Agadir)  
- Lack of interconnection (especially railway) between production areas, conditioning centred and loading ports  
- Low diffusion of ITC  
- Lack of refrigerated warehouses at ports |
| Corporate | - Low frequency of maritime services and inadequacy of geographical network  
- High control of foreign operators of VA logistics services and international road transport (TIR) |
| Juridical | - Lack of harmonisation |

These arise from the port, not adequate to act as a dynamic link in the supply chain. In fact, the main problems are related to the technical/operational interoperability.

In details, the port of Agadir imposes several obstacles to the exporters in terms of:
- long transit time in upstream stages of the transport chain due to the low interconnections between road and maritime transport;
- unavailability of “reception” infrastructure, as there are no refrigerated warehouses capable of storing the products for the export;
- difficulty in connecting production areas, conditioning station and port by railways

Moreover, the port of Agadir is threatened by the improvement of the road network to Tangier (the motorway Tangier–Settat and soon Marrakech-Tangier), that could capture a great share of future traffic.

With regard to this assessment, it is also important to highlight the lack of ICT along the chain that causes additional logistic costs; data transmission and real time information about the position of goods can lead to a stock reduction both in the production and in the physical distribution.

With reference to the corporate interoperability, the analysis of the Souss-Massa transport chain allows for the identification of the following problems:
- low frequencies of shipping departures;
- low flexibility in the organisation of the transport services;
- low reliability of shipments of road haulage (if the lorry misses the ship, the waiting time for next ship is very high);
- lack of referee camion (too expensive and under the monopoly of the European operator) as a consequence of the low level of technological applications;
- maritime lines limited to some destinations and with low frequency;
- maritime transport inadequate for the new tendencies of the distribution in Europe (lack of reliability due to the irregularity of the supply).

In particular, the maritime companies supply services with low level of quality mainly expressed in terms of flexibility, frequency and reliability. The poor circulation of information has important consequences on product competitiveness especially in terms of time (product deliveries at importer premises and waiting time of the ships in the ports) and the general logistics costs.

With reference to the international transport by road (TIR) and refrigerated transport, these are generally performed by companies belonging to foreign companies (that control the market through the localisation of their own branches).
Finally, the juridical interoperability suffers from the lack of inadequate regulations and the lack of standardisation of transport procedures along the chain. Before the entry into force of law 16.99 on 13.3.2003, there were problems originated by the inefficacy of regulations that hindered transport on behalf of others and also due to the need to obtain a permit to use heavy camions. On the other hand, the taxation system remained, in some measure, relatively heavy. The structures of the sector built up several handicaps that do not incite investments in the transport sector; such situation generates high social costs and a loss of gain for all economic operators.

5.2 Bulk transport chains in Algeria

In this section we present the main findings on the interoperability of the bulk transport chains in Algeria: grain, cement and sugar. These chains present similarities as far as the technical, corporate and juridical interoperability is concerned due to the conditioning mode of the products – bulk, pallets and bags – and the technologies used to carried out the different activities along the chain (maritime transport, handling and inland transport).

In the cereal transport chain, the importation is under the quasi-monopoly of the state-owned OAIC (Office Algerien Interprofessionnel des Céréales). The imported products (cereal) are discharged in silos, located in the port areas and later transferred to the hinterland, either to rail terminal silos or to non connected silos. Transportation is carried out by road (80%) and rail (20%). In the case analysed, there are two main importers that control the different governance structure for outbound logistics. In most cases, it is up to the importers/customers to arrange the logistics from the discharging ports (the port of Alger) and even from the exporters.

In the cement transport chain, the outbound logistics are also controlled by the importers. The management of the downstream activities are carried out by different relationships with the suppliers and generally concern the transport from the discharging ports (the ports of Alger and Ghazaouet) to the cement industries and from these to the final point.

Finally, the sugar transport chain is characterised – as with the others two chains - by a high control of the importer of all the activities in the outbound logistics, e.g. from the arrival to the discharging ports (the ports of Alger and Ghazaouet), to the final destination.

5.2.1 The cereal transport chain

The Cereal Supply Chain is the ensemble of activities necessary to procure the grain, to process it, to pack the cereal and to distribute it to the customer (figure 5.3).
The transport chain analysed is that between France and Algeria, as in 2001 France’s exportation accounts for about 1 million tons.\(^6\)

As Algeria is an importer of cereal, the analysis focuses on the outbound logistic activities. More specifically, we studied the following activities:
- the maritime transport;
- the value added Logistics activities carried out in the ports;
- the inland transportation;
- the value added logistic activities carried out for the final distribution.

In particular the identified cereal supply chain structure (actors involved and the activities performed) is described in table 18. More specifically the actors involved are the following:
- the importers: Office Algérien Interprofessionnel des Céréales (OAIC) and Office National des Aliments du Bétail (ONAB);
- the shipping companies involved in the bulk transportation: CNAN;
- the port of unloading: Alger;
- the rail company: Société de Transport de Grains (STG), a joint venture between SNTF and OAIC;
- the local hauliers.

<table>
<thead>
<tr>
<th>Stages</th>
<th>Actors</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import</td>
<td>ONAB</td>
<td>They control the outbound logistics. They are mainly located in the North Centre</td>
</tr>
<tr>
<td>Marine</td>
<td>CNAN</td>
<td>Bulk transport from the port of Marseille – Fos to the port of Alger.</td>
</tr>
<tr>
<td>Unload port</td>
<td>Alger</td>
<td>Handling and storage</td>
</tr>
<tr>
<td>Inland Transport</td>
<td>Local hauliers</td>
<td>Transport towards processing facilities (ERIAD), stoking and distribution points.</td>
</tr>
<tr>
<td></td>
<td>STG</td>
<td></td>
</tr>
</tbody>
</table>

The cereal supply chain in Algeria presents a structure quite linear as the importers have the leading role.

**Importers**

The importers have the whole control of the outbound logistics: they outsource the maritime transport to third parties, while the road transport is managed and controlled by their own resources and structures.

Once the cereals are unloaded at the port of Alger, they are transported by road or rail to the OIAC’s stockage silos within the port of Alger or to the ERIAD’s \((Enterprise Régionales de transformation des céréales)\) processing facilities for the production of flour and bran.

These flows are directly managed by the importers by short term relationships for what the maritime transport is concerned while for the inland distribution the internal growth (by its own resource and structure) is the preferred form of control. Regarding the railway transport (accounting for 12% of the inland distribution), the importers set up only spot relationships with STG as the market is still under the monopoly of SNTF.

With reference to value added logistics services, the importers prefer to directly control the warehousing and distribution services such as storage, order processing, stock control and custom documentation.

\(^6\) 70% of the cereal importation is concentrated in 4 Algerian ports: Alger, Oran, Djen-Djen and Bejaia.
The shipping company

The main national shipping company, CNAN (Compagnie National Algérienne de Navigation), has undertaken an important process of re-organisation ending with the creation of a new company SNTM/CNAN (Société National Transport Maritime). More specifically, within the cereal supply chain, SNTM/CNAN supplies port to port services between the port of Marseille – Fos and Alger. There is no further involvement of this shipping company in other steps of the supply chain. Finally, the track and trace is not supplied because of:
- The kind of the goods transported (bulk).
- The low level of diffusion of ITC in this chain.

Road transport operators

The inland transportation of cereals concerns mainly two flows:
- The OIAC’s distribution network to the stocking points and point of sales
- The delivery to the ERIAD’s processing facilities and to its point of sales.

More precisely, table 19 describes the cereal inland distribution from the port of Alger to the final destination, by itinerary and modes of transportation.

Both services are mainly performed by local hauliers (generally belonging to the importers) or by railway operator. The latter is increasingly becoming more integrated in the cereal transport chain after the creation of a specialised firm, the STG, a joint venture between OAIC and the SNTF. STG supplies, besides the inland transportation, the cross-docking for the distribution of cereals to different regional points of sales.

<table>
<thead>
<tr>
<th>Unloading Ports</th>
<th>Destination</th>
<th>Itinerary</th>
<th>Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALGER</td>
<td>ALGER-BOUIRA</td>
<td>Road+Rail</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ALGER-BLIDA</td>
<td>Road+Rail</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DJELFA</td>
<td>Road+Rail</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ALGER-BLIDA-MEDEA-DJELFA</td>
<td>Road+Rail</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TIZI OUZOU</td>
<td>ALGER-TIZI OUZOU</td>
<td>Road+Rail</td>
</tr>
<tr>
<td></td>
<td>MSILA</td>
<td>ALGER-BOUIRA-BB ARREDJ-MSILA</td>
<td>Road+Rail</td>
</tr>
<tr>
<td></td>
<td>LAGHOUAT</td>
<td>ALGER-BLIDA-MEDEA-DJELFA-LAGHOUAT</td>
<td>Road+Rail</td>
</tr>
<tr>
<td></td>
<td>MEDEA</td>
<td>ALGER-BLIDA-MEDEA</td>
<td>Road+Rail</td>
</tr>
<tr>
<td></td>
<td>AIN DEFLA</td>
<td>ALGER-BLIDA-AINDEFLA</td>
<td>Road+Rail</td>
</tr>
<tr>
<td></td>
<td>ALGER</td>
<td>ALGER-BLIDA-AINDEFLA-TIARET</td>
<td>Road+Rail</td>
</tr>
<tr>
<td></td>
<td>BOUIRA</td>
<td>ALGER-BLIDA-AINDEFLA-CHLEF</td>
<td>Road+Rail</td>
</tr>
</tbody>
</table>

Source: Khan Consultant

5.2.2 The cement transport chain

The cement supply chain is generally composed by the following activities: procurement of raw materials; raw milling and production; storage and distribution (figure 5.4).

Most of the raw materials used are extracted from the earth through mining and quarrying and can be divided into the following groups: lime (calcareous), silica (siliceous), alumina (argillaceous), and iron (ferriferous).

---

7 In the past CNAN was involved in the hydrocarbon transport and in the towing activity.
These are mixed to obtain the correct chemical configuration of the product to be then transformed into cement.

Once the production of cement is complete, the finished product is transferred using bucket elevators and conveyors to large, storage silos in the shipping department. Bags are used primarily to package masonry cement. Once the cement leaves the plant, distribution terminals are sometimes used as an intermediary holding location prior to customer distribution. The same types of conveyor systems used at the plant are used to load cement at distribution terminals.

The transport chain analysed is that between Spain and Algeria. More specifically, Algeria has a cement production capacity of about 8 million tons. The industry is located in the North – Centre and Spain is the main supplier of both raw material for the cement production and other building materials.
In 2001 Spain exported 126,469 tons of cement to Algeria through the ports of Alicante (79,219 tons), Sagunto (about 46,000 tons), Barcelona (585 tons) and Castellon (165 tons). As shown in figure 6, the production areas are located close to the aforementioned ports and the materials are delivered to the ports for the export by road transportation.

As Algeria is an importer of raw materials and cement, the analysis focused on the downstream process of the supply chain, meant as the activities carried out to produce and then distribute the goods to the final client.

The stages, actors and activities identified in the outbound logistics of the cement supply chain are reported in the next table.

<table>
<thead>
<tr>
<th>Stages</th>
<th>Actors</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import</td>
<td>Importer, Intermediary</td>
<td>They manage and control the outbound logistics of the cement supply chain</td>
</tr>
<tr>
<td>Maritime transport</td>
<td>CNAN</td>
<td>Bulk transport from the port of Barcelona to the port of Alger and Ghazaouet.</td>
</tr>
<tr>
<td>Unload port</td>
<td>Alger, Ghazaouet</td>
<td>Handling and storage.</td>
</tr>
<tr>
<td>Inland Transport</td>
<td>Local hauliers, SNTF</td>
<td>Transport towards cement industry</td>
</tr>
</tbody>
</table>

The importers and their representative (intermediary) manage and control the outbound logistics of the cement supply chain. More specifically, they outsource the transport services whilst managing, in house, the warehousing and supporting services to the product.

The governance structure for the transport services is the following:
- Spot relationships with shipping companies for the delivery of the goods;
- Own structure and resource for the road transport.

More specifically, the shipping company involved in the maritime transport is CNAN, and the supplied services is port-to-port, e.g. between the port of Barcelona and the port of Alger. Given the characteristics of the good (solid bulk) and the kind of maritime transport (trump services), the preferred relationship between the importer (or his intermediary) and the shipping company is spot.

Unlike the port of Alger, the port of Ghazaouet presents a more specialised supply of services for the cement. In fact, besides the handling and storage, the following services are supplied: stock control, weighting and quality control.

Concerning the inland transportation of the raw materials and cement to the processing facilities, this is mainly realised by road while only 25% is made by the railway. The road transport is performed by small hauliers belonging to the importer. The destination and itinerary of the cement inland distribution from the port of Alger is described in the table below.

<table>
<thead>
<tr>
<th>Unloading port</th>
<th>Destination</th>
<th>Itinerary</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALGER</td>
<td>ALGER</td>
<td>ALGER-MSILA</td>
</tr>
<tr>
<td></td>
<td>BLIDA</td>
<td>ALGER-BLIDA</td>
</tr>
<tr>
<td></td>
<td>BOUMERDES</td>
<td>ALGER-BOUMERDES</td>
</tr>
<tr>
<td></td>
<td>TIPAZA</td>
<td>ALGER-TIPAZA</td>
</tr>
<tr>
<td></td>
<td>TIAZI-OUZOU</td>
<td>ALGER-TIZI OUZOU</td>
</tr>
<tr>
<td></td>
<td>BOUIRA</td>
<td>ALGER-BOUIRA</td>
</tr>
<tr>
<td></td>
<td>MSILA</td>
<td>ALGER-BLIDA-BOUIRA-MSILA</td>
</tr>
</tbody>
</table>
The strengths and weaknesses of the transport chains: the empirical analysis

5.2.3 The sugar transport chain

The sugar supply chain can be defined as a sub-chain of the sugar cane chain. Sugar and alcohol are its most important products derived from sugar cane, followed by its by-products as bagasse, which can be used to generate energy. Other by-products are molasses, cellulose paste and leaven.

In detail, the sugar supply chain is represented by all the activities carried out to produce the sugar from the sugar cane (processing and refining activities) and to distribute it to the final client (figure 5.7).

![Sugar supply chain diagram](image)

Source: Khan Consultant

The transport chain analysed is that between France and Algeria.

The Algerian refining capacity accounts for 260,000 tons, totally procured by importing raw sugar. As this quantity does not cover the total demand, about 600,000 tons of white sugar is also imported.

As Algeria is an importer of raw sugar, we analyse the downstream process of the supply chain, e.g. from the arrival of the raw sugar to the refining facilities to their final distribution.

There are four main refining areas in Algeria: Mostaganem, Khemis Milana (Ain Defla region), Sfisef (Sidi Bel Abbes region) and Guelma.

More precisely, the analysis focussed on the operators and the activities carried out along the transport chain between the port of Alger and Ghazaouet to the production area of the Defla region.
As for the other chains already analysed in the solid bulk segment, the importers and their intermediary have the whole control of the outbound logistics.

### Sugar supply chain structure

<table>
<thead>
<tr>
<th>Stages</th>
<th>Actors</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import</td>
<td>Importer</td>
<td>They manage and control the outbound logistics</td>
</tr>
<tr>
<td></td>
<td>Intermediary</td>
<td></td>
</tr>
<tr>
<td>Maritime transport</td>
<td>CNAN</td>
<td>Bulk transport from the port of Marseille - Fos to the port of Alger and Ghazaouet.</td>
</tr>
<tr>
<td>Unload port</td>
<td>Alger and Ghazaouet</td>
<td>Handling and storage.</td>
</tr>
<tr>
<td>Inland Transport</td>
<td>Local hauliers SNTF</td>
<td>Transport towards refining industry in the Defla region (Khemis – Milana).</td>
</tr>
</tbody>
</table>

The governance structure for the management of the chain is the following one:

- spot relationships for the maritime transport;
- internal growth for the road transportation;
- in house management of the warehousing and distribution services.

The spot relationship with the shipping company CNAN – as for the cement chain - is mainly a consequence of the characteristics of the good (bulk) and the type of the transport services (tramp). CNAN supplies port–to–port services from Marseille to Alger and there is no involvement of other companies in further steps of the sugar transport chain.

In the port of Alger, the handling and storage are the only services supplied, while in the port of Ghazaouet warehousing and supporting services are also supplied. In fact, the port of Ghazaouet presents a sound specialisation in the bulk segment.

More precisely, the available services within the port, besides handling, are the following:

- storage ad stock control;
- weighting and Labelling;
- pick and pack;
- quality control.

However, these are under the control of the importer or his representative.

Finally, inland transportation is characterised by a predominance of road transportation.

The road transport to the production area is generally performed by small local hauliers belonging to the importer.

With reference to the railway, even if the share of inland transport is less than 20%, the SNTF is undertaking a reorganisation process in order to improve the performance level of the supplied services. Besides transport, the railway company manage an inland terminal for the supply of cross-docking services.

In general, and to summarize main findings of the empirical analysis, we can state that multimodal chains do not exist in the entering flux in Algeria, in the sense that there is not an identified regular operator in each mode and stage of the transport chain, who insure the dispatching of goods or products from the starting point to their final destination.

### 5.2.4 Bulk transport chains interoperability

The main results of the empirical analysis are presented in table 4. The cereal transport chain presents a more complete picture of the factors hampering the level of the interoperability as the importers are – among the other actors interviewed –involved in different stages of the
transport chains and therefore they have a global view of the problems of the whole transport chains.

Two factors affect the technical/operational interoperability negatively in the three chains:
- the lack of inland connections especially railways;
- the lack of common standard interface for EDI.

The lack of inland connections, especially between ports and the railway system, is perceived as the main weakness of the chains as it poses constraints on the cargo delivery to the final destination and affects the performance of the whole transport chain in terms of reliability and logistic costs. In more detail, according to the interviewees the main critical factors of the railway systems are:
- the infrastructure dimension and adequacy;
- the commercial strategies of the main operators;
- and the adequacy of the transport means to the user needs.

The last two are mainly a consequence of the market structure (monopoly) and they highlight a lack of customer oriented strategies of rail companies.

With reference to the lack of common standard interface for EDI, technological advances in ICT improve information exchange significantly in terms of lead-time, completeness and transparency. Clearly ICT can enhance supply chain integration, but it requires systems compatibility within the port community and between the actors of the chain. The establishment of common interfaces for EDI system could provide many benefits to the operators, such as reductions in document processing costs and lead time.

The other weaknesses concern the infrastructures and equipment within the ports, such as:
- the lack of space for the handling (and temporary store of the goods) and the supply of value added logistic services;
- the wharf depth that poses constraints for the ships dimensions.

In particular, the physical organisation of space is becoming very important for ports as it allows them to avoid operational ineffectiveness and to increase the range of value-added logistic services.\(^8\)

With reference to the corporate interoperability, the main weaknesses are related to the maritime and basic terminal services (Handling, storage). This is mainly a consequence of the structure of the maritime and port market that, even though different efforts have been carried out to open the market to private participation, it is still characterised by monopolistic situations. As a result, the high handling and port costs, as well as the low qualitative level of maritime and logistic services, affect the whole transport chain in terms of effectiveness and reliability.

Finally, regarding the juridical interoperability, the main problems seem to be related to:
- the hindrances of administrative and bureaucratic procedures (different permits and authorizations related to transport, custom, port,...);
- the lack of cooperation and coordination between customs and non customs-officer, creating frequent “break” of load along the transport chains.

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\(^8\) Distriparks - that are logistic areas where the commodities are sorted, submitted to treatments that add value (assemblage, packaging, quality control, etc.) and then distributed - can be located out of the port areas if this allows for greater efficiency of road transport in relation to the location of the production and consumption centres. In fact road and railway connections represent a strategic element allowing the extension of ports attraction areas.
### Bulk transport chain in Algeria: main weaknesses

<table>
<thead>
<tr>
<th>Technical/Operational</th>
<th>Cereal Transport Chain</th>
<th>Cement Transport Chain</th>
<th>Sugar Transport Chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Lack of inland connections (especially railways)</td>
<td>- Lack of inland connections especially railways</td>
<td>- Lack of inland connections especially railways</td>
<td></td>
</tr>
<tr>
<td>- Lack of common standard interface for EDI</td>
<td>- Lack common standard interface for information and data exchange (EDI, etc.)</td>
<td>- Lack common standard interface for information and data exchange (EDI, etc.)</td>
<td></td>
</tr>
<tr>
<td>- Inadequate structure and old equipments</td>
<td>- Infrastructure dimension and adequacy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Lack of space within ports (for the supply of value-added logistics services)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interoperability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Lack of specialised logistics services</td>
<td>- Basic Terminal Services at ports</td>
<td>- Quality of Maritime services (frequency and high costs)</td>
<td></td>
</tr>
<tr>
<td>- Low quality of basic and V.A. services at terminals (that impose high costs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Structure of supplier’s market (monopoly of railway and port services)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Low quality of the supplied services (reliability, frequency, flexibility; etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Corporate</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Lack of harmonisation</td>
<td>- Lack of harmonisation of transport procedures</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Juridical</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Own elaboration

### 5.3 Textile and clothing transport chain

The clothing industry is a traditional industry which lies upstream of clothing distribution and downstream from the textile sector for which it is the major outlet. The textile and clothing chain embraces several different sets of activities, occupations and roles (see figure 5.8) whose characteristics shape the profile of the sector.

The existence of these steps of designing, styling, cutting and assembling clothing and the wide range of ways in which they can be combined have an important impact on the organisation of the textile and clothing supply chain. From this point of view, organisation essentially depends on the extent to which these activities are integrated within individual enterprises and on where these activities are located.

Figure 5.8: The textile and clothing supply chain

Some companies for example act as principals, purchasing fabric and carrying out product design and marketing but entrusting manufacture to subcontractors. Increasingly the
relationship with marketing is a critical variable with some distributors establishing subcontract relationships with producers, while some industrial companies seek to move into distribution.

The analysis carried out within WP4 focussed on two transport chains: between Morocco and Spain, and between Tunisia and Italy. Before presenting the results of our survey, it is worth mentioning that:

- Companies in EURO countries export fabrics or parts of garments to Morocco and Tunisia, and then import semi-finished and fully-formed clothes to be then re-exported.
- The EU control of the supply chain has brought Morocco and Tunisia considerable foreign investment and a skilled industrial workforce over the years. However these countries have not invested in developing their supply chains and infrastructures, nor in higher value design and marketing skills.
- In order to smooth the chain, most exporting companies have their own hauliers and custom officer in the factory.

These considerations have brought to a simplification in the analysis of the textile and clothing transport chains as the import of raw materials and the export of semi-finished and finished products follow the same supply chain. More precisely, the import concerns the procurement of the Moroccan or Tunisian factories – where the raw materials are manipulate – and the export refers to the distribution of clothes and others semi-finished products to the final markets.

### 5.3.1 The case of Morocco and Spain

Moroccan textile companies can be categorized on the basis of the nationality source of their original capital. Some are affiliated with U.S. multinationals, but operate out of Morocco in order to supply the EU market.

Other firms have EU roots, but have displaced themselves from Europe to Morocco to take advantage of lower wages and EUAA-associated duty advantages.

European companies based in Morocco pursue a variety of brand and market niche strategies, from lower cost, discount products to upper end, fashion garments. Generally the products are sold principally into the EU market to EU retailers.

Clothing companies operating in Morocco tend to provide CMT services (basic services) to international companies, which design garments and source raw materials from overseas and send them to Morocco for processing into final products for export. Some companies provide all CMT services in-house, others use a combination of in-house and CMT subcontractor services to meet clients’ demands. Increasingly a number of Moroccan firms are modernizing and are capable of delivering full package services to their clients.

However, the industry has been hit by increased competition from a variety of directions, including central Europe, sub-Saharan Africa, Mexico, and the Caribbean. For this reason, the Government defined an investment program for the sector, encompassing cuts in employer benefits contributions, lower energy costs, investment assistance for the acquisition of land and buildings and low interest loans, all designed to stimulate new employment in the sector. The Government has also agreed to make funds available to textile and clothing companies for management consultations regarding modernization strategies, for international advertising campaigns in Europe, and to help finance textile worker training programs to increase the multi-skilling of basic operators.

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9 Morocco has long encouraged manufacturing for export via its “temporary admission” customs regime, which allows exporters to import raw materials and inputs from world markets without payment of duty, as long as the manufacturer’s end product is re-exported.

10 CMT refers to “cut, make, and trim,” i.e. only the key manual assembly operations.
Within such context, the main Spanish ports involved in export of raw materials and in the import of semi-finished and finished products are listed in this table.

<table>
<thead>
<tr>
<th>Textile and clothing flows from Spain to Morocco</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Raw materials</strong></td>
</tr>
<tr>
<td><strong>Loading ports</strong></td>
</tr>
<tr>
<td>Algeciras</td>
</tr>
<tr>
<td>Valencia</td>
</tr>
<tr>
<td>Barcelona</td>
</tr>
<tr>
<td>Others</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
</tr>
</tbody>
</table>

Source: Estadísticas de Comercio Exterior de España and TradeTrans database, 2003

The port of Algeciras has a central role in the textile and clothing trade exchange with Morocco, accounting for 80% of the total export of raw materials and 88% of the total import of semi-finished and finished products.

With reference to the textile and clothing supply chain structure, the foreign firms have a leading role in the management and control of the all activities of the supply chain.

<table>
<thead>
<tr>
<th>Textile – Clothing supply chain structure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stages</strong></td>
</tr>
<tr>
<td>Export</td>
</tr>
<tr>
<td>Inland Transport</td>
</tr>
<tr>
<td>Load ports</td>
</tr>
<tr>
<td>Maritime Transport</td>
</tr>
</tbody>
</table>

**The foreign firms**

EURO companies in Morocco handle all aspects of input procurement, textile sourcing, fabric cutting, garment assembly, laundry and finishing, packaging, and distribution.

Among them, the Spanish denim company SETTAVEX, is Morocco’s leading denim manufacturer. The company features total quality management circles and round-the-clock manufacturing. It works with Moroccan clothing company clients to develop innovative product development and marketing to local as well as West African denim garment distributors. For the moment, most of the cotton fibre used by SETTAVEX is imported from world markets (with origins in West Africa, Syria, and elsewhere) even if the company is considering greater backward integration with Moroccan cotton producers. The semi-finished products are then re-exported to Europe, through the port of Algeciras.

**The inland transport operators**

In Casablanca and Tanger there are 10 branches of big foreign groups for the TIR services, such as Gefco Morocco and Tibbett & Britten, working on the behalf of the producers. These offer truck and sea transportation of textiles to/from the North African country, and also process customs clearance, offer bonded warehousing and local delivery.
The trailers are directly loaded on the vessels at the port of Casablanca and Tanger to the ports of Cadiz and Algeciras. The shipping companies ensure the following daily connections:
- Casablanca–Cadiz; Ro/Ro services supplied by Comanav and Comarship;
- Tanger–Algeciras; Ro/Ro and car/ferry services supplied by Intercona, Comarit, Limadet and Comarship.

The Tanger–Algeciras service is the most important in the textile and clothing chain given the high frequency of the services and the transport capacity of trailers.

**The shipping companies**

As seen earlier, Morocco’s biggest export market is the European Union. With both container and truck shipping available from Morocco’s seaports, Morocco provides an ideal platform for companies seeking just-in-time access to European markets.

Spain is the country with the highest number of regular lines with Morocco, both due to trade relationships and geographical proximity.

COMANAV offers the following services in the textile and clothing chain: Ro/Ro and conventional between Casablanca and Tanger with a frequency of 5 rotations a week. The travel time is about 16 hours.
- Comarship, Intercona, Comarit offer the following services:
- Ro/Ro between Casablanca and Cadiz, and between Tanger and Cadiz
- Car/ferry between Tanger and Algeciras.

The last service is particularly important within this transport chain given the high frequency of the services - 15 rotations per day - allowing trailer transportation of 70,000 units per year.

### 5.3.2 The case of Tunisia and Italy

Tunisia’s export has been built on its outward processing trade with the EURO, under which companies in developed countries can export fabrics or parts of garments, and then re-import them as fully-formed clothes to the originating country. In fact, the EURO accounts for 96% of Tunisia’s clothing trade.

The EURO outward processing arrangements have brought Tunisia considerable foreign investment and a skilled industrial workforce over the years.

The rise of Tunisia as a garment exporter began in the 1970s, as a result of an investment code in 1972, which opened the country to foreign investment (see figure 5.9). Since then, hundreds of foreign companies have established wholly or partly owned concerns, and mainly garment factories, in Tunisia.

![Figure 5.9: EU firms in Tunisian textile and clothing industry](source: CETTEX, 2004)
However the country has not invested in developing its supply chain and infrastructure, nor in higher value design and marketing skills. The upshot has been that Tunisia has a weak textile and finishing industry and tiny export trades to countries other than those in the EU.

Tunisia is presently a leading exporter to the EU of trousers (especially of jeans), lingerie and work wear. It is also an important exporter of shirts, jackets and anoraks. Among the garment sector leaders are Sartex, Lee Cooper, Cavalier (for jeans), Pantalia, Sotuco (for city trousers), CTS, Mamo (a work wear specialist), Playtex, and CIS (which concentrates on lingerie). Other names are Bizertex, Meditex (for chemises), Guevanot and Société de Confection du Sud (for jackets).

The different activities within the textile and clothing industry are geographically concentrated: the most complex items are produced around Grand Tunis area, while Sfax is specialised in low quality products, such as T-shirt and cotton underwear. The area around Nabeul is well known for the production of working clothes while the Sousse – Monastir axis is specialised in sportwear and knitwear.

Co-contracting, which means that Tunisian subcontractors will source fabrics on behalf of buyers, is on the rise. But very few Tunisian exporters are able to design and market self-created collections. Among those few are the men's suit producers Makni, which owns the Particolari brand, along with Moncef Barcous.

Tunisia’s imports from the Western Mediterranean are about 168.000 tons, accounting for 54% of the total importation and exports to West-Med 130.000 tons of clothes and finished products, about 67% of the total exportation.

<table>
<thead>
<tr>
<th>Product</th>
<th>Total (ton)</th>
<th>West Med</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fibres</td>
<td>38.850</td>
<td>6.140</td>
<td>16</td>
</tr>
<tr>
<td>Linen</td>
<td>26.215</td>
<td>14.324</td>
<td>55</td>
</tr>
<tr>
<td>Fabric</td>
<td>133.416</td>
<td>80.767</td>
<td>61</td>
</tr>
<tr>
<td>Cloth</td>
<td>113.650</td>
<td>67.700</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>312.131</td>
<td>168.931</td>
<td>54</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product</th>
<th>Total (ton)</th>
<th>West Med</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fibres</td>
<td>3.868</td>
<td>2.778</td>
<td>72</td>
</tr>
<tr>
<td>Linen</td>
<td>6.815</td>
<td>5.116</td>
<td>75</td>
</tr>
<tr>
<td>Fabric</td>
<td>32.970</td>
<td>23.514</td>
<td>71</td>
</tr>
<tr>
<td>Cloth</td>
<td>150.132</td>
<td>98.780</td>
<td>66</td>
</tr>
<tr>
<td>Total</td>
<td>193.785</td>
<td>130.188</td>
<td>67</td>
</tr>
</tbody>
</table>

Source: CETTEX, 2004

The main ports for the trade exchange in the textile and clothing segment are Radès and La Goulette.

<table>
<thead>
<tr>
<th>Port</th>
<th>Tons</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radès</td>
<td>338.000</td>
<td>85%</td>
</tr>
<tr>
<td>La Goulette</td>
<td>39.000</td>
<td>10%</td>
</tr>
<tr>
<td>Sfax</td>
<td>17.000</td>
<td>4%</td>
</tr>
<tr>
<td>Sousse</td>
<td>1.500</td>
<td>1%</td>
</tr>
</tbody>
</table>

Source: CETTEX, 2004

Among the West Mediterranean countries, Italy represents, with France, the main exporter of raw material and importer of jeans, lingerie and work wear.

The trade exchange between Italy and Tunisia are presented in figure 5.10.

The Italian exports are mainly directed towards the Grand Tunisia area (about 49.000 tons) and Le Sahel (about 18.000 tons), where the most important production areas are located. Then the semi-finished and finished products are re-exported to Italy respectively, 24.199 tons from Grand Tunis and 17.730 tons from Le Sahel.
With reference to the textile and clothing supply chain structure, in this case the foreign firms also have a leading role.

**The textile – Clothing supply chain structure**

<table>
<thead>
<tr>
<th>Stages</th>
<th>Actors</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export</td>
<td>Foreign firms</td>
<td>They manage and control the whole supply chain</td>
</tr>
<tr>
<td>Inland Transport</td>
<td>OTI Tunis</td>
<td>TIR and transport organisation and custom clearance</td>
</tr>
<tr>
<td>Load ports</td>
<td>Radès</td>
<td>Handling, deconsolidation, storage and consolidation for distribution</td>
</tr>
<tr>
<td>Maritime Transport</td>
<td>CTN</td>
<td>Container and conventional between Radès and Leghorn.</td>
</tr>
</tbody>
</table>

**Foreign Firms**

Foreign firms, as for the case of Morocco, have the control of the whole chain. Most exporting companies indeed have a resident customs officer in the factory, to smooth out any problems.

Textile giants such as GAP, Levi Strauss, Lee Cooper and Cacharel are among the 850 foreign companies manufacturing in Tunisia. This number pales in comparison to the 3,000 local textile companies, however, does show that there is still room for growth. Lee Cooper performs 60% of its production in Tunisia, having seen its staff increase from 50 people in 1975 to 900 today. Tunisia’s foreign textile firms export 80% of their goods, furthermore, making it the fourth largest supplier in the EU of ready-made clothes and France’s chief supplier. For coats, Tunisia’s principle customers are in France, Italy, Germany and Belgium.
Benetton is one of the main Italian manufacturers with a textile factory in Sahline and a new factory located in Monastir\[11]\.

The company has organised its production process according to a three-tired model:
- First tier: approximately 150 firms form the productive core of the group. Among them, there are suppliers of raw material and semi-finished products and production plants following all the production phases except packaging, which is handled in Treviso.
- Second tier: approximately 1,600 sub-contracting micro-firms for finishing
- Third tier: shops and contractors.

Tunisia represents first tier suppliers in the Benetton’s production; Benetton supplies the raw material to the production plants and then re-imports semi-finished products to be then re-exported in Europe. With regard to manufacturing activities, a company has been formed in Tunisia under the name of Benetton Manufacturing Tunisia Sarl.

The delocalisation of the production is aimed at reducing the group production expenses as a percentage of sales (mainly thanks to lower labour costs in Tunisia) and to increase the efficiencies of its distribution network (i.e. increased contribution of product deliveries from the local warehouses and improved product time to market) in the medium term.

**Inland transport operators**

Like for other Maghreb countries, the inland transportation notably is dominated by road transport. There are different public sector operators in the road sector: namely, SNTRI (Inter Arban National Transport Company). The SNT (National Transport Company) the 12 regional transport companies (STRG). There are 30 Tunisian companies which are operating within the framework of Transport International Routier (TIR).

As in the case of Morocco, the inland transportation between the production plants and ports is controlled by the producer or his representative.

Generally the local hauliers are committed by the foreign firms or his representative, e.g. the branch involved in the logistics management like Benlog for Benetton. The inland transportation therefore can be supplied by:
- the parent company of the foreign firms;
- local hauliers on the basis of short medium term partnerships (outsourcing).

In this case, Benetton outsources to OTI Tunis inland transportation. More precisely, OTI Tunisie supplies not only the international transport TIR, but also involved in the transport organization (the whole operations of transit and transport on both sides of the Mediterranean, thus guaranteeing the quality of service and the best delivery times for the goods) as well as customs clearance \[12]\.

**Shipping companies**

Italy is the main Tunisian commercial partner (150 calls per month)\[13]\). The connection with Radès and Genoa is Ro/Ro while the container traffic concerns the Italian ports of La Spezia and Leghorn.

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\[11]\ The others Italian manufacturers are ELDO srl, Miroglio – GVB (with three production plants in Tunisia) Marzotto Group and Tacchini. The former has been particularly dynamic in the Tunisian Textile industry, by planning a new industrial district of about 100 Italian firms of the textile and clothing supply chain.

\[12]\ OTI TUNISIE is a subsidiary company of the STE group which was created in Europe in 1984

\[13]\ The port complex TGR has the predominance of the traffic with Europe (350 calls per month). The Sfax has 40 calls per month, Sousse 10 per month and Gabés 15 per month.
CTN (Compagnie Tunisienne de Navigation) is the only public operator (together with SONOTRAK that is only involved in the transport between the isle of Kerkennah and the port of Sfax). CTN supplies the following services:
- Ro/Ro services between Tunis-Genoa-Barcelona-Tunis;
- Container and conventional between Radès and Leghorn (two times a week) and Radès – Genoa (three times a week).

5.3.3 The textile transport chain interoperability: the case of Spain–Morocco

As already highlighted in the first report, clothing companies operating in Morocco and Tunisia tend to provide key manual assembly services to foreign companies, which design garments and source raw materials from overseas and send them back to Morocco and Tunisia for processing into final products for export.

In the cases analysed, e.g. Spain – Morocco and Italy – Tunisia - the foreign firms have the control of the whole supply chain both in the procurement of raw material to the production plants located in Morocco or Tunisia and for physical distribution to the final markets.

As we did not get enough answers from Tunisia, we are only able to present the results on the interoperability for the Morocco – Spain textile and clothing transport chain.

The critical factors of the interoperability are shown in the table below; the most important weaknesses of the chain – as highlighted for the other cases, - are those affecting the transportation and handling costs and the reliability in supplying door-to-door services.

<table>
<thead>
<tr>
<th>Interoperability</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical/Operational</td>
<td>Lack of inland connections (especially railways)</td>
</tr>
<tr>
<td></td>
<td>Lack common standard interface for information and data exchange (EDI, etc.)</td>
</tr>
<tr>
<td></td>
<td>Lack of unitisation of loading units along the transport chain;</td>
</tr>
<tr>
<td></td>
<td>Lack of logistics platform</td>
</tr>
<tr>
<td>Corporate</td>
<td>Low quality of Maritime services (frequency and high costs)</td>
</tr>
<tr>
<td>Juridical</td>
<td>Lack of harmonisation of transport procedures</td>
</tr>
</tbody>
</table>

The lack of inland connections poses serious problems in the organisation and synchronisation of material flows to the manufacturing plants and ports.

Currently, most of the Moroccan ports are not connected to the railroad system.

The port of Tanger, which has most of the traffic to European destinations, has serious constraints in relation to the railway connections because: the wagons can not enter into the port and the station of Tangiers-Port has been suppressed.

The Port of Casablanca has railway connections, but the road transport is more convenient in terms of costs and more flexible as the time for the loading/unloading operations and the customs clearance are too unpredictable for the coordination of a transport timetable. Thus, the haulage is the preferred mode of transport both for the delivery of raw materials (unloaded in the port of Tanger and Casablanca) to the production plants and for delivery of semi-finished products to the port of Tanger and Casablanca for exports.

A part from the problems related to the inland connections, the issue of the common standard interface for information and data exchange has been perceived of crucial importance.

The Textile-Clothing supply chain is characterised by great number of actors (clothing manufacturers, fabric suppliers, darn service suppliers, dyers, etc.) who work together to produce the final products. As the production lots are becoming smaller, more customised and
with shorter time requirements, the need for Information and Communication Technologies are crucial for the management of the inbound and outbound flows of the chain. The producer has a strong interest in knowing when the cargo will be available and whether the announced date of delivery is reliable. The former has repercussions on operating costs while the latter is an essential input in the production planning process (especially for flows synchronisation). Therefore, the development of a common standard interface for EDI affects the competitiveness of the company on international markets and favours the pursuit of J.I.T. strategies and the efficient management of the inventory level.

However, the size of the Moroccan enterprises and their cultural tradition seem to prevent to find out a common exchange format (standards). For this reason, the foreign companies have located their own production plants and branches in Morocco, implementing their own technological systems for data exchanges. This represents only a first step for the improvement of information and communication systems throughout the whole textile and clothing supply chain. A critical issue arises for the creation of a common standard interface within the port community, and between this and the other actors of the chain.

Regarding the lack of unitisation of the loading units along the chain, it refers to the technological incompatibility between the different modes of transport. In fact, the use of container requires technological advancement not only in the maritime stage (transport and handling) but also in other stages of the transport chain. The changing of the load unit (such as from container to pallet) increases time and costs, and reduces the reliability of the whole supply chain.

The lack of logistic platforms is the last factor hampering the technical/operational interoperability\textsuperscript{14}. Such platforms would generate higher value added through the supply of a complex package of logistic and transport services such as consolidation and deconsolidation of the cargo, labelling and pricing, custom, banks, insurances, and they could constitute an ideal hub for the information and data exchange among all the actors of the chain. Moreover, these platforms could bring a recovery of competitiveness for the Moroccan Small and Medium Enterprises thanks to the access to modern tools of physical and information management\textsuperscript{15}.

With reference to the corporate interoperability, the low quality of the maritime services is perceived as the main weakness. The current monopolistic situation of the port services (towage, pilotage and mooring) and the inefficiency in the handling of the goods impose higher costs on the shipping companies and therefore on the final client of the supply chain. In addition, these factors also have an impact on the quality of the services in terms of reliability and frequency.

Finally, even though progress has been done to harmonise the procedures between the two shores, the customs and transport documents are still complex and generate delays and costs. Cross-border cooperation between custom authorities or the connections of ports to Information Technology systems could reduce the number of documents and minimise clearance time.

\textsuperscript{14} It is important to mention that multiple projects for the creation of logistic platforms are in progress, both undertaken by private offices (ONCF, HAVE, ONDEA), and public communities (ODEP, Port of Tangier-MED).

\textsuperscript{15} This is especially in conformity with the spirit of the law 16.99 that integrates in the formal transport of the trucks of more than 3,5 tons, the micro-enterprises of transport and the International Road and Multimodal Transport).
6. CONCLUSIONS AND RECOMMENDATIONS ON INTEROPERABILITY

The structure of the maritime transport flows of the Magreb countries reflects the overall economic and trade patterns, such as negative trade balances, a non diversified and often low value-added exports base, as well as low levels of intra-regional trade. Any inefficiency in the sector imposes high costs on the entire economy.

From the survey, the poor quality of loading-unloading infrastructures constitutes an implicit barrier for importers and exporters. More precisely, high maritime costs are mainly imposed by:

- low port efficiency (insufficient and inefficient infrastructures; inefficient port services);
- disequilibria between import and export trade flows;
- low containerisation of the maritime traffic due to the lack of modern infrastructures in ports;
- absence of integration along the supply chains.

Ports are a major bottleneck in transport chains and streamlining their operations is an obvious reform priority. Different factors prevent ports from efficiently fulfilling their role as a primary modal interface in cross-border chains:

- public owned and strongly protected by public monopoly;
- highly inefficient and expensive port handling services generally badly coordinated and monopolised by unions;
- lack of: customer orientation; modern infrastructures and handling equipment; competent management skills; IT infrastructures and know-how;
- customs procedures.

In general, the Government acceptance of Landlord Port model and Private Sector Participation in ports has only just begun in the form of terminal concessions. In fact, the three Maghreb countries have recently introduced private participation in port investment and operations. However the use of concessions is thus far largely confined to stevedoring concessions for new container and bulk terminals.

As a consequence of a market structure still with monopolistic situations, the inbound and outbound logistics are generally fragmented. In the transport chains analysed, the provision of port services is in the hands of public bodies and the lack of customer orientation (especially in terms of reliability, security and frequency) causes higher logistics costs to the final client. The role of the public authorities should be confined to the creation of a transparent regulatory framework to ensure fair market access and competition between the private operators. The port authority should be the public counterpart for private companies.

For operational efficiency, vertical integration of port management and service provision is needed. Concessions should be awarded to private operators on the basis of competitive tenders and accompanied by transparent regulation to prevent an extraction of monopoly rents. To provide warehousing and storage services (often in conjunction with stevedoring services), private companies should be permitted to lease exiting storage facilities or available space to construct their own warehouses.

Other bottlenecks stem from border-related controls, especially customs. Priorities should be harmonization of customs procedures and product standards, overlapped controls at border crossings, and coordinated facilitation measures along main land corridors. A large number of international conventions to facilitate cross-border trade and transport exist, which the Maghreb should ratify and implement. Of 16 key United Nation transport facilitation conventions, for example, Italy ratified 16 and France 15 – compared to only 4 in the case of Algeria and 5 in the case of Tunisia.

Currently, significant progress has been realised to obtain faster and more efficient inspection and clearing procedures. In countries like Morocco, customs reforms have reduced delays dramatically and other MPs have now started to tackle border related frictions. While most of
those reforms will have to take place at the national level, cross-border cooperation will also be needed.

Regarding inland transport, the haulage in most Maghreb countries is rather competitive with respect to railways. The industry is dominated by the private sector and quite competitive, but further deregulation of prices and market access would enhance efficiency.

In cross-border haulage, the harmonization of standards for equipment and personnel, as well as the liberalization of cabotage and rights of establishment would be desirable from an economic point of view. Nonetheless, further benefits would arise from liberalizing market access and tariffs, reducing formalities at border crossings, and reducing negative externalities through stricter environmental and safety standards.

The railway system represents the weakest link in all the chains, due to different factors, such as:
- lack of dedicated railways terminals within ports;
- capacity constraints on some lines due to the low level of technological development (in some corridors there are still single track);
- inadequacy of railways lines within ports (generally these are aligned along the quays and so they are not suitable for container handling);
- low network configurations both at level of single country and between the Maghreb countries;
- lack of interconnection with the major seaports.

The restructuring of state-owned companies, the opening up of selected routes for private cargo operators as well as the reduction at modal interfaces and borders, would help achieve better and cheaper services.

In this mode, opportunities for the introduction of private participation and competition are more limited. Morocco has implemented a comprehensive and successful restructuring program in recent years that other Mediterranean countries should be considering. Railway companies lack modern commercial management and many are incurring heavy losses. Overstaffing and the outsourcing of maintenance work to the private sector are other issues to be addressed. The facilitation of equipment and personnel transfer at border crossings, and the opening of key routes to private freight operators could also yield significant benefits.

Finally, Information and Communication Technology (ICT) is of crucial importance for all the chains analysed. The effective processing of information and exchange of documents is a prerequisite for the smooth flow of goods. For instance, the effective application of Electronic Data Interchange (EDI) requires changes in the way the transport sector operates. In the Maghreb, outdated sector structures still prevent the effective use of modern ICT tools. Infrastructural investments and commercial management and competition in all parts of the sector are needed, as well as the adoption of EDI by customs authorities and the reduction of bureaucratic frictions. The introduction of EDI (Electronic Data Interchange) in ports will allow remarkable improvement of the fluidity of the flows of goods. It has to be realised by operators in charge of the management of infrastructures and users (transport operators) in order to be really effective. Telematics is also necessary for improving security in each transport mode and relations between operators in the transport chain.

**Recommendations for the improvement of interoperability**

The following measures have been identified in order to increase the level of interoperability of transport chains. Significant improvements must be implemented in relation to goods handling operations, cargo loading-unloading operations, transit time in ports and administrative procedures.

**Rail transport**

There is a need for an improvement of sections capacity, their electrification and a modernisation of signalling and communication systems. All these actions will contribute to the enhancement of service quality and capacity and will be completed through:
- The creation of a Maghreb company for the exploitation of the railway network leaving infrastructure building to national firms;
- The implementation of an independent regulatory authority in charge of transport tariffs, the profitability and the effectiveness of the concession society.

**Road transport**

In this field, actions to be developed are:
- The improvement of road transport operator profile, through training programme and the certification of operators’ competences;
- The harmonisation of the regulatory framework;
- The fluidity of TIR traffics through the creation of “freight village” in order to ensure customs and administrative procedures outside ports;
- The creation of logistics platforms, endowed with new technologies;
- The participation of private sector in the financing and exploitation of road transport infrastructures.

**Maritime transport**

In this field, measures are concerned with, above all, the development of infrastructures and the modernisation of ports in order to increase their productivity and to catch significant traffics.

With regard to the TIR and intercontinental relations, the improvement of the port of Tanger is necessary given its geographic position as a nodal point for hinterland. The Moroccan government decided to build a new port, «Tanger Méditerranée».

Other projects are related to the fluidification of transport chains through the implementation of EDI and the improvement of maritime security through the construction of control towers and the support of VTS (Vessel Traffic System). In particular, they are concerned with the VTS project in Casablanca, Alger and Radès and the EDI project in Casablanca and Alger as well as the container terminal in Alger, the transhipment terminal in Djen Djen and the extension of the container terminal in Oran.

Complementary measures are aimed at:
- transforming ports into dynamic hubs in the international traffics;
- implementing regulatory and institutional reforms for the redistribution of public and private sectors functions and the promotion of private operators participation;
- harmonising and facilitating administrative and customs procedures;
- progressively liberalising port services;
- developing awareness of the rapid increase of container transport and creating a feeder system at a regional level;
- consolidating actions for maritime navigation security and marine environment protection;
- modernising communication systems and appliances;
- adhering to and implementing international conventions (MARPOL, FAL, ..).

**Customs**

In order to harmonise administrative and customs procedures, the followings actions are required:
- the identification and analysis of regulatory and operational obstacles for transport fluidity as well as the implementation of actions aimed at their removal;
- the implementation of international conventions and agreements;
- the development of a regulatory framework in line with EU regulations;
- the introduction of the new information and communication technologies in ports;
- the organisation of training initiatives on procedures with the cooperation of competent institutions.

**Port hinterland extension**

The accessibility and capability to serve the territory represent remarkable obstacles for better exploitation of infrastructures. In fact, transport networks have to ensure not only the
appropriate capacity but also the capability to sufficiently serve the territory. In more detail, they have to allow the access of a large part of the population and economic sectors to international poles of exchange (ports, airports, etc.)

Currently, the access to economic centres (main cities) is relatively scarce. Accessible areas are distributed in a concentric way around these centres (Casablanca, Alger, Tunis). The construction of the trans-Maghreb motorway will allow the coastal areas to rapidly access these centres. Finally, the future establishment of the high speed routes from the French borders to Barcelona and Madrid and from Séville to Algéciras will lead to a significant increase of accessibility. Also, the modernisation of the Tanger-Tunis railway and the realisation of the fixed link across the Straits of Gibraltar will allow the supply of new, high speed services to southern Europe and the development of combined transport between the Maghreb and Europe.

All these afore-mentioned measures are important for the development of integrated transport chains and therefore for the efficient and effective exploitation of all the potential of the multimodal transport system in the Maghreb.

The importance of the fluidity of multimodal transport chains is increasingly crucial, especially in the perspective of the development of performing logistics chains for value-added products.

To this end, it is necessary not only to improve the performance of the different transport modes but also to develop effective intermodal terminals or exchange nodes. In this respect, a major role is played by logistics platforms which can allow better connections between the different modes and ensure value-added logistics services, such as stocking, clearance and goods conditioning.

These kinds of services are well developed in Europe, but are quite non-existent in the Maghreb where the only combined services are supplied by railway operators.

Currently, the volumes of containerised goods are still scarce and the quality of services for each mode of transport is relatively low. Furthermore, there are very few projects concerning the development of logistics platforms. Nevertheless, this situation ought to be analysed with particular reference to four main points:

- the fluidity of goods leaving big ports, with direct railway connections;
- the fluidity of TIR traffics, in particular across the Straits of Gibraltar, with the development of "freight villages" allowing to host vehicles and ensure customs operations outside ports;
- the development of combined transport services in order to include private transport operators in railway terminals;
- the introduction of information systems along the transport chain.

These last initiatives will undoubtedly have the quickest impact, reducing complexity of administrative procedures, especially in the case where information systems implemented are interoperable with European systems.

With regard to rail-road combined transport, current traffics are still very scarce and do not need huge infrastructural investments. In fact, attention should focus on the development of containers and trailer parks.

In conclusion, policy reform and infrastructures investment should be prioritised and coordinated between the Maghreb countries, with the objective to increase traffic flows efficiency (costs, time and reliability). The removal of political, administrative and tariffs barriers at the land borders will facilitate the south-south integration and it will extend the ports hinterlands beyond national borders.

Other than regulatory reform, physical integration through connecting infrastructures is needed. As discussed before, such investment decisions should be made by the private operators. The role of policy makers should primarily be confined to the creation of an enabling regulatory framework. Modern infrastructures need to be developed in order to extend rail and road networks into ports.
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Deliverable D7

SWOP REPORT WITH MAIN FINDINGS AND RECOMMENDATIONS ON INTEROPERABILITY

Annex I - The questionnaire

October 2004
DESTIN PROJECT: DEFINING AND EVALUATING A STRATEGIC TRANSPORT INFRASTRUCTURE NETWORK IN THE WESTERN MEDITERRANEAN

<table>
<thead>
<tr>
<th>Corporate Name</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal status</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td></td>
</tr>
<tr>
<td>Person interviewed</td>
<td></td>
</tr>
<tr>
<td>Position in the company</td>
<td></td>
</tr>
<tr>
<td>Telephone</td>
<td>Fax:</td>
</tr>
<tr>
<td>E-mail</td>
<td>Web-site</td>
</tr>
</tbody>
</table>

N.B. The answers to the following questions will be dealt with in strict confidence. All data and information will be treated jointly with those of other companies interviewed in the survey. It will not be possible to identify single company data from the survey results.
## 1. IDENTIFICATION AND RECONSTRUCTION OF YOUR FIRM’S TRANSPORT CHAINS (TCs)

1.1 Please, describe the key elements of the TCs, affecting the Export and Import of the Maghreb Countries, in which your firm is involved.

<table>
<thead>
<tr>
<th>Key Elements</th>
<th>Export</th>
<th>Transport Chains</th>
</tr>
</thead>
<tbody>
<tr>
<td>N° 1</td>
<td></td>
<td></td>
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<tr>
<td>N° 2</td>
<td></td>
<td></td>
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<tr>
<td>N° 3</td>
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<td></td>
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<td>N° 4</td>
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<td>N° 5</td>
<td></td>
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<tr>
<td>N° 6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Export**

- **Kind of goods (see annex 1)**
- **Volume of freight (000 Ton.)**
- **Country of origin (Morocco, Algeria, Tunisia) and region (see annex 2)**
- **Geographical distance of plant or final customer from the loading Port (<50Km; 50-200Km; >200Km)**
- **Road Infrastructure (Specify the main villages along the route)**
- **Railway Infrastructure (Specify the main villages along the route)**
- **Inland terminal (Interchange nodes, Storage and handling areas, logistics platforms, etc.)**
- **Logistics Services in the Inland Terminal (Warehousing and Distribution; Supporting Services to products)**
- **Road Infrastructure (Specify the main villages along the route)**
- **Railway Infrastructure (Specify the main villages along the route)**
- **Port of the Country of origin (specify)**
- **Port Terminal Types (Container, Ro-Ro, Other specialised terminal, Multipurpose)**
- **Freight Port Terminal Operation (Consolidation, deconsolidation, stripping and stuffing, etc.)**
- **Country of Destination and region (France, Italy, Spain)**
- **Port of the Country of Destination (specify)**
<table>
<thead>
<tr>
<th>Import</th>
<th>Transport Chains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key – Elements</td>
<td>N° 7</td>
</tr>
<tr>
<td>Kind of goods (see annex I)</td>
<td></td>
</tr>
<tr>
<td>Volume of freight (000 Ton.)</td>
<td></td>
</tr>
<tr>
<td>Country of origin (France, Italy, Spain) and region</td>
<td></td>
</tr>
<tr>
<td>Port of the Country of origin (Specify)</td>
<td></td>
</tr>
<tr>
<td>Country of destination (Morocco, Algeria, Tunisia) and region (see annex 2)</td>
<td></td>
</tr>
<tr>
<td>Port of the Country of Destination (specify)</td>
<td></td>
</tr>
<tr>
<td>Port Terminal types (Container, Ro-Ro, other specialised, multipurpose)</td>
<td></td>
</tr>
<tr>
<td>Freight Port Terminal Operation (Consolidation, deconsolidation, stripping and stuffing, etc.)</td>
<td></td>
</tr>
<tr>
<td>Geographical distance of plant or final customer from the loading port (&lt;50Km; 50-200Km; &gt;200Km)</td>
<td></td>
</tr>
<tr>
<td>Road Infrastructure (Specify the main villages along the route)</td>
<td></td>
</tr>
<tr>
<td>Railway Infrastructure (Specify the main villages along the route)</td>
<td></td>
</tr>
<tr>
<td>Inland terminal (Interchange nodes, Storage and handling areas, logistics platforms, etc.)</td>
<td></td>
</tr>
<tr>
<td>Logistics Services in the Inland Terminal (Warehousing and Distribution; Supporting Services to products)</td>
<td></td>
</tr>
<tr>
<td>Road Infrastructure (Specify the main villages along the route)</td>
<td></td>
</tr>
<tr>
<td>Railway Infrastructure (Specify the main villages along the route)</td>
<td></td>
</tr>
</tbody>
</table>
1.2 With reference to the TCs in which your firms are involved please, specify the degree of importance of the different conditioning modes and of the different systems of Inland Transportation, from the origin area of the Maghreb countries to the loading port (EXPORT) and from Maghreb unloading port to the destination area (IMPORT). Assign a score from 1 to 5 (1= Very important; 5=No importance).

### From the origin area of the Maghreb countries to the loading port (EXPORT)

<table>
<thead>
<tr>
<th>Operational choices</th>
<th>Transport Chains</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N° 1</td>
</tr>
<tr>
<td>Conditioning modes</td>
<td></td>
</tr>
<tr>
<td>Container</td>
<td></td>
</tr>
<tr>
<td>Ro-Ro</td>
<td></td>
</tr>
<tr>
<td>Others unitised</td>
<td></td>
</tr>
<tr>
<td>Conventional</td>
<td></td>
</tr>
<tr>
<td>Bulk</td>
<td></td>
</tr>
<tr>
<td>Inland transportation systems</td>
<td></td>
</tr>
<tr>
<td>Road (FCL)</td>
<td></td>
</tr>
<tr>
<td>Road (LCL)</td>
<td></td>
</tr>
<tr>
<td>Rail (Block Train)</td>
<td></td>
</tr>
<tr>
<td>Rail (Parcels Train)</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
</tr>
</tbody>
</table>

### From Maghreb unloading port to the destination area (IMPORT)

<table>
<thead>
<tr>
<th>Operational choices</th>
<th>Transport Chains</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N° 7</td>
</tr>
<tr>
<td>Conditioning modes</td>
<td></td>
</tr>
<tr>
<td>Container</td>
<td></td>
</tr>
<tr>
<td>Ro-Ro</td>
<td></td>
</tr>
<tr>
<td>Others unitised</td>
<td></td>
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<tr>
<td>Conventional</td>
<td></td>
</tr>
<tr>
<td>Bulk</td>
<td></td>
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<tr>
<td>Inland transportation systems</td>
<td></td>
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<tr>
<td>Road (FCL)</td>
<td></td>
</tr>
<tr>
<td>Road (LCL)</td>
<td></td>
</tr>
<tr>
<td>Rail (Block Train)</td>
<td></td>
</tr>
<tr>
<td>Rail (Parcels Train)</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
</tr>
</tbody>
</table>
Further information and comments on the TCs in which the operator is involved.
2. **Strategic choices of your firm in the transport chains**

2.1 Please, specify the scope of transport and logistic services range of your firm.  
*Tick the relevant boxes.*

<table>
<thead>
<tr>
<th>Transport and Logistics services</th>
<th>Transport chains</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td></td>
<td>Export</td>
<td>Import</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialised Transport Services</td>
<td></td>
<td>N° 1</td>
<td></td>
<td>N° 2</td>
<td></td>
<td>N° 3</td>
</tr>
<tr>
<td>“Time constraint” Services (JIT, daily delivery)</td>
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<tr>
<td>Intermodal services</td>
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<tr>
<td>Value added Logistics services</td>
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<td></td>
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<tr>
<td>Supply Chain Management</td>
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<tr>
<td>Transport</td>
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</tr>
</tbody>
</table>
2.2 Please, specify which of the following services your firm supplies by its own structures and resources (S & R) or by using Third Parties. 

Assign a score according to the following key: 1= Only by its own S & R; 2= Mostly by its S & R; 3= Mostly by third party’ S & R.

<table>
<thead>
<tr>
<th>Logistics and transport services</th>
<th>Transport chains</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Export</td>
</tr>
<tr>
<td></td>
<td>N° 1</td>
</tr>
<tr>
<td>Transport Services</td>
<td></td>
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<tr>
<td>Maritime Transport</td>
<td></td>
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<tr>
<td>Road transport services</td>
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<tr>
<td>Rail transport services</td>
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<tr>
<td>Port Terminal services</td>
<td></td>
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<tr>
<td>Track and Trace</td>
<td></td>
</tr>
<tr>
<td>Warehousing/Distribution</td>
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<tr>
<td>Storage</td>
<td></td>
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<tr>
<td>Cargo consolidation</td>
<td></td>
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<tr>
<td>Order processing</td>
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<tr>
<td>Stock control</td>
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<tr>
<td>Pick and pack</td>
<td></td>
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<tr>
<td>Cross-Docking</td>
<td></td>
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<tr>
<td>Others</td>
<td></td>
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<tr>
<td>Supporting Services to products</td>
<td></td>
</tr>
<tr>
<td>Custom documentation</td>
<td></td>
</tr>
<tr>
<td>Cargo inspection</td>
<td></td>
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<tr>
<td>Pre-delivery inspection</td>
<td></td>
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<tr>
<td>Phyto-Sanitary control</td>
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<tr>
<td>Quality control/product testing</td>
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<tr>
<td>Assembling of components</td>
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<tr>
<td>Weighting and Labelling</td>
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<tr>
<td>After-sales services</td>
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<tr>
<td>Others</td>
<td></td>
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</tbody>
</table>
2.3. Please specify the level of competition between the different actors of each stage of the transport chains in which your firm is involved. Assign a score from 1 to 5 (1 = High Competition; 5 = Monopoly).

<table>
<thead>
<tr>
<th>Actors</th>
<th>Transport Chains</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Export N° 1</td>
<td>N° 2</td>
<td>N° 3</td>
<td>N° 4</td>
<td>N° 5</td>
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<tr>
<td>Port Terminal Operators</td>
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<tr>
<td>Maritime Transport Operators</td>
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<td>Road Transport Operators</td>
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<td>Railway Transport Operators</td>
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<td>Inland Terminal Operators</td>
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<tr>
<td>Intermediary Services Suppliers</td>
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<tr>
<td>Value Added Services Suppliers</td>
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</tbody>
</table>

2.4. Please, specify the type of relationship your firm set up with the others actors of the transport chains. Please use the following key: Sp = Spot Relationships; S = Short term relationships; L = Long term relationships.

<table>
<thead>
<tr>
<th>Actors</th>
<th>Transport Chains</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Export N° 1</td>
<td>N° 2</td>
<td>N° 3</td>
<td>N° 4</td>
<td>N° 5</td>
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<tr>
<td>Port Terminal Operators</td>
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<td>Maritime Transport Operators</td>
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<td>Road Transport Operators</td>
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<td>Railway Transport Operators</td>
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<td>Inland Terminal Operators</td>
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<tr>
<td>Intermediary Services Suppliers</td>
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<tr>
<td>Value Added Services Suppliers</td>
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</tbody>
</table>
2.5. With reference to the previous question, please specify the technological tools currently used for the Information and Communication with others actors of the transport chain and what you expect to use in the future.

*Please use the following key: Ed = EDI; Ie = Internet; Ia = Intranet; Em = E-mail; Ot = Others traditional tools (Telephone, Fax and Telex).*

<table>
<thead>
<tr>
<th>Actors</th>
<th>Transport Chains</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Export</td>
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<tr>
<td></td>
<td>N° 1</td>
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<tr>
<td></td>
<td>Present</td>
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<tr>
<td>Port Terminal Operators</td>
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<tr>
<td>Maritime Transport Operators</td>
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<td>Road Transport Operators</td>
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<tr>
<td>Railway Transport Operators</td>
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<tr>
<td>Inland Terminal Operators</td>
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<tr>
<td>Intermediary Services Suppliers</td>
<td></td>
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<tr>
<td>Value Added Services Suppliers (Specify)</td>
<td></td>
</tr>
<tr>
<td>Final Customer</td>
<td></td>
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</tbody>
</table>
2.6. Please specify if the current adoption of the technological tools - mentioned in the previous question - was stimulated by others actors (or factors) and what will stimulate its future adoption.

*Please use the following key: My= My company; Ac= Other Actors; Ex= External factors*

<table>
<thead>
<tr>
<th>Actors</th>
<th>Transport Chains</th>
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<tr>
<td></td>
<td>Export</td>
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<td>N° 1</td>
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<td>Future</td>
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<td>Port Terminal Operators</td>
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<td>Maritime Transport Operators</td>
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<td>Railway Transport Operators</td>
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<td>Inland Terminal Operators</td>
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<td>Intermediary Services Suppliers</td>
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<tr>
<td>Value Added Services Suppliers (Specify)</td>
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<tr>
<td>Final Customer</td>
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</tbody>
</table>
## 3 Factors affecting the interoperability of your firm’s TCs and of Maghreb Transport System

3.1. Please specify the level of influence of the following factors that affect the interoperability the TCs in which your firm is involved.

*Please, assign a score according the following key: ++ very positive; + positive; 0 neutral; - negative; -- very negative*

<table>
<thead>
<tr>
<th>Factors affecting interoperability</th>
<th>Transport Chains</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Export</td>
</tr>
<tr>
<td></td>
<td>N° 1</td>
</tr>
<tr>
<td>Compatibility of the transport infrastructures (e.g. tunnel, bridge and rail gauges, etc.)</td>
<td></td>
</tr>
<tr>
<td>Compatibility of transport equipment</td>
<td></td>
</tr>
<tr>
<td>Availability of required infrastructures (terminals, roads access, rail services, etc.)</td>
<td></td>
</tr>
<tr>
<td>Availability of appropriate equipment at terminals</td>
<td></td>
</tr>
<tr>
<td>Availability of inland connections (e.g. link between port terminal and railway tracks)</td>
<td></td>
</tr>
<tr>
<td>Availability common standard interface for information and data exchange (EDI, etc.)</td>
<td></td>
</tr>
<tr>
<td>Standardisation of loading units (container, .. others)</td>
<td></td>
</tr>
<tr>
<td>Standardisation of operating procedures</td>
<td></td>
</tr>
<tr>
<td>Co-ordination of transport timetables</td>
<td></td>
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<tr>
<td>Others (Specify)</td>
<td></td>
</tr>
<tr>
<td>Development strategies based on vertical integration</td>
<td></td>
</tr>
<tr>
<td>Development strategies based on Co-operation</td>
<td></td>
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<tr>
<td>Scope of services range</td>
<td></td>
</tr>
<tr>
<td>Availability of specialised logistics services</td>
<td></td>
</tr>
<tr>
<td>Structure of the suppliers’ markets (competition or monopoly)</td>
<td></td>
</tr>
<tr>
<td>Quality of supplied services (reliability, frequency, flexibility, etc.)</td>
<td></td>
</tr>
<tr>
<td>Relationship with the final customer</td>
<td></td>
</tr>
<tr>
<td>Others (Specify)</td>
<td></td>
</tr>
<tr>
<td>Single liability for intermodal transport</td>
<td></td>
</tr>
<tr>
<td>Standardisation of custom procedures</td>
<td></td>
</tr>
<tr>
<td>Harmonisation of transport documents</td>
<td></td>
</tr>
<tr>
<td>Harmonisation of safety regulations</td>
<td></td>
</tr>
<tr>
<td>Harmonisation of labour regulations</td>
<td></td>
</tr>
</tbody>
</table>
3.2 What is your opinion regarding the transport systems of the Maghreb Countries?

*Please, assign a score according to the following key: ++ very good; + good; 0 Quite good; - bad; -- very bad*

<table>
<thead>
<tr>
<th></th>
<th>Morocco</th>
<th>Algeria</th>
<th>Tunisia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Transport</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Railway Transport</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Maritime Transport</td>
<td></td>
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</tbody>
</table>

3.3 If the road or railway transport system is bad or very bad, please specify the importance of the following Critical-Factors

*Assign a score according to the following key: 1= Very strong importance; 2= Strong importance; 3= Important; 4= Quite importance; 5= No importance.*

<table>
<thead>
<tr>
<th>Critical-Factors</th>
<th>Morocco</th>
<th>Algeria</th>
<th>Tunisia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure dimension and adequacy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structural constraints for infrastructure enlargement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network configuration</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Geographical coverage of the network</td>
<td></td>
<td></td>
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<tr>
<td>Maintenance adequacy</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Commercial strategies of the main operators</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Age of the transport means</td>
<td></td>
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<tr>
<td>Transport means adequacy to the user needs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bad organisation of the transport services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others (Specify)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
3.4. If the maritime transport system is bad or very bad, please specify the level of importance of the following Critical-Factors. 

Assign a score according to the following key: 1= Very strong importance; 2= Strong importance; 3 Important; 4= Quite importance; 5= No importance.

<table>
<thead>
<tr>
<th>Critical-Factors</th>
<th>Morocco</th>
<th>Algeria</th>
<th>Tunisia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure and Sovra-structures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability of space</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Availability of covered space</td>
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<td></td>
<td></td>
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<tr>
<td>Wharf depth</td>
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<td></td>
<td></td>
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<tr>
<td>Kind of wharf</td>
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<tr>
<td>Kind of yard</td>
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<tr>
<td>Inland connection (rail, road, etc)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Technological level of terminal and equipment</td>
<td></td>
<td></td>
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<tr>
<td>ICT level within the port</td>
<td></td>
<td></td>
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<tr>
<td>Others (specify)</td>
<td></td>
<td></td>
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<tr>
<td>Labour organization</td>
<td></td>
<td></td>
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<tr>
<td>Coordination between port activities</td>
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<tr>
<td>Specialization</td>
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<tr>
<td>Internal Communication</td>
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<tr>
<td>Social conflict</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Others (specify)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services to ships and to products</td>
<td></td>
<td></td>
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<tr>
<td>Technical-nautical services (pilotage, towage, mooring)</td>
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</tr>
<tr>
<td>Basic Terminal Services (Handling, storage)</td>
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<tr>
<td><strong>Value added terminal services (Cargo inspection, control)</strong></td>
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<td></td>
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<tr>
<td>Basic services to products (Weighting, labelling, etc.)</td>
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<td></td>
</tr>
<tr>
<td><strong>Value added services to the products (After-sales services, Quality control/product testing, etc.)</strong></td>
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<tr>
<td>Others (specify)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port and handling costs</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>