CHAPTER 8

TRADE AND LOGISTICS: THE CASE OF THE GRAINS SECTOR

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Exploring the trade routes for cereals in the Mediterranean proves to be quite an exciting adventure. It is a real journey across time to observe economic dynamics in a region with a history of several thousands of years where grain has always been a driving force in the history of societies, powers and trade. It is about going through complex paths where a multitude of actors, professions and infrastructures work together to embody a cereal sector whose strategic dimension is based on demographic, geographic, agricultural, food, logistics and financial determining factors. Lastly, this chapter examines the geopolitical inticacies (Abis and Blanc, 2012) related to the acceleration of agricultural globalisation and the financialisation of vital commodity markets.

It is obviously difficult to tackle all the issues that revolve around grain trade in the Mediterranean. This paper rather aims at emphasising the acuteness of the issue of logistics. In a global context of strong tensions on agricultural markets and rising food demands, the cereal sector is increasingly exposed to the logistics issue. After recalling some basic points on grain trade and its development, this chapter primarily focuses on countries situated on the southern Mediterranean shore that are major grain importers and where the improvement of logistics is a major issue.

Grain trade: permanence, development, and perspective

The contemporary global context is marked by heightened tensions on agricultural and grain markets. Since 2006-2007, the price of cereals is indeed not only characterised by a gradual rise but also by increasing fluctuations and volatility. In Chicago

or in Rouen, the price of wheat is scrutinised with the utmost attention by public and private importers coming from all over the world. Whether they work in the export or import sector, the main activities of grain traders include monitoring crops in exporting countries, preparing tender proposals and defining specifications and financial calculations.

The major international dynamics

The increase in grain prices can be explained by a multitude of factors. Population and economic growth is largely responsible for this development. There are more mouths to feed and more meat to produce – resulting from transformed food patterns, thus heightening the global demand for grain. Three quarters of soybeans and corn and half of the wheat produced in the world are now used to feed animals. After the productive success recorded during the second half of the twentieth century, the years 2000 were characterised by a relative stagnation of yields, more frequent climate-related natural disasters and growing speculative phenomena. Over the past ten marketing years, that is, between 2003-2004 and 2012-2013, the global grain production has been lower than consumption for four times. In the case of wheat only, this situation occurred five times, or once every two years!

Inevitably, these differences between what the earth produces and what the world consumes affect the markets. Even if only a hectare of grain over six participates in international trade, crop failure in one of the granaries of the world has an immediate impact on the markets. In the case of wheat, approximately 20% of the production is exchanged on international markets and up to 35% for soybeans. As in 2007 and 2012, the markets were particularly agitated during summer 2012: drought in the United States and the Russian plains gave a serious heatstroke to cereal prices. Betweens May and August 2012, the price of wheat increased by 40% and that of corn by 30%. Accompanied by strong variations, these prices that are part of an upward trend are powerfully attractive for venture capital. If the financialisation movement of agricultural markets existed for many years, it has accelerated with the liberalisation of public policies since the 1980s. It has also become more complex since the outbreak of the international economic crisis in 2007 (Valluis, 2013). That said, one should not forget that monitoring the thermometer is as important as finding a remedy. Popular anger indeed frequently falls on speculators who are perceived as the source of all evil but the real problem lies in the fact that the world does not produce enough cereals to meet demands. This creates a situation of uncertainty that attracts speculators, thus increasing the risk of strong price fluctuations. The mass influx of cash related to the monetisation of the astronomical debts in developed countries often leads financiers to identify new sectors for investment: the "guilty" are not necessarily those we believe they are... Given this inflation and increased price variability, UN agencies were particularly concerned about the potential impact on importing countries and the world's poor populations. However, these tensions also reveal shortcomings in the regulation of agricultural markets, despite the action of the G20 that set up, the AMIS (Agricultural Market Information System) in 2011 under the aegis of the FAO. This information system on the state of production,

consumption and stocks of cereals is expected to prevent crises[1] with the aim of alleviating the effects.

Nevertheless, in the long-term, international institutions are quite clear about the solutions to be found: the United Nations Food and Agriculture Organisation (FAO) and the Organisation for Economic Cooperation and Development (OEDE) estimate that agricultural production must increase by 60% by 2050 (FAO and OECD, 2012)! However, this increase will be constrained by a limited expansion of cultivated land especially in North Africa and the Middle East (MENA region) where the vast majority of arable land is already being exploited. Therefore, the two organisations believe that the increase in production will have to be implemented though improved productivity. In this regard, they call for investment in research, support to small farms and above all, a reduction of losses. This last point is at the heart of the Mediterranean cereals sector's issues because the logistics problem is undoubtedly the main growth factor of the cereals available in the region. Neither the conquest of land and nor the improvement of local yields seem to meet the increasing needs. Trade and infrastructure optimisation will be the driving forces of an improved food and grain security.

Over-dependence on grain in the Mediterranean region

The Mediterranean basin is one of the world grain epicentres. The riparian countries are still very large consumers while some of them, like France, are leading producers. North Africa and the Middle East (MENA)[2] especially concentrate about 35% of world cereal imports and 30% of wheat only, each year. The limited availability of land and water, together with the inter-annual and inter-seasonal weather changes are major constraints for these countries. The probable decrease in rainfall and the rise in temperatures will increase tensions that will weigh on the perspectives of local production development of these countries. Moreover, the IPCC (Intergovernmental Panel on Climate Change) assessments drew attention (and perhaps deepened the concerns...) on the effects of climate change in the Mediterranean region and its agricultural crops. It is important to add that the population increase complicated the equation. Although in the second half of the twentieth century, successive governments (Lerin, 1986) have implemented agricultural development policies headlining grain farming, it is clear that production has not been able to keep up with the rising demand.

Between 1960 and 2011, in the MENA region, the three-fold increase in production contrasts with the six-fold increase in the consumption of cereals! This phenomenon is explained by a very specific human demand. In fact, even today, a North African consumes twice as much bread per year as a European and three times more than

1 - The AMIS (*Agricultural Market Information System*) is an aggregated system of statistical data on the state of grain trade set at the initiative of the G20 and then chaired by France in 2011. It much first help improve the transparency of agricultural commodity markets through the establishment of a database whose data is supplied by local projects. Then, the role of the AMIS is to encourage the coordination of public political actions against the uncertainties of the market. This is made possible by an alert system, or rapid response forum when a case of abnormal market conditions is identified.

2 - Algeria, Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syria, Turkey, United Arab Emirates and Yemen. These countries represent approximately 5% of the world population.

the world average. This growth in domestic demand also depends on the increase in animal feed needs. Changes in lifestyles in southern and eastern Mediterranean societies did not spare eating habits. Plates are fuller in the beginning of the twenty-first century than in the past with a more frequent presence of meat products. Again, the Mediterranean illustrates this global phenomenon. When the share of grain supply used to feed livestock was only 1% in the beginning of the 1960s, it currently exceeds 30%. In order to meet these increasing domestic needs, agronomic performances remain disappointing compared to those of other regions in the world. From 1961 to 2010, the world average grew from 1432 to 3564 kilograms per hectare of harvested land areas. This yield is largely exceeded by the European Union and North Africa while in the MENA region yields are well below; some Arabic countries have even lower yields than in Sub-Saharan Africa. The difference between yields in Morocco and Algeria and those in China is striking while in the early 1960s the yields were closer. Egypt, where the entire crops are irrigated, is an isolated case: the development of these annual grain yields roughly follows that of France, although a slight decrease is observed since the mid-2000s.

The combination of these different dynamics explains the increasing, structural and strategic recourse to grain imports in the MENA region. The volume has surpassed 70 Mt since 2010, a figure that is 23 times the quantities of cereals imported in the beginning of the 1960s. The countries of this region now account for a third of the global purchases. The domestic cereals needs of this region are met by more than 70% through imports in most countries.

After Japan, Egypt ranks as the second major importers of the world (6% of total imports). This dependency ratio goes up to over 85% in Lebanon, Libya and Jordan. If we take the example of wheat, Egypt is the world's largest importer, followed by Algeria in the 5th position and by other Arab countries ranking among the top 25 (Morocco, Iraq, Turkey, Tunisia, Libya, Yemen, Saudi Arabia and Soudan). Countries of the MENA region have imported an average of 45 Mt of wheat since 2008-2009. Even the volumes of corn are increasing, reaching up to 20 Mt over the past campaigns. Each country simultaneously adopts a singular behaviour: schematically, each one of them has a purchase structure of its own and operate in a unilateral way: a state grains buyer such as the GASC (General Authority for Supply Commodities) in Egypt – the world's largest public importer – or like in Morocco, they is a plurality of private actors; the criteria of price and quality vary according to the importers.

Besides, the quantities imported should also be combined with the average price of a tonne of grain in order to grasp the extent of the economic costs brought by such a dependence on international markets. As regards North African countries[3] where the coverage ratio for grain has rarely exceeded the symbolic threshold of 50% since the 1980s, the amount of purchases amounted to about 12 billion dollars in 2012. The weight of this grain in these Nations' scales of payments becomes unbearable (Hallam and Balbi, 2012) especially if we add the amount of food subsidies (most of which target cereals used to make bread) and if we consider the narrowed

3 - Algeria, Egypt, Libya, Morocco and Tunisia. These countries represent approximately 5% of the world population.

economic margins they make since the outbreak of the Arab uprisings since early 2011. In the case of Egypt, food requirements and the financial security of agencies in charge of imports are at the heart of strategic discussions aiming to call for external assistance since the revolution of February 2011, especially vis-à-vis the International Monetary Fund (IMF). Besides, bread is a food essential with an important cultural and religious significance (Essid, 2012). It is also a determining link between people and political authorities. It is therefore important to highlight the threat of socio-political cyclones that swirl around the issue of grain and food insecurity in the Mediterranean (Abis, 2012; Zurayk, 2011). Even if the beam of causes is quite broad, it is impossible to eliminate the vulnerabilities of the explanatory factors that have contributed to the uprisings taking place across the Arab world since 2011.

Prospective analysis for grain trade

If it is not possible to detail and to nuance the regional landscape a bit more, it is important to remember that the strategic importance of grain is growing and becoming more complex in the MENA region. Emerging trends could be identified, enabling the analysis of long-term perspectives.

Countries are asked to review their agricultural strategies and to strongly re-include the food component in their national security objectives. Resistant to institutional and political uncertainties, the need for food for a population requires policy makers to find all possible responses to alleviate risks. Although the recourse to external supplies is an irreversible process, there are still certain levers regarding domestic production and food chain efficiency that should be activated. Rather than exhausting themselves in a desperate attempt to increase national production, if the vast majority of the MENA region countries invest financial and human resources in the agricultural sector, domestic productivity will undoubtedly increase in the coming years. Even better, aiming to reduce losses and waste, these countries can re-gain sovereignty. If food self-sufficiency is an anachronistic concept, nevertheless, the optimisation of grain chains and the increase in storage capacities can contribute to the improvement of food security in these countries.

Very few countries have sufficient grain volumes to export part of them. Others, like India, can do it occasionally or more regularly like Russia, provided that the crops benefit from the mild climate and that logistics are indisputable. Nevertheless, certain Nations have the capacity to supply the rest of the planet each year. This is case of the United States, Canada and France for example. Yet, with stocks tending to reduce, the fluctuations of export capacity increasingly heighten tensions in the market. While the global demand is gradually growing, the production and export quantities experience much less linear curves. Being higher and more volatile than in the past, prices increasingly determine grain trade. As in the rest of the world, in the Mediterranean region, geostrategic competition between different powers of the grain sector is therefore once again exacerbating (Abis, 2012).

The last projections of the FAO (Alexandratos and Bruinsma, 2012) announce that in order to meet the world demands for grain in 2050, approximately 3,000 Mt of grain should be produced (1,850 Mt have been produced in 2011-2012), half of

which will be used for non-food uses and two thirds of which will be consumed in developing countries. For the latter, the grain deficit, that is, the gap between domestic production and demand would then amount to 200 Mt. In that case, the MENA region with 114 Mt and Sub-Saharan Africa with 56 Mt will confirm their ranks as the first world grain importers. Superimposed to global food and economic dynamics, this grain over-dependence will lead to an intensification of the geopolitical dimension of grain trade in the Mediterranean.

Consequently, buyers compete with each other on all fronts: crop quality and pricing structure (price of grain, ocean freight, insurance, etc.) but also logistical responsiveness, ship loading capacity or even diplomatic support (as old as the world, the power of grain remains relevant). As a result, the list of countries exporting grain to the MENA region is becoming longer. With approximately 35 Mt in 2011-2012, the region around the Black Sea ensures nearly a third of world wheat exports. Thus, Ukraine increasingly wins calls for tender launched by Tunisia, Morocco, Lebanon or Jordan while each year, Kazakhstan strengthens its position as the largest flour exporter. Besides the specific relations maintained with Syria, Russia deploys its trade strategy towards Egypt: during the past recent year, more than half of Egypt's wheat supply was imported from Moscow. There is therefore a reason behind Russia's decision to modernise the Black Sea's port facilities: Moscow is very aware that the improvement of the logistics system will enable the country to conquer additional market shares in the Mediterranean (Riabko, 2012). Lastly, it is important to consider the hypothesis that these three countries (Kazakhstan, Russia and Ukraine) build a cereal pool in the Black Sea in order to have more influence on the markets. This dynamic has undoubtedly an impact on Mediterranean importing countries.

Besides, other countries like Brazil, Mexico, Germany or Argentina sometimes invite themselves to the banquet of grain in the Mediterranean. This proliferation of actors in the grain sector is a further illustration of a globalised agricultural trade in the case of MENA region countries. In this context, in order to remain one of the major trading partners, Europe should be vigilant. In fact, the Mediterranean basin proves to be a preferred destination for wheat exported by the European Union. In 2011-2012, out of the 14.5 Mt sold to third countries, 40% of European wheat was exported to North Africa, 24% of which was exported to Algeria. This amount corresponds to the proportion that this region represents in the total EU exports year after year. France exports half of the amount of wheat coming from the EU to third countries – especially Mediterranean ones – that occupy a very important place[4]. France can rely on the performances of its grain logistics to sometimes succeed in placing larger quantities of grain on markets that are traditionally turned to other sources. Thus, in the summer of 2010, when Russia decided an embargo on the sales of wheat, Egypt, which was its major client, imported wheat from France. Thanks

4 - With a production of about 35 Mt of wheat per season, France exports between 15 and 18 Mt. Half of these volumes is exported to third countries, mainly Algeria, Morocco and Egypt. By aggregating data, it appears that an average of 15 to 20% of the wheat produced in France landed on the southern shores of the Mediterranean during the last marketing years. On the European and world markets, one third of the total exports of French wheat is exported to North Africa.

to its agro-trade vitality that is mainly based on port grain terminals such as Rouen[5], Dunkerque or La Rochelle-La Pallice, France managed to meet Egypt's demand.

Cereals are often perceived and treated as a commodity. Nonetheless, their fungibility is not absolute. This qualitative issue is reflected in the broader perspective of international trade: if a French miller perfectly knows how to benefit from French wheat, this is not necessarily the case of the Turkish, Egyptian or Libyan miller. Both exporters and importers share this issue. The producer's challenge is to achieve a maximum attainable yield and to ensure a yield that will find good value on the domestic market or for export. The buyer's challenge is to find merchandise that will meet his needs at the best price possible. For instance, if the quality of the crop is unsuitable for export (this is highly related to weather conditions during harvest and therefore remains unpredictable), trade commitments will be difficult to meet. The countries that would like to continue playing a significant role in the southern and eastern shores of the Mediterranean will have to take the more demanding specifications into consideration. These specifications will include the necessary adaptations for crop varieties and for the quality of grain mobilised for economic and geostrategic purposes by these exporting countries. Yet, in terms of quality, international competition is increasing and the export sector cannot afford not to get organised to meet demands, at least those of its customers. What was relevant in the past, in the context of the Cold War (Morgan, 1979) when the ideological struggle was predominant, will be also relevant in the near future in a world where the geopolitics of vital resources and the rivalry for access to food will increase.

If this qualitative (and sanitary) aspect plays an important role in the daily life of world traders, buyers and importers, other risks tend to multiply: the price risk (unit price and exchange rates) of course, but also the counterparty risk. The management of commercial operations will therefore become increasingly difficult. In this perspective, the trust relationship between buyers and sellers – and therefore, by extension, between exporting States and importing countries – are severely tested. Multi-commercial commitments, technical support on infrastructural level and the constant adjustment of production according to the changing needs of clients will be undoubtedly decisive for a grain cooperation marked both by trade and development. In other words, human relations will remain crucial in the practice of these grain sector professions. Is this to be considered as a stimulating factor for Euro-Mediterranean relations?

Trade and logistics: inseparable levers for the strengthening of food security in the Mediterranean

Logistics is a natural and necessary corollary for grain markets. The reconciliation between production and food needs has always been a crucial issue for the development of societies and their food supply. For example, the Roman and Egyptian

5 - It is important to recall that Rouen is the first port grain terminal in Europe, with loads of about 8 Mt for each marketing year. Two thirds of these exports go to North Africa.

empires were built around their agricultural supremacy and their ability to feed and supply their armies. There are several structural explanations behind this. The port of Ostia played a fundamental role in meeting Rome's cereal logistical challenge. A third of the city's food supply came from North African countries. The Romans had not only invented a standardised model for army camps, roads or urban areas. Recognising the importance of cereals to ensure social peace in the city, they also invented a model type of granary to stock their grain (the "horreum").

Rediscovery of the importance of optimised logistics

There are several structural explanations. First of all, grain markets are characterised by a highly fragmented productive structure that requires the development of a distribution network in order to supply the multiple consumption centres of a geographical area; this is inevitably achieved through the construction of transport infrastructure (roads, railways, harbours), storage facilities as well as the establishment of an efficient legal framework (ensuring the right to property and its protection). This infrastructure network should also be highly flexible: harvest variability and therefore the variability of sources of supply must be taken into consideration in order to ensure the supply of a food demand that is more or less unyielding.

Then, there is a strong temporal dimension that should also be considered: most cereals are harvested only once a year while they are consumed daily. An efficient industry must be able to create buffer stocks to ensure a continuous distribution throughout the year. In addition, there is also a qualitative dimension: the stored grain is still a living material and their integrity must be maintained in order to remain consumable over time.

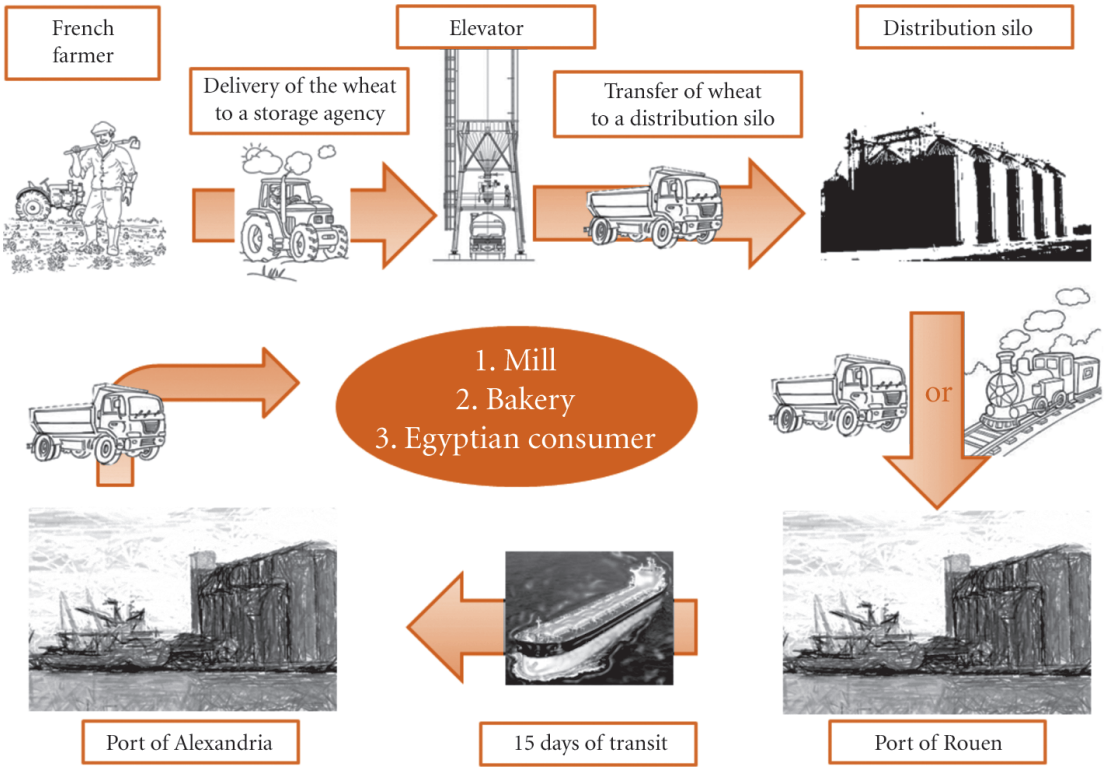
Lastly, the geographical dimension is an issue that is increasing with the development and growing complexity of societies. Transferring grain productions from food surplus areas to food deficit areas has become a real challenge from the moment societies have abandoned hunting and gathering. The transition to agricultural societies and even more so, the transition to sedentary industrial societies brought by the need to trade agricultural commodities and thus establish adequate logistical infrastructure. This need has become even greater with the globalisation and urbanisation movements that have increased the distance between the areas of production and consumption. The current population growth in regions where food supplies are limited like in North Africa requires the strengthening of the functioning of supply chains.

Journey on the grain route

Stressing the importance of logistics is not enough. It is also necessary to understand the complexity and the multiplicity of steps that enable a grain of wheat to travel from the field to the consumer. Market organisations differ according to the history of agriculture in each country. Thus, depending on the region, once the wheat is harvested, the farmer will sell and deliver his yield to a first collecting and storage organisation that can be either a cooperative (France, Denmark, Algeria, Germany), a capitalist private operator (England, Romania, Spain, Tunisia, Morocco), or a state structure (Egypt).

This delivery can be made in bulk in countries where agriculture is developed or in jute bags in areas whose productive structure is more fragmented. The delivered grain must be weighed on a "certified" scale and analysed in order to ensure that both parties are assured they comply with the quantitative and qualitative terms of trade. This will create a favourable context for trade and production. Thereafter, road, rail or even river transport infrastructure will be solicited for the production to be delivered to a silo distributer that will bulk the grain procurement, sort it out and then distribute it to the first processing industry: miller, animal feed manufacturer, semolina producer... This buyer himself will control the goods upon arrival to ensure that the raw material meets his needs; he may then recur to an analytical laboratory. Although grain trade is primarily domestic, for many years, there has been a strong development of global trade requiring better connections with different regions of the world. For example, the world wheat trade that represented less that 50 Mt in the early 1960s now exceeds 130 Mt. The world corn trade amounted to 20 Mt in the early 1960s, now exceeds 90 Mt. Yet, grain trade is not a trivial thing: it requires suitable port infrastructure (enough draft to accommodate ships), facilities for loading and unloading ships (cranes, gantry cranes, sucking pipes, conveyors, transporters...), storage facilities to maximise transit, controllers to ensure the quality of loading and unloading operations. This is the case for both import and export harbours. The efficiency of these facilities depends on the quality of their connection with the in-land network.

Figure 1 - The journey of a tonne of wheat produced by a French farmer to an Egyptian consumer



Source: InVivo.

Improved connectivity to cope with an increased dependency

The global market is not homogenous: it is composed of the sum of multiple micro-markets that are connected through a network of logistics infrastructure. An area that is disconnected with other areas is like a production that fails to find its outlet or a population that has no access to food. Without appropriate logistics, trade and market re-balancing mechanisms no longer work. The latest crises of high prices of 2007-2008, 2010-2011 or 2012-2013 have highlighted the need to strengthen the supply chain. The balance is weaker and availabilities are relatively weaker at the time of demand. It is therefore necessary to establish channels that will allow the world to transfer cereals from where they are available to the regions where they are needed, at the right time.

Box 1: What would be the ideal grain logistics situation for an importing country?

In order to understand the inefficiencies that may exist in some countries, we can draw a comprehensive picture of the ideal situation with regards to grain supply policy. The importing country should be able to accommodate very large ships (60 kt to 90 kt) in its harbours in order to minimise the cost of freight; then, it has to be able to unload ships very quickly to reduce the time of stop-overs thanks to advanced port facilities while the storage capacities should be sufficiently dimensioned. Then, the inland transport network (road and railway) should be in a position to effectively supply the primary processing industries or in-land storage centres. Of course, this should be accompanied by minimised losses during the transit of goods and the financial conditions should be optimised thanks to a banking system that functions properly. Besides, the risks of supply disruption should be minimal. This in turn limits volatility in local markets and also the needs to conserve security stocks. As it is essential to recognise the fact that thanks to optimised logistics, a country's need to have large stocks to minimise the risk of disruption would be smaller. This reduces de facto the financial costs required to manage the sector.

This is why, today, in the producing countries, there is a real struggle for the control over the collection of grain by international trading companies. For instance, in Canada, Viterra was taken over by Glencore, in the United States the cereal collector Gavilon was repurchased by the Japanese trader Marubeni and in Australia, GrainCorp has been taken over by ADM. This is necessarily accompanied by the development of storage capacity that is able to "capture" the grain production. The challenge is there indeed: it is necessary to seek production increasingly farther and to develop the tools to deliver it where it is needed at the lowest costs possible. Meanwhile, exporting countries are actively implementing major investment projects in logistics infrastructure with the aim of gradually optimising the competitiveness of the grain export sectors. The United States have deployed impressive railway structures capable of handling trains over several kilometres. In Brazil, President Lula had launched massive investments in the early 2000s in order to reduce logistics bottlenecks and improve port infrastructure. In France, the public investments will approximately amount to 350 million Euros between 2009 and 2015 for the only port of Rouen, the first European grain terminal. This port will then be able to

accommodate larger ships. Lastly, in Russia, projects to improve the port infrastructure on the Black Sea, the Sea of Azov, the Caspian Sea or even on the Baltic-Arctic Front are flourishing. All these dynamics are part of a global context characterised by power games and rivalries over the control of raw materials. Like other food products, grain is at the centre of this new geopolitics of resources (Lee *et al.*, 2012).

In the Mediterranean, where food needs are growing, more than elsewhere, the production deficit increases the need for adequate infrastructure. Yet, it seems that the wheat import sector remains severely crippled (FAO and World Bank, 2012). Thus, the high cost of inland transport is responsible for an increase in the grain bill of 7% in Tunisia, 12% in Morocco, 21% in Egypt and 40% in Jordan. A better connectivity with the world would enable these countries to significantly reduce the import bill. To address the issues of the supply chain's effectiveness, it is very pragmatic to estimate the cost, time and reliability of the connection between the country of import and the consumption areas. The major costs are related to the ability of the chain to quickly transfer the grain cargo from the export areas to the consumption centres (i) to bulk the flow in order to maximise the economies of scale, (ii) to limit losses along the supply chain (iii).

In the south of the Mediterranean, there are several factors contributing to the increase in the grain import bill. In North African and Middle Eastern countries, the majority of port infrastructures are too small while their import requirements would require an increase in bulk imports. In North Africa, only Egypt and Morocco are able to accommodate ships of 60,000 tonnes (in Algeria the port Djen Djen is underutilised). Libya, Tunisia and Algeria can only accommodate ships of 25,000 tonnes or at best, 40,000. The difference in costs is huge! For instance in Egypt in April 2013: a cargo ship of 60,000 tonnes coming from France cost between 14 and 15 dollars per ton. For a ship of 25,000, the cost is close to 25 dollars per tonne. When the 10-dollar difference is related to the 15 million tonnes of imported grain, one can better understand the considerable amounts this represents.

Besides, this need to bulk the flows grows with the distances needed to transport grain. In the case of wheat, for a long time, the proximity of European granaries (Black Sea, European Union) has facilitated the management of import volumes in small volumes. On the other hand, today, the emerging increase in forage needs to feed animals requires wheat that comes from more distant regions. It is therefore difficult to ignore the United States or South America when one seeks to import corn and even more when one needs to import soya and its by-products. Today, this issue is mitigated by the low cost of freight. Since the past four years, the maritime transport conditions for the dry materials market is in a situation of overcapacity in a difficult global economic context and where the increase in prices remains the norm. Nevertheless, the fact that the sector is of a highly cyclical nature should be kept in mind. It is important to remember that in the early 2008, while grain prices were at their peak, the freight rates between Rouen and Algiers exceeded 40 dollars per tonne when, in 2013, they are hardly above 20 dollars per tonne. In 2007-2008, the overheating of maritime freight prices accentuated the violence of the price increase observed in the grain market. History might repeat itself and the

best way for importing countries to protect themselves against this kind of situation is to optimise their ability to accommodate ships and unload them as rapidly as possible.

It is the dimensioning of these local logistics infrastructure that allows both local production and imports to find their way to the consumers. Inland transport is crucial as it irrigates zones of consumption and decongests the entry points of grain. In fact, we often forget that the costs of inland transport are at least as important as maritime freight costs to deliver goods to the consumer. For instance, in France, it costs almost as much to transport wheat from Eure-et-Loire to Rouen than to transport wheat from Rouen to the Algerian coasts! In North Africa, the transport of grain is mainly done by road; however grain trade has to cope with the daily constraints of traffic congestion in cities. This predominance of road transport over aging (or inexistent) rail infrastructure is partly explained by the subsidising of petrol in several countries. Nevertheless, in times of economic and budget crisis, the transportation of agricultural commodities is affected by the weakening of this public support mechanism. The case of Egypt in 2013 is a striking example: due to the rise in fuel prices, local harvested products are unable to reach zones of consumption thus undermining the balance of the local grain market.

Prospective analyses for grain logistics

In the food sector, especially the grain sector, several Mediterranean countries have decided to invest in the development of storage facilities and infrastructure. This objective can be explained both by national imperatives (to reduce post-harvest grain losses thus reducing the import bill) and by fears vis-à-vis the international tensions. While the investments in storage capacity have been relatively modest over the past twenty years, they are currently developing. The multiple virtuous dynamics of a network of storage capacity have been rediscovered today. As for import chains, the adequate port storage facilities maximise the transit of goods. Thus, ships have enough space to unload their cargos when they arrive in the port. This minimises the costs and reduces losses. It might seem surprising but very often, a port is more perceived as a gateway than a "residence for wheat". Ideally, an importing country should seek to reduce transhipment operations between the port and the primary processing industry in order to reduce merchandise management costs. However, the scarcity of land resources in ports leads to additional costs for major storage compared to in-land storage. This is why today, the United States invest in distribution silos within the country as a strategy to maximise the transit in port silos and transport the goods to the inland areas at a lower cost. With an investment in port storage infrastructure shared between the private and the public sector and a strong impetus for state investment in domestic storage redistribution with a plan for fifty silos, Egypt is an example of this strategy.

In addition, we rediscovered the fact that the development of adequate storage facilities allows easier access to the market and stimulates the production, thus reducing dependence on external inputs. This requires master plans for the collection that often involves the establishment of intermediary storage centres, or, directly, primary processing industries. These allow to structure and organise a chain, which ultimately

enables the producer to make better profits from his work. Local production should also meet the needs of local industry in a qualitative way. A Moroccan, Algerian or Egyptian miller often turns his back on local wheat due to qualitative or sanitary incompatibility with his needs. Yet, it is in this collect centre that the buyer guides the producer-deliverer to adapt his production according to the consumers' needs. At the same time, the collector will also seek to evenly distribute the products he receives from the multitude of operators in order to better serve the existing demands. This is the opposite of Jean-Baptiste Say's famous law of markets according to which, supply creates its own demand: if there is no connection between the producer and the market, this virtuous dynamic put forward by the French economist at the end of the eighteenth century cannot be created. Thus, in the MENA region, the collection rates, i.e. the rates of commercialised products are very low; Morocco is the only exception with a system that has many flaws but which collects more than half of the production while in Tunisia, the rate falls down below 50% and 30% in Egypt. Besides these issues related to the distribution chains, the issue of the conservation of these domestic crops is also crucial. In North African countries, conservation is a big problem: in Egypt, it is said that more than 10% of the grain collected is lost due to the lack of adequate infrastructure. In Algeria, since 2009, the year when grain production reached a record level of 6 Mt, awareness was raised on the lack of storage capacity. In Egypt, the main agricultural bank, which is also the main crop storage organisation, has been debating with the government to stimulate a new investment plan in the sector for many years. It seems that the multiplication of crises of high prices in the agricultural market has been a strong argument to engage proactive policies in this direction. When Egypt is planning to modernise storage areas in "villages" (*Shunas*), in Algeria, 39 silos will be established in order to manage domestic crops.

More broadly, these issues should be put in the Mediterranean strategic context, characterised by increasing food insecurity and heightened concerns. In this region, the agricultural and food policies are among the central pillars of social policies. Government intervention is therefore very important, often at the same level as food subsidies. In a context where the high prices of grain accentuate the weaknesses of food products and increasingly weigh on public finances, the sectors' management costs can also be decreased thanks to optimised logistics. In addition, the volatility of cereal prices leads the countries to reduce the impact within their national territories. In fact, holding stocks and the ability to carry them does not allow States to completely isolate themselves away from the turmoil of international markets. Nonetheless, firstly, this can be considered as a tool helping reduce the risk of disruption (thus avoiding to add domestic volatility to imported volatility). Secondly, it can allow the countries to obtain some flexibility in procurement strategies in order to take advantage of situations when prices are low or on the contrary, to dampen the impact of very high prices. These concerns have found a significant resonance in the G20 summit of the 22-23 June 2011 in Paris where the issue of the link between food supplies and price volatility has been widely debated. The visibility given to this issue has encouraged many countries to continue their investment in storage infrastructure. Since the early 2000s, in Egypt, a program of construction of fifty new silos is being implemented in

addition to the project of improving storage in villages and import infrastructure. The objective is to be able to stock the equivalent of up to six months of consumption (4.5 Mt). In Algeria, in addition to significant infrastructure development, public investment plans for 2010-2014, provide for the extension of storage capacity. In Morocco, the development strategy is not less ambitious. As for Tunisia, the development strategy promoted before the revolution lost impetus but the needs remain sustainable.

Often guided by public forces, these structuring strategies also involve private operators: traders, millers and semolina producers... Private operators show a real interest in storage investments when the State provides space for development. If storage is not the transformer's primary aim (he is more inclined to reduce inventory carrying costs), he may invest in the sector to ensure a better supply. In Egypt for example, since the emergence of the non-subsidised bread chain, private operators have heavily invested in storage infrastructure both in ports and within the country. In Morocco, the government encourages investment in collection infrastructure through storage subsidies. These examples should encourage governments to question the balance to achieve between public and private spheres in order to ensure food supplies for the population.

The limited and inadequate logistics in most southern and eastern Mediterranean countries are therefore a real problem in terms of food security. More generally, they cripple the development of these States. With the globalisation of trade, logistics has become an important vehicle for economic competitiveness. Capable of pulling up a country or a company's growth, its effectiveness depends on public policy, investment, infrastructure, transport, innovation and training. Logistics can help open up some territories and to better connect them to the rest of the country or the world. Moreover, in the Mediterranean region, logistics must increasingly integrate issues of environmental sustainability. The anchoring of a country to the dynamics of globalisation therefore requires a number of logistical skills, related to both the control of time and the management of space. In order to reach such an ambition, international cooperation, primarily at Euro-Mediterranean level, is crucial. Mediterranean countries should collaborate to stimulate synergies in terms of logistics and make their infrastructure facilities complimentary. These statements on this particular subject repeat what all experts conclude with regards to the Mediterranean and what the CIHEAM had summed up in its prospective report in 2008 through this simple statement that remains sorely relevant: "either collaborate or weaken separately" (CIHEAM, 2008).

Conclusion

In addition to the interesting information provided on cereals and their trade throughout history (Collaert, 2013), the main objective of this chapter was to put grain at the heart of the issues of Euro-Mediterranean cooperation that should increasingly focus on the development of relations and infrastructure related to food security. This is certainly a crucial prerequisite for a successful economic and social transition in this region (Breisinger *et al.*, 2011; Sakala *et al.*, 2012). Being the region

of the world that is most dependent on external supplies and this tendency will grow in the coming years, the Mediterranean is inevitably forced to better control the costs of its grain purchases. This can be achieved by giving priority to securing imports (financial capacity, relations with suppliers and market operators) and optimising the sector's logistics.

Being essential for southern and eastern Mediterranean countries, this challenge aims at reducing losses, enhancing storage capacity, overcoming the domestic production deficit, facilitating the transport of grain and limiting the financial burden dedicated to the purchase of grain. If awareness seems to have been raised during the past years, logistics require the mobilisation of material resources on the long term in order to be efficient, modern and competitive. Far from resolving all issues, logistics can help reduce food and political risks. By matching supply and demand, it can facilitate the trade of this strategic product while promoting international technical cooperation. This is a field for a mutually beneficial partnership between the Mediterranean shores.

If the Euro-Mediterranean remains a long-term geopolitical ambition, each step taken towards a greater multilateral solidarity in this region is most welcome. The idea of developing a Mediterranean component of the AMIS system (Agricultural Market Information System) is an encouraging step in the right direction. However, this proposal from the 9th ministerial meeting of the CIHEAM's members countries held in Malta in September 2012 is not enough. As regards food and grain, complementarities and responsibilities should be at the heart of debate in the Euro-Mediterranean region at a time when the world is going through the restructuring of its geo-economic and agricultural balance. Knowing how to produce better, being able to produce more but also decide for whom to produce are three dimensions of the same Euro-Mediterranean grain strategy where trade and logistics would be perceived as levers for this region's food security and geopolitical stability.

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