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FISHERIES AND AQUACULTURE

THE WEALTH OF THE DEEP

The Mediterranean, the sea between lands – a denomination that points to its importance. It is a fact that for man, who names the elements, the land is the place of settlement and the sea the zone of travel. Much more than that, this sea was the natural “Route” for craft in quest of territories, and it is still the busiest shipping route in the world, that of supertankers, but it is also one of the world’s largest and most ancient fishing grounds, whose products have become an integral part of the Mediterranean diet.

Today the Mediterranean accounts for only a small share of the volumes fished throughout the world, a result which reflects the weakness of plankton in its waters when one considers the area of this sea, for compared with other waters of similar area, this output is not particularly significant. Yet as the confluence of several singular seas the Mediterranean offers a biodiversity for which it is still renowned. So the Mediterranean people have long gone fishing elsewhere, particularly in what can be regarded as the mother of the Mediterranean: the great Atlantic Ocean. This is nothing new. The Romans had already realised the importance of such a mass of water when they developed the coastal cities of Hispania.

With the Atlantic Ocean the peoples of the Mediterranean had a true resource which its more capricious waters had long protected from man’s appetite. This was without reckoning with the technologies with which a turbulent ocean can now be crossed, an ocean that is in turn revealing its limits as high population pressures continue to grow.

Aquaculture, which is intended to compensate for seas that are overcrowded if not nearing exhaustion, is often presented as an emerging sector, yet it is actually an ancient activity in the Mediterranean, where it was practised by the Etruscans and developed by the Greeks and Romans. It was already used as a means of stocking fresh products ready for consumption near the major urban centres. But in the 20th century production was intensified as the result of human needs and access to technology. This development, which also concerns more marginal inland aquaculture activities, is of course to be explained by the refinement of marine reproduction and fish and mollusc feeding methods. The inverted curves of sea capture and aquaculture indicate that this seems to be a general trend.

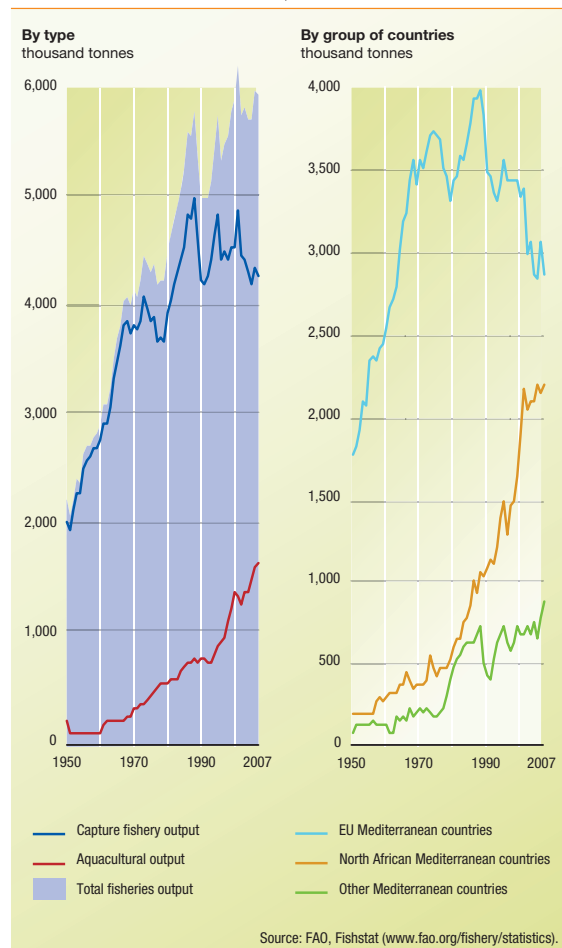
THE SEA AND THE FISHERIES SECTOR

In a world whose population is steadily growing, food security is a crucial concern. Fisheries products are thus essential, particularly for land-poor countries with a wealth of marine resources, such as Egypt or the islands. As the result of technological advancement, the sea and oceans are subject to increasingly intense anthropic pressure, as is the case with the land: overexploitation, pollution, global warming, fishing in deeper and deeper waters are all factors that are jeopardising the sustainability of marine resources. Mediterranean populations have always engaged in fishing in the Mediterranean Sea, this “sea between lands”, and seafood products are central to their diet. Yet some Mediterranean countries (France, Spain, Morocco, Turkey, Egypt,...) also exploit other seas and oceans – the Atlantic Ocean, the Black Sea, and the Red Sea – where they sometimes obtain the bulk of their catch.

FISHERIES AND TRENDS

The data on the various countries have been aggregated in three categories for analysis purposes: the EU Mediterranean countries, i.e. Bulgaria, Cyprus, Spain, France, Greece, Italy, Portugal, Malta, Romania, and Slovenia; the North African countries including Algeria, Egypt, Libya, Morocco and Tunisia; and the remaining Mediterranean countries, i.e. Albania, Croatia, Israel, Lebanon, Monaco, the Palestinian Territories, Serbia and Montenegro, Syria and Turkey. The fisheries products of the countries of the Mediterranean region and the Black Sea amounted to just under 6 million tonnes in 2007, i.e. barely 4% of world output. Total production increased slightly (+8.3%) in the decade from 1997 to 2007, mainly in connection with the growth in the aquaculture sector (+73%) over the same period, which offset the drop in capture fishery (-5.6%).

TOTAL FISHERIES OUTPUT, 1950-2007



The volumes produced are very concentrated: almost half (48%) are produced by the countries on the European shores – mainly Spain, France and Italy, which together account for 40% – whereas Egypt, Morocco and Turkey alone account for 45% of volume. Six countries thus produce around 85% of output. However, whereas total output decreased significantly in the EU Mediterranean countries (-20.5%) during the decade from 1997 to 2007, it increased considerably in the North African countries (+32.9%) and in Turkey (+34.7%).

Threats and regulations

The depletion of resources is now making it difficult to increase output at all, except in the aquaculture sector. Global warming entails considerable uncertainty for the years that lie ahead: although the intensity of its effects on sea water temperature has not yet been measured precisely, it is bound to affect the profile of animal populations. It could bring about intensive redistribution of fish and mollusc species, particularly in the Mediterranean Sea. In view of the urgency of the situation, both in the Mediterranean and in nearby seas, regulations are being established, mainly in the EU context, that define mesh sizes which vary depending on fishing zones and provide a means of limiting the capture of young fish and allowing them to reach maturity.

Furthermore, the General Fisheries Commission for the Mediterranean (GFCM), of which all of the above-mentioned countries except Portugal and the Palestinian Territories are contracting parties, endeavours to regulate a sector where competition is high. This Commission, which was set up under the auspices of the FAO in 1949, focuses on three objectives: promoting the development, conservation

and management of living marine resources, formulating and recommending conservation measures, and promoting cooperation projects in the training field.

INFRASTRUCTURES AND WORKFORCE

The Mediterranean countries have a total fleet of approximately 125,000 fishing boats, but a large proportion of this fleet operates outside the Mediterranean. This is the case with the French, Spanish, Moroccan, Egyptian and Turkish fleets, which also fish in the Atlantic, the Red Sea, and the Black Sea.

The breakdown according to number of vessels per country by no means reflects the capacity of this fleet. For the EU Mediterranean countries account for half of the fleet, but their boats are large, powerful and technologically more efficient than most of the vessels of the other Mediterranean countries. Egypt, in particular, still has a large proportion of unpowered vessels, which operate on the Nile and the lakes.

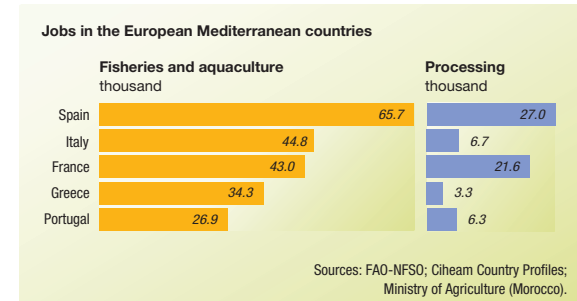
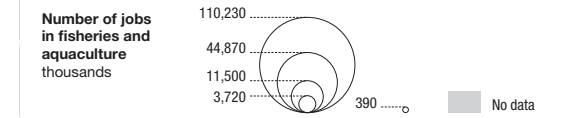
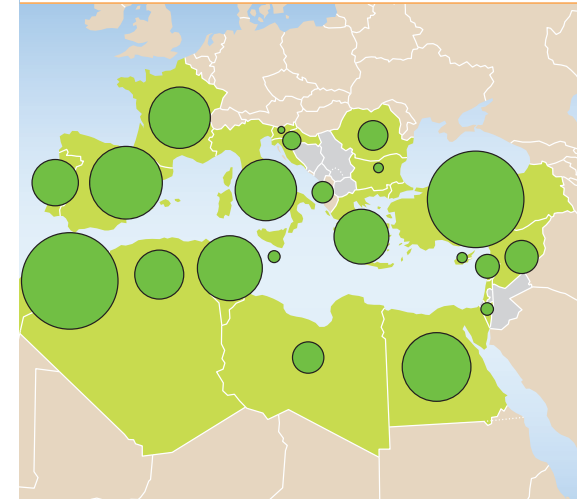
The 20% decrease in the number of fishing vessels in France, Greece, Italy, Portugal and Spain in the period from 1996 to 2007 may be connected with the drop in output but also with the increase in the capacity of vessels, since the reduction in gross output was less marked (15% less in 2007 compared to the 1996 output). In Spain, the main decreases were registered in deep-sea fishing, whereas in France vessels of less than 12 m were the most affected. Since the statistics for the other Mediterranean countries are unfortunately either incomplete or inexistent, it is difficult to identify any trend and, in particular, to see whether the same phenomenon is taking place in the Mediterranean as in Europe.

FISHING AS A SOURCE OF EMPLOYMENT

It is difficult to evaluate employment in the fisheries sector because most countries have no specific statistics and there are many different international sources (FAO, Ciheam, Eurostat, and OECD). The task is complicated by the fact that fishing activities often create part-time jobs. Although Eurostat bases its figures on the criterion of full-time equivalents, this method is not always used outside Europe, where the phenomenon is widespread. Apart from the above-mentioned sources, it is estimated that the fisheries sector (capture and aquaculture) in the Mediterranean countries generates approximately 630,000 jobs. Some 36% of these jobs are in the European Mediterranean countries and 41% in the North African countries. Labour productivity, measured in terms of output per labour unit, varies widely from one country to another in the region, from 1 tonne per worker in Lebanon and Albania to 18 tonnes in Spain and 22 tonnes in France. The EU Mediterranean countries produce approximately 13.3 tonnes per worker on average and thus register higher productivity than do the North African countries (7.8 tonnes) and the other countries in the Mediterranean (5.5 tonnes).

In France, Greece, Italy, Portugal and Spain, in addition to the decrease in the number of vessels there is also a general decrease in the number of people working in capture fishery – according to the OECD the figure dropped by 30% in the period from 1998 to 2004. However, this decrease was not observed in the aquaculture and processing sectors, where a certain degree of stability, and even an upward trend, was registered over the same period. This could indicate that production jobs will be emerging in these sectors in the long term. ■

JOBS IN THE FISHERIES SECTOR



CAPTURE FISHING AND AQUACULTURE

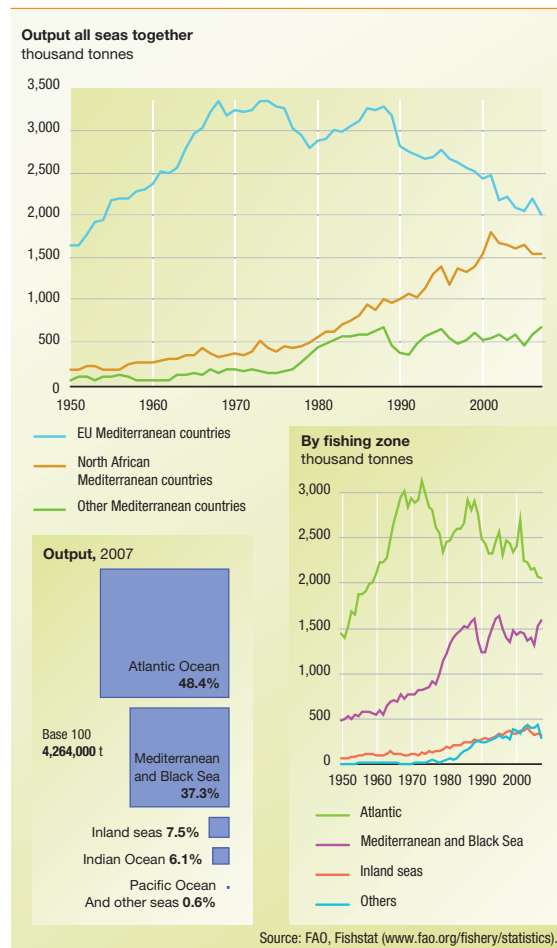
Aquaculture is developing rapidly at the world level, and it is a sector that is steadily growing in the countries around the Mediterranean, where a growth rate of 73% was registered over the period from 1997 to 2007. Growth has declined in the capture fishing sector, on the other hand, a trend that is a connected in particular with the preservation of fish reserves.

CAPTURE FISHING

Over 85% of the catch of the Mediterranean countries is fished in the Atlantic, the Mediterranean and the Black Sea, the remainder being fished in internal waters (7.5%) and other seas such as the Indian and Pacific Oceans (6.7%). This distribution is constantly evolving, with a drop in catch in the EU Mediterranean countries and a marked increase in the catch of their neighbours, particularly Turkey and Morocco. The share of the volume fished by the European countries in the total volume fished by all of the countries in the basin thus increased from 58.5% in 1997 to 47.3% in 2007, whereas the catches of the North African countries increased from 30.5% to 36.3% of the total volume over the same period. This drop in the catches of the Mediterranean countries is connected to some extent with the fact that the volume of their catches in the Atlantic has been decreasing since the mid 1970s (2 million tonnes in 2007 compared to a maximum of 3.1 million in 1973), with a marked decrease in the case of France, Italy, Portugal and Spain, which is partially offset by Morocco's increase in catches.

The main species fished are sardine and mackerel in the Atlantic, and anchovy and sardine in the Mediterranean and in the Black Sea, where there are also large catches of clams, mackerel, hake, bluefin tuna and mullet. Pelagic fish (which live in the superjacent waters and have little contact with

CAPTURE FISHERY



the seabed) predominate, accounting for 57% of catches, and are followed by groundfish (which live near the sea floor – whittings, hake and mullet).

The Mediterranean and Black Seas. From the 1950s until the mid 1980s, fish catches increased and then began to oscillate due to the variation in Turkish catches of anchovies in the Black Sea. In 2007, approximately 1.5 million tonnes of fish were fished in these seas, i.e. 30% of the capture fishing output of the Mediterranean countries. Only two countries – Italy and Turkey – obtain over 50% of their catches in the Mediterranean and the Black Sea. Turkey was the biggest producer in the Mediterranean and in the Black Sea in 2007 (40.6%), but the bulk of its output is composed of low-value pelagic fish, which is caught in the Black Sea. The volumes fished by the European States in these two seas, and also in the Atlantic, have been steadily decreasing since the 1990s, whereas the catches of the North African countries have been increasing since the mid 1970s. The volume of Mediterranean and Black Sea catches of the EU Mediterranean countries amounted to 33.7%, and that of the North African countries to 25.7%, of those volumes in 2007.

AQUACULTURE

This sector now accounts for 30% of fisheries output; production is based more on fish farming (66% of output) than on mollusc farming (33%). It is furthermore very concentrated: Egypt, France, Spain, Italy, Greece, and Turkey account for 95% of total aquaculture output. Aquaculture is developing all the more since high and medium-value species are produced, compared to catches at sea, where low-value species are also caught: in 2007, 35% of catches

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were herrings, sardines or anchovies mainly for non-food use (production of fish meal, for example).

Evolving fish farms. Whereas in Spain, France and Italy production is geared mainly to molluscs, Greece and Turkey focus on the intensive production of fish (sea bream, sea bass and trout), and Egypt, where aquaculture accounts for 63% of fisheries output, focuses on the semi-intensive farming of tilapias, grey mullet and carp.

Quite apart from the volume of fish produced, the value of agricultural products seems to have influenced developments in the sector. In 2007, the production of sea fish (sea bream, sea catfish, mullet, turbot, tuna, etc.) accounted for 30.2% of output and 46.7% of output value, whereas molluscs, which ranked first in terms of volume at 33.6%, accounted for only 24.5% of output value. Furthermore, the number of species farmed is rising. This is more marked in the case of fish than of molluscs, shellfish and aquatic plants, where the diversity of supply is even diminishing. But of the 65 fish species registered 40 generate low output (less than 1,000 tonnes). This is the case with semi-commercial/experimental production modes (meagre, sole, red sea bream, etc.) and commercial production modes targeting local demand or specific market niches (tench, sturgeon, etc.). Mollusc farming, on the other hand, is based on extensive production, which is more connected with the environmental context and in particular with the quantity of plankton. After developing in France, Spain and Italy in the 1970s, 1980s and 1990s, production is now steadily declining both in terms of volume and in terms of variety of species farmed.

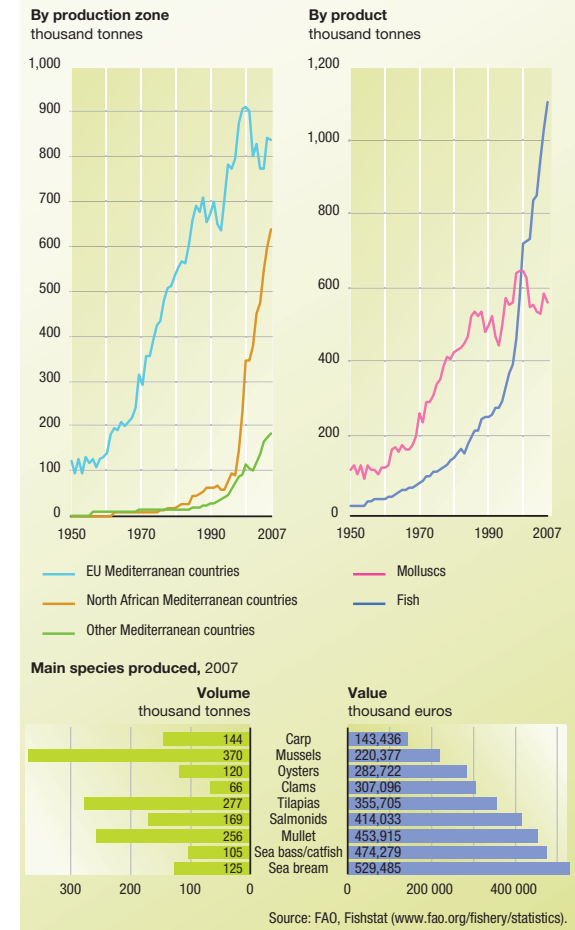
Egypt is the country where aquaculture is being developed most at the present time, in brackish waters or freshwater. This semi-intensive production is aimed at meeting the

animal protein needs of a steadily growing population, which, moreover, lacks space for developing agriculture. This progression of fish-farming in Egypt is playing a major role in the growth of the sector in the Mediterranean alongside farms in Greece, Turkey, Spain and Italy, which practise intensive farming. In the other countries (Algeria, Portugal, Morocco, and Tunisia), aquaculture development is still marginal; the activity is stagnating or is a commercial failure, except in the case of Israel, which has really developed the sector.

LIMITED OUTPUT?

However, after the marked development over the last few years, the aquaculture output of the EU Mediterranean countries seems to have levelled off. This is to be explained by several factors: the lack of new zones that are suitable for farming molluscs and establishing marine fish farms, the drop in the prices of many marine species (particularly sea bass and sea bream) due to abundant supplies, environmental issues, new regulations and the limited diversity of species offered to consumers. Opportunities for expansion now seem to come from the development and establishment of new production technologies that are more environment-friendly, such as recirculation systems, which economise water and energy, and the installation of rearing cages in the open sea. ■

AQUACULTURAL OUTPUT



FISHERIES AND AQUACULTURE MARKETS

Total demand for fisheries products from the Mediterranean region has been steadily rising since the 1960s. This rapid development, which is connected with population growth and the increase in human consumption, is exacerbating the fish reserve deficit.

STEADILY RISING DEMAND

There is a marked difference between consumption in the EU Mediterranean countries and in the other countries in the region. It is much higher in the EU countries in terms of both total demand and per capita consumption. In the period from 2003 to 2005, the Mediterranean countries of the EU, representing 44% of the total population, accounted for 70% of demand with an annual per capita consumption rate of 29 kg, i.e. three times higher than the rate in the other countries.

This increase in consumption in Europe is now levelling off: consumption rose by 7.6% during the period from 1995 to 2003, whereas annual per capita consumption in the other countries of the Mediterranean basin, led by Egypt, increased by approximately 44%, from 7.2 kg to 10.5 kg per person per year. Israel and Portugal are the only countries where consumption has decreased. There are major disparities amongst the European countries of the Mediterranean; per capita consumption in Bulgaria, Slovenia and Romania is close to that of the southern and eastern Mediterranean countries.

The species most consumed, taking all countries together, are large pelagic fish and groundfish, which are particularly popular in Portugal (94 g per person per day), a major cod consumer. Egypt produces and consumes freshwater fish (carp and tilapia). A considerable volume of molluscs and shellfish is consumed, but this consumption is limited almost

exclusively to the Mediterranean countries of the EU.

The fisheries products deficit has increased in almost all Mediterranean countries. The population increase, the rise in per capita consumption, the stagnation or even decrease in captures at sea and the uncertainty as to how aquaculture will develop in most countries suggest a scenario of rising prices which, as is the case with other agricultural commodities, does not necessarily benefit producers – particularly since this demand for fisheries products can be satisfied through imports, which are already high.

IMPORTS AND EXPORTS

Analysis of the fisheries trade reveals a balance of trade deficit from the Mediterranean region. Despite the fact that production has been stable over the last decade, the volume of trade has increased (by 47% in the case of imports and by 51% in the case of exports), reflecting the rapid expansion of the globalisation of trade and expansion of markets.

In 2006, all of the countries, with the notable exception of Morocco, were net importers in terms of volume. When trade is expressed in value, there are five countries which are net exporters: Morocco, Tunisia, Turkey, Croatia and Malta. The European Mediterranean countries – Spain, France, Italy, Portugal, and Greece – are by far the main importers, together accounting for 87% of the imports of the region in terms of volume and 95% in terms of value.

Paradoxically, with 77% of exports in terms of volume and 78% in terms of value in 2006, the countries on the northern shore, together with Morocco, are the main exporters in the region, which is not surprising since, as the main producers, they have dynamic processing sectors, a factor which is important when catch volumes are shrinking.

Imports are increasing in most of the countries in the

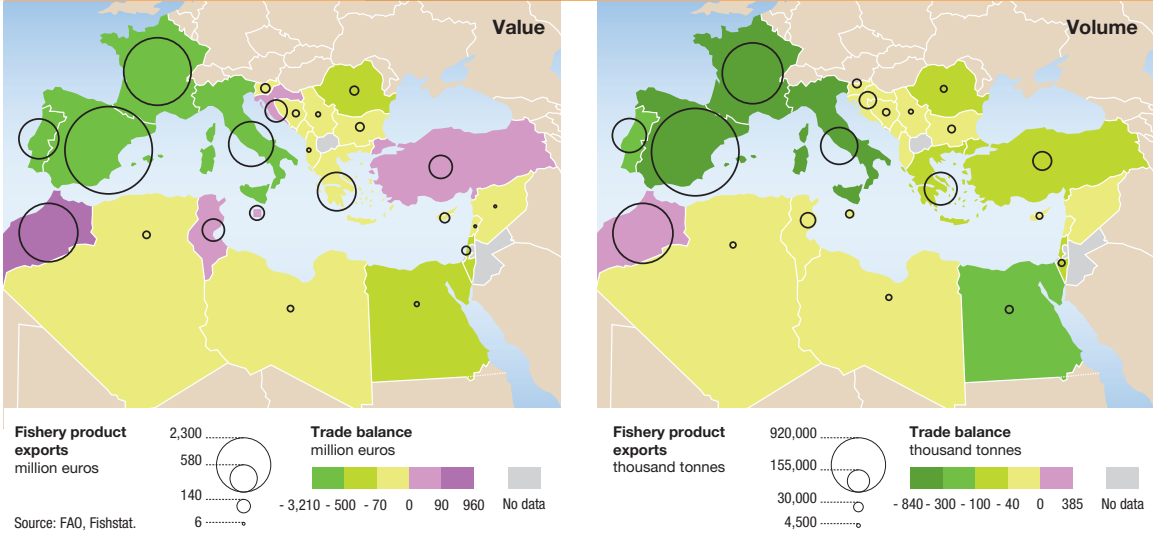
region. This is the case in Egypt, which is under growing demographic transition and where the population is young: demand is exploding (imports have increased by 87%), despite the fact that output also increased – by approximately 120% – in the 1995-2005 period (thanks to aquaculture).

Morocco, on the other hand, is the only net exporter in the region in terms of both volume and value. But now that the 1995-2005 period of growth in exports – which rose by 54% – is over, it will find it difficult to keep this pace up in the years that lie ahead. Output in Morocco in fact increased by only 21% over the same period and, in 2007, there was a slight drop in output, whereas per capita consumption increased.

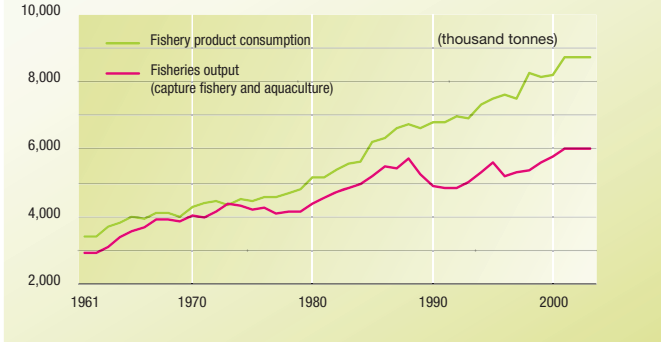
The FAO statistics do not provide information on the origin and destination of imports and exports, and this makes it difficult to analyse the fisheries trade of the Mediterranean countries. Eurostat provides information for the countries of the European Union, however: 47% of the imports of the EU Mediterranean countries come from the EU Member States. Furthermore, outside the European Union, Morocco was the leading supplier of the EU Mediterranean countries in 2007, accounting for some 3% of their total imports. ■



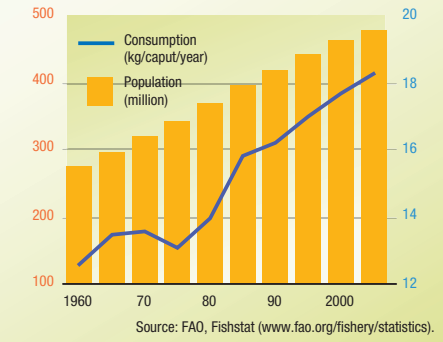
FISHERIES AND AQUACULTURE MARKETS, 2006



Consumption and output, 1961-2003



Population and consumption, 1960-2005



THE JAPANESE MARKET AND BLUEFIN TUNA

Japan is a member of the General Fisheries Commission for the Mediterranean and is known to be a major consumer of bluefin tuna: 80% of Mediterranean output goes to Japan. Bluefin tuna stay in the Mediterranean in the course of their long migration mainly to ensure reproduction; their other breeding ground is the Gulf of Mexico. Until the 1970s, bluefin tuna was fished primarily in the Atlantic, but since then the Mediterranean has become the main region where they are fished, but also where they grow.

This fish is exported at high prices to Japan in particular, where it is consumed as steak or sushi, but is now seriously endangered due to overfishing. The number of *Thunnus thynnus*, which have been overfished for decades, has decreased by 80% in the Atlantic and by two-thirds in the Mediterranean since 1970. The evolution of the stock of bluefin tuna reflects a reality which is also affecting other species and highlights the need for regulation and concerted action in the fisheries domain. In the case of bluefin tuna, the European Commission does set fishing quotas every year, but these quotas are exhausted within a few months. What is even more serious, the volume of illegal catches is reportedly much larger than the quotas.

In July 2009, the Principality of Morocco filed an application with the Convention on International Trade in Endangered Species (CITES) to have bluefin tuna classed in Annex 1, which lists the species requiring the highest degree of protection. Such a decision would amount to prohibiting exports from the Mediterranean and Atlantic to Japan.

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