

FAO MEDITERRANEAN PROJECTS PRODUCTS

1999- February 2009

This publication has been prepared by the FAO Mediterranean regional Projects AdriaMed, CopeMed II and MedSudMed and provides a list of the publications and other informative material issued by the Projects since 1999. Eighty-nine products related to fisheries in the Mediterranean Sea, including CD-ROMs, have been published and distributed in both hard and electronic versions.

The Projects publications are issued as a series of Technical Documents TD (e.g. AdriaMed TD, MedSudMed TD and Informes y Estudios CopeMed) and Occasional Papers related to meetings and research organised by or conducted within the framework of the Projects. Occasionally, relevant documents may be translated into national languages as AdriaMed Translations.

All the publications produced by the Projects are available on the related Project website

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FAO Mediterranean Projects products

1999- February 2009

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INFORMES Y ESTUDIOS COPEMED N^o.01

Robles Pariente, R.

Review of Mediterranean fisheries. Situation and management

The main purpose of this study is to disseminate information on the current status and evolution of the fish stocks (e.g. demersals, small pelagics and large pelagics) among countries of the sub-region. Other objectives are:

- Review the resources management systems;
- Identify the most urgent needs the fish stocks are facing;
- Suggest measures for their scientific management;
- Introduce a “systemic” fisheries concept;
- Recommend priority actions to ensure fisheries sustainability.

The scope of the paper covers the Mediterranean Sea, where fishing pressure, both commercial and sportive, is constantly increasing along these waters and it is expected it will continue to grow in the future. In addition, as an ecosystem, it is considered rather fragile and submitted to increasing pollution.

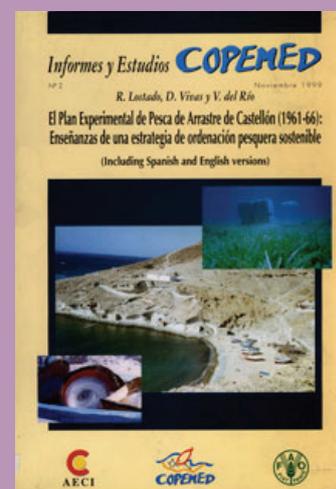
INFORMES Y ESTUDIOS COPEMED N^o.02

Lostado I Bojó, R., del Río Orduña, V., Vivas Agrafojo, D., Alegret Tejero, J.L., Franquesa Artes, R., Leonart Aliberas, J., Oliver Reus, P.A., Robles Pariente, R.

The Castellón trawling project (1961-1966): teachings for a sustainable fisheries management

The idea of making this paper came up during the Scientific Forum on Spanish Fishing that took place in Palma de Majorca in 1997 with the aims of recovering from oblivion the experience of the Castellón Experimental Trawling Project (PEPAC, Proyecto Experimental de Pesca de Arrastre de Castellón), and of emphasizing those teachings that could be useful for the present generation of fishing stakeholders. The FAO COPEMED project director supported from the beginning that initiative and made it possible by deciding to finance this study.

The paper also tries to provide the reader with the possible explanations that have been identified by the research team for the paradox that aroused after the PEPAC experience. So, despite the fact that all the monitoring mechanisms displayed indicated that the Project had yielded successful results which heralded the discovery of an adequate management model for Mediterranean fisheries, this project was not followed by any other initiatives. However, the project remains in the minds of professionals connected with the sea world in the Castellón area and many present practices have their origin in that



singular experience. The PEPAC is a rich and historical example of multi-disciplinarity. First of all, to achieve these goals, the research team made an exhaustive review of reports and articles published both in scientific publications and in local newspapers and magazines. Then, the team realized that a good number of the basic documents had not been published, like the meetings minutes or several sets of statistics and personal documents, which had to be recovered. Besides, a study like the present one would be incomplete without the testimony of the “actors” of the project, those who played a role in it. It was a unique occasion for gathering their live testimonies. It was decided to make several interviews which required seeking these individuals all around the country: Castellón, Sant Carles de la Ràpita, Majorca and Vigo.

INFORMES Y ESTUDIOS COPEMED N°.03

Species Identification and Data Programme (SIDP) of
FAO-FIRM

Encyclopaedia of living marine resources of the Mediterranean - (CD-ROM)

The Encyclopaedia contains information about approximately 150 Mediterranean species. These species have been selected according to their importance for Mediterranean fisheries. The species included in it account for almost 100% of the landings in the Mediterranean Sea. All this information is available in four languages; Arabian, English, French, Spanish.

The CD-ROM Encyclopaedia of the Living Marine Resources of the Mediterranean has been developed within the framework of the FAO-COPEMED project in collaboration with the FAO-FIRM Species Identification Programme (SIDP).

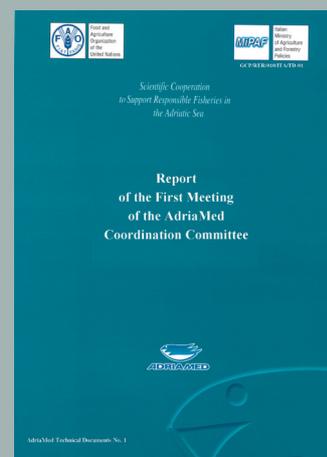


ADRIAMED TECHNICAL DOCUMENTS N°.01

Massa, F. and Mannini, P.

Report of the First Meeting of the AdriaMed Coordination Committee. Termoli, Italy 30-31 March 2000

The first Meeting of the Coordination Committee of the AdriaMed Project (Scientific Cooperation to Support Responsible Fishery in the Adriatic Sea) was attended by representatives of participating countries (Albania, Croatia, Italy and Slovenia). The meeting was held to discuss a strategic approach for implementing, monitoring and coordinating the annual workplans of the AdriaMed Project. AdriaMed is a regional project executed by FAO, with scientific cooperation as its priority and is based on support for cooperative fisheries management of the Adriatic basin. The report provides a synthesis of the presentation, key discussion topics and conclusion with regard to strategic actions for implementing the sustainable fisheries, responsible resource management. It includes also a support paper on Adriatic fisheries landing trends.

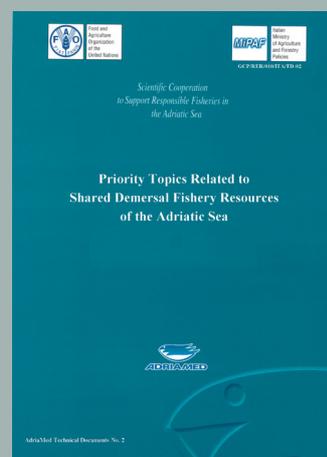


ADRIAMED TECHNICAL DOCUMENTS N°.02

AdriaMed

Priority Topics Related to Shared Demersal Fishery Resources of the Adriatic Sea Report of the First Meeting of the AdriaMed Working Group on Shared, Demersal Resources. Fano, Italy 24-25 June 2000

The first meeting of the FAO-AdriaMed Project Working Group (WG) on the Definition of Priority Topics Related to Shared Demersal Resources in the Adriatic Sea was attended by experts from Albania, Croatia, Italy and Slovenia. In line with the FAO-AdriaMed Project aim of strengthening joint research and regional cooperative management of common fishery resources, the Working Group focused on shared demersal stocks, exploited by trawl fishery, by identifying the most relevant issues and consequently formulating specific activities to be implemented within the framework of the Project. The Working Group considered current knowledge on shared fishery resources including the distribution pattern of the species, the state of exploitation and how much information is at present available on these resources. On the basis of the experience of the participants, the Working Group made a list of species whose stocks should be regarded as shared by the Adriatic Sea countries. The status of current knowledge on the ecology and population dynamics of main shared stocks was discussed. The



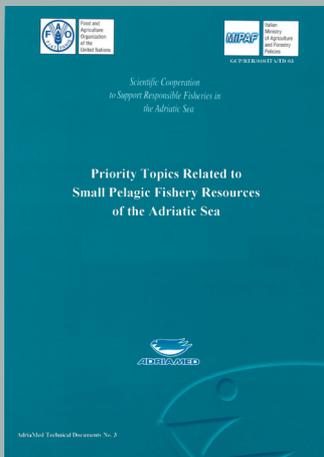
Working Group agreed on the necessity to identify all sources of information concerning the common stocks existing in each country and on the need to prepare an up-to-date bibliographical database for each species. The issue of the known critical areas for the main shared stocks was taken into consideration for the elaboration of monitoring and management proposals. The Working Group stressed the importance of improving knowledge on how stocks are shared by the fishing fleets and gear. The high occurrence of juveniles in commercial trawl catches was discussed and it was proposed that a working programme regarding technical measures for the improvement of trawl net selectivity be supported by the Project. Following the discussion and conclusions of the meeting, the Working Group agreed to finalise specific work proposals to be implemented within the AdriaMed framework. In addition to the aforementioned topics, other matters to be dealt with were identified as: the extension of scientific trawl surveys to the eastern Adriatic sector; the availability of a common set of digital charts; cooperative research on the genetic structure of the most important demersal stocks. Finally, the training requirements of each country were indicated for consideration and follow-up by the Project.

ADRIAMED TECHNICAL DOCUMENTS N°.03

Mannini, P., Massa, F., Milone N.

Priority Topics Related to Small Pelagic Fishery Resources of the Adriatic Sea. Report of the First Meeting of the AdriaMed Working Group on Small Pelagic Resources. Split, Croatia 12-13 October 2000

The first meeting of the AdriaMed Working Group (WG) on the Definition of Priority Topics Related to Small Pelagic Resources of the Adriatic Sea was held in Split, Croatia on the 12th and 13th October 2000. The meeting was attended by experts from Albania, Croatia, Italy and Slovenia. In line with the Project aim of strengthening joint research and regional management of shared stocks of the Adriatic Sea, the WG focused on small pelagic resources by identifying the most relevant issues and consequently proposing and formulating specific activities to be implemented within the cooperative framework of the AdriaMed Project. The first objective was the evaluation of current knowledge on shared small pelagic fish stocks including the distribution pattern of the species, the state of fishery exploitation and how much information is at present available on these resources. The WG agreed on the role of the analysis of the genetic structure of fish and invertebrate populations in



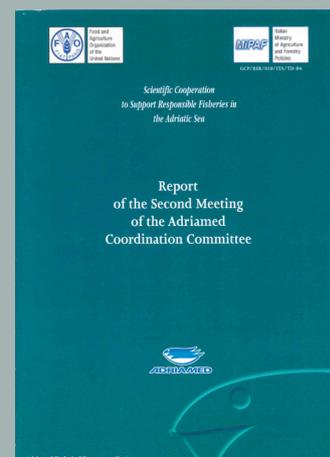
providing information on geographical limits of stocks and gene flow among sub-populations. Following the discussion the list of small pelagic species whose stocks are shared was prepared on the basis of the WG participants experience and was based on bio-economic considerations. The need for the joint preparation of a synopsis on current knowledge on the main commercial small pelagic species of the Adriatic was evaluated. The utility and importance of an up-to-date biological synopsis, reviewing current knowledge on the species concerned, was recognized with priority being given to *E. encrasicolus* and *S. pilchardus*. The WG was briefed on the existing knowledge available in each Adriatic country concerning relationships between small pelagics and environment: the need of identifying the relationships between life cycles of small pelagic species and environmental characteristics of the Adriatic Sea system was discussed. Nine support papers were discussed and are included in this report.

ADRIAMED TECHNICAL DOCUMENTS N°.04

AdriaMed

Report of the Second Meeting of the AdriaMed Coordination Committee. Portorož, Slovenia, 22–23 November 2000

The second meeting of the Coordination Committee of the AdriaMed Project (Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea) was attended by representatives of participating countries (Albania, Croatia, Italy and Slovenia) and other interested parties. The meeting was held to evaluate the first year of Project implementation seven months after the first meeting, in which the overall Project policy was finalised. An overview of activities carried out was given: *inter alia* a Seminar on the preparation of an Adriatic fisheries information system and two international Working Groups on the priority topics related to shared demersal and small pelagic fishery resources of the Adriatic Sea. A number of scientific research programmes have been identified by the AdriaMed Project, through its Working Groups of regional experts, as of high relevance within the overall Project aim and mandate of strengthening scientific cooperation to support responsible fisheries in the Adriatic Sea. Specific requirements for the AdriaMed countries concerning national capacity building were highlighted; the necessity to identify activities concentrating on the continued strengthening of the network established in the AdriaMed area was underlined, and the importance of basin level cooperation was stressed. The interaction between research institutes and administrative



bodies as well as computerized links between the AdriaMed participating countries were illustrated. The Coordination Committee stressed the importance of improving activities planned to strengthen cooperation with the GFCM. Finally the priorities identified for the future and activities scheduled were listed and approved by the Project Coordination Committee.

INFORMES Y ESTUDIOS COPEMED N°.04

Bensch, A. and Taconet, M.

Towards the use of Geographic Information Systems as a decision support tool for the management of Mediterranean fisheries

The FAO COPEMED Project GCP/REM/057/SPA, within the framework of its activities aiming at the enhancement of scientific knowledge for a better management of Mediterranean Fisheries, has led a regional training activity on the use of Geographical Information Systems (GIS). This activity, relying on scientific co-operation, was the subject of a workshop, held at IEO 1 Oceanographic Centre of Fuengirola (Málaga - Spain, December 1998).

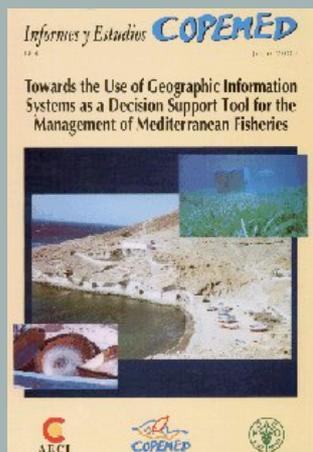
The first publication of the present document is a review of the use of GIS as a decision support tool for fisheries management, based on the communications presented during the Workshop. This synthesis is illustrated by a selection of publications issued from the presentations of the Workshop. We thank all those who took part in the COPEMED GIS Workshop for their contribution in the elaboration of this document, with a special mention to the authors of the herein publications.

ADRIAMED OCCASIONAL PAPERS N°.01

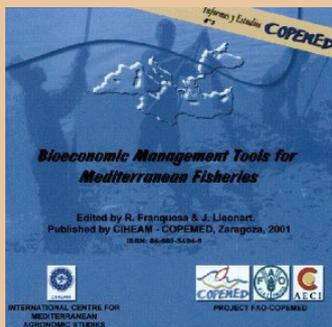
AdriaMed

AdriaMed seminar on the preparation of the AdriaFISH project component (Adriatic Fishery Information System).

The Seminar on the Preparation of the AdriaFISH Project component (Adriatic Fishery Information System), organised by the FAO-AdriaMed Project (*Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea*) was held in Rome, Italy on the 6th and 7th September 2000. The meeting was attended by representatives of Albania, Croatia and Italy. Considering the Project aim of establishing a multidisciplinary integrated, and standardised, fishery sector information system for both national



and regional fisheries management requirements, the Seminar focused on the demonstration of the AdriaFISH information systems' use, the prototype application to the countries and the identification of each country's priorities.



INFORMES Y ESTUDIOS COPEMED N°.05

Lleonart Aliberas, J., Franquesa Artes, R., Oliver Reus, P.A., Tudela Casanovas, S., Maynou Hernández, F.X., Martínez, J., Fernández, B., Recasens Albaladejo, L., Camiñas Hernández, J.A., Abad Cerdan, R.

Bioeconomic Management Tools for Mediterranean Fisheries - (CD-ROM)

This CD-Rom has been developed for the Advanced Course on "Modelling fisheries management strategies in the Mediterranean", that was held in Fuengirola (Spain) from 18-22 of September 2000. This course was jointly organized by the International Centre for Mediterranean Agronomic Studies (CIHEAM), through the Mediterranean Agronomic Institute of Zaragoza, the Centro. Oceanográfico de Málaga of the Instituto Español de Oceanografía (IEO) and the project FAO-COPEMED, with the collaboration of the General Fisheries Council for the Mediterranean (GFCM).

This course is a result of several works and projects carried out by Spanish Research Institutions ICM-CSIC and GEM-UB with collaboration of IEO-Málaga and sponsored by the European Commission, CYTMAR (Spanish National Program for Marine Research) and the project FAO-COPEMED.

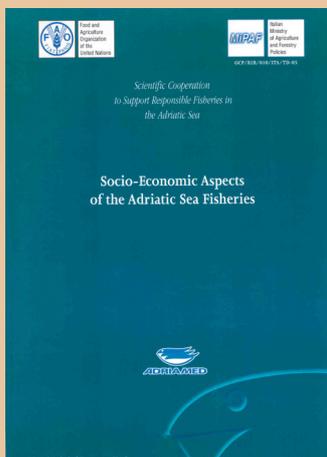
The purpose of that work was to present a practical, bioeconomic fisheries management computer model for the Mediterranean and Mediterranean-type fisheries, allowing to test different management strategies and assess their results. This software is addressed to fisheries researchers (biologists, economists, etc.), stakeholders, fishermen, fisheries managers and policy-makers.

ADRIAMED TECHNICAL DOCUMENTS N°.05

AdriaMed

Socio-economic aspects of the Adriatic Sea fisheries. Report of AdriaMed Meeting on Socio-Economic Aspects of the Adriatic Sea Fishery Sector. Campobasso, Italy 28-29 May 2001

The first AdriaMed Meeting on Socio-Economic Aspects of the Adriatic Sea Fishery Sector was held in Campobasso, Italy on the 28th – 29th May 2001. The meeting was attended by experts from Albania, Croatia, Italy, Slovenia. The main objective of the meeting was to contribute at establishing a network of national experts, gain a preliminary insight into the main priorities to be addressed, identify major gaps in knowledge and expertise in the field, exchange relevant information and identify the next



steps to be taken. The current state of affairs regarding fishery socio-economics research in each country was reported and the suitable common socio-economic variables and indicators to be used around the Adriatic basin were discussed. The questionnaire on fishery socio economic data elaborated by the General Fisheries Commission for the Mediterranean - Scientific Advisory Committee, Sub Committee on Economic and Social Sciences (GFCM-SAC, SCESS) in May 2001 was indicated as a suitable starting point for the discussion of socio-economic variable and indicators to be applied to the Mediterranean. It was resolved that, on the basis of a modified version of the above mentioned SCESS questionnaire, the accessibility of information would be investigated in all the countries. This will constitute the first joint and concerted action of the regional network of fishery socio-economists just established. A preliminary list of each country's priorities, concerning socio-economics aspects, was identified, it includes: legislation and fiscal system, associations, problems concerning fish markets. As AdriaMed is establishing a network of fishing ports for biological sampling purpose it was suggested and agreed that these same ports could be used to collect socio-economic information, thus guaranteeing standardisation of methods.

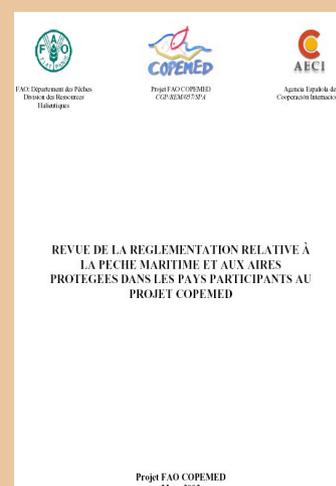
Revue de la réglementation relative à la pêche maritime et aux aires protégées dans les pays participant au projet COPEMED (2001)

Cacaud, P.

Le document examine les dispositions pertinentes de la réglementation relative à la pêche maritime pour chacun des huit pays participant au projet CopeMed. Il a pour objectif principal de répertorier et décrire les dispositions en vigueur relatives à la protection des ressources halieutiques, aux aires marines protégées, à la sélectivité des engins de pêche et autres mesures techniques de protection de ces ressources.

Du 24 au 26 octobre 2001, le projet CopeMed a organisé une première réunion sur la réglementation des pêches maritimes à Tanger (Maroc). Celle-ci regroupait quatre des pays participant au projet Copemed (Algérie, Espagne, Maroc et Tunisie) et avait pour objet principal de faire l'état des lieux de la réglementation relative à la pêche maritime et aux marines protégées dans chacun des pays présents à la réunion 1. Les recommandations formulées pour la préparation d'une deuxième réunion programmée pour juin 2002 sont présentées en ANNEXE.

Cette étude repose essentiellement sur les textes juridiques figurant dans la base de données du bureau juridique de la FAO (FAOLEX).



ADRIAMED OCCASIONAL PAPERS N°.02

AdriaMed

The Geographical Management Units of the Adriatic Sea

The paper provided considerations on the Geographical Management Units (MUs). Some Adriatic demersal species whose stocks should be regarded as shared for management purposes were chosen in order to describe spatial distribution in the Adriatic Sea and as an example of the application of the MUs. Therefore the paper proposed to introduce minor modifications on the boundaries of the MUs proposed by the GFCM for the Adriatic Sea. An overview on some research programmes to be implemented through the AdriaMed Project relevant to the definition of MUs is given.

ADRIAMED OCCASIONAL PAPERS N°.03

Ungaro, N., Vrgoč, N., Mannini, P.

The biology and stock assessment of *Merluccius merluccius* (L.) in the Adriatic Sea: an historical review by geographical management units

The hake (*Merluccius merluccius*) is one of the main commercial and heavily exploited species of the demersal fishery of the coastal countries in the Adriatic Sea. This paper aims to critically review the existing information on the population dynamics and stock assessment of this resource. It is highlighted that, despite the fact that most of the research would indicate very high levels of fishery exploitation of the species for a long time, apparently fishery production has not experienced major crisis over the years. Some of the possible reasons behind this contradiction, which should be taken into account for future research, are discussed. Some programmes also relevant to the hake under implementation at basin level by the FAO-AdriaMed Project are reported.

ADRIAMED OCCASIONAL PAPERS N°.04

AdriaMed

A preliminary contribution to the Mediterranean Operational Units

The paper provided an overview of some of the basic information available relevant to the identification and listing of Operational Units in the Adriatic Sea (Geographical Management Units 17 and 18). Preliminary figures and composition of the Adriatic fishing fleet as a total and by country, fishing gear and vessel size were

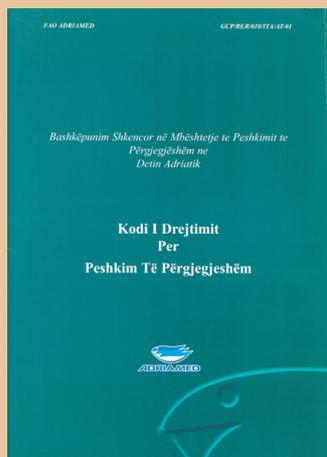
given together with the base ports. The sardine fishery in the Northern and Central Adriatic was used as an example of the application of Operational Units. Within this Management Unit (17) the sardine stock is considered to be shared by the fishing fleets of the coastal states and it is believed to be a single stock. Therefore, the paper proposed to consider only one Operational Unit for this resource and some of its specific, or elementary, components such as base ports, fleet segments and fishing seasonality were indicated as an example of the complementary and desirable information.

ADRIAMED OCCASIONAL PAPERS N°.05

Massa, F. and Mannini, P.

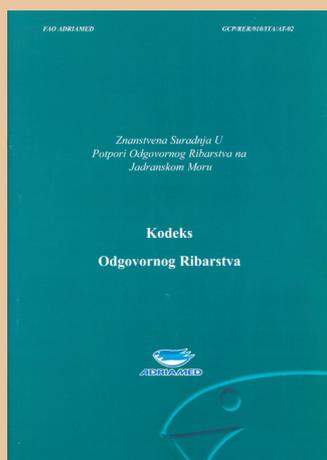
The FAO-AdriaMed Project and its activities of interest to the SAP BIO Project

The establishment of collaboration with the Mediterranean Action Plan (MAP) is part of the implementation strategy of the FAO-AdriaMed Project. This paper provides general information on the AdriaMed Project in order to identify possible areas of cooperation with the SAP BIO Project. The overall aims and objectives of the Project concerning collaboration among the participating countries are indicated as well as aspects relating to fisheries research and the process of strengthening scientific cooperation. A brief introduction to the Adriatic Sea environment is given together with a short overview of Adriatic Sea capture fisheries. Some AdriaMed regional scientific programmes and activities are pointed out as of likely relevance to the SAP BIO. Finally, the initial steps for cooperation between AdriaMed and the SAP BIO Projects are identified and proposed.



ADRIAMED TRANSLATIONS N^o.01 Përkthim në shqip i Kodit të FAO-s të Drejtimit për një Peshkim të Përgjegjshëm

The Code of Conduct for Responsible Fisheries described in this publication sets out the principles and international standards of behaviour for responsible practices with a view to ensuring the effective conservation, management and development of living aquatic resources, with due respect for the ecosystem and biodiversity. It recognizes the nutritional, economic, social, environmental and cultural importance of fisheries and the interests of all those concerned with the fishery sector. The Code takes into account the biological characteristics of the resources and their environment and the interests of consumers and other users. States and all those involved in fisheries are encouraged to apply the Code and give effect to it.



ADRIAMED TRANSLATIONS N^o.02 Hrvatski prijevod FAO Kodeks Odgovornog Ribarstva

The Code of Conduct for Responsible Fisheries described in this publication sets out the principles and international standards of behaviour for responsible practices with a view to ensuring the effective conservation, management and development of living aquatic resources, with due respect for the ecosystem and biodiversity. It recognizes the nutritional, economic, social, environmental and cultural importance of fisheries and the interests of all those concerned with the fishery sector. The Code takes into account the biological characteristics of the resources and their environment and the interests of consumers and other users. States and all those involved in fisheries are encouraged to apply the Code and give effect to it.

ADRIAMED TECHNICAL DOCUMENTS N°.06

AdriaMed

Adriatic Fishery Associations - First AdriaMed Meeting. Split, Croatia 17–18 July 2001

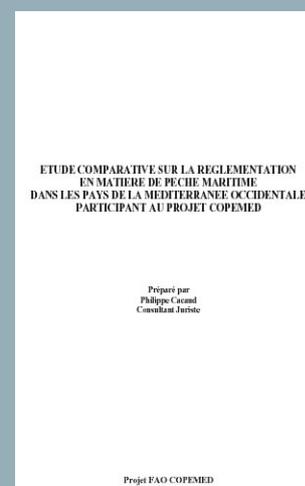
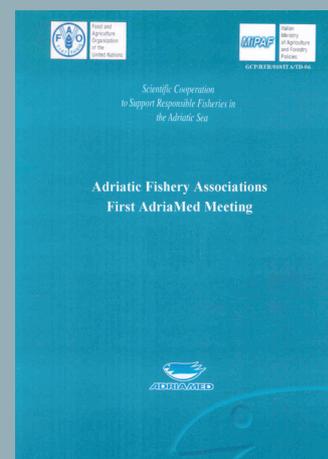
The first AdriaMed Meeting on the Adriatic Sea Fishery Associations was held in Split, Croatia on the 17th – 18th July 2001. The meeting was attended by 29 participants from Albania, Croatia, Italy and Slovenia. The main objective of the meeting was to gain knowledge of the organizational system of the fishery sector at Adriatic level; to discuss the fishery associations' priorities at basin level; to identify and propose topics of cooperation; to support the establishment of a network of fishery associations of the Adriatic Sea as a permanent Working Group. A brief presentation of the FAO AdriaMed Project was given to the participants and recent developments of the main activities were illustrated. An overview of the Code of Conduct for Responsible Fisheries was presented: the background and historical development of the Code, its nature and objectives and selected features of its content were highlighted. The representatives of the fisheries associations of the Adriatic Sea expressed strong support for the provision of the Code, noting among other points the important role to be played by resource users in order to achieve responsible fisheries. The need to develop every aspect of fisheries cooperation at Adriatic Sea basin level was strongly advocated. A brief overview of the fishery sectors in each participating country was given. A memorandum on common and priority topics highlighted during the meeting was issued.

Etude comparative sur la réglementation en matière de pêche maritime dans les pays de la Méditerranée occidentale participant au projet COPEMED

Cacaud, P.

Cette étude juridique comparative traite des quatre thèmes centraux suivants:

- le régime juridique relatif aux espaces maritimes (eaux territoriales, zone économique exclusive, zone de pêche exclusive ou zone de pêche réservée ou zone de protection des pêches);
- le régime juridique d'accès aux ressources;
- les institutions de gestion et d'administration des activités de pêche, y compris les modes d'organisation des communautés de pêcheurs;



- la gestion de l'effort de pêche à travers les mesures techniques d'aménagement.

Sur la base des informations compilées dans le rapport définitif, le présent document examine successivement, sous forme comparative et dans des chapitres distincts, les quatre thèmes mentionnés ci-dessus.

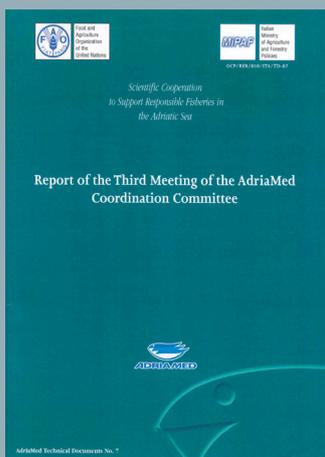
ADRIAMED TECHNICAL DOCUMENTS N°.07

AdriaMed

Report of the Third Meeting of the AdriaMed Coordination Committee. Tirana, Albania 22-23 November 2001

The third meeting of the Coordination Committee of the AdriaMed Project (Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea) was attended by representatives of participating countries (Albania, Croatia, Italy and Slovenia) and other interested parties. The meeting was held aimed at presenting and discussing the results of the activities carried out by the Project. The activities of the AdriaMed Working Groups, the cooperative research programme, the training activities, the issues on the fishery socio-economic aspects and the Project support to the national statistical systems are reported. Preliminary results on four field research projects were reported, "Identification of population units in Adriatic Sea shared stocks by genetic structure analysis", "Data collection and biological sampling system on small pelagics in the Adriatic Sea", "International bottom trawl survey in the Adriatic Sea; "Joint echo-survey and environmental parameters monitoring in the Northern Adriatic Sea (pilot exercise)". Other three research projects concerning the "Inventory of IOF-Split historical data set and time series", "Preparation of a critical review of the current knowledge and available data set on demersal fishery resources of the Adriatic Sea", and "Identification of management options for the Pomo/Jabuka critical area" are presented.

AdriaMed has appeared as a driving force at Mediterranean level on some issues such as the definition of Operational Units, the development of socio-economic indicators and the participation of professional organisations in the management planning process.



INFORMES Y ESTUDIOS COPEMED N°.06

Coppola, R.

Inventory of artisanal fishery communities in the Western-Central Mediterranean

This study refers to the Western and Central Mediterranean covering the FAO-COPEMED Project countries: Algeria, France, Italy, Libya, Malta, Morocco, Spain and Tunisia.

The COPEMED Project, through this initiative, offers the possibility of initiating a programme of work to study this sector in depth, within its area of competence. This programme was undertaken with the co-ordination of, and in consultation with, an international team provided by the FAO-COPEMED project, and it covers distinct themes (Statistics, Biology, Economics, Management). National staff participated as much as possible, in order to improve national competence in this field.

Artisanal fisheries is the weakest part when negotiating management issues on a large scale, and its interaction with the many other activities in the same (shared) area, calls for special attention. It is believed that more knowledge and results from case studies based on actual situations, can help to visualize the changes needed to direct artisanal fisheries toward a more modern management, respected by and respectful of the environment, fishery, etc.

This study is the output of a team that has worked part time, in many cases voluntarily, to achieve some results, which they consider not the point of arrival, but the start of deeper analysis and more sector studies.

INFORMES Y ESTUDIOS COPEMED N°.07

Bayle Sempere, J., Valle Pérez, C., Verdú, A.

ECOCEN 1.00.00. Application for managing fish visual counts

Additional collaboration was provided by the following:

Pablo Sánchez Jerez (Universidad de Alicante)

José A. García Charton (Université de Perpignan)

Jesus Falcón (Universidad de La Laguna)

Rogelio Herrera (Universidad de Las Palmas de Gran Canaria)

Fernando Espino (Universidad de Las Palmas de Gran Canaria)

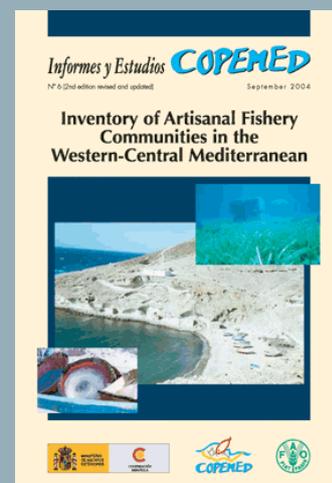
Mateo Garrido (Universidad de Las Palmas de Gran Canaria)

Arturo Boyra (Universidad de Las Palmas de Gran Canaria)

Fernando Tuya (Universidad de Las Palmas de Gran Canaria)

Leon Gutierrez (Universidad de Las Palmas de Gran Canaria)

Olga Reñones (IEO, Laboratorio de Baleares)



Toni García-Rubiés (Institut d'Estudis Avançats de Blanes, CSIC)

Bernat Hereu (Universidad de Barcelona)

This study has been totally developed and financed by the FAO Project for Co-ordination of Fisheries in the Western and Central Mediterranean (COPEMED).

INFORMES Y ESTUDIOS COPEMED N^o.08

Oliver Reus, P.A. and Agostini, V.

Environmental Variability and small pelagic fisheries in the Mediterranean Sea

The importance of the relationship between environmental and fishery variability has been repeatedly addressed in the Mediterranean. Understanding the mechanisms that govern year to year fluctuations in abundance as well as year class strength of Mediterranean fishes is essential for the assessment and management of this resource. Correlations between environmental variables and variations in the spatial and temporal distribution of fish populations in the Mediterranean have been addressed. The relationship between environmental forcing and different stocks of fish has not, however, been clearly identified.

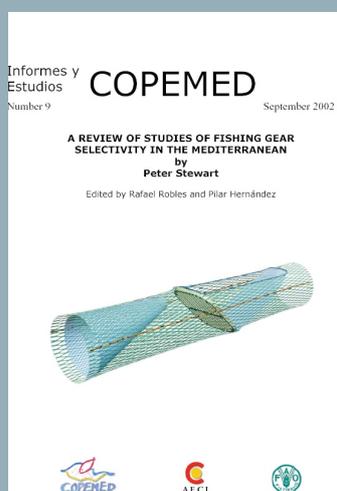
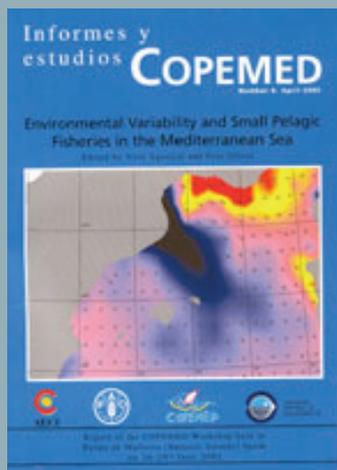
The workshop provided an opportunity for: I. Presentation and stimulation of current scientific thinking on this topic; II. Assessment of relevant Mediterranean data sources/owners; III. Assessment of existing techniques/software useful in these type of studies; IV. Assessment of the feasibility of a joint project involving interested workshop participants.

INFORMES Y ESTUDIOS COPEMED N^o.09

Stewart, P.

A review of studies of fishing gear selectivity in the Mediterranean

This study was commissioned to review past and present work on gear selectivity in the Mediterranean, to assess the relevance of work done elsewhere and to advise on experimental methods. By restricting the search for marine fisheries within the western and eastern Mediterranean, 116 relevant papers were found. A bibliography was compiled with nine categories: reviews, demersal fish selectivity, shellfish selectivity, novel cod-end selectivity, selectivity of set gear and artisanal fisheries, stock assessment surveys, gear performance and catch composition, techniques of measurement and analysis and by-catches of



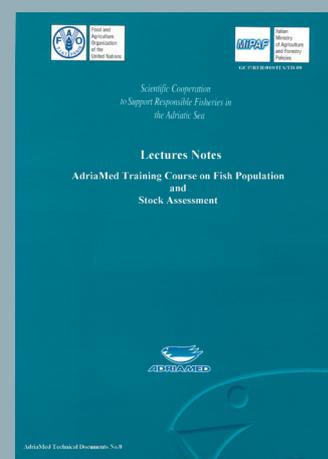
large sea creatures. The scarcity of review papers demonstrated the need for this review. Selectivity parameters for a relatively small number of commercially important species are reported. To aid this new work it was recommended that formal consultation with the fishing industry should take place; the capacity to observe gear and fish underwater should be developed; training in data analysis and fish behavior should be arranged.

ADRIAMED TECHNICAL DOCUMENTS N°.08

Kolding, J. and Ubal Giordano, W.

Lecture notes. Report of the AdriaMed Training Course on Fish Population Dynamics and Stock Assessment. Split, Croatia 10–29 September 2001

The AdriaMed Training Course on Fish Population Dynamics and Stock Assessment was held in Split, Croatia from the 10th – 29th September 2001. It was attended by participants from Albania, Croatia Italy and Slovenia. The main objective of the course was the enhancement of professional skills and the strengthening of scientific cooperation through joint analyses of the scientific information available on shared stocks. Furthermore, this training exercise created an ideal opportunity for junior scientists to perform cooperative analyses and joint assessment of those species whose stocks are shared in the Adriatic Sea. A selection of methods of fish stock assessment is described in detail, with examples of calculations (based on Excel[®] spreadsheets, available from the publisher). Special emphasis is placed on methods based on the analysis of length-frequencies. After a short introduction to statistics and sampling, the text covers the estimation of life parameters, gear selectivity, holistic and analytical models, and prediction models. The last two chapters dealing with multispecies and ecosystem approaches are meant to serve as a conceptual background for future discussions on multi-species considerations that are increasingly relevant in contemporary fisheries research and management.



ADRIAMED OCCASIONAL PAPERS N°.06

Cingolani, N. and Santojanni, A.

Manual of the Recorder – AdriaMed Training Course on Data Collection and Biological Sampling System on Small Pelagics

The AdriaMed Training Course on Small Pelagics Data Collection and Biological Sampling System was held in Ancona, Italy from the 8th – 11th may 2001. It was attended by experts from Albania, Croatia Italy and Slovenia. The main objective of the training course was to introduce a standard methodology for data collection and analysis (statistical data collection, biological sampling, age determination) to be implemented to execute the AdriaMed research programme “Data Collection and Biological sampling System on Small Pelagics”. This Manual focuses on the contents of the first training course, particularly dealing with issues related to biological parameters and otolith reading techniques.

ADRIAMED OCCASIONAL PAPERS N°.07

AdriaMed

Source and Accessibility of Socio-Economic data in AdriaMed member countries. Paper presented at the AdriaMed Meeting “Aspects of Fish Markets in the Adriatic Sea Fishery Sector”. Ancona, Italy 27-28 June 2002

The document presents one of the results of the research activities of the FAO-AdriaMed Project on Fishery Socio-economics in the Adriatic Sea. It deals with a survey on existing socio-economic data in AdriaMed member countries. This paper constitutes a tool for comparison of the existing information on the national fishery socio-economics sector. Contributions of each countries participating in AdriaMed (Albania, Croatia, Italy and Slovenia) are provided.

ADRIAMED TECHNICAL DOCUMENTS N°.09

AdriaMed

Report of the Fourth Meeting of the AdriaMed Coordination Committee. Split, Croatia 3-4 December 2002

The Fourth meeting of the Coordination Committee of the AdriaMed Project (Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea) was attended by representatives of participating countries (Albania, Croatia, Italy and Slovenia) and other interested parties. The meeting sought to present and discuss the results of the activities carried out by the Project. The outcome to date on all field research projects was presented and the work plan for the coming period was discussed and approved, relative to the main areas of Project activity: Adriatic Sea shared fishery resources; Adriatic fishery social and economic aspects; Fishery statistics and information systems; Adriatic Fishery Management; Relations at Mediterranean basin. The Coordination Committee expressed its approbation of the standard and the substance of the work carried out by AdriaMed in the region. As well as approving the plans made by the Project for development in the inter-committee period, the Committee gave some further indications and suggestions on some issues.



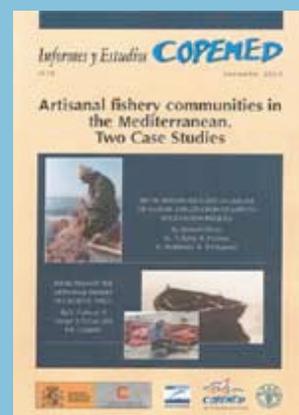
INFORMES Y ESTUDIOS COPEMED N°.10

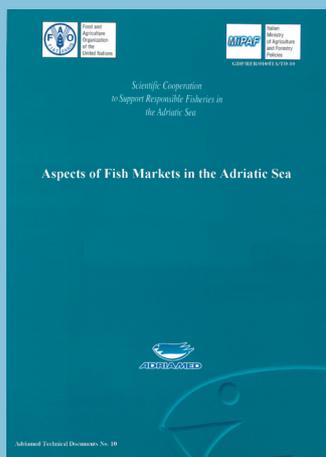
Colloca, F., Crespi, V., Coppola, R., Cerasi, S., Malouli Idrissi, M., Zahri, Y., Houssa, R., Abdellaoui, B., Elouamari, N.

Artisanal fishery communities in the Mediterranean.

Two Case Studies: Evolution of the artisanal fishery in Cilento, Italy. Pêche artisanale dans la lagune de Nador: exploitation et aspects socio-économiques

The present work illustrates two case studies dealing with small scale fisheries systems in two different and significant areas of the Mediterranean sea: the area of Cilento in Italy and Nador Lagoon in Morocco. The whole study on artisanal fisheries consisted of the planning and realization of the following major components: (i) methodological design; (ii) data collection (field work); (iii) data base (ArtFiMed); (iv) case studies; (v) processing and analysis; and (vi) CD output, including appropriate documentation and presentation.





ADRIAMED TECHNICAL DOCUMENTS N°.10

AdriaMed

Aspects of Fish Markets in the Adriatic Sea. Report of the AdriaMed Meeting on the Aspects of Fish Markets in the Adriatic Sea. Ancona, Italy 27-28 June 2002

The AdriaMed Meeting on Aspects of Fish Markets in the Adriatic Sea was held in Ancona, Italy, on the 27th – 28th June 2002. The meeting was attended by experts from Albania, Croatia and Italy. The main objective of the meeting was to gain a better understanding of the fish markets through the collection of relevant information available at national and international (Adriatic Sea) level. The development of research on economics related to the fish market sector was highlighted. A review on the involvement and increasing interest of Italian agricultural economists in the fishery sector was presented, and some methodological considerations were given on the main areas of interest for agricultural economists dealing with fisheries. In particular, the issue of which methods and approaches of agricultural economists are most useful to analyse the economics of fisheries was addressed. The importance of reliable fishery statistics and the constraints often imposed by their unavailability was pointed out with reference to all Adriatic coastal countries. The general issues concerning fish markets in the region were underlined through working papers reviewing the macroeconomic information on Albanian, Croatian and Italian fish market and trade. Some case studies on specific aspects of fish markets in the Adriatic Sea were presented: a) the case describing the market strategic choice made by the Ancona Fishery (Italy), which is based upon the quality certification of the fish product, with quality being a major economic support and incentive to reach sustainability within the sector; and b) the case study of the Termoli fishery (Italy), which was given as an example of how production costs and market aspects can affect relatively small local fisheries. References to the EU directive n.493 of 1991, which gives new tasks to the functioning of fish markets, were made: the importance of not dismantling fish markets but instead rationalising them was underlined. Among the various and diverse aspects influencing the fish markets in the Adriatic Sea region, the most relevant were identified. First of all, fish marketing and trading systems in the Adriatic are very different. They are more developed in some countries and less developed in others, where they are currently being improved. There was general agreement on the fact that without a fish market system and a related proper legislation framework, there is little chance of rationalising fisheries in the Adriatic basin.

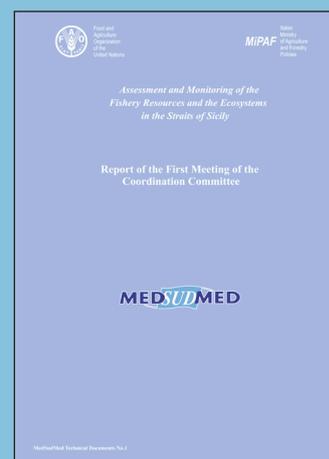
As most fishery resources in the Adriatic Sea are shared by the fleets of coastal countries, it emerged that trade is also somewhat shared, as resources are the same both from the point of view of their distribution and exploitation, and that of trading. Import and export dynamics are particularly important for the region: this aspect should be increasingly investigated because it is very complex. The absence in some countries of fish markets from an institutional point of view is to be particularly stressed. Another issue that emerged from the meeting was the need to invest in quality as a positive effort. Lastly, it was concurred that the development of a common strategy not only for fishery Management but also for fishery product marketing and Trading would be highly desirable. Moreover, the necessity to foster the participation of the Adriatic socio-economic experts in an international context such as the Sub-Committee on Social and Economic Sciences of the GFCM-SAC was underlined.

MEDSUDMED TECHNICAL DOCUMENTS N°.01

MedSudMed

Report of the First Meeting of the MedSudMed Coordination Committee. Rome, Italy 19-20 September 2002

The first meeting of the Coordination Committee of the MedSudMed Project (Assessment and Monitoring of the Fishery Resources and Ecosystems in the Straits of Sicily) was attended by representatives of participating countries (Italy, Libya, Malta and Tunisia) and other interested parties. The meeting was held to evaluate the first months of Project implementation, corresponding to the settlement of the Project, its start-up and the establishment of the contacts with the participating countries. An overview was given of the contacts established with the research Institutes of the participating countries, and the discussions held with the researchers. The briefing and technical meetings that were held during the initial phase of the Project were summarized, and stress was put on the content and outline of a work plan. The consequent proposal for the general outline of research has been discussed and approved for the implementation of the future activities on demersal resources, small pelagic fish and marine protected areas. Besides, the conceptual design of the future MedSudMed Information System was presented, and confidentiality and accessibility of the data were discussed. Explanations were given on the interactions between the MedSudMed Project and the MedFisis Project proposal, regarding the coordination of the statistical and related data processing activities of the FAO

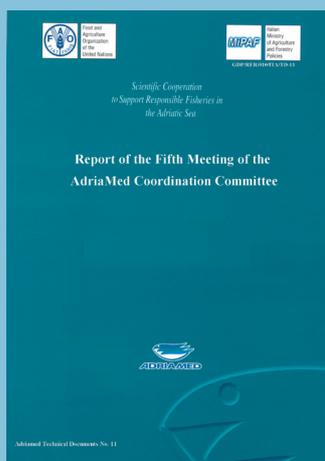


regional Projects in the Mediterranean. Specific requirements for the MedSudMed countries concerning national capacity building were highlighted. The Coordination Committee stressed the importance of improving activities planned to strengthen cooperation with the GFCM. Finally the priorities identified for the future and activities scheduled were listed and approved by the Project Coordination Committee.

ADRIAMED TECHNICAL DOCUMENTS N°.11

AdriaMed

Report of the Fifth Meeting of the AdriaMed Coordination Committee. Rome, Italy 18-19 September 2003



The Fifth meeting of the Coordination Committee of the AdriaMed Project (Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea) was attended by representatives of participating countries (Albania, Croatia, Italy, Slovenia and for the first time the Republic of Serbia and Montenegro) and other interested parties.

The meeting sought to present and discuss the results of the activities carried out by the Project referring to the period 2003-2004. The operative programme followed the methodological approach applied by the Project in implementing the Research Programmes, in strengthening and supporting the AdriaMed Working Groups and network of experts, in improving relations at Mediterranean level between the Project, the GFCM and other regional project entities. The outcome to date on all field research projects was presented and the work plan for the coming period was discussed and approved, relative to the main areas of Project activity: Adriatic Sea shared fishery resources; Adriatic fishery social and economic aspects; Fishery statistics and information systems; Adriatic Fishery Management; Relations at Mediterranean basin. The level of scientific cooperation achieved, the multidisciplinary frame which is being established, the effective data sharing and the progress made in the cooperative appraisal of fishery resources, make the concrete foundations to initiate the process of identifying and agreeing on an array of multidisciplinary sustainable fisheries development indicators, concerted at regional level. The AdriaMed cooperative framework will be further strengthened by the imminent adherence of the Republic Serbia and Montenegro. The AdriaMed participating Countries, through their delegates, wished to clearly point out that the future continuation of the AdriaMed experience is an essential condition to ensure the management and development of the fisheries sector of the whole Adriatic Sea.

ADRIAMED OCCASIONAL PAPERS N°.06 REV.1

Cingolani, N. and Santojanni, A.

Manual of the Recorder – AdriaMed Training Course on Data Collection and Biological Sampling System on Small Pelagics. Ancona, Italy 8–11 May 2001

The document is the revised version of the previously published “Manual of the Recorder”. It is structured in two parts. Part I contains the “Manual of the Recorder” prepared in occasion of the AdriaMed Training Course on Data Collection and Biological Sampling System on Small Pelagics which was held in Ancona, Italy from the 8th – 11th May 2001. The main objective of the training course was to introduce standard methodology for data collection and analysis to be implemented during execution of the AdriaMed research programme “Data Collection and Biological Sampling System on Small Pelagics in the Adriatic Sea”. Part I of this document focuses on the contents of this training course, particularly dealing with issues related to catch and effort data collection and biological sampling. Part II is the Age Determination Manual issued in occasion of the AdriaMed Training Course on Fish Age Determination by Otolith Reading, organised within the same AdriaMed Research Programme in Ancona (Italy), 13th – 24th May 2002. This second training course dealt with age reading in order to introduce standard methodology for anchovy (*Engraulis encrasicolus*) otolith collection and analysis for age determination purposes.

ADRIAMED OCCASIONAL PAPERS N°.08

Giannetti, G. and Donato, F.

Age Determination Manual. AdriaMed training course on fish age determination by otolith reading. Ancona, Italy 13–24 May 2002

The AdriaMed Training Course on Fish Age Determination by Otolith Reading was held in Ancona, Italy from the 13th – 24th May 2002. It was attended by participants from Albania, Croatia Italy, Slovenia and Montenegro. The main objective of the training course was to introduce a standard methodology for anchovy (*Engraulis encrasicolus*) otolith collection and analysis for age determination purposes, to be implemented within the execution of the AdriaMed research programme “Data Collection and Biological sampling System on Small Pelagics in the Adriatic Sea”.

ADRIAMED OCCASIONAL PAPERS N°.09

Cingolani, N., Kariš, T., Sinovčić, G., Kapedani, E.

Anchovy (*Engraulis encrasicolus*, L.) stock assessment in the Adriatic Sea: 1975-2002. Paper presented at the GFCM-SAC Working Group on Small Pelagic Species. Tangier, Morocco 12-14 March 2003

Anchovy (*Engraulis encrasicolus*, L.) is one of the most important commercial species of the Adriatic Sea. The stock of anchovy living in the northern and central Adriatic Sea is shared between Italy, Slovenia and Croatia. This assessment is relative to the anchovy stock of the northern and central Adriatic Sea (GFCM GSA 17), pooling together data from Italy, Slovenia and Croatia. It has been carried out in the context of the AdriaMed-SP research programme. The annual catch of anchovy for the three countries mentioned was obtained for the time interval 1975-2002. These quantities were distributed into fish age classes, so that catch-at-age data were available. That represented the basic input data of Virtual Population Analysis (VPA), employed for the stock assessment described herein. Annual values of mid-year stock biomass at sea, annual values of the unweighted mean fishing mortality rate over the age class range 0-3, annual values of mid-year spawning biomass and corresponding ratios between catch and mid-year spawning biomass were obtained. In addition, annual exploitation rates were calculated and compared with a threshold derived from literature and suggested for small pelagics. The minimum value of both catch and biomass at sea were estimated in 1987, when a substantial drop in the catch and crisis of the anchovy fishery occurred. Even if high values of both fishing effort and fishing mortality rate were obtained for some years before 1987, very low levels of recruitment in 1986 and 1987 seem to be mainly responsible for the collapse of the stock. Since current biomass seems not have risen to the values observed before collapse, it would be unwise for fishing effort to be allowed to rise. With regard to the south Adriatic (GFCM GSA 18), not enough catch and effort data and biological data are currently available for the anchovy to allow stock assessment to be performed. Data collection in the south Adriatic is being carried out in the context of AdriaMed-SP research programme together with the retrieval of past data. Therefore, in the near future, a joint stock assessment will be possible in this area too.

ADRIAMED OCCASIONAL PAPERS N^o.10

Cingolani, N., Kariš, T., Sinovčić, G., Kapedani, E.

Sardine (*Sardina pilchardus*, Walb.) stock assessment in the Adriatic Sea: 1975-2002. Paper presented at the GFCM-SAC Working Group on Small Pelagic Species. Tangier, Morocco 12-14 March 2003

Sardine (*Sardina pilchardus*, Walb.) is one of the most important commercial species of the Adriatic Sea. Stocks of sardine, living in the Northern and Central Adriatic Sea, is shared between Italy, Slovenia and Croatia. This assessment is relative to the sardine stock of the Northern and Central Adriatic Sea (GFCM GSA 17), pooling together data coming from Italy, Slovenia and Croatia. It has been carried out in the context of the AdriaMed-SP research programme. The annual catch of sardine for the three countries mentioned was obtained for the time interval 1975-2002. These quantities were distributed into fish age classes, so that catch-at-age data were available. That represented the basic input data of Virtual Population Analysis (VPA), employed for this stock assessment. Annual values of mid-year stock biomass at sea, annual values of the unweighted mean fishing mortality rate over the age class range 0-5, annual values of mid-year spawning biomass and corresponding ratios between catch and mid-year spawning biomass were obtained. In addition, annual exploitation rates were calculated and compared with a threshold derived from literature and suggested for small pelagics. Since decline of stock biomass is observed after the peak in the first half of the 1980s, and lowest values of this series only correspond to recent years, it would be unwise for fishing effort to be allowed to rise. An apparent increase in estimated biomass is observed in the last year, 2002: caution has to be taken when considering this, as VPA may have difficulties with incomplete cohorts; in addition, change in discarding phenomenon (particularly for small size sardines) could play a role in an apparent increase such as the one described. Therefore, monitoring of discarded quantities, as well as pattern as a function of sardine size, is also suggested. Concerning the South Adriatic (GFCM GSA 18), not enough catch and effort data and biological data on the sardine is currently available to perform stock assessment. Data collection in the South Adriatic is being carried out in the framework of the AdriaMed-SP research programme; the retrieval of past data is also going on. Therefore, in the near future, a joint stock assessment will also be possible in this area.

ADRIAMED OCCASIONAL PAPERS N°.11

Osmani, K., Decolli, P., Ceriola, L., Ungaro, N., Mannini, P.

Assessment of demersal resources by the Albanian trawl fishery: the case studies “hake” and “red mullet”. Paper presented at the GFCM-SAC Working Group on Demersal Species. Tangier, Morocco 12-14 March 2003

The past and current status of Albanian demersal trawl fishery is discussed on the basis of catch and effort data (time series 1960-1992) from the archives of Fisheries Research Institute of Durrës (Albania). Fishing effort steeply increased during the eighties, while a slight reduction has been reported for 1990-1992 when important political and economic changes occurred in the country. Annual yields and CPUEs for total demersal catches have quite stable trends up to the eighties, then they increased in the following two-three years as a result of the increased fishing effort and probably the improved technology (more efficient, bigger vessels, etc.). Strong fluctuations of fishery yields and CPUEs are reported from 1984 up to 1992. With regard to demersal fishery “target species”, surplus production models (biomass-dynamic models) fitted to the available data highlight the decrease of CPUE values for the hake (*Merluccius merluccius*) in the period of investigation. The same models did not provide reliable results for the red mullet (*Mullus barbatus*), a species characterised by a short life span and discrete recruitment. Nevertheless, taking into account the processing constraints of the models used, some new information for the area investigated is reported. The results have to be considered as the first attempt to study the Albanian demersal fishery in a thirty-year period.

ADRIAMED OCCASIONAL PAPERS N°.12

Milone, N., Zeuli, V., Mannini, P.

AdriaMed Trawl Survey Databank: User Manual

The first release of the AdriaMed Trawl Survey Databank system is presented. The application has been designed using Microsoft EXCEL[®] to organize, store and undertake the initial processing and analysis of the data available after the AdriaMed trawl survey of 2001. The background and rationale of the system is illustrated and some guidelines on the use and the utilities related to the system are given.

ADRIAMED TECHNICAL DOCUMENTS N^o.12

Vrgoč, N., Arneri, E., Jukić-Peladić S., Krstulović Šifner, S.,
Mannini, P., Marčeta B., Osmani, K, Piccinetti, C., Ungaro, N.

Review of current knowledge on demersal shared stocks of the Adriatic Sea

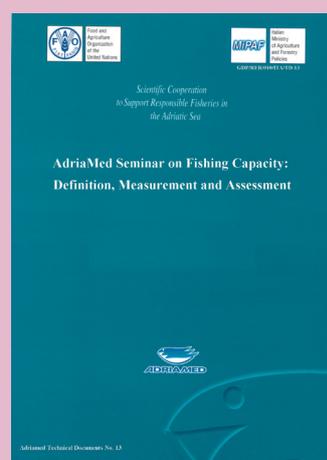
This document reviews and compiles the scientific information on the main commercial species whose stocks are shared by the coastal countries of the Adriatic Sea: European hake (*Merluccius merluccius*), Red mullet (*Mullus barbatus*), breams (*Pagellus* spp.), Whiting (*Merlangius merlangus*), anglerfish (*Lophius budegassa* and *Lophius piscatorius*), Commons sole (*Solea vulgaris*), Horned octopus (*Eledone cirrhosa*) and Musky octopus (*Eledone moschata*), Common cuttlefish (*Sepia officinalis*), European squid (*Loligo vulgaris*), Norway lobster (*Nephrops norvegicus*) and Deepwater rose shrimp (*Parapenaeus longirostris*). Following an introductory section and giving a geographical and hydrographical description of the area this document reviews, in its first part, the research carried out over the years on demersal fishery resources in the Adriatic Sea. It starts from the first expedition "Challenger" in 1873 and includes the results achieved up to year 2000-01. The second part of the document provides a description of each target species including bio-ecology, life-history parameters, fishery exploitation and fishing gear selectivity information. This work is the result of international scientific cooperation among the fishery research institutions participating in the FAO-AdriaMed Project.

ADRIAMED TECHNICAL DOCUMENTS N^o.13

AdriaMed

AdriaMed Seminar on Fishing Capacity: Definition, Measurement and Assessment. Fano, Italy 24-25 October 2002

The AdriaMed Seminar on Fishing Capacity was held at the Laboratory of Marine Biology and Fisheries, Fano, Italy on 24th and 25th October 2002. The Seminar aimed at familiarising experts from several fields related to fisheries in the Mediterranean to the issue of fishing capacity, its definition, measurement, assessment and related management options. The concepts of capacity utilization and target capacity, overcapacity and overcapitalization were introduced and clarified, together with the meaning of capacity under-utilization. In a context such as Adriatic fisheries, appropriate fleet segmentation is essential for capacity assessment. An important step is the



establishment of a proper comparative monitoring system in the Adriatic Sea region, based on correct segmentation of the fleet and also accounting for the important issue of polyvalent vessels. Given the multi-species and multi-gear nature of the Adriatic Sea fisheries, one of the management options to resize the fishing capacity would be to redirect the effort, however the estimation of capacity is possible only as a total and not for a single species. Examples of fishing capacity appraisal were provided through case studies from the English Channel, the Mediterranean and Adriatic Sea fisheries. To assess effective fishery management plans it is important to know the fleet size and structure, the potential output from the current fleet and the target management objectives, considering both biological and economic parameters. The Seminar reviewed possible ways to manage fishing capacity, all of which aim to contrast free and open access to fisheries. Healthy fisheries in an area such as the Mediterranean and Adriatic can only result from careful collaborative management with the sharing of national information at all levels.

MEDSUDMED TECHNICAL DOCUMENTS N°.02

MedSudMed

Report of the Expert Consultation on the Spatial Distribution of Demersal Resources in the Straits of Sicily and the Influence of Environmental Factors and Fishery Characteristics. Gzira, Malta 10–12 December 2002

The first Expert Consultation, Spatial Distribution of Demersal Resources in the Straits of Sicily and the Influence of Environmental Factors and Fishery Characteristics, was held in Malta from 10 to 12 December 2002. All four MedSudMed countries (Tunisia, Malta, Libyan Arab Jamahiriya, Italy) were represented, as well as colleagues from the CopeMed Project and one external expert from the University of Plymouth. As agreed during the Coordination Committee meeting, the objective of the Expert Consultation was to provide an overview of available knowledge on the issue, draw up a programme for the activities to be implemented on the basis of common methodology, propose pilot study cases and identify needs in national and regional expertise. The technical contributions regarded four main themes: fishery biology, physical environment, biocenoses, tools and data management. A synthesis was made by working groups who provided a summary of the available knowledge and data, a listing of the gaps and recommendations to fill these gaps. Discussions were conducted towards an agreement



on an indicative work plan. The adoption of common methods and terminology was considered of utmost importance. The standardization of available data and sampling design also appeared as a priority.

MEDSUDMED TECHNICAL DOCUMENTS N°.03

MedSudMed

Report of the MedSudMed Expert Consultation on Marine Protected Areas and Fisheries Management. Salammbô, Tunisia 14-16 April 2003

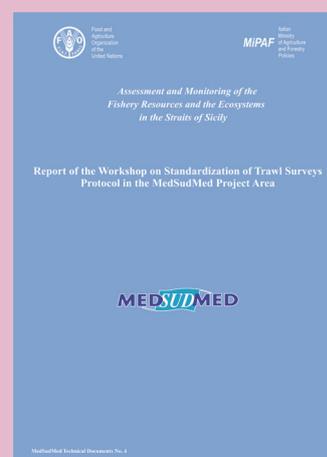
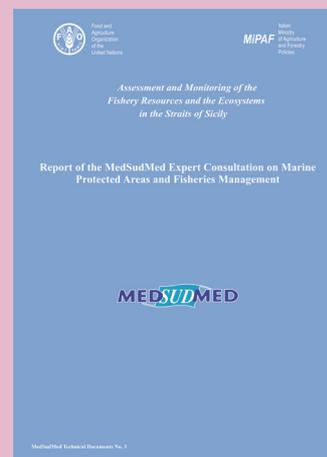
The second Expert consultation organized by the MedSudMed Project was devoted to Marine Protected Areas as tools for fishery management. It took place in Tunis from 14 to 16 April 2003. Twenty-seven experts from research institutions in the MedSudMed participating countries, as well as experts from the FAO CopeMed Project, UNEP RAC/SPA and IUCN attended the meeting. A total of 15 presentations were given according to the terms of reference of the meeting. On the basis of the experts' experience, an overview of several issues related to MPAs in the Mediterranean Sea was given. It highlighted the existence of expertise in the Project area as for monitoring and management of MPAs. The main points raised were: the suitable size for MPAs; impact of fishing closure and artificial reefs on stock and species diversity enhancement; impact of alien species on species diversity and strategies for their monitoring; the suitability of MPAs as fishery management tools. The meeting also allowed taking stock of the existing MPAs in some of the participating countries.

MEDSUDMED TECHNICAL DOCUMENTS N°.04

MedSudMed

Report of the Workshop on Standardization of Trawl Surveys Protocol in the MedSudMed Project Area. Mazara del Vallo, Italy 5-9 May 2003

The Workshop on Standardization of Trawl Surveys Protocol in the MedSudMed Project Area was held in Mazara del Vallo from 5 to 9 May 2003. Research institutes of all four MedSudMed Countries (Italy, Libyan Arab Jamahiriya, Malta and Tunisia) were represented as well as the project staff. The objective of the seminar was to provide all available information on the existing procedures to carry out national and international trawl surveys, compare them and agree on future common methodological protocols. The technical contributions regarded four relevant



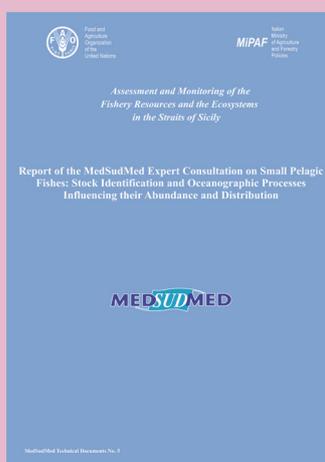
topics: planning of activities at sea and fishing gears, processing of the catches and biological sampling, collecting biological information on target species, and data management and processing. On the basis of these themes three working groups were constituted, who discussed respectively: planning of activities at sea and fishing gear, collecting biological sampling and data management. In short period the participants agreed to maintain most of the current procedures used in collecting data within the national programs and adopt procedures to standardize selected data to be stored in a regional data base to be used for preliminary common analysis.

MEDSUDMED TECHNICAL DOCUMENTS N^o.05

MedSudMed

Report of the MedSudMed Expert Consultation on Small Pelagic Fishes: Stock Identification and Oceanographic Processes Influencing their Abundance and Distribution. Salammbô, Tunisia 1–3 October 2003

The Expert Consultation on Small Pelagic Fish: Stock Identification and Oceanographic Processes Influencing their Abundance and Distribution was held from 1 to 3 October 2003 in Salammbô, Tunisia, and was hosted by the Institut National des Sciences et Technologies de la Mer (INSTM). The meeting was attended by 19 experts from 5 institutions in the Project Area, as well as representatives of the FAO Regional Projects AdriaMed and CopeMed. Fourteen communications were presented; they covered such issues as results of stock assessment carried out by echo-surveys in the Project area, spatial distribution of the main target species, results of the acoustic identification of small pelagic fish species, reproductive strategy and reproductive biology (reproductive cycle, maturity stages, age and growth), small pelagic fisheries, spatial distribution and modeling of fishing effort, influence of meteorological and hydrographical factors on small pelagic fish. The experience of the AdriaMed Project in promoting international cooperative research on shared small-pelagic fish stocks of the Adriatic Sea was presented, as well as the main results of the Workshop on Environmental Variability and Small-Pelagic Fisheries in the Mediterranean Sea organized by the CopeMed Project. The priority list of species that future activities should concentrate on was discussed in the light of the GFCM priority species list, economic and ecological importance, and taking into account the peculiarities of each country. A short synthesis of gaps in the knowledge of the biotic and abiotic factors and oceanographic processes influencing the distribution and abundance of small pelagic fish species was



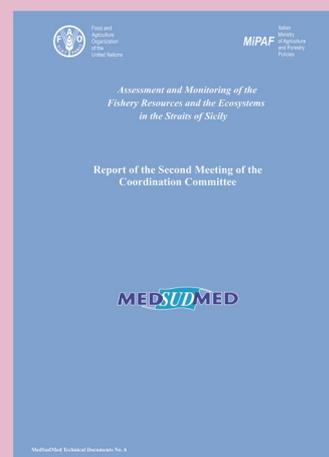
made. The main gaps identified concern: the migration of adults, transport of eggs and larvae, and the effect of abiotic factors. Many data are presently collected during the echosurveys, but they remain insufficient to conduct ecosystem-based studies. The lack of interdisciplinary studies in the area remains one of the main gaps. A series of proposals was discussed, dealing with: (i) spatial distribution and stock assessment of small-pelagic-fish populations; (ii) biological and genetic studies; (iii) eggs and larvae; (iv) relationships between biotic and abiotic factors and life-cycles of small pelagic fish species; (v) fishery analysis and catch and effort data. The importance of developing a functional database for acoustic data resulting from echo-surveys was discussed and agreed upon.

MEDSUDMED TECHNICAL DOCUMENTS N°.06

MedSudMed

Report of the Second Meeting of the Coordination Committee. Salammbô, Tunisia 11–13 February 2004

The Second meeting of the Coordination Committee of the MedSudMed Project (Assessment and Monitoring of the Fishery Resources and the Ecosystems in the Straits of Sicily) was attended by representatives of participating countries (Italy, Libyan Arab Jamahiriya, Malta and Tunisia) and other interested parties. The meeting sought to present and discuss the results of the activities carried out by the Project referring to the period September 2002 - December 2003. The outcome to date on all field research activities and strengthening national capacity building was presented, relative to the main areas of Project activity: spatial distribution of demersal resources in the Project area and the influence of environmental factors and fishery characteristics, small pelagic fish: stock identification and oceanographic processes influencing their abundance and distribution, marine protected areas as a tool for fisheries management. In particular, the results of the related expert consultations were presented, as well as the regional experts recommendations on the activities to be implemented in the next future. As a result, the work plan for the coming period was commented and approved by the participants who discussed issues touching working methodology, field work to be conducted, data processing and training in the field and at laboratory. The importance of standardizing the methodologies was stressed and considered fundamental for the Project purposes. The Project was encouraged to organize cooperative field research to provide information at regional level. The meeting was also updated on the achievements related to the regional database



and information system. Future developments regarding the finalization of several modules were agreed upon and considered highly relevant by the delegates. The delegates expressed their satisfaction with the work achieved to date and with the work plan adopted and encouraged the Project to make every effort to continue strengthening the scientific cooperation between the participating countries.

MEDSUDMED TECHNICAL DOCUMENTS N°.07

MedSudMed

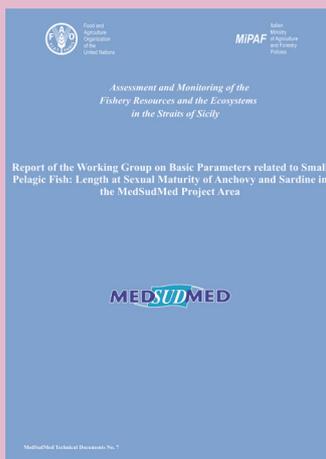
Report of the Working Group on Basic Parameters related to Small Pelagic Fish: Length at Sexual Maturity of Anchovy and Sardine in the MedSudMed Project Area. Mazara del Vallo, Italy 15–16 April 2004

The paper summarizes the discussions held during the working group on length at sexual maturity of anchovy (*Engraulis encrasicolus*) and sardine (*Sardina pilchardus*) organized by the MedSudMed Project. Six Geographical Sub Areas were represented at the meeting, and for each one of them a synthesis of the methodology currently applied to estimate the length at sexual maturity was made. The most documented species is anchovy, but several studies are in progress for sardine. Additional information was given for round sardine (*Sardinella aurita*), as it is an important species in one of the Geographical Sub Area included in the MedSudMed area. Participants discussed the possibility of standardizing the methodologies at regional level, in order to have joint estimates of the length at sexual maturity. An agreement was found on a way of performing a joint estimation of the length at sexual maturity of anchovy, using different data sets, but comparable approaches.

ADRIAMED OCCASIONAL PAPERS N°.13

Cingolani, N., Santojanni, A., Arneri, E., Berlardinelli A., Colella, S., Donato, F., Giannetti, G., Sinovic, G., Zorica, B.
Sardine (*Sardina pilchardus*, Walb.) stock assessment in the Adriatic Sea: 1975-2003. Paper presented at the GFCM-SAC Working Group on Small Pelagic Species. Malaga, Spain 6-7 May 2004

Sardine (*Sardina pilchardus*, Walb.) is one of the most important commercial species of the Adriatic Sea. Stock of sardine, living in the northern and central Adriatic Sea, is shared between Italy, Slovenia and Croatia. This assessment is relative to the sardine stock of the northern and central Adriatic Sea (GFCM



GSA 17), pooling together data coming from Italy, Slovenia and Croatia. It has been carried out in the context of the AdriaMed-SP research programme. The annual catch of sardine for the three countries mentioned was obtained for the time interval 1975-2003. These quantities were distributed into fish age classes, so that catch-at-age data were available. That represented the basic input data of Virtual Population Analysis (VPA), employed for this stock assessment. Annual values of mid-year stock biomass at sea, annual values of the unweighted mean fishing mortality rate over the age class range 0-5 were obtained. In addition, annual exploitation rates were calculated, compared with a threshold derived from literature and suggested for small pelagics. Since a decline in stock biomass was observed after the peak in the first half of the 1980s, and the lowest values of this series correspond just to recent years, it would be unwise for fishing effort to be allowed to increase. The exploitation is just higher than the threshold. Furthermore, difficulties in obtaining economically satisfactory catches by fishermen were perceived both in Italy and Croatia.

ADRIAMED OCCASIONAL PAPERS N°.14

Cingolani, N., Santojanni, A., Arneri, E., Berladinelli A., Colella, S., Donato, F., Giannetti, G., Sinovic, G., Zorica, B.

Anchovy (*Engraulis encrasicolus*, L.) stock assessment in the Adriatic Sea: 1975-2003. Paper presented at the GFCM-SAC Working Group on Small Pelagic Species. Malaga, Spain 6-7 May 2004

Anchovy (*Engraulis encrasicolus*, L.) is one of the most important commercial species of the Adriatic Sea. Stock of anchovy, living in the northern and central Adriatic Sea and is shared between Italy, Slovenia and Croatia. This assessment is relative to the anchovy stock of the northern and central Adriatic Sea (GFCM GSA 17), with pooled data coming from Italy, Slovenia and Croatia. It has been carried out in the context of the AdriaMed-SP research programme. The annual catch of anchovy for the three countries mentioned was obtained for the time interval 1975-2003. These quantities were distributed into fish age classes, so that catch-at-age data were available. That represented the basic input data of Virtual Population Analysis (VPA), employed for the present stock assessment. Annual values of mid-year stock biomass at sea and annual values of the unweighted mean fishing mortality rate over the age class range 0-3 were obtained. In addition, on the basis of the fishing mortality rates and natural mortality rate mentioned, annual exploitation rates were calculated and compared with a threshold derived from literature and

suggested for small pelagics. The minimum value of both catch and biomass at sea was estimated in 1987, when a strong drop in the catch and crisis of the anchovy fishery took place. Even if high values of both fishing effort and fishing mortality rate were obtained for some years before 1987, very low levels of recruitment in 1986 and 1987 seem to be mainly responsible for the collapse of the stock. Since current biomass seems not to have risen to the values observed before the collapse, it would be unwise for fishing effort to be allowed to increase.

ADRIAMED OCCASIONAL PAPERS N°.15

Guarniero, I., Garoia, F., Cilli, E., Landi, M., Di Placido, R., Cariani, A., Ramsak, A., Mannini, P., Ungaro, N., Piccinetti, C., Tinti F.

Genetic stock structure analysis revealed single population units in the shared stocks of Adriatic demersal species. Paper presented at the GFCM-SAC Working Group on Demersal Species. Malaga, Spain 6-7 May 2004

Two genetic research projects (financed in parallel by FAO-AdriaMed and by the Italian Ministry of Agriculture and Forestry Policies) have been carried out to identify population status and structure within the Adriatic shared demersal fish stocks, which are bio-economically relevant for SCSA in the Mediterranean. The sampling and genetic methodologies adopted by both projects were standardised as much as possible for all species by the use of MEDITS samplings and microsatellite marker analyses. Genetic estimators for population status (i.e. genetic polymorphism in terms of allelic diversity, heterozygosity, and fitting of Hardy-Weinberg equilibrium) and structure (i.e. genetic differentiation in terms of fixation indexes and gene flow rates) were applied using specific statistical software. High levels of genetic polymorphism and correlation with Hardy-Weinberg equilibrium were scored in most species, implying good status of stocks. Similarly, high levels of genetic homogeneity were observed among geographical samples in most species, clearly suggesting the occurrence of single population units within the Adriatic shared stocks. Low genetic polymorphism and weak genetic divergences were occasionally found, probably related to specific bio-ecological and behavioural features, and/or to methodological artefacts. In populations of marine species, such a pattern of genetic features can be related to large-size and unfragmented populations (a fishery question: Can it also be associated with undepleted stocks?). This initial picture of the population structure of several Adriatic marine fishery

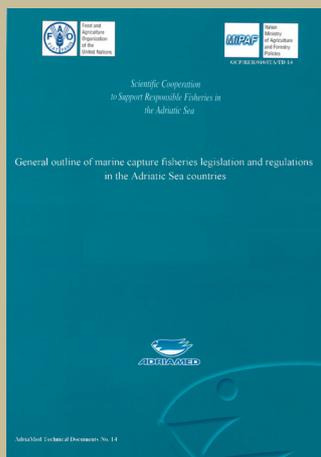
resources needs to be integrated by further genetic analyses carried out at a finer scale as well as by data obtained from other methodological approaches.

ADRIAMED OCCASIONAL PAPERS N°.16

AdriaMed

AdriaMed Social Survey of Albanian Marine Fisheries-Preliminary Results. Paper presented at the GFCM-SAC Sub-Committee on Economic and Social Sciences. Malaga, Spain 10-12 May 2004

This paper introduces the preliminary considerations resulting from the AdriaMed social survey of Albanian marine fisheries that was carried out in 2003. The objectives, the methodological approach and the structure of the survey are presented. Some considerations on the methodologies applied and results are also given.



ADRIAMED TECHNICAL DOCUMENTS N°.14

AdriaMed

General outline of marine capture fisheries legislation and regulations in the Adriatic Sea countries

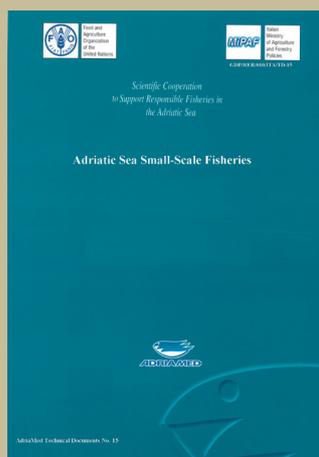
The purpose of this paper is to review national marine fisheries legislation and regulations of Albania, Croatia, Italy, Serbia-Montenegro and Slovenia. The review was undertaken in the framework of FAO-AdriaMed Project activities. In particular, the following topics are examined: i) Country participation in international fishery-related conventions and agreements, regional fishery bodies; ii) Access regimes to fisheries resources; iii) Definitions of terms; iv) Management and conservation measures; v) Monitoring, control and surveillance and measures.

ADRIAMED TECHNICAL DOCUMENTS N°.15

AdriaMed

Adriatic Sea Small-scale Fisheries. Report of the AdriaMed Technical Consultation on Adriatic Sea Small-Scale Fisheries. Split, Croatia 14–15 October 2003

The AdriaMed Technical Consultation on Adriatic Sea Small-Scale Fisheries was held on 14th and 15th October 2003 in Split, Croatia. The Consultation was attended by 21 experts from the four countries participating in the Project (Albania, Croatia, Italy and Slovenia). The objectives of the Technical Consultation were to review, on the basis of participants' experience, the current knowledge and the status of small-scale fisheries in Adriatic countries, to consider the existing monitoring systems, to have up-to-date information on the available scientific and technical knowledge in each country and on the on-going programs focusing on small-scale fisheries. In particular, species whose stocks are shared and small scale fishing gears exploiting these species were dealt with by the Technical Consultation. The Technical Consultation identified the following activities to be regarded as priority and functional to promoting regional scientific cooperation, focusing on the small-scale fishery sector: i) compilation of a gear catalogue of the gear types presently employed by the fisheries of the Adriatic coastal countries; ii) a case study aimed at the in-depth analysis of selected fishing communities; and iii) a fishing effectiveness appraisal based on comparative analyses of similar fishing gears or of the gears targeting a given species in different areas around the Adriatic basin. Four national reports and eight scientific contributions on small-scale fishery exploitation dynamics and interaction with



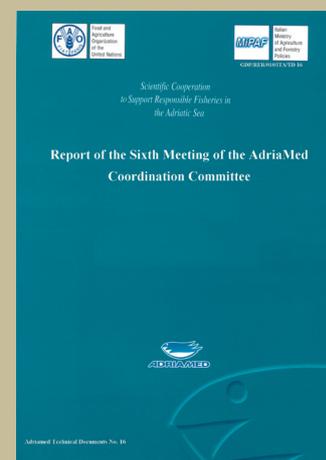
other fisheries presented during the Consultation are included in the document.

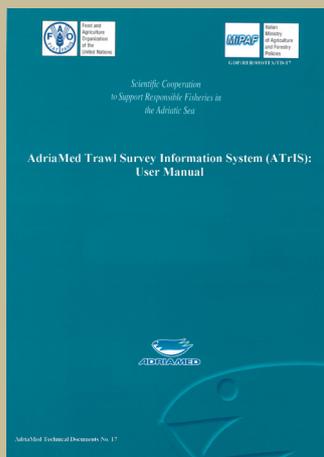
ADRIAMED TECHNICAL DOCUMENTS N°.16

AdriaMed

Report of the Sixth Meeting of the AdriaMed Coordination Committee. Budva, Montenegro 5-6 October 2004

The Sixth Meeting of the Coordination Committee of the FAO AdriaMed Regional Project “Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea” was held in Budva, Serbia and Montenegro, 5th and 6th October 2004. It was attended by representatives of the Project participating countries (Albania, Croatia, Italy, Serbia and Montenegro, and Slovenia) and other interested parties. The meeting sought to present and discuss the results of the activities carried out so far by the Project in its first phase of activities and the Coordination Committee was asked to discuss and deliberate on AdriaMed achievements and future direction. Moreover the activities carried out during the inter-committee period (2003-2004) with detailed description of the major scientific achievements and results of the Project highlighting their relevance to resource monitoring and the formulation of scientific advice for fishery management were presented according to its three main components: Adriatic fishery resources, Adriatic social and economic fishery sciences, Adriatic fishery statistics and information system. The Committee was reminded that the end of AdriaMed Project was scheduled for October 2004 and that an extension period (bridging phase) of one year (October 2004 – October 2005) was made possible thanks to additional funds provided by the Donor. The main issue of the first phase of the Project was to set up the data exchange, data gathering, to harmonize the methods applied at basin level and to form a joint data base on a number of issues. Phase two should include another level thus translating these data and results into actual advice to managers. The AdriaMed countries concurred on the necessity to ensure the continuation of the national execution of most programmes aimed at the routine and standardized monitoring and appraisal of shared resources and of the fisheries upon which they are based. Thus the Committee requested that FAO and the AdriaMed Project prepare a Project Proposal for the second phase of the Project.





ADRIAMED TECHNICAL DOCUMENTS NO.17

Gramolini, R., Mannini, P., Milone, N., Zeuli, V.

AdriaMed Trawl Survey Information System (ATrIS): User Manual

Through the FAO-AdriaMed Project the AdriaMed Trawl Survey Information System (ATrIS) has been developed as a simple and common tool to store and perform basic processing of the data collected by the countries participating in the AdriaMed demersal trawl survey. This document provides useful guidelines to ATrIS users. The objectives of the ATrIS are to facilitate storage, retrieval, updating, analysis and manipulation of trawl surveys data including spatially referenced information; to build capacity to create, use and maintain a trawl survey database in each country; to facilitate sharing of trawl surveys data within and between countries in the Adriatic Sea. The ATrIS consists of 2 parts: i) a database (Access) for storing the spatial and monitoring data for each survey, with basic querying, updating and reporting capabilities. and ii) a spatial database that includes data stored directly within GIS (i.e. ArcView). Key concepts upon which ATrIS has been developed are regional management structure, database consistency management methods, capacity building for data analysis and GIS application and enhanced reporting capacity.

ADRIAMED TECHNICAL DOCUMENTS N°.18

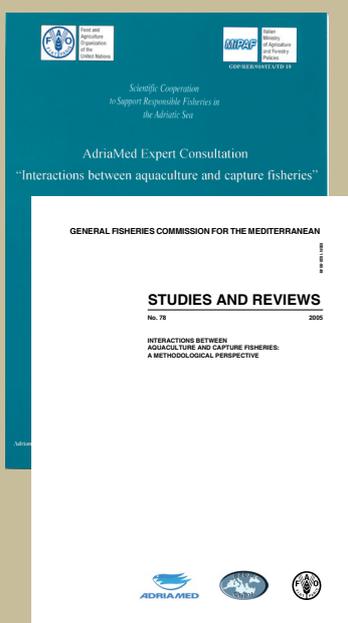
AdriaMed

AdriaMed Expert Consultation “Interactions between aquaculture and capture fisheries”

Issued as Cataudella, S.; Massa, F.; Crosetti, D. (eds.)

Interactions between aquaculture and capture fisheries: a methodological perspective. Studies and Reviews. General Fisheries Commission for the Mediterranean. No. 78.

The FAO AdriaMed Expert Consultation on the Interactions between Aquaculture and Capture Fisheries was held in Rome (Italy), from 5 to 7 November 2003. The principal objective of the Expert Consultation was to explore the main issues dealing with interactions between aquaculture and capture fisheries by using the existing knowledge available at the Adriatic basin level. This initiative would represent a contribution at sub-regional level towards the establishment and implementation of the principles of the FAO Code of Conduct for Responsible Fisheries (CCRF) concerning aquaculture activities. A preliminary matrix for the identification of indicators emerged and was drafted from comments made by the experts from the Adriatic present at the

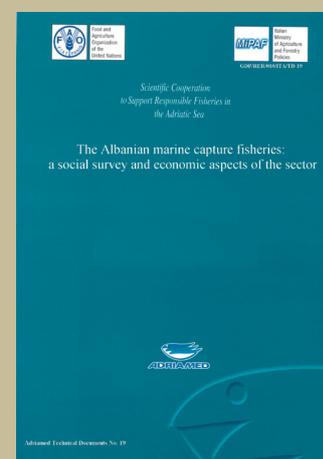


meeting. This matrix represents a first step towards the definition of a set of indicators, in order to monitor the relationship between aquaculture and capture fisheries in the Adriatic Region following the criteria for sustainability. Moreover the Expert Consultation adopted a series of recommendations that could be directed to the Adriatic countries in which it is underlined that positive and negative interactions between aquaculture and capture fisheries must be considered in the context of integrated Coastal Zone Management (CZM) from which they could benefit correct assessment and better interactions between these two sub-sectors, national programmes and international cooperation for research activities dealing with the interactions between aquaculture and capture fisheries both in marine and freshwater environments. Reports on the situation of the aquaculture sector for each participating country (Albania, Croatia, Italy, Montenegro and Slovenia) were discussed and these are included in the document. They include general information (history, tradition, evolution); the characteristics of the sector (historical statistics, species reared, methodologies and technologies applied, production data and seed availability); national policy (national plans, legislative framework, environmental impact assessment, economical feasibility) and production market (general economic indicators, export/import; national policy concerning quality control and labelling policy). Interactions with the national capture fisheries are also detailed. Thematic lectures with specific reference to the Adriatic Sea regarding the market of fish products, their quality and certification systems in both cultured and captured products were illustrated and discussed. Three case studies on the interactions between aquaculture and capture fisheries were also presented on blue fin tuna, eel and shellfish culture.

ADRIAMED TECHNICAL DOCUMENTS N°.19

Forleo, M., Flloko, A., Kristo, R., Mannini, P., Massa, F. (eds).
The Albanian marine capture fisheries: a social survey and economic aspects of the sector

This document introduces the outcome of the AdriaMed Social Survey of Albanian Marine Fisheries that was carried out in 2003 in order to gain a detailed insight into the social context of the Albanian fisheries. The socio-economic aspects considered were assessed from three standpoints: (1) personal data, (2) maritime district characteristics and relations, and (3) crew working conditions and fishing strategies. One hundred and eighty-three fishers were interviewed (561 questionnaires)



from 67 fishing vessels (30% coverage). The survey provided the Albanian fishery management authority with an analytical tool for the identification of the target groups and the livelihood of the fishers; the identification of the motivation of the resource users; the evaluation of the working conditions and fishing strategies; the understanding of the characteristics and the relations within and between the maritime districts; the business practices and strategy. Moreover, the study allowed for an analysis of the intergenerational dynamics between fishers, the interrelation of the various roles within the crew structure and the perception of strengths and weaknesses in the sector, within each maritime district and among the districts. The objectives, the methodological approach and the structure of the survey are presented. Some considerations of the methods used and results obtained are also given.

ADRIAMED OCCASIONAL PAPERS N°.17

Gramolini, R., Mannini, P., Milone, N., Zeuli, V.

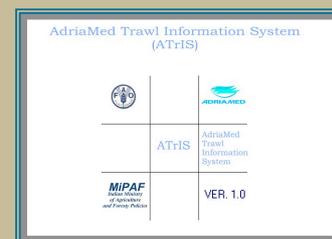
Developing a Regional Trawl Surveys Information System: ATrIS. Paper presented at the GFCM-SAC Sub-Committee on Statistics and Information Transversal workshop on GFCM Statistical Framework and Databases (including IUU white list). Rome, Italy 26 October 2005

Through the FAO AdriaMed Project, a Trawl Surveys Information System (ATrIS) has been developed for the AdriaMed Adriatic countries (Albania, Croatia, Italy, Serbia-Montenegro and Slovenia), providing a flexible common environment to standardize the trawl survey data collected in the AdriaMed demersal trawl surveys. ATrIS was conceived as a simple tool to store and perform basic processing of the data collected, to facilitate and to standardize the data entry and retrieval of data. The ATrIS system offers some basic utilities to interface data with the Geographical Information System (GIS). This paper provides an overview of the approach, the background and the rationale used to develop the AdriaMed ATrIS.

ATrIS ADRIAMED TRAWL INFORMATION SYSTEM SOFTWARE VERSION 1.0 - (CDROM)

AdriaMed

The CD-ROM contains the AdriaMed Trawl Surveys Information System (ATrIS) developed for the FAO AdriaMed Project collaborating countries (Albania, Croatia, Italy, Serbia-Montenegro and Slovenia), providing a flexible common environment to standardize the trawl survey data collected in the AdriaMed demersal trawl surveys. ATrIS was conceived as a simple tool to store and perform basic processing of the data collected, to facilitate and to standardize the data entry and retrieval of data. ATrIS offers some basic utilities to interface data with the Geographical Information System (GIS).

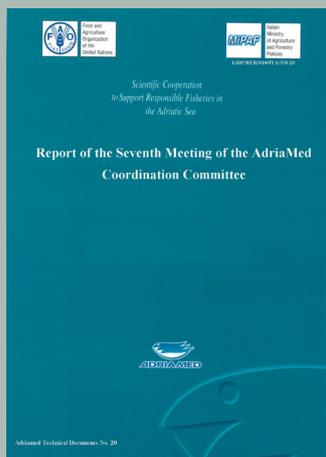


ADRIAMED DIGITALIZED CARTOGRAPHY OF THE ADRIATIC SEA - (CDROM)

AdriaMed

The CD-ROM contains the digitalized cartography of the Adriatic Sea (reference map scale 1:250.000) prepared by the FAO AdriaMed Project with the collaboration of the Hrvatski Hidrografski Institut (HHI) and the Istituto Idrografico della Marina Italiana (IIM).





ADRIAMED TECHNICAL DOCUMENTS N°.20

AdriaMed

Report of the Seventh Meeting of the AdriaMed Coordination Committee. Ljubljana, Slovenia 11-12 October 2005

The seventh meeting of the Coordination Committee of the FAO AdriaMed Regional Project “Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea” was held in Ljubljana, Slovenia, 11th and 12th October 2005. It was attended by representatives of the Project’s participating countries (Albania, Croatia, Italy, Serbia and Montenegro, and Slovenia) and other interested parties. The meeting sought to present and discuss the results of the activities carried out by the Project referring to the period 2004-2005, the so-called “Bridging Period”. The activities followed the methodological approach used by the Project and were presented according to the three main components that are: the Adriatic Fishery resources, the Adriatic social and economical fishery sciences and the Adriatic fishery statistics and information systems. The Committee was reminded that the end of the AdriaMed Project’s “bridging period” was foreseen for 31/10/2005, and attention was drawn on the working paper “Project Future Implementation”, in which objectives, outputs and activities of the proposed extension phase of AdriaMed were introduced and illustrated. In principle, there was a general agreement and expression of satisfaction by the Committee towards the document, however some fine-tuning is still required, in particular for the introduction of some of the activities and outputs. There was also a general recommendation by the Committee to move the Project Headquarters to Rome as this represents for AdriaMed a better logistic situation, also considering cost-efficiency aspects. The period from November 2005 to January 2006 was considered the most appropriate timescale for the implementation of the programme for the next year and for the transfer to FAO HQ.

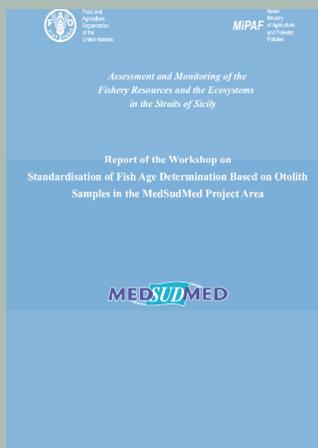
MEDSUDMED TECHNICAL DOCUMENTS N°.08

Rizzo, P. , Gancitano, S., Badalucco, C., Enajjar, S., Mancusi, C., Mosteiro Cabañelas, A., Saidi, B., Sion, L.

Contribution to Guidelines for Age Determination of Chondrichthyes fish from the Mediterranean Sea (application to selected species). Mazara del Vallo, Italy 22 November-1 December 2004

The MedSudMed workshop on age determination of selacean fish was held in Mazara del Vallo, Italy, from 22 November to 1 December 2004. It was attended by participants from Tunisia, Italy and Malta. The main objective of the workshop was to provide an overview of techniques currently used in the MedSudMed Project area for preparation and reading of spines and vertebrae of a series of cartilaginous fish species (*Centroscymnus coelolepis*, *Cetorhinus maximus*, *Carcharhinus plumbeus*, *Galeus melastomus*, *Scyliorhinus canicula*, *Mustelus mustelus*, *Rhinobatos cemiculus*, *Rhinobatos rhinobatos*, *Raja clavata*, *Squalus blainvillei*, *Chimaera monstrosa*). The course provided training and joint preparation and interpretation of samples provided by the participating institutes. Participants had agreed on a common protocol for preparation of the samples prior to the course. Direct observation of vertebrae and spines was conducted, along with tests of two methods for enhancing the appearance of the growth bands (red alizarin and cobalt nitrate). On the basis of the laboratory work and of the relevant bibliography available, trials were performed to identify the most relevant techniques for each species studied. This document details the work done during the workshop and provides general guidelines for cartilaginous fish age determination, as well as the limits of the methods currently used and improvements that could be made in the near future. It appeared that direct observation gave good results for all species except *C. coelolepis*. Red alizarin and cobalt nitrate staining procedures also improved the appearance of growth patterns except for *C. plumbeus*, *Centroscymnus coelolepis*, *Scyliorhinus canicula* and *Galeus melastomus*. Good results were obtained for some species (*C. plumbeus*, and *G. melastomus*), according to the size of the observed individuals. Further investigations are needed; in particular, larger samples should be examined to confirm the methods used and to provide detailed guidelines to be used at the regional level.



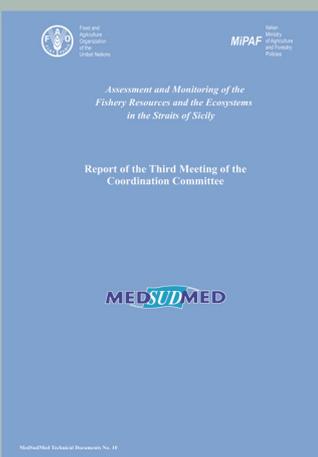


MEDSUDMED TECHNICAL DOCUMENTS N°.09

MedSudMed

Report of the Workshop on standardization of fish age determination based on otolith samples in the MedSudMed Project area. Mazara del Vallo, Italy 13-17 December 2004

The Workshop was attended by experts from Tunisia, Italy, Libyan Arab Jamahiriya and Malta and an international expert on fish age determination, Ms H el ene de Pontual, from the Institut Fran ais de Recherche pour l'Exploitation de la Mer (IFREMER). The main objective of the workshop was to study the possibility of elaborating a standard protocol on ageing in the MedSudMed Project area, based initially on two target species: *Merluccius merluccius* and *Mullus barbatus*. The current activities in the Project Area and an overview of the methods now used were presented, including existing national and international protocols and their principal technical characteristics regarding materials, methods, sampling design and data processing. Then the problems of standardizing age-reading methodology for the target species were discussed: choice of the hard structure, sampling, otolith extraction, otolith conservation, preparation techniques, accuracy and precision, validation etc. A laboratory exercise of age-reading techniques for *Mullus barbatus* was conducted to check the age-reading agreement and precision among six readers. The average percentage agreement in respect of the modal age across all ages and readers in the comparison was 55.2% and the average coefficient of variation (CV) was 45.5%. The relative bias showed that all the readers tended to underestimate older age-classes. Finally, the participants agreed on a common protocol for age determination of the target species and proposed a future intercalibration exercise to assess the percentage agreement in age determination among readers.



MEDSUDMED TECHNICAL DOCUMENTS N°.10

MedSudMed

Report of the Third Meeting of the Coordination Committee. Tajura, Libya 1-2 February 2005

The third meeting of the Coordination Committee of the MedSudMed Project (Assessment and monitoring of the fishery resources and the ecosystems in the Straits of Sicily) was attended by representatives of participating countries, a representative from the European Commission, the FAO Technical matter Officer as well as FAO MedSudMed staff. The meeting sought to

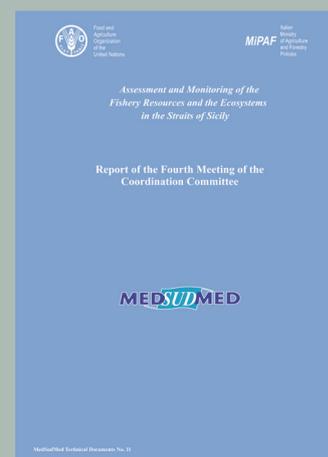
present and discuss the results of the activities carried out by the Project referring to the period February 2004 - January 2005. In particular, the results of the working groups, training courses and technical consultations organized during this intercommittee period were presented. The outcome to date of all field research activities was presented and the work plan for the coming period was discussed and approved, relative to the main areas of the Project activities: spatial distribution of demersal resources in the Project area, the influence of environmental factors and fishery characteristics, small pelagic fish: stock identification and oceanographic processes influencing their abundance and distribution, marine protected areas as a tool for fisheries management. The Committee expressed its appreciation for the quantity and quality of the work carried out by the Project and for the level of coordination achieved, especially concerning the standardization of methodologies at regional level.

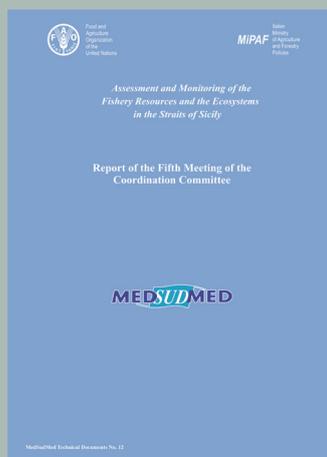
MEDSUDMED TECHNICAL DOCUMENTS N°.11

MedSudMed

Report of the Fourth Meeting of the Coordination Committee. St. Julians, Malta 15–16 February 2006

The Fourth Meeting of the MedSudMed Coordination Committee was attended by representatives of the Donor (Italy), delegations from the countries participating in the Project (Italy, Libyan Arab Jamahiriya, Malta and Tunisia), the Chair of the Scientific Advisory Committee (SAC), the Deputy Executive Secretary of the General Fisheries Commission for the Mediterranean (GFCM) as well as the FAO staff of the MedSudMed Project. A brief reminder was made on the Project objectives and activities and a presentation of the activities implemented for the four MedSudMed components during the intersession period was made. The proposed work plan for the next period was discussed and approved. It focuses on the same priorities of standardizing approaches, increasing scientific knowledge on fishery resources and ecosystems, strengthening national expertise and regional cooperation. A positive appraisal of the MedSudMed Project for supporting all the participating countries in the assessment and monitoring of the fisheries resources and for the good job carried out since the beginning was given. The belief that continuing the Project can only bring success and be beneficial for each of the participating countries was affirmed.



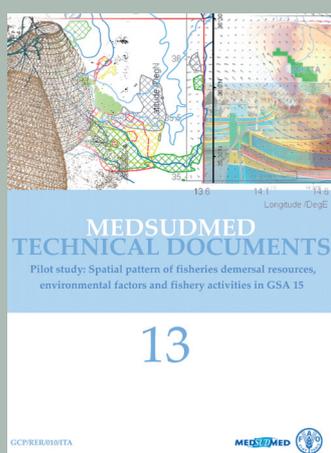


MEDSUDMED TECHNICAL DOCUMENTS N°.12

MedSudMed

Report of the Fifth Meeting of the Coordination Committee. Rome, Italy 9–10 November 2006

The Fifth Meeting of the Coordination Committee was attended by representatives of the Donor (Italy), delegations from the countries participating in the Project (Italy, Libyan Arab Jamahiriya, Malta and Tunisia), the Chief of the FAO Marine Resources Service (FIRM), the Chair of the Scientific Advisory Committee (SAC), the Executive Secretary and the Deputy Executive Secretary of the General Fisheries Commission for the Mediterranean (GFCM), a representative from the European Commission (EC) as well as the staff of the FAO MedSudMed Project. A brief reminder was made on the Project objectives and activities and a presentation of the activities implemented for the four MedSudMed components during the inter-session period was made. The proposed work plan for the next period was discussed and approved. It focuses on the same priorities of standardizing approaches, increasing scientific knowledge on fishery resources and ecosystems, strengthening national expertise and regional cooperation. A positive appraisal of the MedSudMed Project for supporting all the participating countries in the assessment and monitoring of the fisheries resources and for the good job carried out since the beginning was given. The belief that continuing the Project can only bring success and be beneficial for each of the participating countries was affirmed.



MEDSUDMED TECHNICAL DOCUMENTS N°.13

MedSudMed

Spatial distribution of demersal fishery resources, environmental factors and fishing activities in GSA 15 (Malta Island)

The FAO–MedSudMed Regional Project has promoted research on the improvement of knowledge on fishery ecosystems, with a view to the sustainable management of living marine resources in the central Mediterranean (Straits of Sicily). A pilot study focused on the waters around the Maltese Islands (GSA 15), with the aim of providing a comprehensive overview of the spatial distribution of the different life stages of exploitable demersal fishes in relation to the type and distribution of fishing, as well as to the oceanographic factors characteristic of the area of study. Critical zones for their role in the ecology of the main demersal fishery target species were investigated using species abundance data disaggregated by life stage. Spatial analysis

and the application of GIS techniques allowed the identification of preferred habitats (e.g. nursery, feeding and spawning areas) for *Merluccius merluccius*, *Mullus barbatus*, *Parapenaeus longirostris*, *Raja clavata* and *Raja miraletus*. The impact of fishing on these species was assessed, particularly in terms of fish assemblages. The transport paths of early life stages were also hypothesized on the basis of oceanographic factors typical of the area. The results revealed that the spatial distribution of the main fishery resources overlaps the limits of the current GSAs. The analysis of oceanographic factors showed that some fishery resources are sustained by young individuals transported from adjacent GSAs. The results also demonstrated that the spatial distribution of the main demersal fishery resources in the Mediterranean GSA 15 straddles other GSAs, in particular as concerns nursery and spawning areas, indicating that some fishery resources are shared. This implies that harmonized fishery management should be applied over a larger area than is implied by the GSA concept. Finally, the study showed how data provided by different methods could be integrated to enhance the available scientific information in a data-limited situation.

ADRIAMED OCCASIONAL PAPERS N°.18

Albanian Fishery Policies Directorate, AdriaMed, MedFisis

An Overview of the Albanian Fishing Fleet and Landing Dynamics. Paper presented at the GFCM-SAC Sub-Committee on Fishery Statistics and Information. Rome, Italy 11-14 September 2006

This paper describes the design, implementation and performance of the Albanian Fisheries Information System, including results of two years' monitoring of the Albanian commercial fishing fleet (from January 2003 until December 2004). Landing data are analysed, some relevant issues related to data handling, processing and analysis are identified and discussed. Lastly, considerations are formulated for the further improvement of the Albanian Fishery Information System.

ADRIAMED OCCASIONAL PAPERS N°.19

Accadia, P., Ceriola, L., Mannini, P., Massa, F., Milone, N., Ungaro, N.

Applicability and performance of some biological and economic indicators for the Adriatic Sea trawl fisheries in the western GFCM GSA 18

This paper analyses the state of trawl fisheries in the Southern Adriatic Sea (FAO Geographical Sub Area 18) from a biological, economic and social point of view. The analysis was performed using a set of forty-six indicators, twenty-one of which belong to the category of biological (population and community) indicators to be obtained from fishery-independent data and the remaining twenty-five are of socio-economic nature and of fishery-dependent origin. Biological indicators and relative estimators were classified for the single species (population level: *Eledone cirrhosa*, *Eledone moschata*, *Illex coindetti*, *Merluccius merluccius*, *Mullus barbatus*, *Nephrops norvegicus*, *Parapenaeus longirostris*, *Raja clavata*, and *Zeus faber*) as well as for the multispecies approach (community level). Economic indicators include six indicators on economic performance, eight on productivity, four on costs and prices, and one general indicator summarising economic sustainability. From the social point of view, five indicators plus one general indicator summarising social sustainability are defined. Particular attention was devoted to the selection and analysis of sustainability indicators. The standard distinction among biological, economic, and social sustainability has been held in this paper. Trends of these indicators were analysed using the so-called Traffic light system. Reference values were set according to their percentile value in the following series: > 66th percentile, 66th-33rd, and < 33rd percentile. Based on each specific indicator, the three standard colours, green, yellow, and red, were assigned to the three areas defined by the reference values at 33rd and 66th percentiles. The analysis was performed by using data available from the MEDITS surveys project and from IREPA monitoring system in the basin concerned. The period under consideration goes from 1996 to 2003. The inclusive discussion of the results from both fishery-independent and fishery-dependent data analysis underlines some common features. In fact, an apparent and progressive deterioration seems to affect the trawl fishery system in the GSA 18 during the investigated period, according mainly to the variation in catch composition (increasing of r-strategist species and decreasing of k-strategist ones) and to the trajectories of some socio-economic indicators.

ADRIAMED OCCASIONAL PAPERS N° 20

Ungaro, N. Gramolini, R. Osmani, K. Milone, N.

A methodological contribution to the identification of recruitment relevant areas for some shared demersal fisheries resources in the Southern Adriatic Sea (GSA 18). Paper presented at the GFCM-SAC Subcommittee on Stock Assessment. Rome, Italy 11-14 September 2006

This paper represents an exercise to assess the practicability of the methodology applied for the identification of the methodological criteria for the definition of nursery/recruitment areas. The nursery areas are, as a rule, zones characterised by the high concentration of juveniles. The threshold size for the juveniles is generally considered as the length attained at the first year age (Fiorentino *et al.*, 2003), but other metrics can also be considered. In this study, the presence and spatial distribution of recruitment areas of some demersal species in the Southern Adriatic Sea (Italian and Albanian waters only, GSA 18) were analysed on the basis of MEDITS data collection (1996-2004). The identification and mapping of nursery zones were performed through the applications of geostatistic methods in order to confirm the information available in literature. The study on the distribution and consistency of recruitment areas was carried out for the shared demersal species *Merluccius merluccius*, *Lophius budegassa*, *Loligo vulgaris* and *Parapenaeus longirostris*.

ADRIAMED OCCASIONAL PAPERS N° 21

AdriaMed

Abstracts on small pelagic resources presented at the GFCM-SAC GFCM SAC Sub-Committee on Stock Assessment (Rome, 26-30 September 2005). Paper presented at the 7th AdriaMed Coordination Committee. Ljubljana, Slovenia 11-12 October 2005

Abstracts on Adriatic small pelagic resources presented at the GFCM-SAC Sub-Committee on Stock Assessment meeting held in Rome, 26-30 September 2005 by AdriaMed or other sources are reported.

ADRIAMED OCCASIONAL PAPERS N°.22

Crosetti, D.

Interactions between capture fisheries and aquaculture: the ecological fisheries dimension": a review of selected issues. Paper presented at the AdriaMed Coordination Committee. Tirana, Albania 12-13 December 2006

A bibliographic review on the "interactions between capture fisheries and aquaculture", with particular reference to the Mediterranean, is being compiled on the basis of the most relevant and recent literature available, as follow-up of the FAO AdriaMed Expert Consultation on "Interactions between aquaculture and capture fisheries" held in Rome (Italy), from 5 to 7 November 2003. This review is focused on the ecological fisheries dimension and is organised in four sections with independent reviews on the following issues: i) the genetic issue; ii) the pathology issue; iii) the wild seed issue; iv) the aquafeeds issue.

ADRIAMED OCCASIONAL PAPERS N°.23

Milone, N. and Zeuli, V.

The AdriaMed Portal web statistics (November 2006). Paper presented at the AdriaMed Coordination Committee. Tirana, Albania 12-13 December 2006

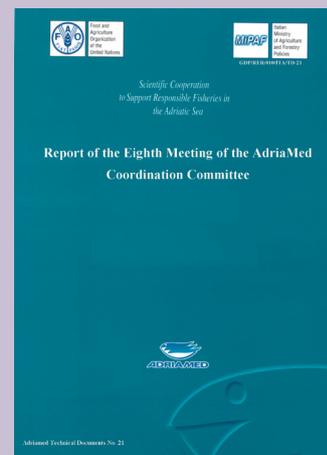
During the sixth year of activity, the AdriaMed Project produced nine databases, available on line on through the AdriaMed web portal (www.faoadriamed.org), and focusing on specific relevant areas of interest for the Project or the countries around the Adriatic Sea. These databases were finalised to improve the availability of information related to the Adriatic Sea fisheries and its accessibility; open access is provided to the information, facilitating the dissemination of scientific materials published in and on the area. The end users of these archives are the researchers, scientists and decision makers who can access a unique system of information at regional level. This simple guide illustrates the main characteristics of each database available on the AdriaMed portal, as well as on CD Rom.

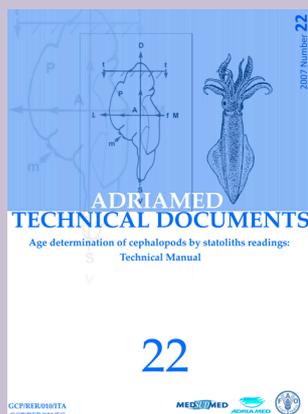
ADRIAMED TECHNICAL DOCUMENTS N^o.21

AdriaMed

Report of the Eighth Meeting of the AdriaMed Coordination Committee. Tirana, Albania 12-13 December 2006

The Eighth Meeting of the Coordination Committee of the FAO AdriaMed Regional Project “Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea” was held in Tirana, Albania, 12th and 13th December 2006. It was attended by representatives of the Project’s participating countries (Albania, Croatia, Italy, Serbia and Montenegro, and Slovenia) and other interested parties. The meeting sought to present and discuss the results of the activities carried out by the Project referring to the period 2005-2006. The activities followed the methodological approach used by the Project and were presented according to the three main components that are: the Adriatic Fishery resources, the Adriatic social and economical fishery sciences and the Adriatic fishery statistics and information systems. Attention was drawn on the working paper “Project Future Implementation”, in which objectives, outputs and activities of the proposed extension phase of AdriaMed for 2007 were introduced and illustrated. The Committee commended that the briefing provided by the Project clearly made evident the amount of scientific achievements compared with the given objectives of each scientific programme, the current state and the future options and actions to be considered in terms of sustainability and continuity also under a national execution scheme. The Committee agreed on the programme of activities proposed and some specific elements were pointed out with reference to some of the activities and related outputs. Furthermore the Committee as support to the programme presented, made the few additional specific suggestions.



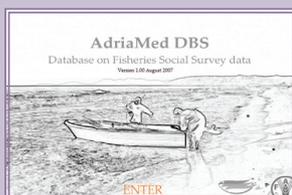


ADRIAMED TECHNICAL DOCUMENTS N°22

Ceriola, L. and Milone, N.

Age determination of cephalopods by statoliths readings: Technical Manual

The main objective of this document is to provide an useful guideline to the age determination methodologies applied to cephalopods using statolith reading. The document is the results of the training activities on this issue organized by the FAO regional Project AdriaMed and MedSudMed in 2006 and 2007. A selection of methods to extract, prepare and examine statoliths is described in detail. A brief introduction describing the importance of growth studies in cephalopods, as well as the function, internal structure and shape of statoliths is also included. Chapter 1 contains the background information. Chapter 2 describes the used terminology and illustrates the position, morphology and function of statolith in cephalopods. In Chapter 3 the equipment and material, the procedure to be used to extract, clean and prepare statoliths for reading, and the methods for the growth increment counting (statoliths reading) are described. Finally in Chapter 4 the potential outcomes of the age determination by using statolith analysis are illustrated. A Glossary is also included in the manual.



AdriaMed DBS - Database on Fisheries Social Survey data. Software version 1.0 - (CDROM)

AdriaMed

The FAO AdriaMed Project, designed and created the DataBase for fisheries Social surveys data (DBS) to hold and manage the data available from social surveys. The DBS is a stand-alone application designed and produced to organize the storage and preliminary analysis of the dataset available after the social survey of the fisheries sector in Albania (carried out in 2003). It is a simple, common tool to store data collected during any fisheries sector social survey and perform basic processing.

ADRIAMED OCCASIONAL PAPERS N°.24

AdriaMed

Some considerations on the concept and definition of the “priority species” for the fishery assessment and management purposes in the GFCM area-Preliminary appraisal for the discussion on the criteria to update the SAC shared stocks lists. Papers presented at the GFCM-Scientific Advisory Committee. Nicosia, Cyprus 22-26 October 2007

The need for clarification on the concept of the priority species is a key research question of the GFCM, as was reported in the Report of the Ninth Session of the SAC (Rome, 2006). Furthermore this issue was recommended in the SAC Preliminary Workplan for 2007: “*Priority species and shared stock lists: - identify criteria to update the SAC priority species and shared stocks lists, for all GSAs, including for the Black Sea.* The main task of this paper is to contribute to the discussion of the concept, analysing the available information and proposing some simple criteria, fundamental if the existing list is to be updated as requested.

ADRIAMED OCCASIONAL PAPERS N°.25

AdriaMed

AdriaMed database on fisheries social surveys data (DBS): User Manual

Through the FAO AdriaMed Project, the DataBase for fisheries Social surveys data (DBS) has been designed and created to hold and manage the data available from social surveys. The DBS is a stand-alone application designed and produced to organize the storage and preliminary analysis of the dataset available after the social survey of the fisheries sector in Albania (carried out in 2003). It is a simple, common tool to store data collected during any fisheries sector social survey and perform basic processing. The scope of this manual is to provide users with guidelines on the various tools available to turn raw data into useful information.

ADRIAMED OCCASIONAL PAPERS N°.26

Gramolini, R., Milone, N., Zeuli, V.

AdriaMed Trawl Survey Information System: the Biological indicators module user's manual (ver. 2.1)

Through the FAO AdriaMed Project the Trawl Surveys Information System (ATrIS) has been developed for the AdriaMed Adriatic countries (Albania, Croatia, Italy, Montenegro and Slovenia), providing a flexible common environment to standardize the trawl survey data collected in the AdriaMed demersal trawl surveys. ATrIS was conceived as a simple tool to store and perform basic processing of the data collected, to facilitate and to standardize the data entry and retrieval of data. The ATrIS system offers some basic utilities to interface data with the Geographical Information System (GIS). The ver. 2.1 includes updates as well a module for the estimation of biological indicators (identified by the Adriatic area researchers). This paper provides some guidelines for the use of the new module.

ADRIAMED OCCASIONAL PAPERS N°.27

Ceriola, L. and Massa, F.

Summary table of European hake (*Merluccius merluccius*) life history for the Mediterranean Sea and North East Atlantic Ocean according to the Essential Fish Habitat (EFH)

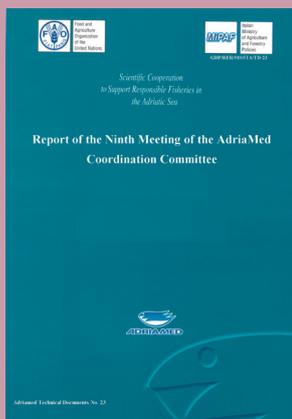
The document provides a first attempt to describe the available information on the distribution, abundance, and habitat requirements for *Merluccius merluccius* in order to facilitate the EFH identification. In this document information is presented as a table according to the model adopted by NOAA (1999). The table is referred as "Summary table for European hake (*Merluccius merluccius*) life history" and comprises a survey of the important literature regarding the whole range of distribution of the investigated species. The data include basic information on the environmental (e.g. location, depth, temperature, salinity) and biological features (e.g. growth, mortality, production) which characterize the different ontogenetic phases in the lifespan of the species. The information collected so far for *Merluccius merluccius* have been made available on the AdriaMed Web pages (<http://www.faoadriamed.org/html/Species/MerlucciusMerluccius.html>).

ADRIAMED OCCASIONAL PAPERS N°.28

Milone, N. and Zeuli, V.

AdriaMed Databases - A brief guide. Paper presented at the AdriaMed Coordination Committee. Zagreb, Croatia 18–19 December 2007

During the sixth year of activity, the AdriaMed Project produced nine databases, available on line on through the AdriaMed web portal (www.faoadriamed.org), and focusing on specific relevant areas of interest for the Project or the countries around the Adriatic Sea. These databases were finalised to improve the availability of information related to the Adriatic Sea fisheries and its accessibility; open access is provided to the information, facilitating the dissemination of scientific materials published in and on the area. The end users of these archives are the researchers, scientists and decision makers who can access a unique system of information at regional level. This simple guide illustrates the main characteristics of each database available on the AdriaMed portal, as well as on CD Rom.

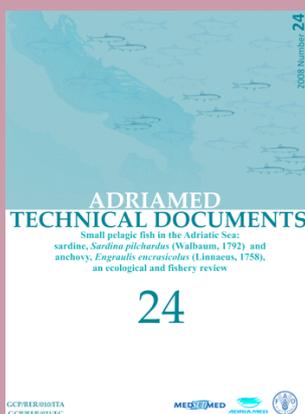


ADRIAMED TECHNICAL DOCUMENTS N°.23

AdriaMed

Report of the Ninth Meeting of the AdriaMed Coordination Committee. Zagreb, Croatia 18-19 December 2007

The Ninth Meeting of the Coordination Committee of the FAO AdriaMed Regional Project “Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea” was held in Zagreb, Croatia, 18th and 19th December 2007. It was attended by representatives of the Project’s participating countries (Albania, Croatia, Italy, Serbia and Montenegro, and Slovenia) and other interested parties. The meeting sought to present and discuss the results of the activities carried out by the Project referring to the 2007. The activities followed the methodological approach used by the Project and were presented according to the three main components that are: the Adriatic Fishery resources, the Adriatic social and economical fishery sciences and the Adriatic fishery statistics and information systems. The document “Project Future Implementation” was illustrated and the Committee agreed on the programme of activities proposed. In addition some additional specific suggestions for the next intersessional period of implementation were formulated by the meeting and the recommendation to take into account the ecosystem approach to fisheries, when appropriate, was expressed.



ADRIAMED TECHNICAL DOCUMENTS N°.24

AdriaMed

Small pelagic fish in the Adriatic Sea: sardine, *Sardina pilchardus* (Walbaum, 1792) and anchovy, *Engraulis encrasicolus* (Linnaeus, 1758), an ecological and fishery review

This document reviews and compiles the scientific information on the main commercial species whose stocks are shared by the coastal countries of the Adriatic Sea: sardine, *Sardina pilchardus* (Walbaum, 1792) and anchovy, *Engraulis encrasicolus* (Linnaeus, 1758). It provides a description of each target species including bio-ecology, life-history parameters, fishery exploitation and fishing gear selectivity information. This work is the result of international scientific cooperation among the fishery research institutions participating in the FAO-AdriaMed Project.

ADRIAMED TECHNICAL DOCUMENTS N°.25

AdriaMed

Hydroacoustic data processing for standard stock assessment using Echoview: Technical manual

This technical manual is written as a guide on how to use Echoview to process hydroacoustic survey data from marine or riverine locations. The theoretical ideas and guides for this manual's processing methodologies are drawn from: i) Simmonds and MacLennan¹ (2005); ii) The Standard Operating Procedures (SOP) for Acoustics in the Great Lakes² (2008). In particular the numbered procedures from Chapter 3. Summary of Standard Operating Procedures are cited; iii) The NMFS/NOAA document³ (2004) – NOAA Protocols for Fisheries Acoustics Surveys and Related Sampling – the Great Lakes SOP draws from this document. Echoview offers many features and settings to facilitate the processing of data for analysis on screen and as exported analyses. Exported analyses can be evaluated in third party database and spreadsheet applications. Many procedures are demonstrated using Simrad EK60 (38kHz, 120kHz) and EK500 data.

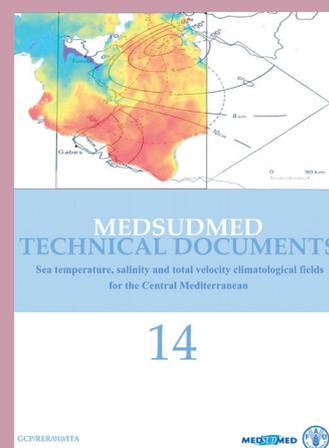


MEDSUDMED TECHNICAL DOCUMENTS N°.14

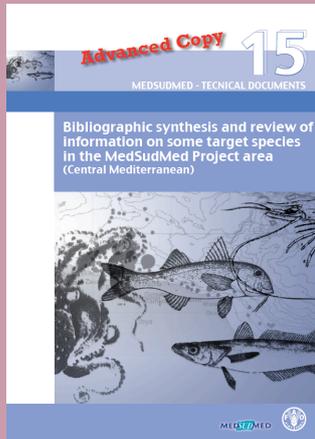
Drago, A., Sorgente, R., Olita, A.

Sea temperature, salinity and total velocity climatological fields for the Central Mediterranean

Climatological characteristics of water masses and circulation in the Central Mediterranean area (Sicily Channel and surrounding areas) have been estimated and compared with previous knowledge. The climatological fields have been calculated in the form of monthly and seasonal averages from the output of a numerical model run over the period of five years (4th January 2000 – 27th December 2004). The numerical model is a 3D primitive equation, mesoscale resolving regional ocean model based on POM (Princeton Ocean Model). The support of literature and satellite data proved to be fundamental to correctly interpret model results and vice-versa. Results show a distribution of the main water masses comparable to the literature and confirm the hypothesis of a counter phase behaviour for the two main branches of the Algerian Current entering in the Sicily Channel, the ATC (Atlantic Tunisian current) stronger in winter and the AIS (Atlantic Ionian Stream) in summer. The model results offer a detailed description in time and space of the hydrological



characteristics of this very dynamic part of the Mediterranean and offer a basis to linkages to ecological and biological implications.

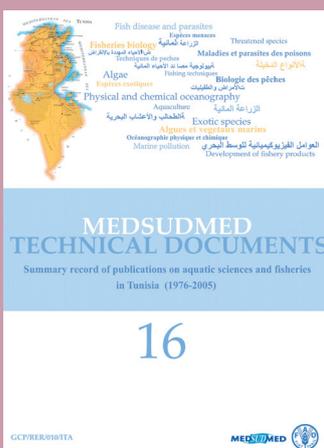


MEDSUDMED TECHNICAL DOCUMENTS N°15

Fiorentino, F., Ben Mariem, S., Bahri, T., Camilleri, M., Ezzeddine-Najai, S., Massa, F., Jarboui, O., Zgozi, S.

Synthesis of information on some target species in the MedSudMed Project area (central Mediterranean)

The present document reviews the knowledge currently available on the biology, ecology and exploitation of *Merluccius merluccius*, *Mullus barbatus*, *Octopus vulgaris* and *Parapenaeus longirostris*, taken from the list of MedSudMed target species. Available knowledge was organized to furnish a synthetic description of these species, including species description (meristics), ecology (geographical distribution, habitats, migrations), biological information (maximum size, spawning activity, length at first maturity, eggs, larvae and post-larvae, recruitment at habitat and nurseries, sex ratio, length-weight relationship, maximum age and natural mortality, Von Bertalanffy growth function, feeding behaviour, stock units), evaluation and exploitation (abundance indices from trawl surveys, strength of recruitment, stock assessment, fisheries, fishing zones and seasons, yield, fishing and discards). Finally a brief compilation of current fishery legislation and management in each country was made.



MEDSUDMED TECHNICAL DOCUMENTS NO.16

MedSudMed

Summary record of publications on aquatic sciences and fisheries in Tunisia (1976-2005)

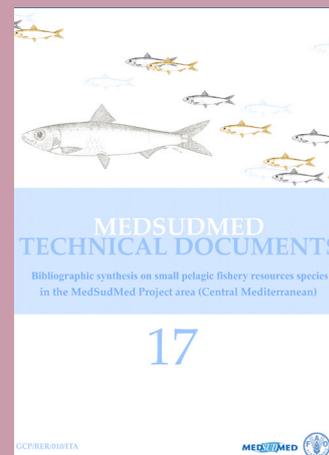
This document is a compilation of abstracts of bibliographic references published in the grey literature in Tunisia between 1976 and 2005. It includes 436 references covering the following topics: 1) Fisheries biology; 2) Aquaculture; 3) Algae; 4) Physical and chemical oceanography; 5) Threatened species; 6) Exotic species; 7) Fish disease and parasites; 8) Fishing techniques; 9) Development of fishery products; 10). Marine pollution. Most abstracts are available in 3 languages (Arabic, English and French). Key-words are available in English and for some abstracts in one or the two other languages.

MEDSUDMED TECHNICAL DOCUMENTS N°.17

MedSudMed

Bibliographic synthesis on small pelagic fishery resources species in the MedSudMed Project area (central Mediterranean)

This document reviews and compiles the scientific information on the main commercial small pelagic fish species whose stocks are exploited by the coastal countries of the MedSudMed project area: European anchovy (*Engraulis encrasicolus*), sardine (*Sardina pilchardus*) and round sardinella (*Sardinella aurita*). More specifically, this work comprises the following sections: 1) "Meta data information", listing the information on *Engraulis encrasicolus*, *Sardina pilchardus* and *Sardinella aurita* available at the relevant national research institutes and organizations of each country participating in the Project. 2) "Bibliographic review", firstly giving a geographical and hydrographical description of the MedSudMed project area and its fishery activity, and containing for each investigated small pelagic species a review highlighting the level of knowledge on the species about ecology, population dynamics and stock assessment. 3) "Information on ongoing and future research", reporting the research programmes and monitoring structure in place regarding the main fishing gears targeting the species under consideration in each country participating in the Project. The protection and management measures applied in the different countries are reported. Finally, published information and research results were compiled and tabulated by variable



MEDSUDMED TECHNICAL DOCUMENTS N°.19

MedSudMed

Preliminary results on spatial distribution of abundance indices, nursery and spawning areas of *Merluccius merluccius* and *Mullus barbatus* in the central Mediterranean

Preliminary results on spatial distribution of some key variables (abundance indices, recruits and spawner density indices) of *Merluccius merluccius* and *Mullus barbatus* populations in central Mediterranean are presented at regional level for the first time. Data were collected during trawl surveys carried out under national programmes (Italy, Libya, Malta and Tunisia) in the MedSudMed Project area (GFCM GSAs 12, 13, 14, 15, 16 and 21). An effort to standardize the data collection and processing was made with the support of the MedSudMed Project. About 290 hauls were made within the depth range 10–800 m in



May–August 2003, covering an area of about 150,000 km². For each haul, spawners were identified as female fish whose total length was greater than the length at 50 percent maturity (the established common value of 30 cm TL and 15 cm TL for hake and red mullet, respectively). Also for each haul, the proportion of recruits, expressed in terms of young of the year, was estimated by analysis of the length–frequency distribution. In the case of hake, a species that reaches maturity at the age of one year, the spatial distribution of the young fish with a length lower than 50% (juveniles) was also considered. Spawning and nursery areas were identified as areas showing the highest values of spawner and recruit indices, respectively. To avoid bias due to the different sampling gears, all the indices were standardized to the maximum value, keeping separate the areas sampled with different nets. Qualitative comparison of hake and red mullet stocks among the Italian–Maltese, the Tunisian and the Libyan sub-regions, revealed that large differences exist in abundance indices and the demographic structure implicit in these indices. Though differences in the small size-classes may result from differences in gear selectivity and survey season, the contrasting distribution observed in the large size-classes is likely to result from an actual paucity of large specimens in the Italian–Maltese sub-region. Analysis of spatial distribution by life-phase showed that both species are distributed, or migrate, across the boundary of two adjacent GSAs or the boundary of a zone of national maritime jurisdiction and the adjacent high seas. Proposals for future research were made to better understand occurrence of stock units and the effect of environmental factors on them.

ADRIAMED OCCASIONAL PAPERS N°.29

Ungaro, N., Joksimovic, A., Pesic, A., Djurovic, M., Kapidani, R., Milone, N., Ceriola, L., Massa, F.

Identification of the priority species and shared stocks in the Mediterranean Geographical sub-area 18 (Southern Adriatic Sea). Paper presented at the GFCM-SAC Sub Committee on Stock Assessment (Antalya, Turkey, 13-16 October 2008)

This paper aims at contributing to test the criteria for the definition of priority species and shared stocks as formulated by the 10th GFCM SAC meeting. The paper represents the output of the AdriaMed Working Group (WG) on demersal fisheries resources (Rome, March 2007) and the follow up to the AdriaMed WG on demersal fisheries resources (Kotor, June 2008). On the basis of the available information in the Adriatic Sea Geographical

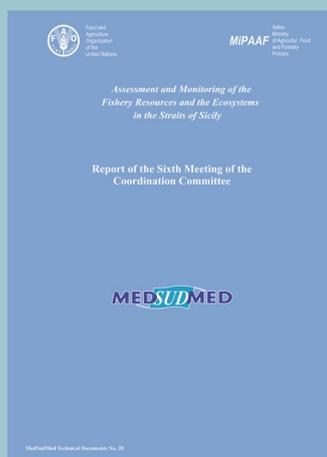
SubArea (GSA) n. 18 the paper provides: a) a list of priority species for fishery assessment and management at Country and large basin level (Southern Adriatic) in the Adriatic GSA n° 18 (Albania, Montenegro and Italy waters); b) a list of the main fishery stocks shared among the national waters of Albania, Italy and Montenegro.

ADRIAMED OCCASIONAL PAPERS N°.30

Ungaro, N., Joksimovic, A., Kapidani, R.,
Ceriola, L., Milone, N.

Comparability of two different methods for the stock assessment of hake (*Merluccius merluccius* L.) in the Mediterranean Geographical Sub-Area 18 (Southern Adriatic Sea). Paper presented at the GFCM-SAC Sub Committee on Stock Assessment (Antalya, Turkey, 13-16 October 2008)

The hake (*Merluccius merluccius*) is one of the main commercial and heavily exploited species of the demersal fishery of the coastal countries in the Adriatic Sea. This paper aims to test the comparability among two different methods for the assessment of the hake stock, specifically in the Adriatic Geographical SubAreas (GSAs) n° 18. Data from 1996-2006 trawl surveys carried out in the GSA n° 18 (MEDITS) were analysed by using both Empirical Indicators and SURBA method. The paper highlights the comparability of the results obtained with the application of the two methods.



MEDSUDMED TECHNICAL DOCUMENTS N°.20

MedSudMed

Report of the Sixth Meeting of the Coordination Committee. FAO-MiPAAF. Salammbô, Tunisia, 4-5 February 2008

The Sixth Meeting of the MedSudMed Coordination Committee was attended by representatives of the Donor (Italy), delegations from the countries participating in the Project (Italy, Libyan Arab Jamahiriya, Malta and Tunisia), the Chair of the Scientific Advisory Committee (SAC), and the Biostatistician of the General Fisheries Commission for the Mediterranean (GFCM), as well as the staff of the FAO MedSudMed Project. A brief remind was made on the Project objectives and activities and a presentation of the activities implemented for the four MedSudMed components during the intersession period was made. The proposed work plan for the next period was discussed and approved. It focuses on the same priorities of standardizing approaches, increasing scientific knowledge on fishery resources and ecosystems, strengthening national expertise and regional cooperation. A positive appraisal of the MedSudMed Project for supporting all the participating countries in the assessment and monitoring of the fisheries resources and for the good job carried out since the beginning was given. The belief that continuing the Project can only bring success and be beneficial for each of the participating countries was affirmed.



MEDSUDMED TECHNICAL DOCUMENTS N°.21

Ungaro N.

Field manual on macroscopic identification of maturity stages for the Mediterranean fishery resources

The MedSudMed Training course on macroscopic identification of maturity stages for the Mediterranean fisheries resources, Tajura, Libya, 9–11 July 2006 was primarily intended for the scientists of the Marine Biology Research Centre (MBRC) and focused on the macroscopic identification of maturity stages of demersal fishery resources. The objective was to teach the basic techniques for the processing of samples and macroscopic identification of maturity stages for different species of fish. More specifically, background information on maturity stages of demersal fishery resources, including basic notions and terminology, was provided. The course also included a general description of the reproductive organs of the main fishery resources (fishes, crustaceans and cephalopods), an analysis of slides illustrating the macroscopic identification

of maturity stages in the Mediterranean species, a description of and comments on the maturity scales currently available. Practical exercises were organized with fresh samples of *Sardinella aurita*, *Scomber japonicus* and *Spicara flexuosa*, and simple techniques, algorithms and exercises to retrieve data on reproductive features (macroscopic) were taught. Following the biological analysis, simple elaboration of the resulting data was performed. All the participants in the course showed interest in the topics and some of them proposed the development of collaboration and new studies on the fish species distributed in the Libyan waters.

MEDSUDMED TECHNICAL DOCUMENTS N°.22

MedSudMed

Report of the Workshop on octopus stocks and related fisheries in the MedSudMed Project area. Salammbô, Tunisia, 18-20 November 2008

The Workshop on octopus stocks and related fisheries in the MedSudMed Project area” (Salammbô, Tunisia, 18-20 November 2008) was attended by experts from Italy, Libyan Arab Jamahiriya, Malta and Tunisia. The main objectives of the workshop were: i) to synthesise and compare the existing knowledge on the biology and distribution of *O. vulgaris*; ii) to identify the gaps to be filled for the identification of *O. vulgaris* populations units; iii) to prepare a work plan in order to verify if the population units of *O. vulgaris* belong to shared stock(s); and iv) to contribute to the identification of the Operational Units targeting *O. vulgaris* in the Project area. Ten presentations were given on biological aspects, distribution and exploitation (including socio-economic aspects) of *O. vulgaris* in the MedSudMed area. The differences and similarities of biological features, exploitation, market and fisheries regulations among countries in the Project area were also pointed out. A joint exercise to identify the fleet segments targeting *O. vulgaris* in the area was carried out. The gaps to be filled in order to identify population units for *O. vulgaris* and to provide a detailed description of the OUs targeting this species in the MedSudMed area were listed and the outline of a work plan to fill these gaps was agreed upon. Two main thematic areas were identified: i) tentative identification of nursery and spawning areas along the Tunisian coasts by processing available surveys data, ii) genetic studies to compare population units. Moreover, a further field of interest was agreed upon: the collection of data for the proper identification of OUs targeting *O. vulgaris*.



