EastMed TECHNICAL DOCUMENTS 06

REPORT OF THE WORKSHOP ON FISHERIES MANAGEMENT STRATEGIES AND APPROACHES

ATHENS, GREECE 15 – 17 MARCH 2011

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ATHENS, GREECE

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ITALIAN MINISTRY OF AGRICULTURE, FOOD AND FORESTRY POLICIES

Hellenic Ministry of Foreign Affairs

Hellenic Ministry of Rural Development and Food

GCP/INT/041/EC – GRE – ITA **Athens (Greece), 15-17 March 2011**

The conclusions and recommendations given in this and in other documents in the *Scientific and Institutional Cooperation to Support Responsible Fisheries in the Eastern Mediterranean* series are those considered appropriate at the time of preparation. They may be modified in the light of further knowledge gained in subsequent stages of the Project. The designations employed and the presentation of material in this publication do not imply the expression of any opinion on the part of FAO or donors concerning the legal status of any country, territory, city or area, or concerning the determination of its frontiers or boundaries.

Preface

The Project "Scientific and Institutional Cooperation to Support Responsible Fisheries in the Eastern Mediterranean- EastMed is executed by the Food and Agriculture Organization of the United Nations (FAO) and funded by Greece, Italy and EC.

The Eastern Mediterranean countries have for long lacked a cooperation framework as created for other areas of the Mediterranean, namely the FAO sub-regional projects AdriaMed, MedSudMed, CopeMed II and ArtFiMed. This made it more difficult for some countries in the region to participate fully in international and regional initiatives for cooperation on fishery research and management. Following the very encouraging experience of technical and institutional assistance provided to countries by the other FAO sub-regional Projects,

EastMed

was born to support the development of regional cooperation and the further development of multidisciplinary expertise necessary to formulate appropriate management measures under the FAO Code of Conduct for Responsible Fisheries and the principles of the Ecosystem Approach to Fisheries (EAF) to ensure rational, responsible and participative fisheries management

The project's **longer-term objective** aims at contributing to the sustainable management of marine fisheries in the Eastern Mediterranean, and thereby at supporting national economies and protecting the livelihoods of those involved in the fisheries sector.

The project's **immediate objective** is to support and improve the capacity of national fishery departments in the sub-region to increase their scientific and technical information base for fisheries management and to develop coordinated and participative fisheries management plans in the Eastern Mediterranean sub-region.

FAO – EastMed Project HQ
Androu 1,112 57 Athens
Greece

Tel: +30210 8847960
Fax +30210 8837600

E-mail: Eastmed@fao.org
URL://www.faoeastmed.org

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Occasionally, relevant documents may be translated into national languages as EastMed Translations (GCP/INT/041/EC – GRE – ITA/ET-00)

Comments on this document would be welcomed and should be sent to the Project headquarters:

FAO – EastMed Project
Androu 1,112 57 Athens
Greece

Eastmed@fao.org

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This document is the final version of the Report of the Workshop on Fisheries Management Strategies and Approaches, organized by the FAO-EastMed Project (Scientific and Institutional Cooperation to Support Responsible Fisheries in the Eastern Mediterranean) in Athens (Greece), 15-17 March 2011.

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ABSTRACT

The EASTMED Workshop on Fisheries Management Strategies and Approaches was held in Athens (Greece), from 15-17 March 2011. It was attended by twenty seven participants from Cyprus, Egypt, Gaza Strip & West Bank, Greece, Italy, Lebanon and Turkey, as well as representatives of FAO Headquarters and the European Commission. During the meeting the participating countries presented information on their management strategies, approaches and management measures that are currently being used in each respective country. The presentations also included an overview of their strengths and weaknesses, with proposals on how the EastMed project could assist in improving the management systems. The workshop then continued with presentations on an overview of typical scientific advice which supports fisheries management in different regions of the world, with case studies from the Mediterranean as well as from other regions in the world. After several discussions and consultations among the participants, the countries listed their strengths and weaknesses and highlighted how the EastMed project could support the improvement of fisheries management in the countries. The most important aspects in which the project could assist included data collection and analysis, information on innovative management strategies such as co-management, the application of the precautionary approach and the ecosystem approach to fisheries management for which a training course for fisheries managers was proposed to be conducted in the near future.

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ATHENS, GREECE
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Opening of the meeting and election of the Chairman

The EastMed Workshop on Fisheries management Strategies and Approaches was held in Athens (Greece), from 15 to 17 March 2011. It was attended by twenty seven participants from Cyprus, Egypt, Gaza Strip & West Bank, Greece, Italy, Lebanon and Turkey, as well as representatives of FAO Headquarters and the European Commission (Annex I).

Mrs Konstantina Karlou-Riga, Coordinator of the EastMed Project, welcomed the participants and thanked them for attending the meeting. She presented the scope and objectives of the project and recalled the reasons for organizing the meeting, referring to the particular need to address management measures in the Eastern Mediterranean Region.

The meeting appointed Mr. Christos Demetropoulos, Minister Councelor from the Greek Ministry of Foreign as Chairman and Mr Jordi Lleonart and Mr. Henri Farrugio as rapporteurs.

The chairman welcomed the participants to Athens on behalf of the Ministry of Foreign Affairs. He thanked the FAO-EastMed for the organization of the meeting with respect to such an important issue for the Eastern Mediterranean. He emphasized the need to share management tools and experiences especially in the Eastern Mediterranean with such a diverse fisheries management regime.

The agenda was adopted without any changes and is attached as Annex III.

After the appointment of the adoption of the agenda all the participants introduced themselves to the meeting.

Information on the management strategies, approaches and measures that are currently being used in each country

Department of Fisheries and Marine Research (DFMR) - Cyprus

The main stocks fished by artisanal fishing vessels and bottom trawlers operating in the territorial waters of Cyprus are: red mullet (*Mullus barbatus*), striped mullet (*Mullus surmulets*), bogue (*Boops boops*), picarel (*Spicara* spp)., red sea-bream (*Pagellus* spp.), rabbit fishes (*Siganus* spp.), cuttlefish (*Sepia officinalis*) and octopus (*Octopus vulgaris*). For polyvalent vessels using drifting long lines the target species are: swordfish, longfin tuna and blue fin tuna.

Licenses for professional fishing: All licenses are annual

- For small scale: (A and B), up to 500 licenses and for (C) up to 850 (actual number around 400), 350 for the use of nets without a boat
- Polyvalent: up to 22
- Up to 4 bottom trawlers in Territorial Waters
- About 8 bottom trawlers outside Territorial Waters

Licenses for marine recreational fishing:

- About 2000 licenses for the use of boat
- About 2200 for spear gun fishing

Important constraints for sustainable fisheries in Cyprus are:

1. High concentration of professional and recreational fishing activities in the coastal waters (2-3 nautical miles off the coast)
2. The narrow continental shelf
3. The continuous activity of bottom trawlers within the territorial waters in the same fishing grounds for many decades

Acknowledging the poor status of the stocks assessed, the Government of Cyprus has formulated and implements, since January 2010 a Fishing Effort Adjustment Plan (FEAP) of the Cyprus professional Fishing Fleet targeting demersal and mesopelagic stocks in its coastal zone. The management plan aims at reducing the fishing effort for all categories of professional vessels that are active in the territorial waters. The main measures, which have been programmed, include the permanent withdrawal of vessels, the use of more selective fishing methods, the reduction in the number of fishing licenses, the reduction in the permitted fishing tools, the creation of fishing protected areas and stricter control measures. All measures are collective and shall not be applied one by one.

FEAP: use of more selective fishing gears:

Static bottom nets with a 32 mm mesh size have constituted the main fishing tool of small-scale coastal fishing vessels (vessels of a length less than 12 metres) for more than thirty years

- Increase the selectivity of all bottom set nets (gill and trammel nets) by changing their minimum mesh size from 32 to 36 mm
- 4 out of 8 Bottom trawlers fishing in territorial waters have already been withdrawn since 2005

FEAP: Permanent withdrawal of vessels

- 12 polyvalent vessels have been withdrawn permanently
- Bottom trawlers fishing in territorial waters to be withdrawn permanently

General Authority for Fish Resources Development (GAFRD) - Egypt

The General Authority for Fish Resources Development (GAFRD) was established by presidential decree No.190 of 1983 to develop national economy in fish resources. Fisheries resources of Egypt in the Mediterranean extend from Salom in the far west until El-Areesh and Rafah in the far east, including the high dam lake at the south which features with welfare and depth water.

In the east, red sea shores are located, which extend 2,000 km from Suez to Halaib and Shalatin. In the west it extends from El- Rayan valley into the Qaron lake in western desert. In the middle of Egypt there is Nile river with 2 branches. In addition fishing occurs also in several northern lakes (Bardaweel, Manzala, Borolos, Edko, Maryoot) and inland lakes (Temsah, El -Bohyrat El -morra).

The overall Egyptian fleet in the Mediterranean region is composed of 1061 trawlers, 1185 longliners, 232 purse seiners and 498 gillnetters. Fishing in the Mediterranean waters is banned during 2 months (May and June) by decision No.120 adopted in 2007 following a recommendation of GFCM. Inland aquaculture is very important (more than 60% of total production) with the culture of species like tilapia and carp. There are also 5 marine hatcheries.

General Directorate of Fisheries - Gaza Strip & Western Bank

There are 4 ports in Gaza strip with about 3,500 fishermen. There is a total of 720 fishing boats of which only 200 are active with a total production of 3,480 tons per year. The fishing area is about 52 square nautical miles with most of it still under the Israeli occupation. There are 32 people working on fisheries in the Ministry, with more than half who are scientists.

The objectives of fisheries management

i) Saving the demand in quantities for fresh fish
ii) Supporting of the Palestinian fishermen

iii) Protection of the marine environment including the fish stocks
iv) Upgrading the efficiency of the fishermen and the governmental staff
v) The continuous development of the infrastructure of the fisheries sector
vi) Reasonable exploitation for all the fish species

The main tools used for management purpose:

i) The fishing activities should be in harmony with the result of the biological and statistical studies
ii) The fishing activities should meet the international standards and conventions
iii) The implementation of the fisheries law
iv) The cooperation with the international donors to support the fisheries sector
v) Procurement of experience from outside the area
vi) Encourage the private sector for investment in the fishing sector
vii) Increasing of the governmental financing for fisheries development
viii) Determine the fishing periods
ix) Determine what type and size of the nets are used for fishing
x) Determine the depth of fishing
xi) Greater control over the fishermen to make sure the implementation of the regulations

Directorate for Marine Fisheries- Greece

1. Overview of Fisheries Sector:

- Fishing vessels: 17,167 vessels
- Manpower of the fisheries sector: 29,313 people
- Fisheries landings: 81,530 tons
- Approximate extensive coastline: 15,000 km
- Countless islands, approximately: > 1500
- Numerous small vessels LOA <10m: 15,461 vessels
- Multi-gear fishery
- Multi-species fishery (> 70species)

2. Legal Framework:

- The implementation of European legislation (Regulations, Decisions) is currently in force
- The basic legislative framework consists of laws adopted by the Parliament after proposal by the Minister of Maritime Affairs Islands and Fisheries
- Additional legislative regulations based on laws are laid down by Decrees and Ministerial Decisions after proposals by the General Directorate for Fisheries, following consideration and approval by the National Fisheries Council (representatives of administration, research institutes, producers' organizations and other stakeholders)

3. Management Approaches and Measures:

- For purse seine and trawler fisheries, in addition to EU legislation there are extensive local and temporal prohibitions throughout the Greek territory
- Specified prohibitions for coastal fisheries include local restrictions regarding specific gears (e.g traps, use of light) and/or species (e.g shrimps, *Solea* spp. corals) plus temporal restrictions regarding specific gears (e.g nets, dredges) and/or species (e.g shrimps)
- Total prohibition for shore seines, driftnets, monofilament nets, submarine light, small purse seines
- Protected Areas: Natura 2000 (202 Zones of Special Protection, 241 Sites of European Importance), National marine parks (Sporades, Zakynthos, Messologi)
- It is prohibited fishing with trawl nets, dredges, purse seines, boat seines, shore seines or similar above seabeds of *Posidonia oceanica*, marine phanerogams, coralligenous habitats and maerl beds

4. Future prospects and conclusions:

- There is provision for a reduction in fishing capacity in the following years within the context of the plan of adjustment of fishing effort, regarding the decommissioning of fishing boats of all categories of fleet (co-funded by EU and national resources)
- The existent legal framework for the management of fishery activities throughout the Greek territory is quite strict and exhaustive
- Control and enforcement are conducted consistently throughout the Greek territory
- Any additional management measures should be implemented in specific cases following well documented scientific evidence
- Fundamental goal remains the enhancement of a culture of compliance and self-control by the producers themselves

General Directorate of Maritime Fisheries and Aquaculture - Italy

In Italy, fisheries policies are implemented within the context of the European Union Common Fisheries Policy (CFP). The responsible authority for fisheries in the Italian waters lies within the Ministry for Food, Agriculture and Forestry and the regional governments. Local authorities have now been entrusted with all competencies in fisheries matters previously managed by Directorate General for Fisheries and Aquaculture including artificial reefs, aquaculture, fishing harbours maintenance, processing, trading and inland waters fisheries. The decentralization process is still in progress and administrative regions are now competent for the realization of local management plans, while the central administration is responsible for the national management plans, which are going to be applied for some specific areas and fisheries under the recently approved European Fishery Fund.

In 2009, the Ministry for Food, Agriculture and Forestry (MIPAAF) implemented some 20 adjustment plans of fishing effort in order to achieve a sustainable balance between capacity and resources (Ministerial Decree of 24 March 2009). The Fishing Effort Adjustment Plans have been implemented within the framework of the Fisheries Operational Programme

(Article 21 of the Regulation EC 1198/06) and have been defined by fleet segment and geographical sub-area (GSA). The final objective is to remove some 25,000 Gross Registered Tonnage from the Italian Fleet. For trawling it is planned that an average rate of decommissioning of 12.5% in GT per year. For other fishing activities targeting demersal fisheries it is established a rate of decommissioning around 5% per year. For pelagic trawling and seine fishing it is established an average reduction of 2.1% in GT per year.

The principal management instruments are based on effort (capacity and activity) regulations together with other complementary technical measures, as mesh size and area and time closure. The only exceptions regards the management of Bluefin tuna (*Thunnus thynnus*), which is regulated by Individual Quotas (IQ) and sedentary species (clams), which are regulated by a co-management (see GFCM glossary) approach based on TURFs (Territorial User-Rights in Fisheries).

All vessels are required to hold a license, which is centrally managed by the General Directorate of Fishery within the Ministry of Agriculture, Food and Forestry Policy. The license identifies the vessel through a European code and other information concerning the vessel characteristics used (among these, the name of the vessel, authorized gear, technical parameters as GT, kW, LOA, etc.). Consequently, one fishing license corresponds to one and only one fishing vessel. Licenses are valid for eight years and are renewed on the request of the ship-owner. In the last years a limit on the issue of new license has been imposed by the administration. This limit has been set in order to comply with the capacity reduction planned first, under the European Multiannual Guidance Programs (MAGPs), in force in the period 1983-2002 and then under the EC Reg. 1438/2003, establishing the new entry-exit regime. To comply with the capacity objectives, the national Administration sets that for those segments where overcapacity has been assessed no new license can be issued and transferability of the existing license on another vessel can only be authorized in case the other vessel has at least the same tonnage and power of the old one.

The other fishing effort control variables are technical measures such as mesh size, and area and time closures. As far as the temporal closure is concerned, the seasonal closure is perhaps the most efficient effort control measure of the Italian fishery management system, both in terms of resources conservation and in terms of enforcement and control. In particular, the seasonal closure is intended to safeguard demersal species during their recruitment seasons.

Italian fisheries are largely influenced by the implementation of a number of area closures, among which the most important are Marine Protected Areas (MPAs), fishing protected areas and some technical measures defining limits from the shore for the activity of trawlers. Italian MPAs are generally divided into 3 different zones according to their different environmental features (A, B and C), where the fishing restrictions are gradually less restrictive. Generally, fishing activities are allowed partly in zone B and in zone C, but only by resident fishermen and by the use of traditional fishing technique. With respect to the fishing protected areas, they respond to the need to protect juvenile concentrations of some species in specific areas. In these zones the fishing activity is completely banned.

Beside the above measures, fisheries in Italy are regulated by a series of technical measures limiting both the input (mesh size and area restrictions) and the output side (size selectivity). Since the beginning of 2007, the main reference of the technical measures is the EC Reg. no 1967/2006 which amends the EC Reg. no. 2847/93, abolishes the EC Reg. 1626/1994 and

establishes new management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea.

Department of Fisheries and Wildlife - Lebanon

The fisheries regulations in Lebanon are being revised and a new legislation will be published soon. The fishing fleet is composed of 2,700 artisanal vessels spread over 44 ports and operating in coastal waters (<6 nautical miles) along a 220 km coastline. The objectives for Lebanon fisheries management stresses the sustainability of the resources and promotion of economic and social well-being of the fishers and stakeholders. No country-wide catch and effort data are available and no stock assessments were ever performed, thus cooperation with scientific community is limited, but this is expected to change in the future enabling sound scientific advice in order to take appropriate management decisions. Furthermore, failure to address effectively the uncertainties has been as a result of lack of funding. The framework of the new approach to Lebanese fisheries management is based on data & information collection & analysis, consultation with stakeholders, legal and other requirements, and eventually rules bases on the precautionary approach, ecosystem approach, adaptive management, and harvest control rules.

Fisheries Department – Turkey

Turkey is endowed with a coastline of more than 8,400 km in length. This coastline borders four distinct sea basins, which are the eastern Mediterranean Sea in the south, the Aegean Sea in the west, the Sea of Marmara in the north-west (wedged in-between the maritime straits of the Dardanelles and the Bosporus), and the Black Sea to the north.

Fisheries resources are diverse, and vary substantially between sea basins. The Mediterranean and Aegean Seas harbour important demersal and semi-pelagic stocks of fish and shrimp. Tuna fisheries are of importance in the Mediterranean, but so are other larger pelagics such as bonito, bluefish and mullet in other sea basins, including the Black Sea. The Marmara Sea is also rich in shrimp and demersal fish resources, while the Black Sea fisheries are largely dominated by the abundant occurrence of small pelagics – the most important species of which are the anchovy and the horse mackerel. There are also relatively abundant bivalve resources which are exploited in the Marmara and Black Sea regions. As a fishing nation, Turkey dominates Black Sea fisheries, landing in excess of 80% of all reported Black Sea landings. Black Sea landings represent 75% of total landings in Turkey. Coincidentally, anchovy also represents about 75% of the total volume of national landings. The total national catch between 1991 and 2008 averaged 474,000 metric tonnes per year, fluctuating between 317,000 and 589,000 mt.[1]

In 2009, the Turkish fleet encompassed some 17,469 fishing vessels (source: SUBIS database). The bulk of the fleet (89.6%) is made up of small scale coastal fishing vessels less than 12 m in length. Most of these lack a superstructure, and run inboard diesel engines. They deploy a number of fishing gears, the most common being bottom and surface gillnets, and dredges.

[1] Source: TURKSTAT

State Planning Organization prepares long-term development plans for economical sectors. A special committee for each sector including fishery is established for a time during the preparation of the Development Plans. 9th Five Year Development Plan of Turkey (covers the period 2007-2013).

The base fisheries law currently in force, numbered 1380, dates from 1971, and was amended by law no. 3288 of 1986 and law no. 4950 of 2003. The law addresses inland fisheries, marine fisheries and aquaculture. With respect to marine fisheries, it establishes a basic system for licensing, the running of cooperatives, the operation of fish markets, and lays down a series of prohibitions – complete with applicable sanctions.

The Ministry for Agriculture and Rural Affairs (MARA) is the Ministry in charge of managing the fisheries sector in Turkey. While law enforcement duties are shared with other state entities, management functions – including health and hygiene, and research functions – are concentrated within MARA.

Fisheries are managed through a series of technical management measures which are formulated and/or updated on a periodic basis. The periodicity of such updates was two years in the past, and more recently it has been extended to four years. The extended period between updates provides for a more stable basis to assess the impact of applied management measures, and provides the industry with a more stable regulatory framework within which they can develop and plan their operations.

Management measures, such as gear regulations and prohibitions, seasonal and spatial closures, minimum sizes of species, etc. are regulated through a comprehensive and detailed '*notification*' which is published and circulated by MARA. Measures typically apply to given seas, zones therein, and gears and fleet segments.

A fishery information system (called SUBIS) has been developed and made operational in recent years. SUBIS is accessible by KKGM offices throughout the country, providing different levels of access and security protocols for system users. Currently, modules run on SUBIS include the following data sets:

a) Catch Information: logbook data
b) Sales notes: data on first sales
c) Catch certificates under the EU IUU Regulation (1005/2008)
d) Vessels: vessel characteristics data
e) Licenses: the three types of licenses referred in the previous section

SUBIS is proposed to become the central data handling hub for the sector, but it is still in the process of being fully set up and receiving all information.

For the future activity Turkey’s plans are:

- Improve the SUBIS information system so that it converges fully with EC Decision 2010/93 for Transverse Variables
- Establish a new system for biological sampling
- Establish fisheries independent surveys
- Establish economic surveys of fishing fleets
- Improve effort estimates, capacity estimates and carry out a new fishing vessel census

- Create integrated fisheries databases

Discussions

After each presentation participants asked some questions and/or clarifications, but most of them addressed general questions. The Cypriot delegate clarified that the Department of Fisheries and Marine Research had long discussions with the fishermen before they agreed on the implementation of regulations. Cyprus also expressed its readiness to discuss on finding ways to manage the fishing activity in international waters with other countries fishing the same stocks.

Egypt clarified that most of the fishing activities occur in coastal waters up to 150 m and intend to expand fishing activities into offshore waters. The country intends to do this by transferring vessels which fish in coastal waters to offshore waters thus increasing the fishing opportunities and at the same time reducing fishing effort in coastal areas. Vessels are also restricted to fish in the Mediterranean and cannot be transferred to fish in the Red sea. Data collection is being conducted in ports however no formal stock assessments have been conducted by the GAFRD.

With respect to the Gaza Strip & West bank it was clarified that fishermen fish very close to the shore, not more than 100 m from the coast and the fishing fleet is artisanal in nature. Data collection on landings is conducted in ports and the staff of the research institutes is not enough for the collection and analysis of data.

In Greece there are specific programs for monitoring small pelagic species but there is a lack of information concerning the demersal species. Staff from the research institutes is enough for the collection and analysis of data. A systematic and regular inspection for smaller vessels is required.

Italy clarified that it uses TURFs (Technical User Rights for Fishing) and co-management for clams (a mono-species fisheries) management in the Adriatic with a system of collective quotas in each harbour and uses also ITQ (Individual Transferable Quota) in the bluefin tuna fishery.

Lebanon highlighted that its fleet is composed of artisanal vessels and that only coastal fishing licences are given by the Ministry and hence no offshore activities exist. The market for fish is in high demand and this leads to an increase in fishing activity. However they have very limited control and surveillance to monitor fishing activities. A private university is doing a catch assessment survey in the northern part of the country, however the data collection should be improved by also including the entire country in the catch assessment survey.

Turkey clarified that the Black Sea and Mediterranean are treated separately for management purposes. The Turkish fleet is frozen, in terms of number of boats since 2002.

Most of the participants recognized the importance of recreational fishing in the Mediterranean fisheries and stressed that this issue must be addressed.

It was highlighted that modern fisheries management must be science-based, including wherever possible, evaluation of the socio-economic outcomes. Moreover, with a view to ensure a stable and robust management it would be advisable to establish fisheries management measures within a long-term management plan with the inclusion of reference points (either model based or empirical), input and/or output measures and technical measures. This would allow to set up a precautionary and adaptive management framework. The importance of co-management has been noted, however the existence of many fleets and gear categories is an added difficulty. In addition the lack of a regulatory framework in some countries is another problem. It was mentioned that in some cases the lack of political will is one of the reasons for an absence of an adequate and effective management system.

It was mentioned that pilot surveys are very important for the Mediterranean in order to determine which best management measures should be adopted. The participants also felt the need that the time has come to move further from the traditional management. The active participation of EastMed countries in the working groups and subcommittees GFCM meetings must be encouraged by the countries.

Overview on the scientific advice that support the fisheries management[2]

Presentations were made by one of the consultants on the scientific advice that supports fisheries management including definitions of overfishing, assessment advice and management including the future of fisheries and the role of aquaculture.

There are several kinds of overfishing: (a) growth overfishing occurs when the individuals caught are too small, (b) recruitment overfishing leaves few spawners and (c) ecosystem overfishing or habitat degradation.

The causes of overfishing are several and include

i) Short term strategies as contrary to sustainability that is a long term concept
ii) Economic model and subsidies. The market is not a good tool to regulate the exploitation of renewable resources. Subsidies facilitate the increase in effort and catchability
iii) Bad memory, we do not remember past healthy fisheries and ecosystems. Our reference is too recent. On the other hand we remember and adapt the industry to, the unsustainable yields of growing fisheries
iv) Technology, with few exceptions, increases the fishing mortality through enhancing efficiency
v) IUU fishing
vi) Increase of the demand (market unbalance)
vii) Industry`s adaptation to historical maxima
viii) The "tragedy of the commons" considering the property rights and the problems of management of the resource as a public good
ix) The decision makers priorities which are not always in favour of sustainability of the resource

The participants discussed that since the words "fully exploited" can be understood in different ways by scientists and by the industry, in order to avoid confusions it should always

[2] The presentations made during the meeting can be available on request by the FAO EastMed project

be made clear what the term fully exploited means (i.e. no room for increase in fishing mortality). In several cases when there is not enough data, it is not necessary to wait for the collection of a huge and exhaustive amount of information in order to get an idea of the status of some stocks. Most of the times it is possible to use empirical indicators. In this respect catch and effort data and surveys at sea are of prime importance. It is essential to establish reference points and fisheries managers may use target, threshold and limit (e.g. MSY) reference points in order to facilitate the decision making at the international level.

Some participants pointed out that technology is not always a factor leading to over exploitation since some technologies (e.g. escapement grids, alternative gears) can help the sustainable exploitation of resources. Some developing countries may need to introduce technology in order to sustainably manage their fisheries.

The consultants presented also a communication on assessment, advice and management. Relationships between stock assessment, scientific advice and fisheries management are three steps of the process of fisheries administration. Assessment is a judgment made by a scientist or scientific body on the state of a resource, advice is the set of recommendations, based on assessment, given by scientists to managers and management is the art of taking measures affecting a resource and its exploitation with a view to achieving certain objectives. Assessment allows to estimate the current value of several indicators (i.e. MSY or maximum sustainable yield), find the optimum yield per recruit given the exploitation ratio and selectivity, or perform simulation of the effect of alternative management strategies. At this stage data availability is critical to the reliability of the results. The advice should be clear (non ambiguous), easy to understand by managers (no technicalities), and scientifically sound (working documents available) and should contain evaluations of short and long term effects and when possible, management alternatives. Several standards to describe the stock status are available and should be used. Fisheries management should establish the management goals, which can be several, diverse (i.e. biological, ecological, socio-economical) and quantitatively expressible as reference points to which the indicators must refer. In some cases different management goals appears to be contradictory, in particular when short and long term objectives are both involved. There are different management strategies, including reactive (not very useful), adaptive, precautionary, and co-management, the last three are included in the EAF (Ecosystem Approach to Fisheries). EAF is the framework to develop the whole process of fisheries management, and includes the classical stock assessment approach but also the exploited ecosystem and the socio-economics of the fishery.

The participants discussed that the adoption of minimum catch sizes (rather than minimum landing sizes) could be a standard to oblige the fishermen to develop on their own methods to improve the selectivity of the gears they are using. It was stressed the need for the administration to apply the EAF including the participation of stakeholders in management decisions.

A question was raised on the utility of subsides in fisheries. Some of the participants pointed out that not all subsidies have negative effects: the question of the effects of allocation of subsidies to certain sectors is not a simple cause and effect phenomenon. Agriculture and fisheries are primary activities providing food supply to the countries and this is the reason why they were always supported with subsidies. There are several institutions in the world that could help the EastMed member countries in providing guidance for good practices on subsidies.

The consultants made a last short presentation about the future of fisheries and the role of aquaculture. According to the recent history of fisheries, the mid-long term future of fisheries is quite pessimistic, unless some corrective management actions were taken. The possible role of aquaculture in the future world food security does not seem to be very significant, except for the omnivorous freshwater fish

Management Strategies, approaches and methods used in different regions of the world[3]

The actors and the processes of decision for management of the resources are many and vary according to stocks. Some of them have only an advisory role while others have also a management role. However they are all processed through a scientific body (advisory committee, scientific council, committee for research, etc.) producing advices on the status of the stocks and management recommendations which are transferred to a decision making body (Commission, Council, Committee, etc).

During the meeting a presentation was done on the structure and role of the two main Regional Fisheries Bodies dedicated to the assessment and management of the Mediterranean fisheries, that are the General Fisheries Commission for the Mediterranean (GFCM) and the International Commission for the Conservation of Atlantic tunas (ICCAT).

The GFCM previously known as the "General Fisheries Council for the Mediterranean" which is an FAO body had been operational since 1952. In 2004 an amendment changed its mandate into a Commission consisting of 23 Member countries along with the European Union. Its objectives are to promote the development, conservation, rational management and best utilization of living marine resources, as well as the sustainable development of aquaculture in the Mediterranean, Black Sea and connecting waters. Membership is open to both Mediterranean coastal states and regional economic organizations as well as to United Nations member states whose vessels fish in Mediterranean waters.

The GFCM operates by means of its committees, namely the Scientific Advisory Committee (SAC), the Committee on Aquaculture (CAQ), the Compliance Committee (CoC), the Committee of Administration and Finance (CAF) and their respective subsidiary bodies. It also enjoys the support of FAO cooperative projects at sub-regional and regional level which enhance, in particular, scientific cooperation and capacity building in participating countries in line with GFCM priorities and strategies.

The International Commission for the Conservation of Atlantic Tunas was created in 1966 to ensure the conservation of the resources of tuna and tuna-like species of the waters of the Atlantic ocean, including the adjacent seas. It counts twenty two member countries and is responsible for the management, the study of populations, biometry and ecology of tuna and tuna-like species, the oceanography of their environment and the effects of natural and human factors upon their abundance. With respect to the Mediterranean sea, the scientific works which are carried on concern mostly the bluefin tuna, albacore and swordfish stocks.

[3] The presentations made during the meeting can be available on request by the FAO EastMed project

Other non-Mediterranean Regional Fisheries Bodies (e.g. ICES, NAFO) were also presented which have an indirect influence on the Mediterranean since some Mediterranean countries are also part of these other regional fisheries bodies.

The International Council for the Exploration of the Sea (ICES) counts twenty member countries bordering the North Atlantic and the Baltic Sea. It is the prime source of scientific advice on the marine ecosystem to governments and international regulatory bodies that manage the North Atlantic Ocean and European waters. ICES is a network of more than 1600 scientists from 200 institutes linked by an intergovernmental agreement to add value to national research efforts. ICES plans and coordinates research through its national delegates and through a large number of expert groups. Meetings are open to observers from non-governmental organizations.

The Northwest Atlantic Fisheries Organization (NAFO) regulates 20 stocks of 11 fish species and has adopted multi-year management plans for some of them. It is the first regional fisheries management organization to regulate the fishery of elasmobranches species.

The decisional process for the adoption of management measures of the Fisheries Common Policy of the European Union has also been described. This process starts from the data collection from the fishery sector and the scientific institutes, followed by a diagnosis and advice through international fisheries bodies providing advice on the status of the stocks and management recommendations to the European Commission which ensure the link with the political decision makers of the European Council of Ministries.

The stakeholders are involved in this decision-making process by mean of the Regional Advisory Councils (RACs). The role of the RACs is to develop recommendations and suggestions on the aspects of the fisheries in the zone which they cover and to pass them to the European Commission or to the competent national authorities. The Mediterranean RAC called RACMED is composed of 31 fishers organizations from Italy, Spain, France, Greece, Malta, Cyprus and Slovenia.

During the workshop a brief description of the FAO Mediterranean projects (COPEMED II, ARTFIMED, MEDSUMED, ADRIAMED, EASTMED, MEDFIIS) and their objectives were also given. These projects are executed under the responsibility of the FAO Fisheries and Aquaculture Department to support the capacity building of countries in order to undertake science based fisheries management, including the participation of countries in GFCM activities.

The COPEMED II project is dedicated to the coordination to support fisheries management in the Western and Central Mediterranean, ARTFIMED has been built to improve the socio-economic situation and sustainable livelihood of the target communities in Morocco and Tunisia, the objective of ADRIAMED is the scientific cooperation to support responsible fisheries in the Adriatic Sea, MEDSUDMED is particularly dedicated to the assessment and monitoring of the fishery resources and the associated ecosystems in the Straits of Sicily, MEDFISIS is building a fishery statistics and information system in the Mediterranean and EASTMED develops scientific and institutional cooperation to support responsible fisheries in the Eastern Mediterranean.

It was stressed the need of having in each country a system of data collection and analysis with a scientific advisory committee allowing to provide advice at national level to the administration for the sustainable exploitation of the resources.

Italy clarified that it applies a stratified sampling survey data collection for both landings and socio-economic variables. The obligation to use logbooks is fulfilled, but the data doesn`t cover all the fishing fleet (only vessels more than 10 m, and catches threshold more than 15 kg). The sampling represents about 10%. Logbook is an instrument with multiple objectives, mainly as a control tool at sea and at the landing ports as well as a way to introduce data into the system. Logbook is particularly useful to get spatial deployment of fishing effort.

In Greece, up to 1995 the local port and custom authorities were the only responsible bodies for the collection of data on fisheries landings by species and fishing gear category in 14 geographic divisions in the Aegean and the Ionian Sea, which are analysed and published by the National Statistical Service of Greece. Since 1995 there is an additional monitoring of fisheries catches and effort, by ichthyologists of fisheries offices and research institutes, including onboard survey of commercial catches and discards, which nowadays is carried out within the framework of the National Programm for Fisheries Data Collection following the EU data collection Framework.

Italian delegate noted that the case of bluefin tuna demonstrates that industrial seine vessels are too big and are hardly compatible with the Mediterranean practices. The Turkish delegate added that ICCAT developed very strict rules for the recovery of the stock. Probably the traps and longlines are better and more sustainable fishing gears than purse seines. Longline by-catch of protected species could be prevented by the improvement of technology in the gears. The EU representative remarked that fleets must be proportionate to the fishery and the observed unbalances may be due to short–long term phenomena. Some participants commented that since the size of vessel is related to size of gear, a possible solution to prevent the construction of large vessels could be to forbid the use of large gears.

Case studies from the Mediterranean or elsewhere[4]

The consultants presented case studies of fisheries management in the Mediterranean. The first case study dealt with the Castellon trawling project (1961-1966) which represents an important example of successful fisheries management. The problem affected 7 ports of the Spanish coast, in which in 15 years the effort had increased from 10,000 hp to 50,000 hp and the CPUE decreased from 2.4 kg/hp to 0.2 kg/hp. The fishers asked for a solution so three stakeholders got an agreement: fishermen, "sindicatos" (trade unions), authorities and scientists, developed a project. In 1961 the rules where: a closure from the 1st of May until 30th September and 36 mm mesh size, however these rules were not enforced at all. The project consisted in implementing the following measures: Time at sea 10-12 hours at day (previous 12-14). Mesh size actually at 36 mm during the three first years, then, to 40 mm. Five days a week for fishing (previously there were 6). Saturday became a no fishing day. In order to protect hake and poor cod, a three month closure (April to June) for 1962 and 1963 and a two month closure (May and June) for 1964 – 1966. In order to protect the juveniles of red mullet, cuttle fish, common pandora, auxiliary seabream and prawn, prohibition to fish at depths shallower than 50 m from August 1st to November 15th. Total prohibition to fish in depths shallower than 30 m. The results were the following: the landed weight at the end of

[4] The presentations made during the meeting can be available on request by the FAO EastMed project

the project was 21 % higher than the previous year at beginning of the project. The CPUE of target species increased 47 % and the average economic yield by boat and day (after price correction) increased 67 %. Unfortunately, after the experience, the measures that had been shown so beneficial were not maintained: the monitoring was stopped, the surveillance relaxed, the closures disappeared and the mesh decreased in size.

Another case is that of Adriatic sardine, that has suffered a dramatic stock biomass decrease from about 100,000 tonnes in the early 80s to about 10,000 in early 2000s. The stock recruitment relationship shows a very clear case of recruitment overfishing. The last years it appears to be recovering.

The last case study is trawling in Catalonia as an example of the role of subsidies, with half of the benefit is equivalent to the fuel tax exemption. This is a clear indication that this kind of subsidies artificially contribute to maintain effort in a overexploitation environment.

A short communication regarding the minimum legal size were presented for two cases: hake and anchovy. In Mediterranean the minimum legal size of hake is 20 cm, the same species (and the same market) in the Atlantic is 26 cm. On the other hand size at first maturity (females) is 36 cm total length. This is an example of misuse of minimum legal size. Similar considerations can be made for anchovy with a legal minimum total length of 9 cm and first maturity at 11 cm (except in the Adriatic). The GFCM Working Group on Small Pelagics, Subcommittee on Stock Assessment and Scientific Advisory Committee recommended to adjust the minimum legal length to the length at first maturity. The Commission (GFCM) took note but did not endorse it as recommendation.

Many other case studies of non-Mediterranean fisheries were illustrated with similar problems of mismanagement. North Sea herring is an example of good management after overexploitation. The anchoveta of Peru is a case of a very large stock subject to wide environmental oscillations (El Niño). The case of the anchovy of the Bay of Biscay shows how the decision makers disregarded the scientific advice for 2005 (TAC of 5,000 tonnes) and negotiated a TAC of 30,000. However in autumn 2005 the fishery had to be closed because it had collapsed. It was closed until 2010 when it was reopened against the scientific advice. The next case studies presented were the well known collapse of Newfoundland cod, and the subsequent fishing war between Canada and Spain, followed by the overexploitation process of Argentinean hake after the fishing agreement with the EU.

Two examples on the effects of temporal closures of very different time scales where also presented. The first one was the no fishing years due to the first world war between 1914-18. The other was the two months closure of some ports South of Catalonia. In both cases the level of production is much more higher when the fishery is reopened but this production quickly decreases to the previous levels.

The consultants also presented a detailed description of a case study in the Gulf of Lion in the GFCM Geographical sub-area 7 in which there is a shared fishery for hake which is exploited by French and Spanish trawlers, longliners and gillnetters.

Assessments of the hake stock point to heavy growth overexploitation and likely recruitment overexploitation. The results of surveys carried out during the last decade indicate that the canyons of the continental slope of the eastern part of the gulf act as a 'refugia' for large spawners of several commercially important species, including hake, insuring the recruitment

into the fishery on the continental shelf. Moreover, due to the overexploitation of this area the fishing activities have begin to shift off the continental shelf in the recent years.

In 2009 in order to avoid the collapse of the resource a fisheries restricted area has been established in which it has been decided to freeze the fishing effort at the 2008 level, of all gears exploiting the demersal resources. In order to increase the protection of spawning aggregations on the continental shelf edge and slope the GFCM Scientific Advisory Committee has been requested to extend the scope of advise to the entire canyons system in the Mediterranean.

The consultants also presented the recent GFCM and ICCAT assessments and management advice. Periodical updating of the assessments of several stocks of Mediterranean demersal and small pelagic are achieved by GFCM. Furthermore an increasing number of assessments are coming from other sources (national or international working groups, FAO regional projects) and the number of assessments has doubled during the last 10 years. The scientific knowledge on large pelagic stocks and fisheries is annually updated by ICCAT.

With respect to the demersal stocks, it can be concluded that except in a few cases the status of the stocks obtained during the last decade has been full exploitation or growth overexploitation. This situation is the result of both the conditions of the exploited populations and the exploitation patterns which are traditionally applied to them. The available models lead to forecast a passage to a state of recruitment overfishing if the general tendency to a growing effort of the various fishing activities was carried on according to the pattern prevailing during the recent past. Most of the recruits never reach the age of first reproduction and in most cases the current fishing mortalities are 30-80% higher than the biological reference point. The recent analyses show that 79% of the demersal stocks assessed in 2010 (mainly in the North Western fisheries) are recognized as overexploited, while 17% are fully exploited and only 4% are underexploited.

However it was noted the resilience of some fisheries which are essentially based on massive catches of juveniles. This resilience is mainly due to the fact that some individuals of the species can be present in 'refugia' in which these areas are not targeted by traditional fisheries, like the canyons of the continental slopes, which protect the large individuals of the spawning stocks.

Some analyses to forecast the effects of various management scenarios on some overexploited stocks show that the spawning stock biomass would return above reasonably safe levels by reducing fishing mortality. Such a reduction will also ensure the economic viability of the trawl fisheries in the long term.

In most of the cases the management advice given by GFCM for the demersal fisheries are to reduce fishing mortality through reducing the effort activity and improving the selection pattern of the fishery such as the use of the 40 mm square mesh in the trawl cod-end, reduce, time at sea, number of fishing boats, engine power, bollard pull and trawl size. The protection of nurseries by implementing area closures for fishing during the recruitment period is also of high importance. The situation of the small pelagics stocks (mainly sardine and anchovy) assessed in 2010 is relatively slightly better with 46% overexploited, 36% fully exploited and 18% underexploited. In general the management of the fisheries of multi-species stocks of sardine and anchovy needs to account for the interactions between the species. It was also advised to introduce seasonal closure during the peak seasons of spawning.

According to the ICCAT conclusions the bluefin tuna is a heavily exploited species. The current total catches often exceed 50000 tons while the MSY of the stock is around 25000 tons. The catches of juveniles and adults are still much higher than those recommended by the scientists, the stock is under high fishing mortality rates and the spawning stock biomass is low, however indices of good recruitments have been observed in the recent years. The main challenge for the conservation and management of this stock is nowadays more political than scientific and the priority is to get accurate and trustworthy fisheries information and a real control of the current management measures.

Most participants mentioned that temporal closures are in place in each respective countries in order to improve the conservation of the stocks. The consultants pointed out that temporary closures can have different objectives including to allow the fish to grow during the period and thus improving the length at first capture. The consultants mentioned that in some cases temporal closures may lead to a shift in catches from one season or month to the next with an overall no net benefit to the stocks.

However some participants mentioned that from a social point of view a temporary closure can benefit the fishers by allowing the fishers to reduce the costs of the fuel and other expenses during this period and increase net profit during the following months.

Cyprus mentioned that from the perspective of fisheries sustainability temporary closures are often giving disappointing results. This has been the case for the trawl fisheries of Cyprus for which the assessments done on 5 stocks have shown to be depleted after such closures have been in place for 30 years. If applied alone, without any additional management measures, temporary closures can have no effect on the stock status if the resulting gain in biomass is immediately exhausted when the fishery is reopened. They can also have a negative effect by inducing the arrival on the market of a large amount of catches following the re-opening of the fishery and producing a reduction in the prices.

Strengths & weaknesses of each country`s management system

During the last session the participants representing each country discussed and listed the main strengths and weaknesses of their respective management systems. Based on this the participants also highlighted their needs from the EastMed project in order to reduce the weaknesses in their management systems. The details can be found in the table on page 16.

The main conclusions of the discussion during this session was to increase the scientific capacity of the countries by encourage researchers to attend the scientific meetings (working groups and subcommittees) not only to provide results but also to extend relationships to other researchers around Mediterranean. EastMed must play a paramount role in supporting countries to collect and analyse data for management purposes

The importance of Ecosystem approach to Fisheries management (EAF) has been noted especially regarding co-management and the application of precautionary approach and the participants highlighted the need to organise a training workshop for managers on EAF.

Adoption of the workshop report and closure of the meeting

The Workshop Report was adopted on Thursday, 17th March 2011

Country	Strengths	Weaknesses	Needs from the project
Cyprus	Good data collection & historical data A Policy division Effort in improving the bad situation of the status of the stocks by the application of a management plan Easy and Regular contact with groups of fishers Good IT systems	No producer organizations Limited human resources and infrastructure for research Need more exchange of information between research, administration and fishers	Increase knowledge through training on innovative management strategies (e.g. EAF, co-management) Education to fishers Networking
Egypt	Good systems for aquaculture An administrative structure Good fleet register and licensing system	Research capacity Data on production in the marine sector Need more exchange of information between research, administration and fishers	Improved data collection through the project Data analysis Networking
Gaza Strip & West Bank	Staff in the Ministry Active fishermen co-operatives Legal framework	Lack of expertise Insufficient resources Restricted fishing area	Training and capacity building for the staff Education to fishers Support for fisheries monitoring and research activities Networking
Greece	Exhaustive legal framework (local and temporal) and protected areas Data collection framework Satisfactory human resources for scientific research Implementation of management plan for small pelagic fisheries	Insufficient data series for stock assessment of demersal species Conflict between fishers using different gears Lack of producer organisations Limited funding for control & enforcement Need more exchange of information between research, administration and fishers	Education of fishers on the need of management measures Networking
Lebanon	Only an artisanal fleet Political will to improve the management system Consultation with stakeholders Active fishermen co-operatives in every port Legal framework	Monitoring and control No data collection and official research capacity Limited IT equipment and software Limited human resources High density of fishing vessels Open access to the sea	Training and capacity building of staff and stakeholders IT support Assistance in data collection Training in monitoring, control and surveillance
Italy	Experience in management systems Exhaustive legal framework Data collection and analysis Monitoring and control	Improve research capacity for some particular stocks Conflict between the stakeholders Loosing technical expertise in artisanal fisheries Need more exchange of information between research, administration and fishers	Sharing information with other countries on landings, quantity, price, market information and management Improve relationship between administration, scientists and fishermen (co-operatives) What is the level of the organisation of the fishers in each country
Turkey	Fisheries Information System VMS, Monitoring and Control IT system for data collection Legal Framework Benefitting from IPA (EU Pre-accession)	To collect good quality data (Biological & Socio-economic) Data Analysis Collaboration with co-operatives Research capacity (infrastructure + human resources) Need more exchange of information between research, administration and fishers	Training on data collection and analysis Networking

ANNEXES

Annex I List of participants

Cyprus

George Payiatas
Fisheries Officer
Department of Fisheries and Marine Research
Ministry of Natural Resources and Environment
Email: gpayiatas@dfrm.moa.gov.cy

European Commission

Franco Biagi
Administrator
Directorate General for Maritime Affairs and Fisheries, Unit A-2
"Fisheries Conservation and Control in the Mediterranean and Black Sea
Email: Franco.Biagi@ec.europa.eu

Egypt

Allaeldin Effat Helmy Hassan Elkhorazaty
Fisheries Manager
General Authority for Fish Resources Development

Gamal Mohammed Sharafeldin Mohammed Abdala
Fisheries Manager
General Authority for Fish Resources Development

Gaza Strip & West Bank

Mohammad Husni Abdel Qader Qamhiyeh
Deputy General Director for Fisheries
Ministry of Agriculture – General Directorate of Fisheries
Email: mqam@yahoo.com

Greece

Argyris Kallianotis
Director
Fisheries Research Institute
Email: akallian@inale.gr

Christos Demetropoulos
Minister Counselor
Ministry of Foreign Affairs
E-mail: b06@mfa.gr

Dimitra Petza
Officer
Ministry of Maritime Affairs, Islands and Fisheries
Email: syg077@minagric.gr

Dimitris Mitropoulos
Acting General Director
Ministry of Maritime Affairs, Islands and Fisheries
Email: syg001@minagric.gr

Eugenia Lefkaditou
Researcher
Hellenic Centre for Marine Research
Email: teuthis@ath.hcmr.gr

Evaggelia Scariba
Counselor Expert A
Ministry of Foreign Affairs, Directorate for Organisations Dealing with International, Economic and Monetary Affairs
Email: b06@mfa.gr

Marina Petrou
Director
Ministry of Maritime Affairs, Islands and Fisheries
Email: syg025@minagric.gr

Panagiotis Tsachageas
Eastmed Focal Point
Ministry of Maritime Affairs, Islands and Fisheries
Email: syg111@minagric.gr

Italy

Plinio Conte
Chief of Unit
General Directorate of Maritime Fisheries and Aquaculture, PEMAC VI
Ministry of Agriculture, Food and Forestry Policies
Email: p.conte@politicheagricole.gov.it

Dario Pinello
Advisor
Institute for Economic Research in Fishery and Aquaculture (IREPA)
Email: dariopinello@yahoo.com, pinello@irepa.org

Lebanon

Dahej El Mokdad
Head, Division of Forests and Natural Resources
Department of Fisheries and Wildlife, Ministry of Agriculture
Email: dahezM@hotmail.com

Samir Majdalani
Head, Department of Fisheries and Wildlife, Ministry of Agriculture
Email: sem@cyberia.net.lb

Turkey

Erdinç Güneş
Officer, Program Coordinator
DG for Agriculture Research, Ministry of Agriculture and Rural Affairs
Email: erdincgunes67@gmail.com

Kürüm Vahdettin
Head of Fisheries Department
DG for Agriculture Research, Ministry of Agriculture and Rural Affairs
Email: vahdettink@kkgm.gov.tr

FAO

Konstantina Riga
FAO EastMed Co-ordinator
FAO - EastMed Project
E-mail: konstantina.riga@fao.org

Mark Dimech
FAO EastMed Technical Officer
FAO - EastMed Project
Email: mark.dimech@fao.org

Petri Suuronen
Fisheries Officer
FAO – FIRO
Email: petri.suuronen@fao.org

Henri Farrugio
FAO EastMed Consultant
IFREMER
Email: henri.farrugio@ifremer.fr

Jordi Lleonart
FAO EastMed Consultant
Institute of Marine Sciences
Email: lleonart@icm.csic.es

Stella Tampakaki
EastMed Clerk
FAO - EastMed Project
E-mail: styliani.tampakaki@fao.org

Antigoni Foutsi
Temporary FAO EastMed Staff
FAO - EastMed Project
E-mail: antigonifoo@yahoo.gr

Observers - WWF

George Paximadis
Observer
WWF
Email: g.paximadis@wwf.gr

Annex II Terms of Reference

FAO EastMed Workshop on Fisheries Management Strategies and Approaches

Terms of Reference

The Workshop will bring together managers and/or decision-makers to develop capacity on fisheries management, including:

- Present information on the management strategies, approaches and measures that are currently being used in each country;
- Discuss the strategies and approaches used, and share the experiences of the different countries;
- Discuss other strategies, approaches and methods presented and analysed in the literature or used in other regions of the world;

Annex III Agenda

FAO EastMed Workshop on Fisheries Management Strategies and Approaches

Agenda
15–17 March 2011
Athens, Greece

1. Arrangements of the meeting
2. Adoption of the agenda
3. Appointment of the Chairperson and Rapporteurs and Introduction of the participants
4. Outline of the objectives of the Workshop and expected results
5. Information on the management strategies, approaches and measures that are currently being used in each country
    a. Presentation of each country management strategy (Cyprus, Egypt, Gaza Strip and West Bank, Greece, Italy, Lebanon, Turkey)
    b. Discuss the strategies and approaches used, and share the experiences of the different countries
6. Overview on the scientific advice that support the fisheries management
    - Overfishing (what overfishing is? Why do we overfish?)
    - Assessment-advice-management
    - Marine Protected Areas (MPAs)-Fishery Restricted Areas (FRAs)
    - Data collection
    - Future of fisheries and role of aquaculture
    - Role of the GFCM and FAO Regional Projects
7. Strategies, approaches and methods used in different regions of the world
    - RFBs (GFCM, ICCAT) other actors (FAO, EC, UNEP, CIESM, BSC, GEF, ICES, etc.)
    - EU Coordinate Action CREAM
8. Case studies from the Mediterranean or elsewhere
    - Mediterranean case studies
        - FRA
        - Assessments in GFCM
        - Minimum length sizes (hake, anchovy)
    - Non-Mediterranean case studies

9. Strengths & weaknesses of each management system by country (data collection, monitoring, research, stakeholders, IT facilities, Institutional framework, IUU, education, regionalisation)
    - How can the strengths be maintained and weaknesses reduced
    - An inventory of strategies on how the management systems of each country can be improved
10. How EASTMED can contribute in improving the management systems keeping into account the objectives of the project?

11. Adoption of the report

Beneficiary countries

Countries with waters included in the GFCM
Geographical Sub-Areas (GSAs) 19-20 and 22-28

Donors

Greece

- Ministry of Foreign Affairs
- Ministry of Rural Development and Food

Italy

- Ministry of Agriculture Food and Forestry Policies

European Community

- Directorate General of Maritime Affairs and Fisheries (DG-MARE)

Hellenic Ministry of Foreign Affairs

Hellenic Ministry of Rural Development and Food

ITALIAN MINISTRY OF AGRICULTURE, FOOD AND FORESTRY POLICIES

eastMed

FAO – EastMed Project

1 Androu str. 112 57 Athens Greece
Tel: +30 210 8847960 Fax: +30 210 8837600
E-mail: Eastmed@fao.org http: //www.faoeastmed.org