FISHERY COUNTRY PROFILE	Food and Agriculture Organization of the United Nations	FID/CP/GRC
PROFIL DE LA PÊCHE PAR PAYS	Organisation des Nations Unies pour l'alimentation et l'agriculture	September 2006
RESUMEN INFORMATIVO SOBRE LA PESCA POR PAISES		

GREECE

GENERAL ECONOMIC DATA - September 2006

Area:	132 000 km²
Shelf Area:	94 340.4km²
Coastline	13,676 km
Population (2005):	11.1 million
GDP at purchaser's value (2005):	$US 213.7 billion
PCE per head (2005):	$US 19 670
Agricultural GDP (2004):	6.6% of GDP

FISHERIES DATA

Commodity Balance (2003):

	Production	Imports	Exports	Total Supply	Per Caput Supply
	tonnes liveweight				kg/year
Fish for direct human consumption	189 571	146 883	96 146	241 164	22
Fish for animal feed and other purposes	5 021	na	na	na	

Estimated Employment (2003):

(i) Primary sector (including aquaculture): Fishing: Processing: Aquaculture:	37 701 30 196 3 360 4 145
Trade Value of Fisheries Imports (2004):	$US 473 500 000
Value of Fisheries Exports (2004):	$US 414 537 000

The seas and the land

The seas around the Greek peninsula which include the Ionian, Aegean, Thracian, Cretan, and Libyan Seas, are generally deep with narrow continental shelf and steep slopes, except for some shallower areas in the north Aegean Sea and inside the gulfs across the main land. The high diversity of oceanographic conditions creates a large number of habitats where many different stocks and species live. The system is characterized by high biodiversity, rich coastal biotopes and landscapes, sea

morphology with significant average depth, oligothrophic waters and mild climatic conditions, determining a unique marine entity. The apparent limited pollution detected only in certain marine zones close to the main cities, reinforces the feeling of a healthy natural marine environment.

Two main seas surround the Greek peninsula, the Aegean and the Ionian Sea. The Aegean Sea is bounded to the east by the Turkish coastline, to the north and west by the Greek mainland and to the south by the island of Crete. The Thracian Sea, which is part of the Aegean Sea, connects with the Black Sea through the Bosporus Straits, the Marmara Sea and the Straits of Dardanelles. It has the widest continental shelf and is the most productive region of the Aegean Sea. The combination of brackish water inflow from the Dardanelles and discharge from a series of large rivers is the predominant factor affecting the structure of the water column in the area. The circulation is mainly determined by the surface inflow from the Dardanelles, which, under the influence of the prevailing wind patterns, shifts above or below the island of Lemnos, creating thermohaline fronts and gyres. The surface circulation pattern of the Aegean Sea changes temporarily and seasonally, influenced by local and strong meteorological events. During the winter, a cyclonic gyre at the northern basin of the Aegean Sea appears associated with the northerly movement of sea water along the Turkish coast, together with the southerly movement along the eastern coastline of Greece. In the southern part, two small cyclonic gyres appear between Cyclades and Crete during the winter. The area is affected by the general inflow of Levantine intermediate water moving northwards through the strait Crete-Carpathos-Rhodos island. In the summer, the northern Aegean circulation shows a characteristic southerly movement, induced from the general wind climate (Etesians). In the southern part a local gyre system modifies the general circulation with an eastward movement along the northern coast of Crete.

Although the North Aegean Sea is more eutrophic than the South Aegean Sea, eutrophication does not appear to be a problem in this region, although in recent years the phenomenon of red tides and eutrophication episodes have been frequent in the Thermaikos Gulf and the Gulf of Kavala respectively.

In the western coast of the country, the Eastern Ionian Sea has deep waters, with a maximum depth of 5121 m, which is the maximum depth in the Mediterranean. The main water masses of the area are the Modified Atlantic Water near surface coming from the Western Mediterranean, characterized by relatively low salinity of 38 o/oo and a minimum of temperature of 14^{o}C in the northern part. In deeper waters the subsurface water mass of Levantine Intermediate Water has higher salinity up to 39 o/oo, decreasing from south to north. Colder and less saline waters come from the Adriatic Sea with salinity of 38.7‰ and temperature of 13^{o}C. Through the straits of Kythira Island, the Eastern Ionian Sea is also influenced by water masses more saline and rich in oxygen coming from the Aegean Sea. The area is oligotrophic with decreasing nutrient gradient from the western to the eastern part. However, the concentration of nutrients in the Ionian Sea is still higher than that of the Aegean Sea.

The fish fauna of the Aegean and Ionian Seas is mainly dominated by species of Atlantic-Mediterranean origin, with Lessepsian migrants present mainly in the south eastern part of the Aegean, and some Black Sea living species in the Thracian Sea.

The main characteristics of the Greek peninsula are a long and fragmented coastline, with more than 3000 small and larger islands and islets in the archipelago, and a large number of natural harbors. Since ancient times these characteristics favored marine navigation and allow today the spread of the fishing fleet over an extensive area. Fishing continues to be an important industry in the country.

Main landing ports in Greece

Role of the fisheries sector in the national economy

The fisheries sector, as a branch of primary production, is considered important for the national economy despite its small contribution to GDP (about 0.35 per cent in 2003), as it contributes to maintaining the economic and social cohesion of large areas of the country (coastal areas and the Aegean and Ionian islands). Approximately 38 000 people are employed in this sector.

Within this sector, the new branches of **fish farming** and processing are being developed (106 208 tons in 2005), which perform well in exports, contribute to covering demand in the domestic market and reinforce employment in related areas (e.g. shipbuilding).

In 2005, fish production in all categories (fishing, fish farming, lagoons) reached 198 946 tonnes.

The fisheries

Greece has a typical multi-gear and multi-species fishery,which includes almost 17 500 professional fishing boats, with different characteristics of size and activity (Table 1).
There are 360 trawlers larger than 12 meters, 300 purse seines, 400 beach seines, 530 surface long liners, 16 800 gill-netters and bottom longliners mostly with boat length smaller than 12 meters. The large number of gill-netters underlines the importance of shore fishing even today when it continues to be one of the most important activities of the coastal zone, in economic and social terms. In distant islands or isolated areas fishing is still the main activity. In these areas, where usually there is not the alternative of agricultural employment, fishing and tourism support each other and allow many families to live in areas that otherwise would be empty.

Fishing boat categories in Greece

Boat category	Length category	Number of boats	Mean length (m)	Mean power (kW)	Mean capacity (GRT)	Mean age (years)
Trawls	<12 m		11,1	60,6	8,1	35,0
Trawls	12-24 m	156	20,8	262,1	49,3	30,3
Trawls	24-40 m	181	27,9	312,0	128,9	14,3
Purse seine	<12 m		9,9	47,4	6,8	43,3
Purse seine	12-24 m	276	18,3	172,2	36,1	26,2
Purse seine	24-40 m	20	26,8	237,0	98,3	7,7
Beach seine	<12 m	357	9,6	54,2	5,5	41,0
Beach seine	12-24 m	51	12,8	105,4	14,0	37,2
Surface long lines	<12 m	445	8,6	34,3	4,4	19,0
Surface long lines	12-24 m	90	14,9	100,8	22,1	15,3
Coastal boats	<12 m	16.546	6,5	18,1	1,9	24,3
Coastal boats	12-24 m	307	13,7	94,5	17,4	17,3
Other	<12 m		9,6	50,2	5,4	38,8

(Data from Greek National registry system-2005)

The offshore fisheries were developed in the early 1970s but the largest expansion began in the 1980s after the admission of Greece in the European Union. Both the capacity and horsepower of the vessels increased mainly after this period and were stable since the middle of the 90s, when measures for the limitation of licenses for offshore fishing boats were enforced. The 650 boats involved in offshore fishing account for 60 per cent of the national fish production.

The main fishing gears used in the Aegean Sea are bottom trawls and purse seines for the offshore fisheries and gillnets, trammel nets, longlines, traps and trolls for the coastal fisheries.

The Aegean fisheries are characterized by multi-species composition where many commercial species appear seasonally in the catches. The main species caught are anchovy, sardine, hake, flounder, sea breams, wrasse, scorpion fish, pandora, anglerfish, horse mackerel, skate, lobsters, pink and brown shrimps, red mullet, octopus and squids. The main catch of the coastal fleet is the brown shrimp during spring and early summer, cuttlefish and octopus in the winter, while for purse seiners is anchovy and sardine. Trawlers in the winter catch mainly red mullet, hake, octopus, prawn, shrimp and crayfish.

The fishing grounds exploited by the majority of the Hellenic fishing fleet are not uniformly located along the coastal zone of the country. The major fishing grounds are located within the range of the continental shelf, in areas rich in brackish water, plankton and local upwellings. The areas which have these characteristics are clearly defined and placed along the coast of the Thracian Sea where the shelf is 35 n.m. wide, like the Thermaikos gulf with a relatively similar breadth but smaller extent, the Pagasiticos, Evoikos, Saronikos, Korinthiakos and Patraikos gulfs, the area of central Cyclades and the area located between the islands of Patmos and Kos in the SE Aegean Sea. Less extensive fishing grounds with a small scale fishing activity are located along the vast majority of the Hellenic peninsula coasts as well as the small gulfs of the insular areas.

As a result, the biggest part of the fishing effort takes place close to the gulfs such as Thermaikos, Evoikos, Saronikos and Patraikos. In the open seas the fishing grounds are located mainly along the Thracian coasts, the deeper areas of Thermaikos gulf and in central Cyclades.

The fishing grounds are often associated with the presence of extensive shelf characterized by smooth and flat substrate where most important is the activity of trawling. On the contrary, purse seiners are active in open seas rich in plankton and uplift currents, areas where the presence of pelagic fish is

sharply greater. The coastal boats confine their activity mostly in a zone 3-10 n.m wide along the coasts, usually in areas with natural reefs, near peninsulas or areas close to river mouths and estuaries.The carrying capacity of an area invigorated by the presence or absence of big rivers shapes the relevant sea's food chain and determines the diversity of the species as well as the abundance of individuals in all trophic levels. The extent of the submarine grounds between the isobath of 10 and 200 m, determines the quantity of the production while the physical characteristics of the water and the predominance of a particular substrate and depth determine the qualitative composition of the catches.

The main categories of gears are distributed across the area according to the nature of the fishing grounds . The Hellenic offshore fleet (known as medium range fishing fleet) is mainly distributed in the north and central part of the country in proximity to the richer fishing grounds. Because this category of the fleet restricts its activity to the extent of 350 m isobath, a big proportion of the exploited fishing grounds is placed in zones with wide shelf. As concerns the coastal fleet, it is distributed all over the country, but the majority of the vessels are located in the south Aegean islands.
In particular the major part of the offshore fleet is concentrated in the ports of Alexandroupoli, Kavala, Thessaloniki, Volos, Halkida, Piraeus, and Patra. Some ports constitute special cases since they have a big number of coastal vessels such as Kalimnos, Fournoi, Fanari in Rodopi, Limenas in Thassos Island, Elafonisos in Lakonia, Koilada in Argolida and Kisamos in Chania, Crete etc. (Fig, 1) Those areas are characterized by intensive fishing effort in accordance with the development of supportive actions and the development of necessary infrastructure.

According to the data extrapolated through the National system for the monitoring of fishing activities for 2005, capture fisheries production amounts to 92 738 tonnes. From them 30 per cent are small pelagic species, mainly sardine and anchovy. The remaining quantity is divided between 70 species of commercial fish, 5 cephalopods, 6 crustaceans and 2 bivalve species.

Main species landed in Greek ports

Species	Production (tn)
Sardina pilchardus	2349
Engraulis encrasicolus	1950
Merluccius merluccius	12300
Boops boops	8765
Trachurus sp.	6759
Sarda sarda	7675
Spicara smaris	5176
Octopus vulgaris	5094
Mullus barbatus	4393
Parapenaeus longirostris	4004
Sepia officinalis	3882
Penaeus kerathurus	3417
Lophius spp	2715
Raja sp	2572
Mullus surmuletus	2470
Illex coindetii	1676
Pagellus erythrinus	1551
Scomber scombrus	1541
Solea vulgaris	1446
Eledone spp	1295

Loligo vulgaris	1075
Sparus auratus	1040
Nephrops norvegicus	917
Selachii	913
Dicentrarchus labrax	480
Trigla spp.	275

Data from the National system for the monitoring of fishing activities

Organization of Hellenic Fisheries

Fishery in Greece constitutes an important sector of the primary production and contributes in smaller or greater proportion to the economy of each particular area. If we accept the fact that the pace of boat construction shows the trends of the fleet and as a result the productivity of the sector, the decrease in number of vessels that is being noticed since the beginning of the 1990s, after the implementation of the restrictive measures for the fishing effort all over EU and the relatively small interest for the replacement of the old vessels, shows that the sector has entered a restructuring phase. The construction of a medium-range fleet took place mainly during the 1980s, when a vast proportion of the incentives for the Hellenic fisheries was used for the construction of offshore vessels. In contrast, the 1990s was the period when most applications for the withdrawal of vessels have been submitted, following the enforcement of the restrictive measures regarding the tonnage of the Hellenic fleet.

Trawlers

The Hellenic offshore vessels have two categories of licensing. There are vessels with a license for bottom trawling and vessels that combine both licenses for bottom trawling and purse seining. Vessels of the second category are usually those which were manufactured earlier. Since 1970s fishing with bottom trawling is prohibited for the June to September period in Hellenic waters. Some of the offshore vessels which had double licensing before the inspection system that applies nowadays retained that advantage and therefore they can alternate the two ways of fishing. Usually purse seiners stop fishing activity during the period 15 December - 28 February, according to the relevant provision. However there are two factors determining the beginning of the alternative fishing with purse seine:

- The quantity of the benthopelagic species that are being fished, which determines the fish prices in the market
- The prices of small pelagic fish, especially anchovy and sardine

In years when bottom trawling is profitable even during May, when usually the efficiency of the bottom trawlers gradually diminishes and eventually stops at the end of the month, vessels with double licensing continue to fish even during that month with bottom trawling. However, if the quantities of benthopelagic species decrease or if demand for anchovy and sardine, which are the main pelagic species fished, is high, then gradually those vessels change their gear and start fishing with purse seines. With the above pattern the number of vessels that are landing their catch in the country's fish wharfs gradually diminishes towards the end of May.

The crew of these vessels consists of 5 persons beside the captain and as a general rule comprises of 2-3 foreign sailors. All the vessels use similar trawlers with 40mm mesh size (stretched) in the sack. During this last decade, the traditional bottom trawl manufactured by fishermen seems to be loosing pace and is being replaced by imported trawls. The new trawls have a bigger height (2.5m compared with the 1m of the traditional ones) and width (12m compared with 8 m of the traditional ones).

Every cruise of these boats lasts usually for two consecutive days and then the vessel returns to the main or secondary port in order to land the catch.

It is estimated that out of the catches landed in the ETANAL's fish wharfs the bigger quantity (40-60 per cent) consists of small pelagic fish, 40 per cent regards catches landed by bottom trawlers and approximately 10 per cent consists of landings from the small coastal vessels.

The main fishing fields of the trawling fleet extend from 20 to 300 m deep. The mean distance ranges from a few miles from the coast, inside the territorial waters, to a limited depth of 450 m, far outside the

territorial waters. The fishing season lasts from October 1st to May 31st. In addition, fishing is generally prohibited inside the three miles from the coast according to the EU regulation.

The main problem for the trawler fleet is the increase in operational costs of the vessels, especially fuel, which leads to the employment of foreign and cheaper crews coming mainly from Egypt. The investment of ship owners in larger vessels aims at increasing the ability of the vessels to fish in distant fields and under hard weather conditions. Large vessels operate more days per year but their costs are raised by the higher fuel consumption. In this way, they actually make profit only if they can sell in seasons when the prices increase due to the lack of landings or to the inability of smaller vessels to provide the market with fish. Smaller vessels operate with relatively low costs, taking advantage of the coastal zone, but are more affected by weather conditions.
The latest regulations that impose the removal of trawling gears away from the coasts did not favour them. On the other hand, the higher abundance of commercial species in the coastal zone compensates for the reduced ability of fishing during winter and somehow balances the financial differences between the two vessel categories.

Purse seiners

Purse seiners generally avoid keeping off the coast or the closest port, trying to be to the fish market in good time to achieve high prices and to ensure their catch reaches the local market in good conditions. The main target species for purse seiners are sardine and anchovy. The latter species especially, with the periodical variation of its stock, defines the financial condition of the fleet and the raw material available for fish processing units.

The main problem of the purse seine fleet is the high fluctuation of the quantity of the catch. Especially the fluctuation in the quantities of anchovy, whose stock is strongly influenced by the change in environmental factors, determines the profit of the units. In addition, purse seiners are strongly dependent on the prices offered for anchovy in the processing sector, which is affecting the market in an effort to keep prices as low as possible. The import of raw material from third countries is usually used as a measure of pressure for keeping the prices low. In addition, purse seiners demand a numerous crew for their operation, which again comes from Egypt. Some of the vessels, however, continue to employ Hellenic crews coming from areas with fisheries tradition, such as the islands of Thasos, Paros, Fournoi etc.

Some other problems that affect fishing MF activity are:

- The vessels are overburdened with debts, a situation which is amplified by the high interest rates of the banks.
- If the tendency not to replace old vessels independently of economic reasons continues, it will affect the potential of the sector in those areas still dependent on fisheries.
- The existing infrastructure is still only at a medium level of efficiency. The absence of landing and auction infrastructure in smaller ports that are located close to the fishing grounds, creates a parallel trade of fishery products that are neither recorded from the statistical service, nor taxed.

Coastal fleet

As mentioned in the introduction, the Hellenic seas have as major characteristics the extended length of the coasts, the complicated coastline, and the big network of ports. Those characteristics favour the scattering of the fleet in many small size ports, in which up to 17 000 professional fishing vessels can be found, vessels which are engaged exclusively in coastal fishery.
Coastal fisheries even nowadays continue to be, economically and socially, one of the most important activities in the coastal zone. Coastal fisheries employ many families who do not have other means of earning a living, especially in remote islands or isolated areas.
In contrast to medium-range fishery, coastal fishery uses a plethora of methods with intermittent use during the year. This way of fishing concentrates periodically the fishing effort on a particular species stock, thus avoiding its overexploitation and its eventual collapse. However, even these methods need to be controlled, especially because of the concentration of an excessive number of vessels in confined

areas, while for numerous fishing methods of the coastal fishery more defined measures are needed in relation to the features of the gears, the closed areas, and the seasons.

Perspectives and Problems of the fishery sector

In the main Mediterranean countries most of the fishing activity is being focused in the area within the 12 n.m. Having in mind that the Hellenic national waters are limited to 6 n.m. it can be said that the Hellenic fishery depends to a great extent upon coastal resources. In many cases the narrowness of the continental shelf favours the concentration of the fishing fleet only in limited zones. The conflict of interest between different gears is the main symptom of the narrowness of the available space, in addition to the continuous pressure imposed on the fishing stocks, a pressure which is not leaving any room for the implementation of management measures which could be based on alternative or periodical use of the fishing grounds.

The future of the fishery in Greece is closely related with the common rules of the Mediterranean fishing policy and the measures proposed at European level. The contemporary Common European Policy, which aims at the general reduction of the number of fishing vessels, is leading many fishermen to withdraw their vessels and retire from the profession. The fact that only a small capital is needed for the building and operation of a coastal vessel, pushes many professional fishermen or farmers to purchase a coastal fishing vessel which they use in order to gain an extra income. In that way the most dynamic sectors, such as that of professional fishermen, are weakened while the tendency for a partial occupation in fishery is strengthened. In addition, this raises excessively the number of coastal fishing vessels with crews who, in some cases, have the slightest relation with the sea.

The statutory enforcement of the 3 mile zone or the 50m depth within which fishing with trawling gears is prohibited is expected to improve the situation of the coastal fishery as long as a basic form of management and the enforcement of the principle of co-responsibility are applied. However, it is obvious that the improvement of the financial situation of the fishing units cannot be the result of an increase in catches, but only of the diminution of production costs and the improvement of the quality of the fish landed.