Concise report on fishing issues in the countries of the southern Mediterranean and on research and management requirements in the sector

Berraho A.

in

Basurco B. (ed.).
The Mediterranean fisheries sector. A reference publication for the VII meeting of Ministers of agriculture and fisheries of CIHEAM member countries (Zaragoza, Spain, 4 february 2008)

Zaragoza : CIHEAM / FAO / GFCM
Options Méditerranéennes : Série B. Etudes et Recherches; n. 62

2008
pages 155-162

Concise report on fishing issues in the countries of the southern Mediterranean and on research and management requirements in the sector

A. Berraho
Director General
INRH, Institut National de Recherche Halieutique
2 Rue Tiznit, Casablanca 01, Morocco

SUMMARY – In the field of marine biodiversity, the southern shore of the Mediterranean hosts a variety of marine resources of commercial interest. The exploitation of these resources is concentrated mainly in the coastal zone, where juveniles of several species are found, and is characterised by the sometimes troubled coexistence between the artisanal and industrial sectors. The results of the research work carried out in the North African region show that most of the marine resources are either fully exploited or already at an advanced stage of overexploitation. Concerning fisheries research, the information available on certain aspects of these resources is often missing, particularly in population dynamics and the biological cycle; this lack of information has a negative influence on the quality of stock assessments and consequently on the measures taken in fisheries management. In order to achieve the objectives of resource conservation and sustainable management, a better coordination of research is needed, to be achieved through a close integration of the regional and subregional research networks and the establishment of integrated management plans together with accompanying measures, such as the creation of protected marine areas, and the strengthening of North and South Mediterranean cooperation but also between the southern regions themselves.

Keywords: Southern Mediterranean, sustainable exploitation, fisheries research, integrated management.

RESUME – *"Note synthétique sur la problématique des pêches au niveau des pays de la rive sud de la Méditerranée et besoins en matière de recherche et de gestion du secteur". Dans le domaine de la biodiversité marine, la rive sud de la Méditerranée héberge des ressources marines d'intérêt commercial très variées. L'exploitation de ces ressources, confinée notamment au niveau de la zone côtière, lieu de concentration des juvéniles de plusieurs espèces, se caractérise par la coexistence parfois conflictuelle d'un secteur artisanal et d'un secteur industriel. Des résultats des travaux de recherche menés dans la région nord-africaine, il ressort que la plupart des ressources marines exploitées sont soit dans un état de pleine exploitation, ou déjà dans une situation de surexploitation avancée. En matière de recherche halieutique, il importe de souligner que les informations disponibles sur ces ressources comportent de nombreuses lacunes notamment en matière de dynamique et de cycles biologiques des ressources ; ces lacunes influent négativement sur la qualité de l'évaluation des stocks et par conséquent sur les mesures de gestion des pêches. Pour la réalisation de ces objectifs de conservation et de gestion durable des ressources, il importe de mettre en œuvre une meilleure coordination de la recherche et ce, à travers une intégration étroite dans les réseaux de recherche régionaux et sous-régionaux ainsi que l'instauration de plans de gestion intégrée des ressources avec la mise en œuvre de mesures d'accompagnement telles la création d'aires marines protégées, ainsi que le renforcement de la coopération nord-sud et sud-sud.*

Mots-clés : *Méditerranée-sud, exploitation durable, recherche halieutique, gestion intégrée.*

The southern Mediterranean: Context and constraints

The southern shore of the Mediterranean hosts a wide range of fishery resources of commercial interest, made up of small and large pelagics, demersal species, shellfish and coral. These resources are distributed along the whole Mediterranean coast with relative abundance depending on regions. A significant part of the commercial species of high market value (demersal stocks) is under the jurisdiction of territorial waters. However in certain zones, the demersal and pelagic species are considered as overlapping stocks and hence shared between two countries or more.

Marine research work and fishing-related activities are conducted in different institutions and

bodies, such as research institutes, the Ministries of Agriculture and Fisheries, the Ministries of Higher Education and Scientific Research and the Ministry of Land Planning and the Environment.

The diversity of bodies entrusted with fisheries research is often a constraint that prevents a fruitful collaboration for the sector; this situation prevails in most countries of the region and an absence of coordination is detrimental to the fisheries sector and consequently leads to a divergence in fishing policies at a regional level. This divergence is a major constraint for the sustainable exploitation and management of resources, some of which are at alarming levels of overexploitation.

In fact, the results of the research work show that most of the Southern Mediterranean stocks are either in a situation of maximum exploitation or are already in an advanced state of overexploitation, due mostly to a disproportionate increase in the fishing effort. This situation is mainly caused by fishing activities being confined to the coastal regions, where the fishing effort surpasses the stock replacement capacity. As a consequence, the fishing yields do not reach the profitability levels desirable for most of the active fishing units in the region.

In order to ensure the sustainability of the resources exploited, research strategies should be rationally associated with the exploitation and management strategies. In order for them to be efficient, these strategies should be coordinated between the different countries, especially in the case of the shared stocks. This coordination should take place on a regional basis through the exchange of data and the assessment of the state of resources of commercial interest for the region. Well-designed research work should be adopted to safeguard the resources and their environment; it should likewise be accompanied by a control of the compliance with fisheries regulations both on land and at sea.

Nevertheless, for most of the southern Mediterranean countries, the implementation of fisheries research should likewise permit a robust and balanced management of the sector, subject to the mobilisation of sufficient financial resources and expertise in the field of fisheries.

Biodiversity in the Mediterranean

Regarding biodiversity, the Mediterranean Sea, which represents only 0.8% of the world ocean surface area and less than 0.25% in volume, holds about 7% of the known marine fauna and 18% of the marine flora (28% is endemic).

Regarding the South Mediterranean and its biodiversity, in the last decade, following intense exploitation, a serious trend towards scarcity has been observed in certain marine species, with all the dramatic consequences that this produces on the environment. For example, the case of the sea date banks in the sea of Kariat Arkman (Nador, Morocco) whose exploitation has been accompanied by a degradation of the cliffs where this species is found. At the regional level, the turtle (*Caretta caretta*), is also under pressure in certain areas, as it is often a by-catch of certain fishing gears. For the other zoological groups, particularly red coral, the high level of fishing effort gives rise to low abundance levels, as is the case of the regions of Al Hoceima and Nador (Morocco). In this area prospections in collaboration with the professionals of the region are under way in an effort to locate other potential stocks for sustainable exploitation.

In order to limit the impacts of overexploitation, which affect more than one stock on an international level and lead to the degradation of the marine environment, some palliative measures have been taken through pilot actions. Among these measures the establishment of marine reserves in general and national parks managing marine areas are evident solutions.

Within this framework, and for the protection of Mediterranean biodiversity, the World Conservation Union (IUCN) defined a group of 6 categories of Marine Protected Areas (MPA) in 1978 that were revised and adopted in 1994. In the South of the Mediterranean, Morocco and Algeria plan to use the mentioned IUCN categories for the new legislative texts that are currently being drawn up.

It is noteworthy that often the different MPA categories are managed by the same ministry (almost always the Ministry of the Environment). However, at times the management of the MPAs falls within the responsibility of different Administrations in the same country; as is the case of Morocco and Algeria in the South of the Mediterranean, where there are MPAs that are not designated, whose

management responsibility falls upon the Ministries of Water and Forests, and the Coastal Authority, respectively. In Tunisia there are 2 MPAs belonging to categories II and IV that are managed by the Coastal Authority. Likewise, in Egypt, there are 2 non-designated MPAs, whilst in Libya, there are none.

Furthermore, experiences in the region have also been reported on the introduction of eco-management marine zones in order to help safeguard the ecosystems protected by them. In this context, the case of the National Park Al Hoceima in the Moroccan Mediterranean is to be mentioned. This is an original case as the Park englobes both a continental strip and a contiguous maritime strip. In fact, the establishment of this eco-management zone is justified by the fact that the biological stocks of the zone are increasingly under threat from overexploitation and need urgent protection. The objective is to protect the marine ecosystem (fish, sponges, coral, marine mammals, etc.) and to rationalise the exploitation methods, avoiding any destructive activity to the environment and to conserve a part of the biodiversity of this region.

Mediterranean aquaculture

Aquaculture is proving to be an alternative for fish production in the region. However, this activity is still far from reaching its objectives. Aquaculture needs to be integrated with the other activities involved in the use of coastal areas, such as tourism. Likewise, progress should be made to reduce the impacts that this activity has on the environment. It is to be observed that regarding aquaculture, and with a view to ensuring an advance in this field in the countries concerned, it is important to make an effort to set up national aquaculture development plans.

Mediterranean fisheries

Fishing is of long-standing tradition throughout the whole Mediterranean. Presently, it is particularly characterised by the sometimes conflictual coexistence of an "artisanal" sector (or coastal, to be more exact) and an industrial sector, by the multi-purpose nature of the majority of fishing units and by very disperse fishing and marketing activities along the coasts.

Fishing fleets and catches

Mediterranean fisheries are extremely diversified, with numerous fishing fleets based along the coast in a large number of ports. Most of the Mediterranean fleets are artisanal, with the exception of the industrial fleets that capture large pelagics in the high seas. The coastal fishing units are clearly predominant in most countries (Table 1). However, the purseiner fleet likewise constitutes an important element of Mediterranean fisheries.

Whereas precise information does not exist on the capacity and size of all fleets in every country, it is generally recognised that an expansion and a modernisation of the fleets, whether semi-industrial or small-sized, is taking place. Such a policy aims not only to improve the fishing effort but also to enhance the living conditions of the marine fishermen.

The classification of the fishing units often differs from country to country. Cases vary, classifications may refer to either the type of gear mainly used, to the target species or to the fishing technique (distinction between coastal fishing / small-scale and offshore fishings, or between artisanal fishing, traditional fishing and industrial fishing).

The fishing units operating in the Southern region of the Mediterranean include:

(i) Coastal fishing units that include small-scale fishing (artisanal fishing), and multi-purpose fishing (nets, long-lines, pots, etc.). The target resources are essentially demersal species.

(ii) The trawlers mainly target the demersal species.

(iii) The purseiners (industrial) mainly target the small pelagics, as well as the tuna fishing units and others (mixed units and dredges).

On the basis of this classification, the global number of fishing units operating in the region of Northern Africa would be around 29,500.

Table1. Number of fishing units and captures (in tonnes) per country in the Southern Mediterranean

Country/fleet	Coastal fishing	Trawlers	Seiners	Mean production (period: 1970-2000)
Algeria		4,000		65,719
Egypt	2,562	1,355	135	28,878
Lebanon		2,662		2,267
Libya	3,340	91	130	16,800
Morocco	2,950	120	150	28,121
Syria	1,470	20	-	1,552
Tunisia	13,680	458	319	66,652

Source: FAO Fishstat.

Pelagic fishing mainly targets sardines, anchovies, mackerel and sardinella; the sardine often making up the essential part of the landings. The anchovy is a less-abundant species, with rather small captures in comparison to sardines.

Trawling exploits several species at the same time without preference. Among the species exploited by this activity and which make up an important percentage of captures are: seabream, bogue, red mullet, pink shrimp, hake, common pandora, blue whiting, argentine, cuttlefish and octopus.

Fishing for blue-fin tuna and swordfish occurs mainly during their seasonal migration from the Atlantic to the Mediterranean or in the opposite direction using tuna nets, hand-lines, surrounding nets and drift nets as well as surface long-lines; the main fishing grounds of this species are situated in the Straits of Gibraltar.

Small tunas are caught mainly with seine nets, drift nets and to a lesser extent tuna nets. These species are marketed locally, destined either for consumption or for the processing industry.

State of the stocks of commercial interest

Most marine resources exploitation of the region takes place along the coast. This area is fragile and threatened by the pressure of a large number of fishing vessels targeting demersals and small and large pelagics. The state of the main stocks is assessed via the direct method on board research vessels (acoustic prospection campaigns and trawling) and also using indirect methods (biological monitoring and sampling of the main species exploited).

The stocks studied in the countries of the southern Mediterranean are approximately 5 demersal finfish species (hake, red mullet, striped red mullet, common dentex, axillary seabream), 4 small pelagic species and 2 large pelagic species, 2 crustaceans and a red coral species.

The results of the evaluation of the main stocks of the region –within the framework of the Working Groups of the Scientific Advisory Committee (SAC) of the General Fisheries Commission for the Mediterranean (GFCM)– show that the demersal stocks are considered, in general, as being fully exploited or even overexploited. This statement is specially based on the analysis of abundance indexes, on recruitment yield and on the biomass levels of these stocks. Furthermore, despite a theoretical regime of overexploitation, certain fisheries could be maintained thanks to the particular

biology and ecology of certain species, as could be the case of hake. Abundance of the small pelagics stocks undergo strong inter-annual variations, mainly for environmental reasons. In general, stocks are considered overexploited, particularly in the case of the anchovy; and fully exploited in the case of the sardine.

The large pelagics stocks, particularly blue-fin tuna, is presently undergoing a continued fishing effort increase. The crustacean stocks are in a situation of overexploitation due to a large fishing effort and a weak biomass level. For the other zoological groups, particularly the case of red coral, analysis of the present situation shows a high level of fishing effort, giving rise to low levels of abundance.

Research programmes at a regional level

The research activities are carried out in the region to study the biology of the high market-value species and map their abundance, make a socio-economic analysis of the main fisheries, assess the status of the main stocks exploited, monitor the state of health and the oceanographic parameters of the Mediterranean waters and study marine biodiversity.

The data bases generated from such research programmes support the elaboration of technical and scientific components upon which the management of exploited resources is based.

In the Southern Mediterranean, the data bases maintained in each country have several origins (Research Institutes, Ministries of Agriculture and Fisheries, of Higher Education, of Territorial Planning and the Environment, Fisheries Offices). It is also noteworthy that in recent years these statistics have improved a great deal in this area of the Mediterranean thanks to:

(i) Research programmes established by different institutions (biological sampling of landings of market fish, surveys conducted on catches and on fishing effort, scientific campaigns at sea, study of marine biodiversity, etc.).

(ii) Computerised recording systems of the landings (production in weight and in value per day, per vessel, per species and for each port); in fact, for the case of Morocco, catch data is recorded in most of the national ports, using a standard system, that allows disaggregated data to be provided per species or per group of species and per vessel. This system has thus allowed substantial improvements to be made to the quality of fisheries data.

(iii) The support of local and regional projects and the implementation of networks of databases under the auspices of the GFCM.

Research and management requirements of the sector

In the light of the results of the assessments of the main exploited stocks in the region and the research programmes set up, there seem to be numerous gaps in information concerning the population dynamics and the biological cycle of the Mediterranean fish populations, as well as stock assessment. Hence part of the scientific knowledge becomes fragmented. It is necessary to make assessments within the framework of research programmes, taking into account the intrinsic characteristics of the resources and their bioecology as well as their environments, in order to monitor the evolution of such resources as well as their spatial and temporal variability.

Therefore, the rational exploitation of resources and their sustainable management requires the adoption of a two-fold approach, that is to set up, at the same time, research strategies and resource management strategies.

Research strategy

Concerning fisheries research, the following actions are recommendable:

(i) Strengthening direct method prospections, through participation in regional research assessment campaigns, such as Medit; through which the Southern Mediterranean countries will have more elaborated data bases on the potentials of their resources, especially those of deep water demersals.

(ii) Establishment of structured and standardised data bases that should be integrated in fisheries information systems.

(iii) Inclusion of the southern Mediterranean countries in the regional and international scientific networks, for example: Carbo-Ocean, Eurocean, Encora, Mytilos, etc.

(iv) Enhanced cooperation between FAO and UNEP, particularly within the framework of regional projects such as MedPol, and the GFCM projects such as COPEMED, MedSudMed, Adriamed, MedFisis, and SIPAM. These projects constitute regional cooperation networks of excellence and will facilitate technical and financial support to be ensured for research in the region. In fact, through the regional MedFisis project, the countries of the southern Mediterranean may benefit from the necessary technical assistance for the improvement of their national fisheries statistics and regional information systems that could constitute a precious decision-support system for GFCM, the body entrusted with the implementation of fisheries management policies at a regional level.

(v) Improved North-South cooperation for transfer of technology and expertise for the benefit of the southern Mediterranean countries.

(vi) Consolidation of South-South cooperation, for the exchange of information and experiences leading to the perpetuation and sustainability of resources, particularly by a harmonised management of shared and overlapping stocks.

Strategy for a sustainable management of resources –future options

In order to ensure the protection of fishery resources, management measures applied in the territorial zones of each country of the region, include the following: (i) freezing of investments; (ii) control of landing sizes; (iii) delimitation of fishing prohibited zones; and (iv) continued improvement of scientific research.

These actions represent significant indications of the countries' concern for fisheries management at a regional level. However, there is still an absolute need for effective surveillance and enforcement of the regulatory measures in force, as well as the control of illegal, undeclared and unregulated fishing.

Generally, the management objectives can be divided into two groups. Those which address the sustainability of stocks and fisheries such as: (i) the fixing of annual or seasonal fishing quotas; (ii) the fixing of a level of fishing effort; (iii) the preservation of spawners; (iv) the protection of juveniles by establishing minimum capture sizes; and (v) the protection of nurseries by setting up fishery reserves.

And those intended for the maximisation of fisheries production, that is, of the yield or socio-economic benefits, through: (i) the improvement of the selectivity and the fishing techniques; (ii) the choice of fishing zones and seasons; and (iii) the addition of value to catches by improving the quality of products on board.

Consequently, there is growing awareness of the need to arrange the objectives in order of importance; thus, the sustainability of fisheries should be ensured before pursuing production maximisation objectives. This hierarchy is an implicit part of the precautionary principle and is also the basis of all biological advice formulated by the advisory bodies.

It is worthwhile mentioning that regarding the Southern Mediterranean and following the example of other regions of the world, the fishing effort has increased considerably over the last decade, meaning a decrease in the captures of most stocks. This situation makes it necessary to implement a sound resource management strategy based on the adjustment of the fishing capacity to the potential of the resources; thus, among the measures that permit the perpetuation of resources of the region, it is appropriate to mention the following actions:

(i) Strengthening the prohibition of trawling along the coastal strip.

(ii) Development of the necessary instruments for better selectivity of fishing gears.

(iii) Strict protection of the coastal zone, including sensitive areas for resources (nurseries).

(iv) Strict control of landing sizes.

(v) Elaboration of fisheries management plans.

(vi) Enhancement of the resources research programmes.

Regarding the exploitation of stocks, considerable effort should be made urgently in the South of the Mediterranean to improve the scientific advice provided for fisheries management. The present level of stock assessment, and more generally of fisheries research for assessment purposes, is not enough or is inappropriate for adequate and effective advice to be offered to the sector and to the fisheries managers. Therefore, it is of utmost importance to work on this aspect in the Southern Mediterranean:

(i) The establishment of evolutionary management plans that can be refined and adjusted whenever the information on stocks of commercial interest improves and when the stock assessment methods give better results.

(ii) The elaboration of reliable data bases analysed by standard methods, that can be used to better inform the decision-makers of the country on the most appropriate measures for resource management.

(iii) The harmonisation of legislations in the countries of the region.

(iv) The establishment of protected marine areas, as well as a means for the protection and management of fisheries and biodiversity.

(v) The establishment of management mechanisms responding to the environmental and social dynamics and changes.

(vi) The development of integrated management coastal zones.

(vii) The implementation of monitoring bodies of the fisheries and of the state of the environment for the subsequent generation of regional databases on resources and ecosystems.

(viii) The exchange of experiences within the framework of regional and subregional forums, such as the international Euro-Mediterranean colloquium on "*Building together responses to challenges posed by the Mediterranean sea*", held in Toulon (France) upon the initiative of IFREMER and the Forum on the Alboran Sea, organised in Malaga (Spain) by IUCN on "*The conservation and sustainable development of the Alboran Sea"*. Both events took place in November 2007.

References

Barbault, R., Chevassus-au-Louis, B. and Teyssedre, A. (dir.) (2005). *Biodiversité et changement globaux-Enjeux de société et défis pour la recherche*. Ministère des Affaires Etrangères, France.

Boudouresque, C.-F., Avon, M. and Gravez, V. (1991). *Les espèces marines à protéger en Méditerranéen*. GIS Posidonie, Marseille, France.

CBD (2004). *Integrated marine and coastal areas management (IMCAM) Approaches for implementing the convention on Biological Diversity.* CBD Technical series No. 14. AIDE Environment/RIKZ, Coastal Zone Management Centre, the Netherlands and Secretariat of the Convention on Biological Diversity.

CIHEAM, International Centre for Advanced Mediterranean Agronomic Studies (2003). Mediterranean Fisheries. In: *Developmnet and agri-food policies in the Mediterranean region, CIHEAM Annual*

Report 2002, Part III, pp. 151-214. English version of the report available from: http://ressources.ciheam.org/fr/ressources/report2002.htm. French version of the report available from: http://ressources.ciheam.org/fr/ressources/rapport2002.htm.

GFCM (2007). *Report of the 10th session of the Scientific Advisory Committee (SAC)-GFCM*. GFCM, Cyprus (Nicosia), 22-26 October 2007.

López Ornat, A., Pons Reynés, A. (Pangea Consultores S.L.) and Noguera, M. (2007). *Utilización de las Categorías de Gestión de Áreas Protegidas de UICN en la Región Mediterránea*. Consejería de Medio Ambiente de la Junta de Andalucía, Sevilla, Spain and UICN-Gland, Switzerland and Malaga, Spain, 211 pp. Available in English French and Spanish from www.uicnmed.org and www.juntadeandalucia.es/medioambiente

Ministère de l'Intérieure, Ministère de l'Agriculture et de la Reforme Agraire and Ministère des Pêches et de la Marine Marchande (1993). *Parc National d'Al Hoceima – Plan directeur d'Aménagement et de Gestion – Propositions. METAP/Plan Bleu-SECA.* Ministère de l'Intérieure, Ministère de l'Agriculture et de la Reforme Agraire, Ministère des Pêches et de la Marine Marchande, Morocco.