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MedSudMed

GCP/RER/010/ITA

Report of the Third Meeting of the  
Coordination Committee

Tajura, Libya 1–3 February 2005

The conclusions and recommendations given in this and in other documents in the *Assessment and Monitoring of the Fishery Resources and Ecosystems in the Straits of Sicily* Project series are those considered appropriate at the time of preparation. They may be modified in the light of further knowledge gained in subsequent stages of the Project. The designations employed and the presentation of material in this publication do not imply the expression of any opinion on the part of FAO or MiPAF concerning the legal status of any country, territory, city or area, or concerning the determination of its frontiers or boundaries.

## Preface

The Regional Project “Assessment and Monitoring of the Fishery Resources and the Ecosystems in the Straits of Sicily” (MedSudMed) is executed by the Food and Agriculture Organization of the United Nations (FAO) and funded by the Italian Ministry of Agriculture and Forestry Policies (MiPAF).

MedSudMed promotes scientific cooperation between research institutions of the four participating countries (Republics of Italy, Libya, Malta and Tunisia), for the continuous and dynamic assessment and monitoring of the status of the fisheries resources and the ecosystems in this area of the Mediterranean.

Research activities and training are supported to increase and use knowledge on fisheries ecology and ecosystems, and to create a regional network of expertise. Particular attention is given to the technical coordination of the research activities between the countries, which should contribute to the implementation of the Ecosystem Approach to Fisheries. Consideration is also given to the development of an appropriate tool for the management and processing of data related to fisheries and their ecosystems.

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## GCP/RER/010/ITA Publications

The MedSudMed Project publications are issued as a series of Technical Documents (GCP/RER/010/ITA/MSM-TD-00) related to meetings, missions and research organized by or conducted within the framework of the Project.

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## Preparation of this document

This document is the final version of the report of the Third Meeting of the Coordination Committee, organized by the FAO-MedSudMed Project (*Assessment and Monitoring of the Fishery Resources and the Ecosystems in the Straits of Sicily*), in Tajura, Libya 1–3 February 2005.

## Acknowledgements

The Marine Biology Research Centre, particularly the Director Dr Nouredin Essarbout, who provided kind hospitality and assistance in the organization of the Meeting, is gratefully acknowledged.

MedSudMed.

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### **ABSTRACT**

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 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. 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.

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# Report of the Third Meeting of the Coordination Committee

Tajura, Libya, 1–3 February 2005

## Opening of the meeting (Agenda Item 1)

1. The third Coordination Committee Meeting of the FAO MedSudMed Project was held in Libya from 1 to 3 February 2005. The meeting was kindly hosted by the Marine Biology Research Centre in Tajura. The representative of the Project Implementing Agencies and delegations from the countries that participate in the Project attended the meeting together with a representative from the European Commission, the FAO representative of the Marine Fishery Resources Service as well as FAO MedSudMed staff.
2. The Coordination Committee was welcomed by the Director of the Marine Biology Research Centre, Dr Nouredin Essarbout who thanked the participants and introduced the national authorities present. The establishment of the scientific cooperation in the Project area was highlighted and appreciation was shown for the level of coordination achieved, especially concerning the standardization of methodologies applied in research.
3. The MedSudMed Project Coordinator took the floor and thanked the representatives present for their attendance. The Meeting was reminded that the Project has been operative for four years, during which time a cooperative context has been developed in which the main scientific institutes and management bodies participate; indeed for the first time in the relevant Geographical Sub Areas MedSudMed has created a context of scientific collaboration on innovative issues that are particularly relevant for the management of fishery resources, especially concerning the monitoring system for small pelagic and demersal species and the relations with the marine ecosystems.
4. The Meeting was briefly reminded that, in the framework thus established, MedSudMed has organised permanent working groups on the different components of fishery research, the Project has also set up several lines of applied research, and has conducted several training courses and technical consultations. The resulting technical publications that have been issued were brought to the attention of the Committee, as several such documents were presented as material accompanying the working papers of this 3<sup>rd</sup> Coordination Committee meeting. Furthermore it was noted that there has been significant cooperation with the General Fisheries Commission for the Mediterranean (GFCM) and its Scientific Advisory Committee (SAC) and Sub Committees.
5. Moreover it was mentioned that the activities carried out over the year preceding this 3<sup>rd</sup> meeting followed the recommendations made at the second Coordination Committee meeting (Salammbô, Tunisia 11-13 February 2004). At this point the MedSudMed Coordinator called on the delegations to continue to give their valued advice and orientation to the Project, by commenting on the progress made to date and evaluating and fine-tuning the proposed work programme for the coming period.
6. The Chairman of the Libyan National Authority for Marine Investment, Dr Hussin Marai, welcomed the delegates to Libya and to this 3<sup>rd</sup> meeting of the MedSudMed Coordination Committee. He thanked the participants and Dr Essarbout for arrangements made for this meeting. He was pleased to have the honour of hosting the 3<sup>rd</sup> meeting in the Libyan

Jamahiriya. Indeed, it would have given him great pleasure to have also hosted the 1<sup>st</sup> meeting in the country, and this for many reasons, however, time may still permit an even greater participation of Libya. Dr Marai thanked Dr Essarbout once more for his full involvement in the Project. He hoped that 2005 would be the occasion to strengthen and reinforce Libyan participation through MBRC, so that greater results can be achieved. He thanked Fabio Massa, Coordinator of the Project, who, with his team, works extremely hard towards regional cooperation. He stressed the importance given by the Libyan authorities to the aspect regarding data and the construction of databases. While there is great appreciation for the training, participation in workshops and scientific achievements of the MedSudMed Project, a major interest regards data, its acquisition, organization and subsequent analysis. Dr Marai expressed his interest in knowing results of the surveys that were carried out in the Project area. He hoped that one of the outcomes of the Project will be the national capacity building. In the meantime, Libyan authorities offer all required means and technical assistance to the Project in order to achieve its goals. Every success was wished to the Coordination Committee for its work.

### **Election of the Chairman and adoption of the agenda (Agenda Item 2)**

7. Dr Nouredin Essarbout was proposed as Chair of the meeting, the Coordination Committee approved. The Chair brought the attention of the Committee to the agenda that was adopted without changes.
8. Preliminary comments were made by the European Commission (EC) representative who has particular responsibility for Mediterranean fisheries and international relations in the area also covered by the MedSudMed Project. Thanks were first of all given to the Libyan authorities for their kind hospitality; the position of the EC towards the FAO Regional Projects and especially MedSudMed was described, emphasis was placed on the need to work together to strengthen the GFCM as a multilateral forum. The meeting was reminded that the EC sees Regional Projects such as MedSudMed as tools that serve also to consolidate the work of the GFCM SAC. Appreciation was also expressed for the results achieved to date by the Project through the many research activities but in particular the role of the Project in uniting the participating countries in a cooperative context that can be exploited by the GFCM. The financial involvement of the EC in the FAO Regional Projects was also touched on.
9. The attention of the Meeting was drawn to the folder of documents presented by the Project and especially the working paper concerning the progress made in the intersessional period.

### **Report on the Project's progress (Agenda Item 3)**

10. The FAO MedSudMed staff made a presentation of the major achievements of the Project during the year from February 2004 to January 2005. Emphasis was placed on the high level of standardization achieved within the Project area in the fields of data collection and analysis and where the research programmes on demersal and small pelagic species are concerned: "Spatial distribution of demersal resources in the Project area and the influence of environmental factors and fishery characteristics" and "Small



pelagic fish: stock identification and oceanographic processes influencing their abundance and distribution”.

11. The cooperative research programmes were described as well as working groups that aimed at creating common agreement on methodology throughout the Project area of implementation. This has been coupled with training courses as and when the need arose, arranged on an *ad hoc* basis. Working groups dealing with the standardization of age determination methods were organized, one on vertebrae of selacean fish preparation, reading and interpretation and one on the preparation and interpretation of otoliths for two target species (*Merluccius merluccius* and *Mullus barbatus*). Moreover, a working group with the aim of comparing and standardizing the calculation of age at sexual maturity of anchovy and sardine was held, the results of which were presented at the SAC Sub-Committee working group on small pelagic fish (Malaga, May 2003). The Protocol to be used during acoustic and ichthyoplankton surveys was discussed among and agreed upon by the regional experts.
12. In line with the recommendations of 2<sup>nd</sup> Coordination Committee meeting, the Project implemented a series of activities dealing with field work; the Project supported the organization and the participation of regional experts in cooperative surveys at sea (ichthyoplankton and acoustic surveys). As regards trawl surveys, the standardized protocol produced by the MedSudMed Project was implemented at sea during simultaneous surveys that were organised in autumn 2004.
13. As regards the processing of the trawl surveys data, the regional experts decided to create small thematic working groups that would operate according to terms of reference agreed upon at regional level. The topics to be addressed by these working groups include the study of biomass abundance and spatial distribution, the study of influence of abiotic factors on abundance and spatial distribution of fish biomass, the identification of nursery and spawning areas, the characterisation of the main fish assemblages in the Project area and the description of habitats, benthos and macro invertebrate communities. Results produced by these working groups will be considered as a basis of multidisciplinary pilot studies that deal with the integration of several layers of information.
14. In the perspective of data processing to be performed at regional level, a seminar on multivariate analysis methods used to analyze marine communities was organized and attended by all MedSudMed participating institutes. Moreover, the meeting was informed that the MedSudMed Project supported a study on benthic communities in Maltese waters conducted by the Malta Centre for Fisheries Sciences (MCFS) in collaboration with the University of Malta.
15. As regards the processing of acoustic and ichthyoplankton data, the methodologies to be applied are under discussion among the experts of the area.
16. The meeting was updated on the recent developments of the MedSudMed Fishery and Ecosystem Information System (FEIS). A trial prototype was released, with a module allowing the manual input and the control of the data. A demonstration was made on the functioning of the software, with an overview of the different components (i) trawl surveys resources, (ii) echo-surveys resources, (iii) ichthyoplankton resources and (iv) operational unit resources. An overview was given of the functionalities of the first three components, in particular the data management options (adding new data, modifying

existing data, browsing inside the data base, query the data base and produce reports on the content of the data base). Import/Export tools were also presented to the meeting.

17. It was recalled that the FEIS has been developed in synergy with other systems under development in the Region. As regards the component on operational units, particular attention was given to the connection with the MedStat Regional Statistical System under development by MedFisis project. The synergy with MedStat concerned two main aspects: 1) the regional codification and reference issue and, 2) the liaison between MedStat and FEIS in the domain of data sharing. MedStat has developed a “Regional Reference and Codification System” to manage and support the whole relationship between local, national and regional data and definitions references. This is the most important tool to maintain an acceptable degree of coherence between databases belonging to different systems. MedStat/Regional Reference System validates, complements and maintains the codification component of FEIS initially proposed by the regional experts. Concerning the data interaction, MedStat has developed built-in capability to export to FEIS the Operational Units Performances by country and according to agreed protocol.
18. The meeting was informed of the creation of the SeaTrim Software, the manual of which was presented with the meeting documents. This software was developed by IRMA-CNR in collaboration with MCFS for the analysis of trawl surveys data. The publication of the manual of the software by the MedSudMed Project will allow it to be put at the disposal of the scientific community of the area and training was requested on the software for scientists from INSTM and MBRC. The Project also expressed its willingness to publish similar works conducted in the Project area..
19. According to its mandate, the Project promoted the national capacity building by supporting the participation of regional experts in 8 MedSudMed meetings and in 3 international symposia or meetings.
20. The Project also reinforced regional cooperation through the participation in workshops, meetings, seminars and conferences organized in the Mediterranean area. Invitation was made to other regional Projects to participate in the Project’s work in order to promote technical cooperation.
21. The meeting was informed that the MedSudMed web site is being reinforced, with an operational mailing list and that nine technical documents and two Occasional Papers were published or are in the pipeline.
22. The Project was asked to provide some further information on the development of the component of Project activities concerning Marine Protected Areas (MPAs). The Committee was reminded of the MedSudMed Expert Consultation held in 2003 on the application of MPAs as a tool for fisheries management, the report of which will shortly be issued by the Project. Guidelines should ideally now be produced and used in the identification of potential MPAs in the Project area as well as the possibility of organising *ad hoc* workshops.
23. Following the presentation of the Project’s achievements, the floor was opened to questions concerning the information given.

24. Thanks were given to the Project by the Tunisian delegation for the presentation of results. Some further information on results from the Tunisian side was given to supplement the information provided by the Project. In particular the work at sea was described together with some results on their programmes on small pelagic fish, demersal and eggs and larvae survey.
25. The Committee expressed much appreciation for the quantity and quality of the work carried out by MedSudMed. Some clarification was requested by the European Commission representative, the Project staff were asked to give their consideration regarding the follow up of the workshop on length at sexual maturity of key small pelagic species, as this is a sensitive issue given the attempts to establish minimum landing sizes in the Mediterranean and the discrepancy between length at sexual maturity data provided by scientists around the region. Furthermore details were requested on the assessment of demersal species and the outcome to be presented at the 2005 GFCM SAC.
26. The Project staff informed the Meeting that the results of the work carried out by MedSudMed and the regional experts of the Project area on the specific issue of length at first maturity was firstly a comparison of the data collected and methodologies applied at regional level, as presented during the Working Group on Small Pelagic Resources of the SAC Sub Committee on Stock Assessment held in Malaga in May 2004. The Committee commented that the difference in the results can be determined by several aspects, even when using the same methodology. Differences observed are probably determined by the diverse environmental factors in the different GSAs.
27. Concerning the presentation of the results of the research on the demersal resources, the Committee was informed that in the framework of the Project's programme "Spatial distribution of demersal resources in the Project area and the influence of environmental factors and fishery characteristics" and in particular on the basis of the recent survey carried out, it is the intention of the experts of MedSudMed to organise "*ad hoc*" Working Group for the analysis and processing of data that aims at estimating some of the fundamental scientific information at regional level, biomass index and determination of length at sexual maturity for selected demersal species and for the identification of nursery areas and the characterisation of the fish assemblages.
28. The delegations presented the work carried out during the intersessional period. The Representative from Malta described the work of the MCFS that has been brought together over the last year in close collaboration with FAO Projects, EU programmes and the GFCM. The MCFS has been carrying out several types of surveys, participating in the GRUND and MEDITS trawl surveys, in the acoustic and in the ichthyoplankton surveys conducted in collaboration with IRMA-CNR and in the framework of MedSudMed. The Committee was informed on the success of studies on benthos, identification of biocenosis that were conducted in collaboration with the University of Malta. MCFS has also continued to successfully collect data on fleet, catch and effort. In response to the call for strengthening of data input into the MedSudMed FEIS the availability of Maltese data was assured, indeed there are processed data originating from several disciplines of fisheries science as well as some raw data from fields such as meteorology and oceanography.
29. The Tunisian delegation provided some further details on activities carried out in 2004, such as the acoustic survey in GSA 14 in the winter and the subsequent complete

campaign in summer covering GSAs 12, 13 and 14. In addition the eggs and larvae survey in the Gulf of Tunis and the Gulf of Hammamet as well as the demersal trawl survey that also covered the three relative GSAs with a total of about 150 hauls. The Meeting was informed that analysis of these data will begin shortly. Joint data processing should start with a preparatory meeting that will be held in Salammbô, and that will be attended by GIS experts of the Project area. In addition appreciation was expressed for the MedSudMed training course and working groups that have seen full participation from the Tunisian experts.

30. A representative from Libya presented the work achieved by his institute during the inter-sessional period. The participation in the MedSudMed Project consisted mainly in the participation of Libyan experts in the several encounters (working groups, training and surveys). MBRC was represented in all encounters that were organized by the MedSudMed Project, except one. The meeting was informed on the different types of data that are currently stored in the National data base (Fisheries, Benthic Fauna, Plankton, Physical & Chemical characteristic of sea water, Bottom type/Sediment texture). Examples of results were shown on fleet statistics that are collected along the whole Libyan coast, studies on bottom types and habitats. A trawl survey was conducted in 2003 in the eastern and central part of Libyan waters (between the Egyptian border and Misrata). As regards the surveys at sea on board the R/V Nour, 2004 was described as a preparatory year. In 2005, the institute expects to conduct a trawl survey that would cover the western coast (between the Tunisian border and Misrata), and an acoustic survey along the entire Libyan coastline. However, it would be necessary to have concrete support in terms of equipment and expertise from MedSudMed. The meeting was also informed about the recent evaluation of the R/V Nour with the support of the MedSudMed Project which was acknowledged for the support provided so far. All efforts will be made for greater cooperation in the near future.
31. The MedSudMed Scientific Coordinator informed the Committee that the Italian programme for both demersal and small pelagic fish are unchanged in their routine and for the coming year have been reconfirmed together with full cooperation as for the previous year.
32. Furthermore the MedSudMed Scientific Coordinator took the opportunity to inform the Meeting that in his long experience many ways have been sought to share knowledge and expertise around the Mediterranean Large Marine Ecosystem (LME); careful consideration and collaboration have always been recognised as essential requisites for the management of the Project area of intervention and beyond. FAO and the GFCM are considered a good starting point, given their umbrella role, such bodies are in a position to launch cooperation at a scientific level even where such cooperation seems less straightforward when the countries are addressed individually. In the past know-how has been developed and the scientific community has grown through the national programmes, however the moment has arrived to strengthen them. In the case of data collection, which initially took place as a national requirement, then successively as an EU requirement in those countries that belong to the EU, now it is desirable for this to be extended to other areas and therefore the fundamental importance of Regional Programmes like MedSudMed is recognised. In this respect the activities carried out by the Regional Projects should represent a first step to consolidate the national programmes on data collection in a permanent way and also to activate and consolidate the analysis of data in the framework of the GFCM and thus bringing the nations of the Mediterranean

into real regional cooperation. The Coordination Committee expressed its appreciation for the valuable contribution of the MedSudMed Scientific Coordinator.

#### **Development and guidelines in relation to the Project's programme for the next period (Agenda Item 4)**

33. The Project Coordinator introduced the working paper CC03/03 that refers to the development of the Project's programme for 2005. The Committee was informed that this document represents the continuation of the work programme and activities planned in order to achieve the objectives identified within the different Project Components. The Committee was also informed on the interest expressed by the Donor to support the extension of one year of the Project to permit the accomplishment of the remaining tasks in the sectors of cooperation and field research. This would postpone the end of the Project from October 2005 to October 2006.
34. The Project's proposed work plan for the coming period considers the continuation and strengthening of the existing lines of intervention as indicated during the 2<sup>nd</sup> Coordination Committee meeting. Effort will be continued towards the standardization of the methodologies applied focusing on procedures followed for laboratory work and data processing methodology.
35. In order to improve scientific knowledge the Project will continue supporting the cooperative research and field activities that aim to cover relevant scientific gaps that remain. Particular effort will be made in areas where information is limited and where national programmes need relevant support from the Project. In particular strong support will be provided by the Project for the implementation of national survey programmes at sea in areas where gaps have been identified.
36. The list of field activities and working groups concerning the small pelagic and demersal fisheries resources were presented to the Coordination Committee. It was stressed that the Project will support all the activities aiming at the definition of methodology for the analysis and processing of data toward the scientific outputs at GSA or regional level.
37. In the work programme, the component of the Marine Protected Areas for Fisheries Management will remain one relevant component of the Project and in this respect the Project will concentrate on producing guidelines on the relevant criteria to be used for the implementation of MPAs taking into account also the outputs of the different working groups and "*ad hoc*" workshops.
38. The relevant scientific outputs of the Project Working Groups, as well as the significant results of the research activities would also be presented at the GFCM-SAC meeting as regional contributions by the Project in the framework of its activities
39. In line with the Project component that foresees improvement of national capacity in terms of expertise. Particular attention will be paid to the on-the-job training during the surveys at sea and to the laboratory work for the post-processing of samples collected at sea. The Project will also endeavour to supply such equipment as may be necessary for the effective pursuit of Project objectives.

40. The Meeting was further informed that, by the end of the first phase of MedSudMed the information system FEIS will be completed; the further plans include the distribution of the system to all the participating countries. Other modules could be further developed, in particular for the inclusion, management and visualisation of oceanographic remote sensing data.
41. The Committee suggested that the Project further develop the web pages in order to increase the dissemination of the Project results.
42. The Coordination Committee approved the programme of work presented by the MedSudMed staff for the coming period of Project Implementation.
43. The planning table of the R/V Hannibal for 2005 was presented by the Tunisian representative. Trawl surveys are planned to be conducted in spring (GSAs 12 and 14) and autumn (GSAs 12 and 13). The meeting recommended that the MedSudMed participating institutes exchange information on the planning of activities of the other research vessels that operate in the Project area. This would allow for coordination of the work at sea among the different research vessels and to perform simultaneous trawl surveys and possible inter-calibration exercises for both trawl and acoustic surveys.
44. The proposal was recalled to organize a workshop on Ecosystem Approach to Fisheries (EAF) with the support of the two Regional Projects, Copemed and MedSudMed and according to the recommendations of the GFCM SAC. On this issue the Committee discussed the possibility to organise such a meeting in consideration of the fact that some of the activities of the Project are in line with the Ecosystem Approach to Fisheries (EAF). However, after some debate, the general agreement was that it would be more fruitful to delay the organization of such a meeting, while waiting to get more outputs and have some material to discuss, such as the results of the multidisciplinary studies indicated in the work programme of the Project.
45. The representative from Malta informed the Meeting that all conditions are right to start working on a multidisciplinary pilot study as indicated in the Project workplan, and left to the Project to choose the team who will work on this. There is still time to carry out such a study in areas where the availability of data makes it possible, and present the results at the next SAC session.
46. The issue of data collection was discussed; it was underlined that correlating environmental and biological information is a tricky task. While all institutes regularly conduct biological studies on fishery resources and produce biomass estimations, relatively little information is available on the effect of abiotic environment. All participants agreed to recommend pursuing efforts towards environmental data collection and processing, according to the mandate of the MedSudMed Project. In this perspective, the FEIS will be a useful tool for the storage of different types of data that will be collected in a systematic way.
47. The proposal was made that attention be put on sea beds, in particular Posidonia meadows. This was considered to be a fundamental issue on which most institutes of the area already have on-going activities.

48. Suggestions were provided by representative of the EU as a contribution to the discussion of the 2005 programme of work for the three Project components. As regards demersal resources, it was suggested to promote a deeper knowledge on the spatial distribution of fishing effort according to the fleet segmentation adopted by SAC, devote major attention to the technical interactions of demersal fisheries and pay major attention to the production of common assessment of shared demersal resources, although not declared officially as such by SAC (ie *Merluccius merluccius*, *Parapenaeus longirostris*, *Aristeus antennatus*, *Aristaeomorpha foliacea*, *Zeus faber*, *Nephrops norvegicus*, *Poliprion americanus*). As regards the component on small pelagic fish, the necessity was highlighted of using the current knowledge on the effects of oceanographic processes on spatial distribution and abundance to develop in-year assessments of pre-recruit and recruit biomass and thus provide the relevant information for a real time management of the exploitation. Regarding the component on MPAs, the EU representative suggested to speed up the acquisition of knowledge on the identification and dimensioning of these areas and assign a goal or more goals for their establishment (protection of nursery areas, of sensitive habitats...). Finally, as a result of the implementation of the new GFCM, but without undermining the work plan of the Project, it was considered highly advisable that the Project follows the recommendations of the SAC and provides relevant information to the Commission for its work.
49. The suggestions provided by the EU representative to have a practical application of the findings of fisheries research were fully appreciated. After a discussion the Committee underlined that the main objective of the Project is to study the fisheries resources with a holistic approach in which many aspects are considered, not to carry out stock assessment *per se*. However, many of the issues suggested by the representative of the EC are some of the fundamental scientific information within the general outline of the research activities considered for each Project Component. The example was given of the mapping of the biomass abundance, the identification of nursery areas, and of the identification of stocks and the identification of length at first maturity; moreover, results obtained during the ichthyoplankton surveys can be used for recruitment studies. In this respect and in the framework of the Project programme, relevant scientific outputs as indicated will be presented to the appropriate SAC Sub Committee meeting as a regional contribution and to add value to the Project activities. In addition, it was considered ambitious for the MedSudMed Project to decide which should be the MPAs in the Project area; the Project will rather provide some relevant tools useful to define which criteria should be applied for the implementation of the MPAs.
50. The Project Coordinator confirmed that much of the relevant scientific information on the Project component on MPAs was on hold until information is gathered within the other two components. However, the guidelines that are to be produced by MedSudMed will duly include examples of results of activities conducted in the past and practical experiences.
51. The Tunisian representative brought to the attention of the meeting that the Copemed Project had published a volume on MPAs. This publication was translated in French and will also be soon available in Arabic; it could be used as support for the activities to be implemented in the framework of the related MedSudMed component.

### **Other matters (Agenda Item 5)**

52. The Scientific Coordinator of the MedSudMed Project, Dino Levi, announced his retirement, foreseen for April 2005. He commented on his positive experience within MedSudMed, both from a scientific and human point of view, and expressed his satisfaction in seeing that the establishment of strong cooperation between the participating institutes was achieved or is in the pipeline.
53. The Technical Matter Officer, Rino Coppola, also announced his imminent retirement and informed the meeting that he would continue following and collaborating with the MedSudMed Project activities.
54. It was requested from the Project to produce shortly a timetable of the foreseen scientific meetings. This would allow the institutes to prepare their participation with enough time in advance and would avoid administrative difficulties as experienced sometimes in the past.
55. Director of MBRC underlined the excellent benefit from Regional Projects which stimulate the creation of a human and scientific network to improve the quality of the cooperation and for the benefit of institutions such as GFCM.
56. The Committee thanked the MBRC for the excellent organization of the meeting and the warm hospitality. It was underlined that although Libya has been present in recent years in all international meetings, enthusiasm seems to have increased under the direction of the Director of MBRC.

### **Date and venue of the next Coordination Committee Meeting (Agenda Item 6)**

57. Upon the kind invitation of the Representative of Malta the next Meeting of the MedSudMed Coordination Committee will take place in Malta, the date will be proposed in due time by the Project.



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## Agenda

1. Opening of the meeting
2. Election of the Chairman and adoption of the agenda
3. Report on the Project's progress
4. Development and guidelines in relation to the Project's programme for the next period
5. Other matters
6. Date and venue of the next Coordination Committee Meeting

## List of Documents

<b>FAO-MedSudMed: CC3/01</b>	Agenda
<b>FAO-MedSudMed: CC3/02</b>	Report on Project's Progress (February - January 2005)
<b>FAO-MedSudMed: CC3/03</b>	Development of the Project's Programme: priorities identified and activities scheduled for the next period
<b>FAO-MedSudMed: CC3/04</b>	Progress report on Database and Application Components – MedSudMed Fishery and Ecosystem Information System (MSM FEIS)
<b>FAO-MedSudMed: CC3/Info 01</b>	List of participants
<b>FAO-MedSudMed: CC3/Info02</b>	Report of the Second Meeting of the Coordination Committee GCP/RER/010/ITA/MSM-TD-06.
<b>FAO-MedSudMed: CC3/ Info03</b>	Workshop on the Standardization of Echo-Surveys and Ichthyoplankton Surveys Protocol in the MedSudMed Project Area GCP/RER/010/ITA/MSM-OP-01 (draft copy)
<b>FAO-MedSudMed: CC3/ Info04</b>	Working Group on Basic Parameters Related to Small Pelagic Fish: Length at Sexual Maturity of Anchovy and Sardine in the MedSudMed Project Area. GCP/RER/010/ITA/MSM-TD-07 (draft copy)
<b>FAO-MedSudMed: CC3/ Info05</b>	SeaTrim Software for the Exploratory Analysis of Trawl Information in the Mediterranean. GCP/RER/010/ITA/MSM-OP-02 (draft copy)
<b>FAO-MedSudMed: CC3/Info06</b>	Contribution to Guidelines for Chondrohichtyes fish Age Reading in the Mediterranean Sea (Application to selected species of the Mediterranean Sea). GCP/RER/010/ITA/MSM-TD-08 (draft copy)
<b>FAO-MedSudMed: CC3/Info07</b>	Workshop on Standardization of Fish Age Determination Based on Otolith Samples in the MedSudMed Project Area. GCP/RER/010/ITA/MSM-TD-09 (draft copy)
<b>FAO-MedSudMed: CC3/Info08</b>	Meeting on Component on Spatial Distribution of Demersal Resources in relation to Environmental Parameters and Fishery Characteristics. GCP/RER/010/ITA/OM-M/19
<b>FAO-MedSudMed: CC3/Info09</b>	List of documents

## **Report on Project's Progress (February 2004 – January 2005)**

### **Introduction**

This paper summarizes the activities carried out by the MedSudMed Project between February 2004 and January 2005. The activities originate from the work programme approved during the 2<sup>nd</sup> Coordination Committee meeting held in Salammbô, Tunisia, 11-13 February 2004 (GCP/RER/010/ITA/MSM-TD-06, document CC3/info2 refers) and represent the follow-up to that meeting.

During the 2<sup>nd</sup> Coordination Committee meeting a general outline of research, workshops and training was agreed upon and implementation of the related activities was roughly scheduled. It was decided that the MedSudMed Project would implement work plans related to the three main components dealing respectively with:

- (i) Spatial distribution of demersal resources and the influence of environmental and fishery characteristics
- (ii) Small pelagic fish: stock identification and oceanographic processes influencing their abundance and distribution
- (iii) Marine Protected Areas (MPAs) and fisheries management

Furthermore, a fourth component (iv), transversal to the previous three, focused on the development of the Fishery and Ecosystem Information System (FEIS), with the support of the regional experts.

In the past period, the Project organized a series of activities related to:

1. cooperative research programmes
2. working groups
3. national capacity building
4. regional cooperation: the Project participated in a range of regional meetings as organized by the GFCM SAC and FAO Regional Projects AdriaMed and Copemed, and other bodies in order to reinforce the technical cooperation at regional and extra-regional level.
5. Project communication: since the last meeting of the MedSudMed Coordination Committee, other Technical Documents of the Project were published or drafted in order to disseminate the Project results and achievements

The results of these activities are summarized in the following pages for each Project component. The Project also organized further technical meetings and supported regional experts' travel and study in external contexts.

## 1. Working Groups

In coherence with the activities and work-plan agreed upon during the 2<sup>nd</sup> Coordination Committee meeting, the Project implemented a series of activities dealing with field work and data processing methodology. During the inter-session period, the goals of standardization of data collection and of data processing were pursued. This was also the occasion to get an idea on the training required in the Project area. The following working groups were organized and supported by the Project:

### MedSudMed Component on Demersal Resources

- **Workshop on age reading of selacean fish (22 November – 1 December 2004, IRMA Mazara del Vallo, Italy).** The workshop was attended by 8 participants from Tunisia, Italy and Malta. The main objective of the workshop was to provide an overview of the techniques currently used in the Project area for the preparation and reading of spines and vertebra of a series of cartilaginous fish species. The workshop was the occasion to provide training and perform joint preparation and reading of samples brought by the participating institutes. Participants had agreed on a common protocol for the preparation of the samples prior to the course. Two methods for enhancing the growth bands were tested (Red Alizarin, cobalt nitrate) and direct observation of vertebrae and spines was performed. On the basis of the laboratory work and on the available bibliography, a synthesis was made on the most relevant techniques for each studied species. One of the outputs of the workshop was a synthesis of the methods that can currently be used in the Project area for the main species of interest. The limits of these methods and the improvements that could be made were also highlighted (GCP/RER/010/ITA/MSM-TD-08, document CC3/info6 refers).
- **Workshop on standardisation of fish age determination based on otolith samples in the MedSudMed Project area (13-17 December 2004, IRMA Mazara del Vallo, Italy).** The main objectives of the workshop were to standardise the age-reading methodology and to establish homogeneous age-reading criteria at regional level. The workshop provided an overview of the methodologies applied to two target species on the basis of existing national and international protocols and the technical characteristics available in the participating institutes. Future perspectives on this issue include the calculation of age-length-keys and the transformation of length structures in age structures, according to a common protocol to be used in the framework of the MedSudMed activities (GCP/RER/010/ITA/MSM-TD-09, document CC3/info7 refers).
- **Technical meeting on the MedSudMed Component on Spatial distribution of demersal resources in relation with environmental parameters and fishery characteristics (16-17 December 2004, Mazara del Vallo, Italy).** The meeting aimed to get an update on the work achieved so far, present the data inventoried by the different institutes and that can be used to fulfil the objectives agreed upon during the expert consultation held in Malta (December 2002). Representatives from each participating institute summarized the work achieved so far on demersal resources and offered a synthesis of the available data. Methodologies of work to be applied were discussed and a calendar of activities was agreed upon. Participants agreed to create small thematic working groups to perform the data processing, following precise terms of reference. It was agreed that where all data are available pilot studies would integrat

different layers of information (fish biology and ecology, habitats, abiotic environment...) (GCP/RER/010/ITA/OM-M/19, document CC3/Info8 refers).

- **Seminar on multivariate methods to analyze marine communities (25-27 January 2005, La Goulette, Tunisia).** The objective of the seminar was to provide an overview of the multivariate analysis methods currently used in one of the MedSudMed participating Institutes for the study of marine communities, more specifically fish assemblages and description of biocenosis. The seminar was illustrated by case studies, and was also an occasion to exchange views between participating institutes.

### **MedSudMed Component on Small Pelagic fish**

- **Workshop on the standardization of echo-surveys and ichthyoplankton surveys protocol in the MedSudMed Project Area (13-14 April 2004, IRMA Mazara del Vallo - Italy).** The meeting was hosted by IRMA-CNR and was attended by 14 experts from MedSudMed Project participating institutes. A common protocol to be used at sea during the joint echo-surveys and ichthyoplankton surveys was produced (GCP/RER/010/ITA/MSM-OP-01, document CC3/info3 refers). The participating experts agreed on the equipment to be used on board, periods of sampling, protocols of biological and environmental sampling, processing and management of the collected information. This work was done in two parallel sessions corresponding to echo-surveys and ichthyoplankton surveys.
- **Working Group on Basic parameters related to small pelagic fish: length at sexual maturity of anchovy and sardine in the MedSudMed Project area (14-16 April 2004, IRMA Mazara del Vallo – Italy).** The meeting was hosted by IRMA-CNR and was attended by 12 experts from MedSudMed and AdriaMed Project participating institutes. Experts from six Geographical Sub Areas (GSA) 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 of anchovy (*Engraulis encrasicolus*) and sardine (*Sardina pilchardus*) 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 GSA 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. The discussions held during the working group were summarized in a report that will be published as MedSudMed Technical Document and that was presented at the SAC Working Group on small pelagic species (Málaga, Spain, 6-7 May 2004) (GCP/RER/010/ITA/MSM-TD-07, document CC3/info4 refers).

## **2. Cooperative research programme**

During the intersessional period, field work started in view of fulfilling the objectives set for each component of the Project. Data collection at sea was conducted following the standardized protocols that were agreed at regional level. Surveys at sea involved mixed teams with experts from several institutes on board the research vessels; this was an occasion

to provide on-the-job training. Discussions were also held on data processing methods and implementation in order to produce results at regional level.

### **MedSudMed Component on Small Pelagic fish**

- **Cooperative Ichthyoplankton Surveys (17 June - 6 July 2004, R/V “Urania” and 11-23 August 2004, R/V “Hannibal”)**. In agreement with the recommendations of the Coordination Committee, mixed teams participated in the ichthyoplankton surveys organised by the IRMA-CNR from Italy and INSTM from Tunisia on board their respective research vessel (“Urania” and “Hannibal”). On-board training was provided for scientists coming from other institutes of the MedSudMed area. Purpose of both surveys was the collection of ichthyoplankton samples in order to provide information on the reproductive strategy of the main pelagic species in relation with environmental parameters. In line with the activities conducted by the MedSudMed Project and in agreement with the Malta Centre for Fisheries Sciences (MCFS), the sampling area of the survey organized by IRMA-CNR was extended to the Maltese territorial waters. The participation of two researchers from MCFS in the Italian oceanographic survey (17 June- 6 July 2004) and of one researcher from the Marine Biology Research Centre, Libya (MBRC) in the survey at sea organized by INSTM (11-23 August 2004) was also supported by the MedSudMed Project.
- **Cooperative Acoustic survey (04-20 October 2004, R/V “Dalla Porta”)** was conducted in cooperation with IRMA-CNR. The objective of the survey was to collect information on the spatial distribution and abundance of small pelagic fish, and on the environmental conditions. In agreement with the MCFS and with the support of the MedSudMed Project, the sampling area was extended to the Maltese territorial waters. Acoustic data, and therefore information on the spatial distribution and abundance of small pelagic fish, will be made available for the first time in GSA 15. The survey was conducted in coherence with the protocol agreed upon at regional level (GCP/RER/010/ITA/MSM-OP-01, document CC3/info3 refers). Moreover, the MedSudMed Project supported the participation of an expert from the MBRC who was provided on-the-job training during the survey.

### **MedSudMed Component on Demersal Resources**

- **Trawl survey (September-October 2004)**. Following the standardization of the trawl survey protocol in the MedSudMed Project area (5-9 May 2003, IRMA Mazara del Vallo - Italy), two institutes, INSTM and IRMA-CNR conducted a trawl survey according to the same protocol (GCP/RER/010/ITA/MSM-TD-04). The GSAs 12, 14, 15 and 16 were covered to a maximum depth of 800 m. Both vessels simultaneously prospected the areas where they usually sample. Overlapping zones were also identified and could be used for inter-calibration of the gears. The collected samples are being processed in view of joint data processing for the study of abundance and demographic parameters of the target species, the characterization of the main fish assemblages and the habitats, and the identification of the relevant abiotic factors that may explain the features observed.
- **Study of the benthic habitats and biotic assemblages of actual and potential fishing grounds**. The MedSudMed Project is currently supporting a study of the benthic habitats and biotic assemblages of actual and potential fishing grounds within



the Maltese Fisheries Conservation Area. In line with the objectives of this Project component, the MCFS is expected to locate essential fish habitats and identify common benthic features that may attract fish; characterize in terms of benthic assemblages and physical characteristics of the seabed such as benthic habitats including foraging areas, nursery grounds, and spawning areas important for fish as well as possible new bottom-trawling sites; study the physical and biological response of the benthic ecosystem to different regimens of fishing disturbance within real fishing grounds. The overall objective of the study is to develop and test ecological indicators and models to monitor the ecosystem effects of fishing on fish production in a range of habitats.

With the perspective of conducting field work in areas that are not currently covered by the surveys at sea, an evaluation of the R/V “Nour” of the Marine Biology Research Centre, Tajura, Libya was made. The acoustic equipment and technical specifications were examined in order to perform the calibration and testing of the vessel’s echo-sounder. The equipment was found to be functioning and in good shape. Missing pieces of equipment will be installed with the support of the MedSudMed Project, in view of surveys at sea that will be conducted in a short future.

### **3. Information System**

During the intersessional period, the Project went on for the development of the MedSudMed Fisheries and Ecosystems Information System (MSM FEIS), which is an application designed to be a system allowing the organization and standardization of the data collected in the MedSudMed Project area. The FEIS is aimed at supporting the field activities. The primary motivation is to standardize, aggregate and analyze the data, and give further possibility of exporting them onto a Geographical Information System (GIS). In the last period, from July 2003 to September 2004, the module that allows the input and the control of the data was finalized. A “beta version” (trial prototype) was distributed to the MedSudMed participating institutes, in order to test it, so that future developments may optimize the functions of the module (full details are provided in the document CC3/04).

### **4. National Capacity building**

As mentioned above, training was provided during the surveys at sea, in particular ichthyoplankton and acoustic surveys. Trainees were integrated into the working teams and were initiated in the use of the equipment (CTD probes, fishing nets, echo-sounders...), processing and conservation of the samples or data collected (measurements of physical/chemical parameters of the water column, zooplankton sampling, conservation of zooplankton samples and identification of fish larvae species, sediment sampling and analysis). The trainees produced reports in which they comment on the cooperation established with other institutes and request follow-ups to field work, in particular activities on data processing (acoustic data preparation and management, ichthyoplankton identification and classification...).

Moreover, two working groups organized by the MedSudMed Project were aimed at standardizing age reading methods based on demersal fish vertebrae and otoliths (GCP/RER/010/ITA/MSM-TD-08, CC3/Info 6 and GCP/RER/010/ITA/MSM-TD-09, CC3/Info 7 refer). Both working groups produced guidelines to estimate fish age using

common methodology at regional level. The encounters were also an occasion to highlight the heterogeneity of expertise in the Project area. Advantage was therefore taken to train less experienced experts in age reading methods.

Same approach was adopted during the Seminar on multivariate methods to analyze marine communities (25-27 January 2005, La Goulette, Tunisia), where a talk was given on multivariate analysis methods applied in fisheries ecology. The first part of the seminar was organized as a course for young scientists who received an initiation to the different techniques (cluster analysis, multidimensional scaling...) that should be used to fulfil some of the MedSudMed scientific activities.

As requested during the 2<sup>nd</sup> Coordination Committee meeting, representatives from the MedSudMed participating institutes were supported to attend the International Symposium on Quantitative Ecosystem Indicators for Fisheries Management (31 March-3 April 2004, Paris, France). It was an opportunity to learn from experiences gained in other regions and to establish links with institutions and scientists from around the world. Some works dealing with the Mediterranean Sea were presented at the Symposium on the development of ecological indicators (identification of keystone species, indicator on ecosystem impact, population, community and trophic indicators) for Mediterranean fisheries management. The discussions held during the Symposium highlighted that so far, there are well-defined indicators for fisheries management based on ecosystem considerations and that information about the use and properties of ecosystem indicators has much improved. The next step would be the production of guidelines useful to test indicators and develop frameworks for their application.

<b>Meeting</b>	<b>Participants</b>	<b>Institutions</b>
Seminar on multivariate methods to analyze marine communities (25-27 January 2005, La Goulette, Tunisia)	12	4
Workshop on standardisation of fish age determination based on otolith samples in the MedSudMed Project area (13-17 December 2004, Mazara, Italy)	22	6
Training course on age reading of selacean fish (22 November – 1 December 2004, Mazara, Italy)	8	5
Cooperative Acoustic Survey (04-20 October 2004, R/V Dalla Porta)	1	1
Cooperative Ichthyoplankton Survey (11-23 August 2004, R/V Hannibal)	1	1
Cooperative Ichthyoplankton Survey (17 June - 6 July 2004, R/V Urania)	2	1
Working Group on Basic parameters related to small pelagic fish: length at sexual maturity of anchovy and sardine in the MedSudMed Project area (14-16 April 2004, Mazara, Italy)	12	6
Workshop on the standardization of echo-surveys and ichthyoplankton surveys protocol in the MedSudMed Project Area (13-14 April 2004, Mazara, Italy)	18	5

## 5. Regional cooperation

The reinforcement of regional cooperation is being encouraged by the Project through participation of regional experts in several workshops, meetings, seminars and conferences organized in the Mediterranean area. Relations were constantly maintained with the researchers and the Institutes of the Project area for the discussion of the Project's activities, planning and organization of the working groups, and comments on the documents produced by the Project. Invitation was also made to other regional Projects to participate in meetings organized by the Project in order to promote the technical cooperation between Projects and take advantage of their experience and the results already obtained.

In particular the Project:

- Attended the **SAC Working Group on small pelagic species (Málaga, Spain, 6-7 May 2004)**. During the meeting, the MedSudMed contribution "Working Group on basic parameters related to small pelagic fish: length at sexual maturity of anchovy and sardine in the Project area" was presented. The paper presented by the Project was then further discussed during the Sub Committee on Stock Assessment (SCSA) meeting. It contributed to enrich the available information and to lead to the conclusion that the length at sexual maturity should be monitored annually in order to assess its variability, rather than establish a fixed value that would be valid at Mediterranean level.
- Participated in the **5<sup>th</sup> session of SAC Sub Committee on Marine Environment and Ecosystems (Málaga, Spain, 10-12 May 2004)**. The results of the MedSudMed Expert Consultation on small pelagic fish were presented. One of the mandates of the 2004 session of SCMEE was to "update information on mapping of essential fish habitats with a view of progressively implementing an ecosystem based approach to fisheries". In this line, it was considered relevant to present the results of the MedSudMed Expert Consultation on small pelagic fish at the SCMEE, as this issue had been discussed and that future activities had been designed and agreed upon by the participants. The drafted Technical Document reporting the expert consultation was distributed to the SCMEE participants.
- Attended the **AdriaMed WG on small pelagic fish** that was held in Bari from 29 June to 1 July 2004. The objective of the participation was to take note of the AdriaMed experience on several issues (joint acoustic surveys and stock assessment) that are also of interest for the MedSudMed Project. A presentation was given to describe the on-going and foreseen activities to be implemented by MedSudMed for each topic of the Project component on "Small pelagic fish: stock identification and oceanographic processes influencing their abundance and distribution" (standardization of sampling protocols for acoustic and ichthyoplankton surveys, on-going work at sea, expected working groups on data processing, planned experiment on *in situ* measurement of target strength (TS), initiatives on biological issues such as the estimation of length at sexual maturity, identification of the stock unit, forthcoming workshop on inter-calibration of age-reading methods, description of the FEIS, Fishery and Ecosystem Information System).
- Was invited to the **12th Copemed Steering Committee meeting (Malta, 9-13 March 2004)**. The meeting was attended by a representative of the MedSudMed Project. Results of the activities conducted in 2003 were presented by the Project and by the countries also participating in the MedSudMed Project. Discussions were held between the two Projects to co-organize a seminar on age reading according to the

conclusions of the MedSudMed second Coordination Committee meeting held in Tunisia in February 2004 in which the Copemed Project participated. A review on Marine Protected Areas is being published by Copemed and should also be translated into French in collaboration with INSTM in Tunisia. It was recalled that MedSudMed activities will concentrate on the implementation and use of MPAs exclusively in a fisheries management perspective.

- Supported the participation of regional experts in meetings relevant to MedSudMed activities and organised by other Regional Projects or Mediterranean bodies:
  - A regional expert attended the 3<sup>rd</sup> World Conservation Congress of IUCN in order to participate in a workshop on Ecosystem Approach to Fisheries and give a presentation on the activities implemented by the MedSudMed Project (17-25 November 2004, Bangkok, Thailand).
  - A regional expert also attended the Annual Science Conference of ICES (22-25 September 2004, Vigo, Spain).
  
- Participated in the **7<sup>th</sup> session of the GFCM SAC (19-22 October 2004, Rome, Italy)** where presentation was made of the latest MedSudMed achievements. The objectives of the Project were recalled, the activities conducted for each one of the Project's component were described (Demersal resources, Small Pelagic fish, MedSudMed Information System). The meeting was informed that for the intersession period, the activities mostly concentrated on the organization of cooperative field work, e.g. trawl surveys, echo-surveys and ichthyoplankton surveys, as well as training on board research vessels. The results obtained during the MedSudMed standardization meetings/working groups were also presented and appeared to be in line with the SAC requests and recommendations.

## **6. Project Communication**

### **6.1. Web site (<http://www.faomedsudmed.org>)**

The MedSudMed website was regularly updated with the announcement of forthcoming events. The mailing list was activated and is now operational.

The connections to the web site have regularly increased during the last year (from an average of 150 hits per month to nearly 600 visits per month). Hits originate mainly from North America (48%) and Europe (33%). Very few connections are registered from Africa (1.3%); this highlights the necessity of reinforcing and advertising this tool in the next future.

### **6.2. Technical Documents**

Several technical documents are being reviewed by the Project; they are related to the encounters organized by the Project (Expert Consultations and workshop). The documents contain a report on the discussions held during the meeting, with the activities proposed by the experts and their recommendations.

The MedSudMed Project Publications are issued as series of Technical Documents (GCP/RER/010/ITA/MSM-TD-00) or Occasional Papers (GCP/RER/010/ITA/MSM-OP-00) related to meetings and research organised or conducted within the framework of the Project.

The MedSudMed Serial will be included in the monitoring list of AdriaMed (ASFA International Partner).

The following documents have been published or are being finalised:

MedSudMed. 2004. Report of the Second Meeting of the Coordination Committee. GCP/RER/010/ITA/MSM-TD-06. *MedSudMed Technical Documents*, 6: 47 pp.

MedSudMed. 2004. Working Group on Basic parameters related to small pelagic fish: length at sexual maturity of anchovy and sardine in the MedSudMed Project area. GCP/RER/010/ITA/MSM-TD-07. *MedSudMed Technical Documents*, 7 (in preparation).

MedSudMed. 2004. Contribution to Guidelines for Chondrohichtyes fish Age Reading in the Mediterranean Sea (Application to selected species of the Mediterranean Sea). GCP/RER/010/ITA/MSM-TD-08. *MedSudMed Technical Documents*, 8 (in preparation).

MedSudMed. 2004. Workshop on standardisation of fish age determination based on otolith samples in the MedSudMed Project Area. GCP/RER/010/ITA/MSM-TD-09. *MedSudMed Technical Documents*, 09 (in preparation).

MedSudMed. 2004. Workshop on the standardization of echo-surveys and ichthyoplankton surveys protocol in the MedSudMed Project Area. GCP/RER/010/ITA/MSM-OP-01. *MedSudMed Occasional Papers*, 1 (in preparation).

De Santi, A., Fiorentino, F., Camilleri, M., Bianchini, M.L., Ragonese, S. SeaTrim Software for the Exploratory Analysis of Trawl Information in the Mediterranean. FAO-MiPAF Assessment and Monitoring of the Fishery Resources and the Ecosystems in the Straits of Sicily. GCP/RER/010/ITA/MSM-OP-02. *MedSudMed Occasional Papers*, 2 (in preparation).

**Developments of the Project programme:  
priorities identified and activities scheduled**

The aim of this paper is to give the Coordination Committee members some elements for the discussion of the MedSudMed Project work programme for the coming period and to put the Committee in a position to give advice to the Project on further activities to be carried out. The priorities, where Project activities are concerned, were identified during the consultations organized by the Project following the recommendations of the 1<sup>st</sup> Coordination Committee, the results of which were presented and discussed during the 2<sup>nd</sup> Coordination Committee meeting held in Tunisia in February 2004. Many of the activities programmed have been carried out, others are ongoing or in the pipeline.

The activities scheduled for the next inter-committee period are summarized below. Most of them are in progress, other proposals are the follow up of the MedSudMed Working Groups, while further activities focus on supporting, where necessary, the national research programmes in order to establish effective scientific cooperation at regional level. As well as their national significance or their position within the regional dimension of the Project, all the planned activities could also represent pilot activities for the other countries of the Mediterranean Sea area and serve to strengthen cooperation around the whole Mediterranean region. The Coordination Committee members are called on to give their contributions in order to orientate and advise the Project on the work-programme to be followed.

During the 2<sup>nd</sup> Coordination Committee meeting, as a result of the Expert Consultations held, a number of medium and long terms activities to be implemented by MedSudMed were discussed. These activities were summarized in tables (Report of the Second Meeting of the FAO MedSudMed Coordination Committee, GCP/RER/010/ITA/MedSudMed-TD06, Annex E refers) listing the general outlines of research and training programmes. For each component the table defined the overall objective, the background rationale, the methodological approach, the activities in relation to the on-going national and regional research activities, the expected output, the GSA covered, the research institution involved and the required training, working groups as well as the research activities.

The Project Components are unchanged and therefore for the coming period of Project activity updated versions of the same tables are put forward, on the basis of recent progress made and the results achieved by MedSudMed in the various areas of intervention. The content of these tables represents the methodological framework of the Project programme.

Scientific cooperation among the different institutions involved in the Project as well as increasing the scientific knowledge on the fishery resources and the relations with the abiotic and biotic factors in the Project area should remain the priority of MedSudMed.

For the next period the MedSudMed Project will aim to achieve the objectives indicated below, each area of Project activity is described in further detail in the following pages of this document:

- a. To continue supporting the scientific standardisation of the methodologies applied in relevant studies related to fishery resources and to the relationship between fishery resources and biotic and abiotic factors;

- b. To continue increasing scientific knowledge on fishery resources and their ecosystem in the Project area through the continuation of the programme of research activities already identified;
- c. To continue strengthening the national expertise, in particular where gaps need to be filled for the implementation of Project activities;
- d. To continue the implementation of the MedSudMed Fishery and Ecosystem Information System (FEIS) regarding the main aspects related to fishery resources and biotic and abiotic environment;
- e. To continue strengthening cooperation at Mediterranean level, among the countries and between the MedSudMed Project, the GFCM and other FAO Regional Projects;
- f. To continue strengthening and supporting scientific cooperation between the different experts and institutions involved in the Project activities, who represent the scientific network of the Project.

The approach that was considered relevant by the regional experts is to produce detailed terms of reference for each topic covered by the Project components. These terms of reference will be used as standardized guidelines by the participating institutes and will be followed during ad hoc working groups aiming at increasing knowledge on fishery resources by producing scientific results. These working groups will be the occasion of strengthening the scientific network of regional scientists. Results obtained will be duly published by the MedSudMed Project, as outputs of the activities and presented at regional level.

#### a) Standardisation of methodology

So far, much effort was made by the Project and the research institutes involved in the Project activities to achieve standardization of sampling design and the protocols used in the different survey programmes. As a result, common protocols started to be used for field work (trawl surveys, echo-surveys) and whenever possible for the processing of the samples collected at sea. Thanks to the level of standardization achieved, comparable data are now available in the Project area. In the next future, efforts towards standardization should be continued, focusing on procedures followed for laboratory work and data processing methodologies (statistical analysis, mapping procedures...).

For the coming period the Project will concentrate on analysis of the data collected during the surveys programme. Detailed terms of reference for the data analysis should be written for each activity to be conducted in the different Project components, in view of the working groups that will be organized. Therefore, for each topic or type of activity, regional experts should agree on terms of reference giving details on the whole data procedure, such as: list of data to be used, algorithms to be applied, variables to be taken into consideration, criteria to be applied for specific data selections...

Where demersal fishery resources component is concerned, the topics to be taken into consideration for further discussion on standardization procedures are listed below, with examples of issues to be detailed in the terms of reference:

- Abundance and demographic structure of target species: procedure to estimate the biomass to be applied for a regional estimation of the biomass, age/length classes to be considered for the identification of the spawning and nursery areas;
- Fish assemblages: faunistic lists to be considered, statistical analysis to be performed;
- Description of habitats, benthos and macroinvertebrate communities: topics to be considered and level of detail that should be reached in the description of the bottom types/assemblages, conventions or classifications to be used;
- Influence of abiotic environmental factors: underlying scientific hypotheses the analysis should be based on, selection criteria for most relevant environmental factors that may have an influence on the spatial distribution of the adult biomass, localization of spawning areas and fish assemblages, type of multivariate analysis to be performed;
- Mapping procedures: strategy and procedures to be applied, basic cartography to be used, type of projection, type of interpolation, resolution of maps;
- Standard parameters for biological knowledge and for fisheries management: list of most relevant parameters to be calculated and definition;
- Delineation of the main stock units and identification of the shared stocks in the Project area: target species, protocol to be used.

Where small pelagic fishery resources component is concerned, the topics are the following:

- Acoustic sampling in the Project area: protocol for the additional transects to be performed in order to fill the remaining gaps, available equipment and calendar of available boats;
- Ichthyoplankton sampling: proposal of additional samples to be collected in areas that are not currently covered, calendar and available equipment and boats;
- Regional estimate of the small pelagic fish biomass: details on the preliminary processing of echograms to be performed, spatial resolution of the data, definition of the methodology and joint analysis for the echo-integration and for biomass/species distribution at GSA and regional level;
- Spatial distribution of small pelagic fish biomass in relation with environmental factors and fishing activities: environmental parameters to be taken in consideration, available circulation/hydrographic models, statistical methods/models to be used;
- Eggs and larvae distribution and relative abundance pattern: sample processing to be performed in laboratory (identification of species, classification...), procedure for the estimation of eggs, larvae and zooplankton biomass;
- Regional map of the main spawning areas of small pelagic fish species: criteria to be used for the identification of these areas, mapping procedures, basic cartography to be used, type of projection, type of interpolation, resolution of maps;
- Environmental factors explaining the distribution and transport pattern of eggs and larvae: variables to be taken into consideration and related processing of environmental data collected, statistical/numerical analysis to be performed;
- Target Strength-length relationship of sardine and anchovy: working methodology, equipment required, sampling site and period, statistical analysis to be made;



- Stock unit of selected species through the analysis of genetic structure: target species, protocol to be used.

The terms of reference, as detailed as possible, should be circulated to the participating institutes in order to go ahead with the preparation of data and information that are necessary, and perform preliminary processing of data when required. Efforts will be made to explicit all procedures so that institutes are operational and process the available data and information in standardized way prior to the working groups which should be practical work sessions.

#### b) Increasing scientific knowledge

The research activities identified by the experts during the MedSudMed Expert Consultations and implemented by the Project, concentrated mainly on demersal and small pelagic fishery resources. The activities indicated are based both on existing national programmes and on specific research programmes considered as priorities by the experts. The cooperative research activities described are intended not only in terms of field research, but also as studies and reviews implemented by the Project.

For the coming period the Project will concentrate on supporting the Working Groups that will be established with the specific task of analysing the available information; such Working Groups will be given clear terms of reference with methodologies that have been discussed and concurred by all concerned. The output will be in the form of technical information that is directly useful to the countries and the researchers of the MedSudMed Project area and the wider Mediterranean area (thus further reinforcing the pilot role of the Project).

On the basis of the results obtained by the MedSudMed Working Groups mentioned herein, multidisciplinary pilot studies will be implemented and will start in the GSAs where all data concerning the different disciplines are available in a standard format.

The Project will pay particular attention to supporting the programmes that aim to cover relevant scientific gaps that remain. Particular effort will be made in areas where information is still limited and where national programmes need relevant support from the Project. In particular, strong support will be provided by the Project for the implementation of national surveys at sea in areas where gaps were identified (such as GSA 21). Field activities and working groups that are foreseen for the next intersession period are summarized below.

#### **Demersal resources**

- The Project will organise Working Groups aiming at defining the methodologies for the analysis and processing of data. The work sessions that are foreseen should deal with:
  - Regional biomass estimation, determination of length at sexual maturity for selected demersal species and of the main biological parameters;
  - Common cartography of demersal resources abundance (density index and associated relevant parameters) and identification of nursery and/or spawning areas;

- Characterisation of fish assemblages;
- Characterisation of benthos and macroinvertebrate communities associated with the survey and of critical habitats for fisheries resources;
- Identification of the most relevant abiotic environment parameters possibly influencing demersal fisheries resources abundance and spatial distribution, and description of the underlying processes.
- Cooperative trawl surveys (spring 2005) will be operated to continue the data collection according to the standardized protocol;
- Data will be collected to analyse the fisheries sector in the different GSAs covered by the Project. Information should deal with the fleet composition, fleet activity and, whenever available, catch composition and rates;
- Multidisciplinary pilot studies will be conducted on the basis of the results obtained by the Working Groups. These studies will consist in an integration of several layers of information (fish biology and ecology, abiotic environment, habitats...).

### **Small pelagic fishery resources**

- The Project will organise Working groups with the objective of processing data and produce results on the following issues:
  - Regional assessment of the small pelagic fish biomass: joint analysis of acoustic data to calculate and describe the biomass/species distribution at GSA and regional level;
  - Environmental factors: identification of abiotic parameters influencing the spatial distribution of small pelagic fish biomass and description of the patterns observed, when information is available, correlation will also be sought with fisheries activities or characteristics;
  - Regional mapping of the main spawning areas of small pelagic fish species: following the standardized processing of the ichthyoplankton samples at laboratory, the spatial distribution of eggs and larvae will be described and the main spawning areas will be identified;
  - Environmental factors explaining the distribution and transport pattern of eggs and larvae.
- Acoustic sampling in the Project area: additional transects will be performed in areas where no data is available so far;
- On-the-field experiment: determination of the acoustic Target Strength for sardine and anchovy, and joint calculation of the TS-length relationship;
- Ichthyoplankton sampling will be conducted according to the protocol that was agreed upon in the Project area. Priority will be given to areas where information is missing. Whenever possible, acoustic sampling on adults will also be conducted (parallel acoustic and ichthyoplankton surveys);
- Data will be collected to analyse the fisheries sector (as per Project Component on Demersal Resources).

## **Marine Protected Areas**

As discussed during previous meetings, this Project component is transversal to the other ones. Therefore, activities will be organized on the basis of results obtained by the two previous Project components. In the coming period, the Project will concentrate on (i) producing guidelines on the relevant criteria to be used for the implementation of MPAs and (ii) superimposing layers of information produced by the Working Groups in order to provide basic inputs to feasibility studies on Marine Protected Areas according to the guidelines produced.

### c) Building national capacity

In the coming period, the Project will continue to strengthen the national expertise through the implementation of an *ad hoc* programme. The Project will continue to consider the full involvement of all the research institutes and scientists from the participating countries as a priority; an increase in national capacity in terms of expertise will therefore continue to be promoted through the support of specific research programmes that are coherent with the activities of the Project. Seminars and training activities will also be considered both for the implementation of research activities and in the efforts to standardise scientific methodology, as described in the tables presented in Annex 1.

In particular, the Project will continue to support:

- On-the-job training during the surveys at sea for the small pelagic and demersal fishery resources (acoustic, ichthyoplankton and trawl surveys);
- Harmonisation of expertise in laboratory work for the post-processing of samples collected at sea, use and manipulation of laboratory equipment and ad hoc soft wares;
- Strengthening of regional expertise on data processing by organizing study tours and/or ad hoc training courses with the support of extra-regional experts if required;
- Participation in international meetings or symposia to learn from experiences gained elsewhere and establish contacts with scientists from around the world.

The Workshops scheduled for the standardisation of methodologies will be conducted using the one already carried out on trawl survey protocols as a model. Furthermore, other *ad hoc* training courses focusing on specific requirements from the Institutes could be considered; some training could also be arranged in cooperation with the other FAO Regional Projects. The organisation of such meetings and training sessions will be considered in accordance with availability of equipment and laboratories.

Wherever possible, the Project will continue in providing the equipment necessary to the Institutes for the implementation of the MedSudMed activities.

### d) Fisheries and Ecosystems Information System (FEIS)

The Project component that concerns the establishment of a Regional Information System could continue towards:

- The completion of the data analysis modules, in particular those related to GIS;
- The development of additional data analysis tools that may be used in routine by the regional experts; this could be done on the basis of the results of the working groups;
- The publication of the FEIS on the web, displaying only information at metadata level;
- The presentation and distribution of the National components of the system to the participating institutes to get comments and to start using the software;
- The presentation of the prototype to SAC Sub-Committees to get comments on possible diffusion of the FEIS to other regions.

e) Cooperation at Mediterranean level and between the MedSudMed Project, the GFCM and other FAO Regional Projects

Results of the meetings of Project Working Groups, as well as the results of the research activities as they become available would be presented at GFCM-SAC meetings as regional contributions by the Project in the framework of its activities. Cooperation will be sought with the other FAO regional Projects (Adriamed, Copemed and MedFiSis), as well as international institutions on topics that may be of common interest with MedSudMed.

f) Project network

It is the aim of the Project to continue strengthening and supporting scientific cooperation among the experts and institutions involved in MedSudMed activities, these represent the scientific networks of the Project. These networks are well established and much of the work that concerns discussion of methodologies can now be carried out electronically, meetings will only be considered for highly specialised issues and where a technical output is required.

**Annex 1: General outline of research, Workshops and training programme to be implemented by the MedSudMed Project in the coming period.**

<b>Programme</b>	<b>Spatial distribution of demersal resources in the Project area and the influence of environmental factors and fishery characteristics</b>
<b>Overall Objective</b>	To describe the spatial distribution of demersal resources in the Project area and the factors explaining it, including biotic and abiotic environmental parameters and fisheries characteristics.
<b>Background Rationale</b>	Despite the management frameworks adopted, very little information is available on the distribution of demersal resources in the Project area. In this context, trawl surveys have been regularly conducted in the Project area by the different institutes since 1985, in order to enhance knowledge on the spatial distribution of demersal populations at various stages of their life cycle. However, sampling designs and protocols used to date differ and do not allow a homogeneous spatio-temporal analysis of the data, due to the absence of a coherent regional data set. As a result, experts of the region highlighted the importance of standardizing the methodologies to fill the remaining gaps in knowledge on spatio-temporal variability of fish distribution at regional level, in particular regarding fish communities, feeding grounds and habitat mapping. Besides, in the absence of seasonal data covering relevant biological periods, key knowledge on reproduction grounds of the main target species is still missing in the Project area, as well as the description of the main physical processes influencing the abundance and distribution of early life stages. Finally, for many areas a relevant gap remains on the quantification and spatial distribution of fishing effort, considering the absence of geo-referenced data on this issue. A common approach as well as standardized methodologies and protocols are needed to fill the gaps highlighted and obtain valid results and information at regional level.
<b>Methodological approach</b>	<p>Combined trawl surveys with environmental measurements. Eastward extension of the ongoing trawl surveys to include Libyan waters and addition of sediment sampling. Different life stages of the agreed priority species will be considered (recruits, juveniles, adults), and a component will focus on the identification of the stock units.</p> <p>All the relevant socio-economic information related to the fishery activities and fishing pressure in the area studied will be gathered.</p> <p>Whenever necessary, the organisation of working groups involving representatives of all participating institutes, to discuss, standardize, prepare activities to be implemented,</p>
<b>Activities</b>	<ul style="list-style-type: none"> <li>- <b>Discuss, prepare and agree upon regional standardized methodologies and protocols to be used in the data inventory and collection (done)</b></li> <li>- <b>Discuss, prepare and agree upon regional standardized methodologies and protocols to be used in the data processing (in progress)</b></li> <li>- <b>Create an inventory and collect existing data and information available in the participating institutes in order to extract background information to be used as preliminary basis for further studies (in progress)</b></li> <li>- <b>Execute joint trawl surveys in pilot areas in order to cover representative portions of the Geographical Sub Areas included in the Project Area (started)</b></li> <li>- <b>Prepare common data sets including biological, environmental and sediment data following the standardized protocols prepared and agreed upon by all institutes involved (in progress)</b></li> <li>- Carry out data compilation and processing to produce validated results at regional level, using already existing data and data provided by standardized trawl surveys:             <ul style="list-style-type: none"> <li>o Identification and description of the spatial distribution of the target species agreed upon by the participating institutes by calculating and mapping the density index for each species (<i>Merluccius merluccius</i>, <i>Mullus barbatus</i>, <i>Mullus surmuletus</i>, <i>Trachurus trachurus</i>, <i>Pagellus erythrinus</i>, <i>Helicolenus dactylopterus</i>, <i>Parapenaeus longirostris</i>,</li> </ul> </li> </ul>

	<p><i>Aristaeomorpha foliacea, Nephrops norvegicus, Eledone cirrhosa, Sepia officinalis, Octopus vulgaris, Raja clavata</i>)</p> <ul style="list-style-type: none"> <li>○ <b>Processing of sediments and biological samples to identify and classify the main biocenosis in the Project area using the standard terminology of RAC/SPA when applicable (in progress)</b></li> <li>○ Description of the fish assemblages of demersal resources according to bathymetry, biocenosis and substratum</li> <li>○ Analysis of the stock unit based on biological parameters and genetic markers: data elaboration in order to provide information on the genetic structure of selected populations</li> <li>○ <b>Growth and age determination of selected species based on standardized methodology using otolith reading (in progress)</b></li> <li>○ Calculation of the length at sexual maturity of selected species</li> </ul> <p>- Analysis of the fisheries sector and of the spatial distribution of fishing effort in the Project area, where possible on the basis of the available information.</p>
<b>Relations with the on-going national and regional research activities</b>	National surveys are conducted annually and geo-referenced data are processed routinely for the mapping of the resources and for age reading. Local information exists on relationships between biomass concentration and oceanographic processes, as well as on the spatial distribution of fishing effort
<b>Expected Outputs</b>	<ul style="list-style-type: none"> <li>- <b>Standardized sampling protocols to be used at regional level (done)</b></li> <li>- <b>Standardized data processing protocols to be used at regional level (in progress)</b></li> <li>- <b>Full inventory of existing data and information regarding relevant issues and mentioning the availability of the information (in progress)</b></li> <li>- <b>Regional biomass estimation and distribution of the stocks at regional level (in progress)</b></li> <li>- <b>Single thematic maps for each target species and relevant environmental factors (in progress)</b></li> <li>- <b>Mapping of benthic ecosystems/habitats in the Project area (in progress)</b></li> <li>- Localization of spawning and nursery areas and relationships with physical processes</li> <li>- <b>Characteristics of the main fish assemblages and relationships with habitats and physical processes (in progress)</b></li> <li>- Definition/Calculation of standard parameters relevant for biological knowledge and for fisheries management</li> <li>- Delineation of the main stock units and identification of the shared stocks in the Project area</li> </ul>
<b>GSA Covered</b>	As far as possible, the pilot activities mentioned above will be conducted in representative portions of the Geographical Sub Areas covered by the Project
<b>Research Institutions involved</b>	INSTM, IRMA-CNR, MBRC, MCFS and other relevant institutions that could be invited to give scientific support on specific matters
<b>Required training, working groups and research activities</b>	<ul style="list-style-type: none"> <li>- <b>Workshop on standardization of trawl survey protocols (done)</b></li> <li>- Workshop on standardisation of data processing methodologies (TBD)</li> <li>- <b>Workshop on growth and age determination based on otolith reading (done)</b></li> <li>- Working Group on determination of length at sexual maturity for selected demersal species: definition of standard protocol for the collection of representative samples and the statistical processing of the data (TBD)</li> <li>- Seminar on common cartography and mapping of demersal resources density index, and description of fish assemblages</li> <li>- Seminar on stock unit identification</li> </ul> <p><b>Cooperative trawl surveys (started)</b></p>

<b>Programme</b>	<b>Small pelagic fish: stock identification and oceanographic processes influencing their abundance and distribution</b>
<b>Overall Objective</b>	To estimate abundance and spatial distribution of small pelagic fish at regional level, considering also early life stages distribution pattern in relation to environmental parameters and fishery characteristics.
<b>Background Rationale</b>	Small pelagic fish populations are generally characterized by significant fluctuations in their abundance, and this probably affects the spatial distribution of the stocks. This variability has also an economic incidence on fisheries depending on these resources. The lack of information on regional assessment of small pelagic fish biomass was underlined on repeated occasions. Moreover, important gaps in knowledge on the possible migration of the species, stock units and relationships with environmental conditions still need to be filled. To date, several studies have been conducted on these issues in the Project area, using different sampling designs and softwares, and data have been collected regularly since 1998. Yet, enhancing knowledge on these issues at regional level implies the use of standardized protocols for any data collection and processing. This appears a pre-requisite for the obtaining of any useful result for management purposes. A common approach as well as standardized methodologies and protocols are needed to fill the gaps highlighted and obtain valid results and information at regional level.
<b>Methodological approach</b>	Joint acoustic and ichthyoplankton surveys combined with pelagic trawling. Both surveys will be combined with biotic and abiotic environmental measurements and parallel collection of remote sensing data. Organisation of working groups
<b>Activities</b>	<ul style="list-style-type: none"> <li>- <b>Discuss, prepare and agree upon regional standardized methodologies and protocols to be used in the data inventory and collection (done)</b></li> <li>- Discuss, prepare and agree upon regional standardized methodologies and protocols to be used in the data processing</li> <li>- <b>Create an inventory and compile existing data and information in the participating institutes in order to extract background information to be used as preliminary basis for further studies (in progress)</b></li> <li>- <b>Prepare survey design in the Project area and standardization of sampling design, equipment and soft wares used on board, both for ichthyoplankton and echo-surveys (done)</b></li> <li>- <b>Execute a joint echo-survey and ichthyoplankton survey extending the prospected zones to representative portions of all GSA covered by the Project (started)</b></li> <li>- Prepare common data sets including biological and environmental data following the standardized protocols prepared and agreed upon by all institutes involved</li> <li>- Carry out data compilation and processing to produce validated results at regional level, using already existing data and data provided by standardized sampling surveys: <ul style="list-style-type: none"> <li>o Assessment and mapping of the small pelagic fish biomass at regional level by using direct methods (echo-integration and experimental trawling)</li> <li>o Analysis of environmental factors at regional scale, in particular temperature, phytoplankton, currents</li> <li>o Joint data analysis coupling eggs and larvae distribution and abundance to biotic and abiotic measurements, by using direct maps comparison and/or spatial statistics methods</li> <li>o Determination of the acoustic Target Strength for sardine and anchovy, and calculation of the TS-length relationship</li> <li>o Analysis of the stock unit based on biological parameters and genetic markers: data elaboration in order to provide information on the genetic structure of</li> </ul> </li> </ul>

	<p>selected populations</p> <ul style="list-style-type: none"> <li>○ Growth and age determination of selected species based on standardized methodology using otolith reading</li> <li>○ Standardisation of basic parameters (length at sexual maturity, age-length and TS-length relationship)</li> </ul> <p>- Analysis of the fisheries sector and of the spatial distribution of fishing effort in the Project area and when possible on the basis of available information.</p>
<b>Relation with on-going national and regional research activities</b>	<p>Annual/seasonal surveys are currently organized in the area, by INSTM (Tunisia), and IRMA-CNR (Italy), for the assessment of the biomass and the coupling of biological data to oceanographic variables. The spatial distribution of several species is drawn up, as well as the bathymetric distribution of the different age and size classes. Eggs and larvae samples are also collected on a regular basis.</p>
<b>Expected Outputs</b>	<ul style="list-style-type: none"> <li>- <b>Regional estimate of the small pelagic fish biomass (in progress)</b></li> <li>- Spatial distribution of small pelagic fish biomass and relative abundance pattern in the Project area, in relation with environmental factors and fishing activities</li> <li>- <b>Eggs and larvae distribution and relative abundance pattern (in progress)</b></li> <li>- Regional map of the main spawning areas of small pelagic fish species</li> <li>- Identification of the main environmental factors explaining the distribution and transport pattern of eggs and larvae</li> <li>- <b>Validated Target Strength-length relationship at regional level for sardine and anchovy (in progress)</b></li> <li>- Improved knowledge of stock unit of selected species through the analysis of genetic structure of the studied populations</li> </ul>
<b>GSA Covered</b>	<p>Studies will be conducted in representative portions of the Project area</p>
<b>Research Institutions involved</b>	<p>INSTM, IRMA-CNR, MBRC, MCFS and other relevant institutions that could be invited to give scientific support on specific matters</p>
<b>Required training, working groups and research activities</b>	<ul style="list-style-type: none"> <li>- <b>Preparation of surveys at sea and standardisation of working methodologies (sampling period and sampling design, type of data, software, storage of data) (done)</b></li> <li>- Working group on Target Strength calculation based on historical data</li> <li>- <b>Joint echo-surveys (started)</b></li> <li>- Presentation of the sampling surveys results</li> </ul>



<b>Programme</b>	<b>Assessment of Marine Protected Areas as a tool for Fisheries management</b>
<b>Overall Objective</b>	To assess the feasibility of MPA implementation for fisheries management purposes, and to produce guidelines on the use of MPAs as a tool for fisheries management specific to Mediterranean areas. The overall objective is to provide proposals on the design, localization and use of such tools and/or further studies, taking into account the existing experience and peculiarities of Mediterranean fisheries.
<b>Background Rationale</b>	During the Project's Expert Consultation organized on this issue, the role of MPAs in the reduction of the fishing mortality, protection of key portions of the stocks and of fish feeding grounds was highlighted. Critical points were indicated as: (i) the dimension of the area to be protected; (ii) legal aspects of the access of the different users to the protected areas; (iii) the assessment of the socio-economic benefits of the implementation of MPAs; (iv) monitoring, control and surveillance to be implemented with particular attention to fishing exploitation. The experts highlighted the existing experience and scientific expertise on these issues in the Project area. However, they underlined the lack of guidelines providing methodological framework and strategic criteria for the implementation of MPAs in a management perspective and taking into account the characteristics of the Mediterranean. Moreover, the experts underlined the relevance of finding common ground between usual considerations on MPAs for biodiversity conservation and fisheries management, for instance in the use of homogeneous terminology. The preparation of specific guidelines on the use of MPAs as a tool for fisheries management in the Mediterranean could also help with this aspect.
<b>Methodological approach</b>	<p>1) Establish the spatio-temporal dynamic and status of the fisheries resources inside and outside the identified area using mapping tools (GIS), particular attention must also be given to the issues dealing with the abiotic environment as well as biodiversity including knowledge of biocenosis present in the area. This assessment should be based on background information touching biological, ecological and socio-economical issues.</p> <p>2) description of the fishing effort and pressure exerted inside and outside the area (in space and time).</p> <p>3) on the basis of the above, identify clear objectives of fisheries management, technical measures to be adopted and the monitoring programme including biological, environmental and socio-economic aspects.</p>
<b>Activities</b>	<ul style="list-style-type: none"> <li>- <b>Collection and compilation of relevant data on fisheries resources and their ecosystems (habitat, environment, fisheries activity, socio-economy, fishing effort) related to the definition of pilot study zones (in progress)</b></li> <li>- Definition of pilot study zones</li> <li>- Definition of a monitoring programme to assess the effect of fishing closure</li> </ul>
<b>Relation with the on-going national and regional research activities</b>	Activities implemented in the framework of this programme will take advantage of on-going research dealing with demersal resources, habitat identification and mapping, assessment of fishing effort. The activities will be conducted in close collaboration with the programme identified by the Consultation on demersal resources, due to the overlap of several topics.
<b>Expected Outputs</b>	<ul style="list-style-type: none"> <li>- In the Pilot study zones, description of: <ul style="list-style-type: none"> <li>- dynamics and status of fisheries resources</li> <li>- relevant environmental processes influencing the resources</li> <li>- critical/key habitats</li> <li>- fisheries activity depending on the key resources (fishing effort inside and outside the zone)</li> <li>- relevant socio-economic aspects</li> </ul> </li> <li>- Assessment of the effect of fishing closure on biomass, mean size of fish, spillover and socio-economic relationships</li> </ul>

	- <b>Guidelines for the implementation and assessment of MPAs for management purposes adapted to Mediterranean case studies (in progress)</b>
<b>GSA Covered</b>	Pilot study zones will be either included or straddling the GSA included in the Project area
<b>Research Institutions involved</b>	INSTM, IRMA-CNR, MBRC, MCFS and other relevant institutions that could be invited to give scientific support on specific matters
<b>Required training, working groups research activities and timing</b>	Working group on data collection and data processing An <i>ad hoc</i> Working Group will be organised for the implementation of pilot studies. The Working Group will focus on the preparation of the scientific protocol including data collection and processing

**Progress report on Database and Application Components  
MedSudMed Fishery and Ecosystem Information System (MSM FEIS)**

### **1. Background information**

Following the agreements reached at the 1<sup>st</sup> and 2<sup>nd</sup> Coordination Committee meetings, the MedSudMed Project continued the development of the Fishery and Ecosystem Information System (FEIS) which is to act as a regional system. The FEIS was designed to provide a framework within which the MedSudMed Project participants can share and transfer knowledge, information and data. Particular focus is given to knowledge management, Geographical Information System and communication facilities within the Project. To this end, regional experts were involved in the development of FEIS by providing their comments and suggestions for the technical development of the system.

On release of the final product, it is foreseen that the package will be installed and made operational in each MedSudMed participating institution, so that each will have an independent, but compatible, module covering the resources of its own national zones, as well as a part of a common international module covering the shared ecosystems and resources. Therefore, each Institute received the prototype of the FEIS in its current state for testing and reviewing for specific adaptation to suit national exigencies.

This document, as for the previous Coordination Committee meetings, is an update of the current status of the FEIS development. Recent developments regard the Corporate database and Applications.

### **2. Objectives of the FEIS - Fisheries and Ecosystems Information System**

The FEIS is designed to support scientific communities and country administrations in the development of a system for monitoring fisheries resources and ecosystems through the organization and standardization of present and past data produced in the Project area, complemented by accessory data and information obtainable from the Internet, and duly structured to enable its access for immediate and/or further pooled processing. The aim of this system is to act as an analytical support tool to study marine ecosystems, natural phenomena and fisheries, by providing a framework within which the project participants can share information and data. It will also enable the creation of applications to support the management, analysis and representation of data relative to fishery resources and their environment. The key information concerns biological aspects of the resources, environmental parameters, fishery statistics and accessory data. The primary motivation is to standardize, aggregate and analyze the data, and enable them to be exported on a GIS. The primary users and beneficiaries would be the partner countries of MedSudMed, as well as the scientific institutions of the General Fisheries Commission for the Mediterranean (GFCM) and FAO. The further use through the WEB will also be open to the external world with limitations on some source data for which authorization might be necessary.

### 3. Conceptual Reminders

The database is a vital part of management information systems and therefore the approach and technology applied for managing data is crucial. Databases are instruments to supply processed data to management information systems in a structured and normalised way to support analysts, planners, and managers in the decision-making process. It is therefore the building block of Information Systems (IS) and Decision Support Systems (DSS).

FEIS, on the whole, is a pure DSS built on Information Systems Structure where a progressive and interactive logic has been introduced to guide the users to reach a goal (partial or final decision) stepwise. The problem solving is enhanced by an interactive dialogue between the system and the user. Elementary, simple models that can easily be understood and interpreted rather than complex, integrated models were given preference. In this way, it is believed that different models and strategies may be used to support each of the phases of decision making: intelligence, design, choice, testing, learning, Internet, Networks, etc.

The key issue, at design level, was to have decided that the System Database would not be a shared application but a corporate application interacting and aggregating a family of databases (Database System) for which the level of authorization and control was totally with the partner Institutions and their contents jointly established by the regional experts participating in the various Project components. In such environment, the corollary was that the whole data processing flow, from the data collection, operation transactions, forms, interpretation, input and output rules and criteria, has created a “corporate” logic.

For the development and implementation of FEIS, a mixed working approach was decided on whereby the design of the whole configuration followed a top-down logic and the implementation was bottom-up. In this case it was possible to develop applications piecemeal, as close as possible to their natural environment, guided by national staff (the end-users) and useful to the local administrations. The development, although adapted to the various cases, was always done within a fixed, robust framework. Moreover, in FEIS an initial country was always chosen (followed by another country with different situations) to be used as test case to develop prototypes. The strategy was to use real life situations as pilot surveys in order to complete at the same time and therefore with the same resources, the development of the working prototypes and the main system.

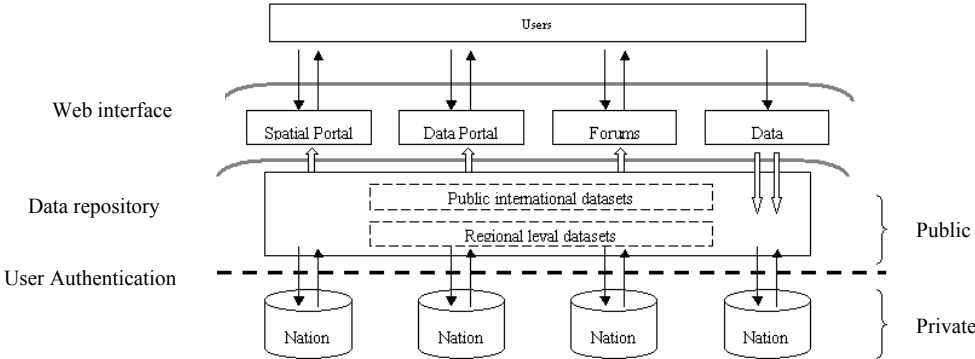


Figure 1. Basic conceptual scheme of the FEIS.

The overall framework, the components, the relationships between elementary Databases and their basic data models, as well as the functional specifications, were established beforehand. The structural positions of each database in the overall design and their input/output parameters, computer languages and options as well as constraints, were also set at the beginning. Computing system requirements (working station platforms) were also imposed.

The implementation process, the level of detail, the amount of data processed and the level of interaction with national counterparts as well as national specifications were developed stepwise. National requirements were included in the system development without upsetting the overall plan. Also, development priorities were adjusted according to the case, but always respecting the specifications set in the general framework. This approach was, in a way, dictated by the situation. Some participating institutes had different priorities and different preparation and resources to follow the same development plan.

In FEIS the functional integration has been the most important plan at design level. At functional level, the different software functions for processing data and generating results are provided as a single system. The package software has built-in communications features required to accomplish integration between sub-systems.

Hereafter are the 6 main database models interacting with the FEIS Corporate System.

- ❖ The Regional/National/Local Reference and Codification System
- ❖ The inventory of environmental parameters provided by public databases (Internet origin)
- ❖ Pelagic Resources (Acoustic surveys results)
- ❖ Demersal Resources with subset on Benthic Fauna and Sediment (Trawl Survey results)
- ❖ Plankton resources (Ichtyoplankton surveys results)
- ❖ Operational Units Performances by national fleets (MedStat origin)

## **4. Corporate Database**

### **4.1. Development phases**

During the inter-session period, the structure of the corporate database was finalized, in particular the eventual design of the four main parts filled with data provided by different types of surveys at sea: (i) Trawl surveys, (ii) Acoustic surveys, (iii) Ichtyoplankton Surveys and (iv) Frame survey (Operational units data). On the basis of suggestions made by regional experts, new tables were added in the structure of the database, in order to include missing fields. The corresponding forms were updated in order to allow the user to insert and visualize the relative data.

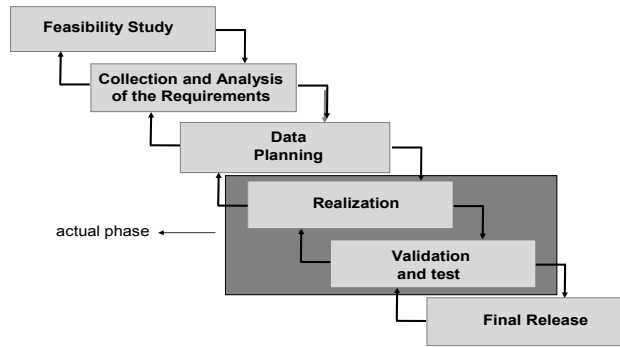


Figure 2. Phases of development of the corporate data base

## 4.2 The database data model

The data structure includes fields that are identical for all types of surveys. These common fields include information such as the data owner, the name of the survey, the country/ies involved, the period of sampling, Geographical Sub Area (GSA) covered, as well as the spatial-temporal coordinates of the samples collected during the survey (latitude, longitude, time, bottom depth ...). More specific fields vary from one type of survey to the other. On request, the MedSudMed Project can supply the whole structure of the data bases. In any case, they will be presented in the FEIS technical documentation as adequate.

### 4.2.1. Trawl surveys

The trawl survey data structure includes 4 tables related to:

- Identification of the survey where mention is made of the trawlable area, the swept area, in addition to the general description of the survey
- Identification of the haul: duration of haul, horizontal and vertical opening of the net
- Related biotic parameters recording the measurements made on single fish (species, length, weight, gonad weight, sex...)
- Related abiotic parameters include physical measurements such as temperature, salinity, current...

### 4.2.2. Acoustic surveys

Due to the important volume of data recorded during each acoustic survey, and as it appeared impossible to find a common spatial-temporal resolution of the samples for all participating institutes, it was agreed to store general information on the surveys without storing each datum. However, detailed data are available on biological sampling. Therefore, specific fields in each table of the data structure regard:

- Identification of the survey: sampling design, type of echo-sounder, acoustic sampling frequency, pulse duration...
- Identification of the haul: very similar to trawl surveys, except that mention is made of the size of the sub-sample.

- Related biotic parameters recording the measurements made on the fish caught (species, number of individuals, average length and weight, total catch ...)
- Related abiotic parameters include physical measurements such as temperature, salinity, current...

#### **4.2.3. Ichthyoplankton survey**

Five tables were created in the data structure related to this type of survey:

- Identification of the survey: in addition to the usual general fields, information regarding the characteristics of the Bongo net (mesh size, diameter), type of flowmeter and calibration coefficient.
- Identification of tow with all required information to calculate the exact depth of the net during the sampling (length of wire, angle of stabilization), and the volume of water filtered.
- Identification of sample with fields corresponding to the species, number of eggs and larvae that were caught.
- Identification of eggs with information on every single egg observed (size, shape, development stage)
- Identification of larvae with fields on measurements made on the individual larvae (length, age...)

#### **4.2.4. Operational Units data from frame survey**

As regards information on operational units, the FEIS is being interfaced with the outputs produced by the FAO regional Project MedFiSis. This Project has already developed data entry forms for the data input and management (MedStat). Therefore, it was agreed that the FEIS will be provided by the raw data in MedStat format. To date, the Project was provided with a table containing data on vessels (length, gross tonnage, gears, fishing period...), fishing grounds (distance from the port), target species of the fleet operating in GSA 15.

### **4.3 Status of data stored in the Regional Corporate Data Base**

Upon request of the MedSudMed Project, participating institutes input data in the FEIS prototype. A summary of the data currently stored in the FEIS and available for the data processing is shown in the table below.

Additional data were provided to the MedSudMed Project, but have not yet been inserted in FEIS, either because the data structure is not finalized (ex. for meteorological data), or because of format reading problems that should be solved shortly.

Table 1. Summary of data that were provided by the MedSudMed participating institutes and stored in the FEIS

Type	Name	Year	Owner
Trawl Surveys	MEDITS 02	2002	IAMC - CNR <sup>1</sup>
	MEDITS 03	2003	IAMC - CNR and MCFS
	MEDITS 04	2004	
Echo Surveys	SERENA I	April 1994	IAMC - CNR
	SERENA II	December 1995	
	SERENA III	June 1996	
	Echo MAGO 98	June 1998	
	JUVENILE 99	October 1999	
	JUVENILE 00	September 2000	
	ANCHEVA 00	July 2000	
	JUVENILE 01	October 2001	
	ANCHEVA 02	August 2002	
	ANCHEVA 03	June 2003	
JUVENILE 04	October 2004		
Frame surveys	-	2004	MCFS <sup>2</sup>

## 5. Applications

Each participating institute was provided with a version of the FEIS Elementary Database for training, data entry, comments and suggestions. The whole interfaces can be provided on request.

Each application contains several modules, among these the most important are:

- Data entry module: The manual data entry is finalized, and it is now possible to input data for three different surveys (trawl, acoustic and ichthyoplankton).
- Query data, processing and reporting: The databases are equipped with a detailed and itemised query system to select and group records according to one or several options. Resulting datasets are processed locally or exported for further analyses. All results, processed or only tabulated, are reported according to various reporting standards.
- The import/export tool was implemented to input and extract data from and to the regional corporate database, and thanks to the use of a file in standard format it is possible to exchange automatically the data in the corporate and national databases. Import/export protocols are developed jointly between the project staff and national correspondents (data owners).
- Data analysis module: A tool to select data from the different surveys and extract them in an Excel table or view them in a GIS map in ArcView was developed. Moreover, it is possible to make analyses, view the distribution of a species or make a diagram, etc. It is worth mentioning that the FAO Fishery Department provided free copies of ArcView to all the participating institutes.

<sup>1</sup> Istituto per l'Ambiente Marino Costiero

<sup>2</sup> Malta Centre for Fisheries Sciences



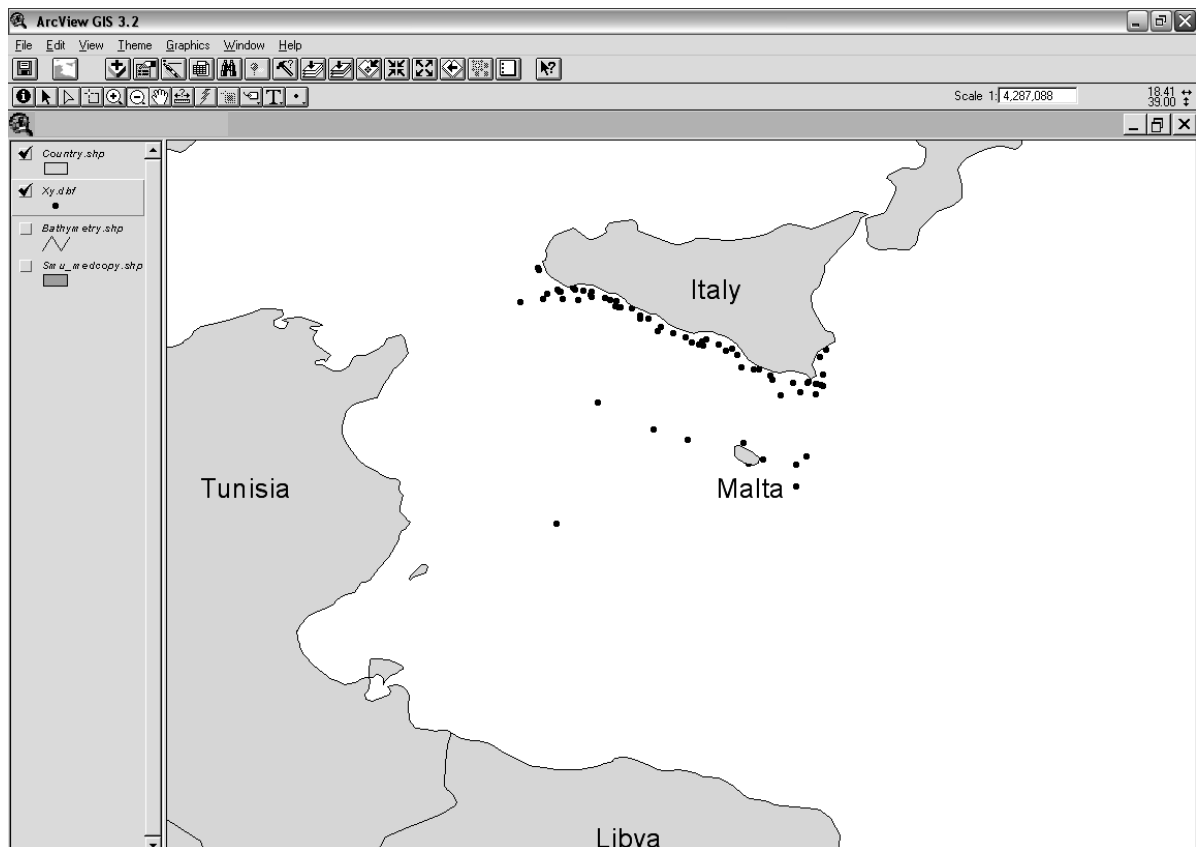


Figure 3. Example of GIS output of FEIS

## 6. General comments on the development status

One of the main activities envisaged for more attention in the near future is related to the Clearing-house potentiality of FEIS. This hidden side of the system was not fully previewed at the beginning. In fact, the interest generated for it to also be used as a repository system of all surveys conducted by participating institutes was reported on various occasions. It seems that in the Project area surveys are conducted and results stored in unstructured and unsystematic ways, and often no record of the data sources is kept.

As far as the national-regional data communication is concerned, a few points must also be put forward:

- a) the full interaction that FEIS has reached with “Sea Trim” Data Base (limited to trawl surveys recording and processing) developed by the Istituto per l’Ambiente Marino Costiero (IAMC), branch of Mazara del Vallo, in collaboration with the Malta Centre for Fisheries Sciences. The SeaTrim is used for national data management and is fully compatible with FEIS at Corporate level; the interaction with FEIS operates through the data communication protocol produced jointly by SeaTrim and FEIS developers.
- b) FEIS has been developed following two main production lines, one as a corporate database and a second as a national database (100% compatibility with the Corporate Database), where all the data management functions are available.
- c) as far as the Institut National des Sciences et Technologies de la Mer (INSTM) is concerned, though the link has not been developed yet, the advances on the work done

in this field by INSTM make it possible to envisage an equivalent level of connectivity between national and regional systems.

d) FEIS has been presented at the “International Conference on Marine Biodiversity Data Management” (Hamburg, Germany, 29 November - 1 December 2004) with a title “Fisheries and Ecosystems Information System: a tool for the implementation of the Ecosystem Approach to Mediterranean Fisheries”. The draft presented will be finalized and published in the conference proceedings (if needed copy of the draft report can be provided).

e) the internet component of FEIS has been halted while awaiting finalization of the DataBases and, mainly, awaiting a consistent number of records in all the databases in order to produce a working and accessible prototype.

## **5. Future developments and publication**

The future tasks will be fully devoted to the finalization of the databases, development connecting protocols, and massive data entry by national counterparts.

Another major area of development will be the finalization of the Web Interface that remains, in any case, a function of the previous task.

The finalization and publication of the documentation is the last development issue.

After the above, the system will be posted on the web to be commented and critically reviewed. The project is expecting to present an advanced release at the 2005 SAC session.