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PARLIAMENTARY ASSEMBLY OF  
THE MEDITERRANEAN

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**ROLE OF FISHERIES AND AQUACULTURE  
IN FOOD SECURITY OF THE  
MEDITERRANEAN COUNTRIES**

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**THE INTERNATIONAL OCEAN INSTITUTE (IOI)**

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# ROLE OF FISHERIES AND AQUACULTURE IN FOOD SECURITY OF THE MEDITERRANEAN COUNTRIES

## Executive Summary

Capture fisheries and aquaculture supplied the world with about 149 million tonnes of fish in 2010 with a total value of US\$ 217.5 billion, of which about 128 million tonnes was utilized as food for people, and preliminary data for 2011 indicates an increased production of 154 million tonnes, of which 131 million tonnes was destined as food. World per capita food fish supply increased from an average of 9.9 kg (live weight equivalent) in the 1960s to 18.4 kg in 2009 of which 126 million tonnes was available for human consumption.

The total fishery yield of Mediterranean fleets is estimated at 970,110 tonnes of edible marine produce, whereas aquaculture in Mediterranean countries produced yields of 1,663,000 tonnes, an increase of 89 percent compared with those of 1995. Among those countries practising aquaculture, Egypt (42 percent), Spain, France, Italy, Greece and Turkey accounted for 96 percent of yields for Mediterranean countries. Across all Mediterranean countries, apparent consumption per capita for all freshwater and marine fish products has been growing since 1961, as shown by the mean quantity for each country, rising from an initial 7.7 kg per capita to 19 kg per capita in 2007. In 2008, the mean consumption of aquatic produce in Mediterranean countries was 18.6 kg per capita with the total estimated consumption of about 8.6 million tonnes.

Marine fisheries and aquaculture are crucial, both socially and economically, to 23 countries of the Mediterranean region, providing animal protein and supporting food security for over 464 million people. An estimate of 32 percent of this population lives in close proximity to coastal areas, relying on fish resources not just for food but also for their livelihoods.<sup>1</sup> Small-scale fisheries play a particular important role in Mediterranean fisheries, where they represent more than 80 percent of the total vessel fleet. In the Euro Mediterranean area, artisanal fisheries represents 70 percent of European fishing vessels (30,000 of the 35,000 vessels operating in the Mediterranean). The total Mediterranean consumption of fish products will reach about 9.5 million tonnes in 2030, showing an increase of 30 percent.<sup>2</sup> Challenges in fisheries in the Mediterranean region including overfishing, marine habitat degradation and pollution; IUU fishing, deep-sea bottom fishing impacts and major challenges for the aquaculture sector have been described. The current operating methods for Mediterranean fisheries and aquaculture do not provide optimum sustainability for these sectors or the environment they exploit. To stress the crucial role of healthy marine ecosystems, sustainable fisheries and sustainable aquaculture for food security and nutrition and in providing the livelihoods of millions of people, the development of long-term management plans for fisheries and aquaculture will be needed to take into account the marine ecosystem as a whole, optimal fishing capacity, integrated framework of cooperation and governance.

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<sup>1</sup> Naji, M. 2013. Referred to Sauzade and Rousset (2013). Enhancing Small-Scale Fisheries Value Chains in the Mediterranean and Black Sea. GFCM.

<sup>2</sup> Naji, M. 2013. Referred to Malvarosa and De Young (2010). Enhancing Small-Scale Fisheries Value Chains in the Mediterranean and Black Sea. GFCM.

## Background

The Parliamentary Assembly of the Mediterranean (PAM) is an intergovernmental organization established for promoting regional diplomacy within the Mediterranean countries. PAM tackles most pressing issues as well as long-term concerns on conflict resolution in the Mediterranean, terrorism, migrations, climate change, energy, impact of the financial crisis, inter-cultural and inter-religious dialogue, etc. with particular focus on environmental issues within the framework of the PAM 2<sup>nd</sup> Standing Committee. PAM has benefited from the expertise of many United Nations departments and agencies in carrying out its mandate and is also ready to support them in their respective missions. PAM was granted an observer status at the United Nations General Assembly in December 2009.

PAM has been requested by the United Nations to contribute to the report of the UN Secretary General on the topic of the fifteenth meeting of the Informal Consultative Process, which will be held in New York from 27 to 30 May 2014, namely “The role of seafood in global food security”.

PAM in cooperation with the International Ocean Institute (IOI) has reviewed information on the Role of Fisheries and Aquaculture in Food Security of the Mediterranean Countries. Though information in this document is from various sources, it has been frequently referred to from the final report on the Analysis of Economic Activities in the Mediterranean: Fishery and Aquaculture Sectors by Sacchi (2011)<sup>3</sup> as it provides an in-depth analysis and up-to-date information. This may be useful information towards achieving the common vision (113) of the United Nations Conference on Sustainable Development entitled “The Future We Want” at the Rio+20 held in 2012 which stressed the crucial role of healthy marine ecosystems, sustainable fisheries and sustainable aquaculture for food security and nutrition and in providing the livelihoods of millions of people.<sup>4</sup>

## Objectives

The paper is to contribute to the report of the UN Secretary General on the topic of the fifteenth meeting of the Informal Consultative Process, which will be held in New York from 27 to 30 May 2014, namely “The role of seafood in global food security”, focused on the role of fisheries and aquaculture in food security of the Mediterranean countries.

### (a) The State of the World Fisheries and Aquaculture

Capture fisheries and aquaculture supplied the world with about 149 million tonnes of fish in 2010 with a total value of US\$ 217.5 billion, of which about 128 million tonnes was utilized as food for people, and preliminary data for 2011 indicates an increased production of 154 million tonnes, of which 131 million tonnes was destined as food.<sup>5</sup> World per capita food fish supply increased from an average of 9.9 kg (live weight equivalent) in the 1960s to 18.4 kg in 2009. Of the 126 million tonnes available for human consumption in 2009, fish consumption was the lowest in Africa (9.1 million tonnes, with 9.1 kg per capita), while Asia accounted for two-thirds of the total consumption, with 85.4 million tonnes (20.7 kg per capita), of which 42.8 million tonnes was consumed outside China (15.4 kg per capita). The corresponding per capita fish consumption figures for Oceania, North America, Europe, and Latin America and the Caribbean were 24.6 kg, 24.1 kg, 22.0 kg and 9.9 kg, respectively. Fish and fishery products represent a very

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<sup>3</sup> Sacchi, Jacques. 2011. Analysis of economic activities in the Mediterranean: Fishery and aquaculture sectors, Plan Bleu, UNEP/MAP Regional Activity Centre. 83 pp.

<sup>4</sup> <http://www.sustainabledevelopment.un.org/futurewewant.html>.

<sup>5</sup> FAO. 2012. The State of World Fisheries and Aquaculture 2012. Rome. 209 pp.

valuable source of protein and essential micronutrients for balanced nutrition and good health. Fish is the most important protein source in many developing countries. Fish consumption is highest in China and in western industrialized countries<sup>6</sup>. In 2009, fish accounted for 16.6 percent of the world population's intake of animal protein and 6.5 percent of all protein consumed. Globally, fish provides about 3.0 billion people with almost 20 percent of their intake of animal protein, and 4.3 billion people with about 15 percent of such protein.

### **(b) The State of the Mediterranean Sea**

The Mediterranean Sea's characteristics are described<sup>7,8</sup>. It is almost enclosed by Europe, Africa, and Asia with its only natural connections being to the Atlantic Ocean by the Strait of Gibraltar in the west and to the Sea of Marmara by the Strait of Canakkale and the Black Sea by the Strait of Istanbul in the east. The man-made Suez in the southeast connects the Mediterranean Sea to the Red Sea. Twenty-three states have a coastline on the Mediterranean Sea. They are Albania, Algeria, Bosnia and Herzegovina, Croatia, Cyprus, Egypt, France, Gibraltar, Greece, Israel, Italy, Lebanon, Libya, Malta, Monaco, Montenegro, Morocco, Slovenia, Spain, Syria, The Palestine Territories, Tunisia, and Turkey. There are 69 rivers that flow into the Mediterranean, the largest being the Po, the Rhone, the Nile and the Ebro.<sup>3</sup>

The Mediterranean Sea is an enclosed sea, with an area of 2.5 million square kilometers and has a volume of about four million cubic kilometers, with depths as great as 5,121 m<sup>2</sup>, an average depth of 1,500 metres<sup>5</sup>; with uniform temperatures of 12.5-14.5 degree Celsius. Located at mid-latitudes half-way between the subtropical and the temperate zones, the climatic and ecological characteristics of the Mediterranean Sea's region are partly maritime and partly continental which has resulted in it being used as a climatic model for other regions around the world. The Mediterranean climate is generally one of mild west winters and hot, dry summers. Temperature stratification can occur during extended periods of calm seas, high temperatures and inflow of freshwater. The Mediterranean Sea's unique mixture of subtropical and temperate elements has contributed to species diversity which has few equals in the world. Although the Mediterranean Sea accounts for only 1.5 percent of the earth's surface, it hosts approximately 7 percent of the known world marine fauna and 18 percent of its known marine flora, of which 28 percent is endemic to the Mediterranean Sea<sup>9</sup>. Between 10,000 to 12,000 marine species have been recorded and new species are regularly discovered and described although biomass in the Mediterranean is low<sup>10</sup>.

The total population of the Mediterranean countries was 464 million with four countries accounting for 60 percent of this total, namely; Egypt, Turkey, France and Italy.<sup>3</sup> About 157.3 million people live on 46,000 km of Mediterranean coastline, with approximately 200 million

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<sup>6</sup> World Ocean Review. 2013. Living with the Oceans: 2: The Future of Fish – The Fisheries of the Future. 143 pp.

<sup>7</sup> Jeftic, Ljubomir. 2009. AoA Region: Mediterranean Sea. In An Assessment of Assessments, Findings of the Group of Experts, Pursuant to UNGA Resolution 60/30: Regional and Supra-regional Summaries and Technical Annexes. The United Nations Environment Programme and the Intergovernmental Oceanographic Commission of UNESCO. P. 103-112.

<sup>8</sup> Cartes, J.E., Maynou, F., Sarda, F., Company, J.B., Lloris, D., Tudela, S. 2004. The Mediterranean deep-sea ecosystems: an overview of their diversity, structure, functioning and anthropogenic impacts. In: The Mediterranean deep-sea ecosystems: an overview of their diversity, structure, functioning and anthropogenic impacts, with a proposal for conservation. Part 1. IUCN, Malaga and WFF, Rome, Italy, pp. 9-38.

<sup>9</sup> Fredj, G., Bellan-Santini, D. And Menardi, M. 1992. Etat des Connaissances sur la Faune Marine Mediterraneenne. Bull. Inst. Oc. Monaco 9, 133-45.

<sup>10</sup> UNEP/MAP/MED POL. 2004. Transboundary Diagnostic Analysis (TDA) for the Mediterranean Sea. UNEP/MAP, Athens, 282 pp.

tourists arriving in the region every year. The Mediterranean region's unique landscape and monuments make it a popular tourist destination. Consequently, urbanization has been growing, particularly along the coastal strip, to accommodate both permanent and transient populations. This influx has resulted in substantial modifications of the coast itself and adverse effects on the environmental quality.

The Mediterranean Sea supports a wide range of ecosystems, from the rich sea-grass meadows and rocky reefs of the coastal zone, to the seamounts, cold seeps and trenches of the seabed<sup>11</sup>. At its deepest, the Mediterranean reaches depths of over five thousand meters. Over ten thousand species have been identified in the Mediterranean Sea, representing 8-9 percent of the world marine biodiversity<sup>12,13</sup> despite representing only 0.7 percent of the marine area<sup>14</sup>. In the Mediterranean Sea, biodiversity is not uniform throughout but varies with longitude, depth in the water column and distance from the coast. Coastal regions and shallow waters have special features, and the western and eastern portions of the Mediterranean differ greatly in biodiversity richness. The Mediterranean also hosts a large number of endemic species<sup>9</sup>.

### **(c) Mediterranean Marine Fishery Yields**

In 2008, the total fishery yield of Mediterranean fleets was estimated at 970,110 tonnes of edible marine produce (i.e. excluding corals, sea urchins, sponges and turtles). They comprise of pelagic, sharks and rays, crustaceans and molluscs and demersal fish species. The coastal demersal fish dominate over other demersal species and small pelagic species such as sardines, anchovies and sardinellas and comprise the majority of pelagic landings. The only declared yields are taken into account (often only what is put on the market) excluding 'throwbacks' and, apparently, most of the yields from small-scale artisanal fishing where the produce is sold direct to the customer.<sup>3</sup>

In 2008, yields of migratory species (about 55,063 tonnes) were broken down into four main groups: bluefin tuna (15,628 tonnes), swordfish and other billfish (nearly 12,000 tonnes), albacore tuna (2,975 tonnes), bonitos and other associated species (24,460 tonnes).<sup>3</sup>

### **(d) Inland Fisheries**

There are inland fishery activities which include professional fisheries on the lakes, rivers and estuaries of Mediterranean countries, though it is currently marginal or declining concerns cyprinids, salmonids and brackish water species.<sup>3</sup> In Egypt and Lebanon, recreational angling provides a significant food supply and source of revenue. The total yields is 41,011 tonnes in which Egypt has an estimated yield of 300,000 tonnes and nearly 40,000 fishermen employed in the activity, mainly using sailing and rowing boats.<sup>3</sup>

### **(e) Aquaculture**

Aquaculture covers on-shore aquaculture including freshwater fish farming, and marine aquaculture, which includes both seawater and brackish water fish farming and shellfish farming. Aquaculture yields in Mediterranean countries come from both on-shore waters

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<sup>11</sup> Greenpeace. 2005. Marine Reserves for the Mediterranean Sea. 58 pp.

<sup>12</sup> Zenetos, A., Siokou-Frangou, I., Gotsis-Skretas, O. and Groom, S. 2002. The Mediterranean Sea-blue oxygen-rich, nutrient-poor waters. In Europe's Biodiversity-biogeographical regions and seas. European Environment Agency.

<sup>13</sup> Steiner, Richard. 2006. Lebanon Oil Spill Rapid Assessment and Response Mission, Final Report. IUCN, the World Conservation Union, IUCN Commission on Environmental, Economic and Social Policy (CEESP), and Green Line Association, Lebanon. 26 pp.

<sup>14</sup> Occhipinti-Ambrogi, A. and Savini, D. 2003. Biological invasions as a component of environmental change in stressed marine ecosystems. Marine Pollution Bulletin 46.

(rivers, lakes, ponds and reservoirs or other artificial bodies of water) and marine and lagoon waters on the Mediterranean or other coastlines (Red Sea, Black Sea, Sea of Marmara and Atlantic). It thus produces a wide variety of freshwater, brackish water or marine fish, molluscs and crustacean species.

In 2008, aquaculture in Mediterranean countries produced yields of 1,663,000 tonnes, an increase of 89 percent compared with those of 1995. Among those countries practising aquaculture, Egypt (42 percent), Spain, France, Italy, Greece and Turkey accounted for 96 percent of yields for Mediterranean countries. Taking advantage of favourable conditions, Egypt is the country that has had the strongest growth, with the development of semi-intensive aquaculture for mullet (world's leading producer), tilapia (second producer worldwide) and carp in the Nile delta. Turkish, Greek, Tunisian and Croatian aquaculture has also benefited from a significant growth, as can be seen by comparing yields for 1995 and 2008. In contrast, French and Italian yields have declined (by 15 percent for France and 31percent for Italy).<sup>3</sup>

#### **(e) Fish Per Capita Consumption**

Buyers potentially have three sources of supply for fish products: local catch yields, aquacultural produce and imports, whether this is for direct consumption (fresh, chilled or frozen) or for processing for later human consumption. Subtracting exports from these three sources gives the fish supply, also called the apparent consumption; in this study, this figure is expressed in kg per person per year. Across all Mediterranean countries, apparent consumption per capita for all freshwater and marine fish products has been growing since 1961, as shown by the mean quantity for each country, rising from an initial 7.7 kg per capita to 19 kg per capita in 2007. In 2008, the mean consumption of aquatic produce in Mediterranean countries was 18.6 kg per capita with the total estimated consumption of about 8.6 million tonnes. Six countries were above this average: Spain (40 kg per capita), France (35 kg per capita), Malta (30 kg per capita), Italy (24 kg per capita), Croatia (23 kg per capita) and Greece (21 kg per capita).<sup>3</sup> The highest levels of aquatic produce with a mean consumption of 22 kg per capita, are found in EU countries, while Southern Mediterranean countries only consume 9 kg per capita.<sup>3</sup>

Analysis per type of produce shows that the relative share of pelagic and demersal species in this consumption varies between countries: while Turkey, Algeria, Syria and Morocco are strong consumers of pelagic fish, EU countries like Spain, France and Italy consume more demersal species. The increase in consumption in EU countries slowed in the late 1980s and consumption started to decline in the early 2000s, while in certain Southern Mediterranean countries, such as Algeria and Libya, consumption continues to increase. The availability of marine produce can be affected by external events which may either prevent fishing or limit trade (such as for former-Yugoslav countries, Palestine, Israel and Syria). Finally, with the exception of Morocco, Egypt and Turkey, no Mediterranean country covers its aquatic produce consumption by its aquacultural and fishing yields, which makes them highly dependent on imports. Mediterranean countries as a whole produce approximately 70% of their consumption. EU countries only produce 42% of their consumption from their aquaculture and fisheries, with the largest deficit probably affecting demersal species. Apart from Morocco, all countries import more than they export in tonnage terms.<sup>3</sup>

## **(f) Some Challenges in Fisheries and Aquaculture of the Mediterranean Region**

### ***Overfishing, Marine Habitat Degradation and Pollution***

In the Mediterranean Sea, the overall situation has remained stable but difficult since the last global assessment. All hake (*Merluccius merluccius*) and red mullet (*Mullus barbatus*) stocks are considered overexploited, as are probably also the main stocks of sole and most sea breams. The main stocks of small pelagic fish (sardine and anchovy) are assessed as either fully exploited or overexploited<sup>15</sup>. IUCN has warned that more than 40 species of marine fish currently found in the Mediterranean could disappear in the next few years.<sup>16</sup> According to the study, which provides the first comprehensive regional IUCN Red List assessment of the native marine fish species for an entire sea, almost half of the species of sharks and rays and at least 12 species of bony fish are threatened with extinction, due to overfishing, marine habitat degradation and pollution. The study indicates that commercial species like Bluefin Tuna (*Thunnus thynnus*), Dusky Grouper (*Epinephelus marginatus*), Sea Bass (*Dicentrarchus labrax*) or Hake (*Merluccius merluccius*) are considered threatened (critical endangered, endangered or vulnerable) or near threatened with extinction at the regional level, mainly due to overfishing. The study highlights the need to: reinforce fishing regulations, create new marine reserves, reduce pollution, and review fishing quotas, in particular for threatened species.<sup>17</sup>

### ***Illegal, Unregulated and Unreported Fishing***

Illegal, unregulated and unreported (IUU) fishing is a major problem worldwide, linked to the lack of effective management systems and also to increased commercial pressure on dwindling fisheries resources<sup>5</sup>. The Mediterranean is no exception to this problem. A good example is the extensive use of driftnets, which continues despite their prohibition in the Mediterranean.

### ***Deep-sea Bottom Fishing Impacts***

The Mediterranean deep-sea fisheries are targeted at relatively few species compared to other oceans, with an emphasis on hake (*Merluccius merluccius*) and deep-water shrimps (*Aristeus antennatus*, *Aristeomorpha foliacea*)<sup>18</sup>. However, other deep-water species are also fished, including blue whiting (*Micromesistius poulassou*), greater forkbeard (*Phycis blennoides*), angler fish (*Lophius spp.*), conger eel (*Conger conger*) and blackspot sea bream (*Pagellus bogaraveo*), as well as crustaceans including shrimps *Parapenaeus longirostris*, *Pasiphaea spp.*, *Acantheephyra eximia* and *Plesionika spp.*, the Norway lobster (*Nephrops norvegicus*), and the crabs (*Geryon longipes* and *Paramola cuvieri*).

For the past eight years, the issue of protecting biodiversity in the deep sea in areas beyond national jurisdiction-the high seas-has been extensively debated by the United Nations General Assembly (UNGA) and in other international fora.

The UNGA adopted a series of resolutions, beginning with Resolution 59/25 in 2004, which called on high seas fishing nations and regional fisheries management organizations (RFMOs) to

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<sup>15</sup> FAO. The State of World Fisheries and Aquaculture 2010. Rome, FAO. 2010. 197 pp.

<sup>16</sup> Abdul Malak, D., *et al.* 2011. Overview of the Conservation Status of the Marine Fishes of the Mediterranean Sea. Gland, Switzerland and Malaga, Spain: IUCN. Vii + 61 pp.

<sup>17</sup> International Institute for Sustainable Development. Biodiversity-I.iisd.org/news/iucn-warns-of-marine-fish-extinctions-in-mediterranean-sea/.

<sup>18</sup> Bensch, A. Gianni, M., Grebroval, D., Sanders, J.S., Hjort, A. 2008. Worldwide review of bottom fisheries in the high seas. FAO Fisheries and Aquaculture Technical Paper No. 522. Food and Agriculture Organization of the United Nations, Rome, Italy. 145 pp.

take urgent action to protect vulnerable marine ecosystems (VMEs) from destructive fishing practices, including bottom trawl fishing, in areas beyond national jurisdiction<sup>19</sup>. Deep sea bottom fisheries have significant impacts on deep-sea communities formed by emergent epifaunal animals such as corals and sponges<sup>20</sup>. Vulnerable marine ecosystems (VMEs) on the sea bottom may also be susceptible to the direct and indirect effects of increased sediment load in the water overlying the seabed that can smother live colonies or bury hard substrata required for settlement of larvae. Removal of target fish species and the dumping of by-catch or offal from fish processing can impact ecosystems in general, potentially including coral, sponge and other communities that form VMEs, and individual species, especially if they influence food webs, within such habitats.

In 2009, the UNGA reviewed the implementation of Resolution 61/105, adopted in 2006<sup>21</sup> which called on states and regional fisheries management organizations (RFMOs) to regulate high seas bottom fisheries through conducting impact assessments to determine whether significant adverse impacts on VMEs would occur. Furthermore, the resolution calls on high seas fishing nations to close areas of the high seas to bottom fishing where VMEs were known or likely to occur unless such fishing could be managed to prevent SAIs on VMEs.

Recognizing that the implementation of the resolution was insufficient, the General Assembly adopted Resolution 64/72<sup>22</sup>. This resolution reaffirmed the 2006 resolution and made it clear that the measures called for in Resolution 61/105 should be implemented consistent with the FAO Guidelines by flag states and RFMOs prior to allowing, or authorizing, bottom fishing on the high seas. Resolution 64/72 places particular emphasis on conducting impact assessments of bottom fisheries on the high seas and calls on states and RFMOs to “ensure that vessels do not engage in bottom fishing until such assessments have been carried out”.

Resolution 64/72 further calls for stock assessments and conservation measures to ensure the long-term sustainability of deep-sea fish stocks and non-target species, and the rebuilding of depleted stocks. The reviews on the regulations adopted by the RFMOs with responsibility for the management of deep-sea bottom fisheries on the high seas in the Mediterranean was reported<sup>14</sup>. It was found that four deep-water species were managed, namely; *Aristeus antennatus*, *Merluccius merluccius*, *Nephrops norvegicus*, and *Parapenaeus longirostris*; the deep-water species not managed are sharks; the closure of areas to protect VMEs was made in less than five areas, but

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<sup>19</sup> UNGA. 2004. Resolution 59/25 Sustainable fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments. UNGA A/RES/59/25. Available at: [http://www.un.org/Depts/los/general\\_assembly/general\\_assembly\\_reports.htm](http://www.un.org/Depts/los/general_assembly/general_assembly_reports.htm), 16 pp.

<sup>20</sup> Rogers, A.D., Gianni, M. 2010. The implementation of UNGA Resolutions 61/105 and 64/72 in the Management of Deep-Sea Fisheries on the High Seas. Report prepared for the Deep-Sea Conservation Coalition. International Programme on the State of the Ocean, London, United Kingdom, 97 pp.

<sup>21</sup> UNGA. 2007. Resolution 61/105 Sustainable Fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments. UNGA A/RES/61/105. Available at: [http://www.un.org/Depts/los/general\\_assembly/general\\_assembly\\_reports.htm](http://www.un.org/Depts/los/general_assembly/general_assembly_reports.htm), 21 pp.

<sup>22</sup> UNGA. 2009. Resolution 64/72 Sustainable Fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments. UNGA A/RES/64/72 not yet issued (as of 10 January 2010); Available as General Assembly document A/64/L29 at: <http://www.un.org/Docs/journal/asp/ws.asp?m=A/64/L29> [http://www.un.org/Depts/los/general\\_assembly/general\\_assembly\\_reports.htm](http://www.un.org/Depts/los/general_assembly/general_assembly_reports.htm), 27 pp.

fishing was banned below 1,000 meters depth, the Environmental Impact Assessments of deep-sea fisheries in the Mediterranean on benthic ecosystem had not been conducted.

### ***Combating illegal, unregulated and unreported fishing***

Regionally, necessary steps to tackle IUU fishing in the Mediterranean Sea include the development of a regional register of fishing vessels and a review of the GFCM to ensure that measures such as inspection at sea can be effectively taken and efficiently implemented<sup>5</sup>. Mediterranean countries also need to prepare and implement national plans of action to combat IUU fishing, as mandated in the international Plan of Action of the United Nations FAO. To date, Spain is the only Mediterranean country to have adopted a National Plan of Action to combat the problem of IUU fishing. While illegal catches and discarded by-catch are now receiving lots of attention, the systematic neglect of small-scale fisheries by government has led to their substantial catch often remaining undocumented. This has caused us to overlook the only fisheries which, in the long-term, may survive the present crisis. Indeed, small-scale fisheries, using passive gear and exploiting coastal stock, may already have an ecological advantage over large, fuel-guzzling and habitat-destroying trawl fisheries, and thus offer a way out of the present crisis of fisheries<sup>23</sup>.

### ***Mediterranean aquaculture***

Mediterranean aquaculture is a large and dynamic industry which has grown substantially in many General Fisheries Commission for the Mediterranean (GFCM) countries over recent years and plays an important social and economic role in the region.<sup>24</sup> Aquaculture provides opportunities to meet increased consumer demand for aquatic products while reducing the dependence on often over-exploited wild stocks. This sector, along its value chain, ensures job opportunities and contributes to food security in the whole GFCM area. The ultimate challenge is to create a conducive and enabling regional environment where aquaculture would continue to flourish in a shared market through modern governance, experience and knowledge sharing, and cooperation in the area. Main challenges for the aquaculture sector include acceptability of aquaculture products related to impact on the environment, food quality and safety, social integrity, certification and traceability, and organic aquaculture; animal welfare; capture fisheries – aquaculture interactions; certification; climate change; conflicts on over use of coastal areas with consideration on ICZM as a viable framework for a better marine spatial planning and aquaculture zoning site selection and the involvement of local communities during planning activities; environment – aquaculture interactions; information management to assess and monitor the marketing of aquaculture products with strategic market data such as levels of fish consumption, distribution channels, market trends and trade information on aquaculture products should be made available to farmers, policy-makers and other key stakeholders; legal framework and procedural aspects which calls for harmonization and simplification of policies; promotion and marketing; scientific research and cooperation.

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<sup>23</sup> Pauly, D. and Zeller, Martina. Habitat Ocean: How to save the Ocean's Biodiversity. In XVII Malente Symposium. More than Water-Oceans and Global Responsibility, October 12-14, 2008. P. 63-64.

<sup>24</sup> GFCM. 2013. Studies and Reviews NO. 93: Indicators for Sustainable Aquaculture in Mediterranean and Black Sea Countries, Guide for the use of indicators to monitor sustainable development of aquaculture. 60 pp.