



MedSudMed

GCP/RER/010/ITA

Report of the First Meeting of the MedSudMed
Coordination Committee

Rome, Italy 19 – 20 September 2002

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

MedSudMed Project publications are issued as 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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This document is the final version of the Report of the First Meeting of the MedSudMed Coordination Committee, organized by the FAO-MedSudMed Project (*Assessment and Monitoring of the Fishery Resources and the Ecosystems in the Straits of Sicily*) in Rome, Italy, 19-20 September 2002.

Acknowledgements

We wish to record the constructive participation of all members of the MedSudMed Coordination Committee, and particularly, the effective chairmanship of Dr R. Rigillo.

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MedSudMed.

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

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ABSTRACT

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

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Report of the First Meeting of the MedSudMed Coordination Committee

Rome (Italy), 19-20 September 2002

Opening of the meeting, speeches and statements from the representatives of the participating countries (Agenda Item n. 1)

1. The first MedSudMed Coordination Committee meeting of the Food and Agriculture Organization of the United Nations (FAO) Project entitled Assessment and Monitoring of the Fishery Resources and Ecosystems in the Straits of Sicily was held at the Fisheries Directorate of the Italian Ministry of Agriculture and Forestry Policies (MiPAF) on 19 and 20 September 2002 in Rome. The meeting was attended by representatives of the participating countries (the Republics of Italy, Libya, Malta and Tunisia), representatives of the Marine Resources Service (FIRM) of FAO, Fisheries Department (FI), the General Fisheries Commission for the Mediterranean (GFCM), the FAO Regional Projects CopeMed and AdriaMed, the European Commission (EC) Fisheries Directorate General for International Institutions and Arrangements as well as the MedSudMed Project staff. The List of Participants is given in Annex A.
2. The meeting was opened by the Chief of FIRM. The floor was then given to the delegate of MiPAF who thanked FAO and underlined the importance of the Project for the Italian Government. It was emphasized that Italy's expectations for this challenging Project are high; it is considered strategically important in the Mediterranean and indeed regarded as a global context in the need to improve sustainability of fishery resources and strengthen scientific cooperation between countries. The Project's objective to promote interaction between scientific structures on the basis of equality and common methodologies was appreciated together with the possibility to share data on fishery science in the Project area.
3. The Chief of FIRM welcomed the participants on behalf of the Director General of FAO. It was highlighted that the adoption of the Code of Conduct for Responsible Fisheries has stimulated awareness that fishing activities should be 2001 regulated with appropriate knowledge of and proper consideration being given to the ecosystem approach to fisheries. The Reykjavik Conference on Responsible Fisheries in the Marine Ecosystem, held in Iceland in October 2001, highlighted the importance of taking into account ecosystem considerations in the assessment and management of world capture fisheries. The results of the Reykjavik Conference were introduced into the World Summit on Sustainable Development recently held in Johannesburg. FAO is pleased to note the relevant contribution made on the subject of sustainable fisheries to the final Declaration of the Johannesburg World Summit. Considering the multidisciplinary nature of the fishery system and the complexity of the marine ecosystem, major efforts need to be made in order to define the scale of human intervention and to identify the appropriate indicators and reference points which will be a guide for the application of the Ecosystem Approach to Fisheries. It is with these purposes and the aim of drafting relevant technical guidelines that the FAO-FI organized an Expert Consultation on Ecosystem-based

Fisheries Management which is currently being held in Reykjavik from 16 to 19 September 2002. The FIRM of FAO notes positively that the MedSudMed Project Document and technical guidelines already available identify actions and activities which are in line with the Code of Conduct for Responsible Fisheries and the Reykjavik Declaration. It was brought to the attention of the meeting that Project activities, related to fisheries ecosystems, represent a contribution to GFCM activities as indicated during the Fifth-session of the Scientific Advisory Committee (SAC) of the GFCM held in July this year and particularly during the work of its Sub-Committee on Environment and Marine Ecosystems (SCEME). The Coordination Committee was therefore requested to discuss, orientate and approve the work plan for the MedSudMed Project that will represent a valuable guideline for the future of the Project and will contribute to strengthen the capabilities of the GFCM, reinforcing its role as a regional fisheries management organization. A special tribute was paid to the Republics of Italy, Libya, Malta and Tunisia as members of the MedSudMed Project. Honour was also conferred on the fisheries directorates and scientific institutions, which have so far been involved in the preparation of the Project activities and for the cooperation demonstrated. Gratitude was expressed to the Italian Government for financing the Project.

Election of the Chairman (Agenda Item n. 2)

4. The participants agreed to the proposal made for the election of a representative from the donor Government, Italy, to Chair the meeting.

Adoption of the Agenda (Agenda Item n. 3)

5. The Provisional Agenda (Annex B) presented by the MedSudMed Project staff was adopted with no changes. Some time was conceded to the meeting participants to read the documents prepared for discussion. The List of Documents is given in Annex C.

Brief introduction of the MedSudMed Project (Agenda Item n. 4)

6. The Chairman passed the floor to the MedSudMed Project Coordinator who gave a presentation of the Project activities including its aims and methodologies (Annex D). The most relevant information was given and reference was also made to the content of the Project Document (Annex E). The participants were reminded that the MedSudMed Project was conceived to support scientific communities and countries in the development of a monitoring system for the studies of the fishery resources and ecosystems. Reference was again made to the coherence of the MedSudMed thematic with the Code of Conduct for Responsible Fisheries and the recommendations related to ecosystem considerations in fisheries management and that of the Reykjavik Conference on Responsible Fisheries in the Marine Ecosystem. The main objectives of the Project were also emphasized again, such as the increase of scientific knowledge on the ecosystems in the Straits of Sicily, the strengthening of national and regional expertise, the development of scientific cooperation for the standardization of the methodologies used in fisheries research. In addition, the main activities aimed at fulfilling the objectives were listed: collection of scientific information related to fisheries; implementation of research activities and of an

information system; including an *ad hoc* Geographic Information System (GIS); and organization of training courses. Moreover, the Project Coordinator introduced to the meeting participants the main activities carried out by the Project. Reference was made to the report on the status of the MedSudMed Project activities (Document CC1/01, Annex D), in which the most relevant elements of the preparatory phase are synthesized, including missions and relative technical follow-up conducted by the Project staff and the contacts made with the participating countries and scientific counterparts. As a follow-up to this first period, a MedSudMed technical meeting was held on 5 July at FAO Headquarters (GCP/RER/010/ITA/OM-M03, refers). The meeting focused on a scientific-oriented discussion of the Project activities, research priorities and methodological approach. It was underlined that the research activities must focus on the relationship between fishery resources and the environment. Furthermore, scientific research should be defined at regional level and should take into account the priorities of GFCM. Finally, the preparation and content of technical documents to be addressed to the Coordination Committee were discussed. The participants were also informed that the Project had been introduced to the relevant regional entities, such as GFCM, GFCM-SAC and CopeMed. Due to the strengthening of relationships and management facilities, contacts were reinforced with the AdriaMed Project.

7. The representative of the EC introduced himself to the meeting, describing the function of his office toward GFCM matters and international fishery relations. A tribute was paid to FAO and the Italian Government for making possible the MedSudMed Project. The meeting was informed that at the European Union (EU) Fisheries Department, FAO regional projects are considered a cornerstone providing the necessary knowledge at management level to aid the decisional process. The meeting was also informed that a draft action plan for the Mediterranean area was being discussed at commission level in the framework of the common fishery policy reform. The EC representative expressed the wish of his office for the MedSudMed Project to support the building of true management structures in the region.
8. The question of interrelationship between FAO regional projects CopeMed and MedSudMed was raised. It was stressed to the meeting that the regional projects, together with the AdriaMed Project under implementation in the Adriatic basin, were complementary and that there is no risk of an overlapping of activities, as all three are under the umbrella of FAO, FIRM. However, should such a situation arise, necessary action will be taken to ensure that the resources are not used unnecessarily. The need of an accurate coordination of the Projects was, therefore, stressed. Nevertheless, the meeting was reminded that MedSudMed is a new generation Project with a focus on environmental/ecological aspects. A new direction for fisheries management is expected to emerge from this Project. Strategies will be sharpened and further focused as a result of previous activities. The need was underlined for MedSudMed to draw on the experience of CopeMed.
9. Speeches by the representatives of the participating countries followed. The Tunisian delegate thanked FAO and the Italian Government for making the Project possible. The meeting was informed that due to the efforts of CopeMed, the Tunisian research

capabilities have been further developed and a program on stock assessment has been set up with other countries in the area. The result of the strengthening of these capacities has been a change in the Tunisian Government's strategies toward fisheries management. The Coordination Committee informed of the President of the Republic of Tunisia's award, which was assigned to the Institut National des Sciences et Technologies de la Mer (INSTM). However, it was also noted that, at regional level, there are some gaps in the studies, such as the study of some shared stocks, the application of technology and the lack of a suitable framework to link the studies undertaken to a discussion on global changes in environmental parameters. MedSudMed is therefore considered highly opportune as a complete project which covers many of these aspects that are not under detailed consideration, yet.

10. The Libyan delegate thanked FAO for its role as coordinator and the Italian Government for financing the Project. The meeting was informed that, in Libya, marine fisheries and relative infrastructures are often overlooked where development is concerned, therefore, all efforts to help update this development are appreciated. As a result, involvement with MedSudMed will be as intense as possible in order to achieve the same level of research and structure as the other countries in the Project area.
11. The Maltese delegation expressed its congratulations to Italy and FAO on the instigation of the MedSudMed Project. It was noted that learning more about fisheries can only serve to improve management practices and render the sector more sustainable; the final goal of all intervention must be the preservation of the ecosystem and the interest on the part of the population which lives off fisheries. The Coordination Committee was informed that the Code of Conduct for Responsible Fisheries had been translated into Maltese to make its concept clearer at local level and that the management and research infrastructure had also been improved. Given these developments, the launching of MedSudMed with its ecosystem-oriented activities is considered highly opportune.

Outline of the main project components (Agenda Item n. 5)

12. The main aspects of the MedSudMed Project components were introduced to the meeting by the Project staff. Reference was made to Document CC1/02 - General Outline of Research (Annex F). The document presents a preliminary plan of general guidelines in line with the recommendations of the Reykjavik Conference illustrated by three proposals and consequently on research priorities identified by the GFCM-SAC Sub-Committee on marine environment and ecosystems. The general guidelines are structured in five organizational steps to be followed in order to: (i) produce a synthesis of previous studies, data and information available on the whole ecosystem; (ii) assess the utility of remote sensing and environmental data for the identification of relevant patterns characterizing feeding and/or reproductive habitat; (iii) field-oriented investigations on key issues that will have been identified; (iv) establish a routine regional monitoring programme based on informative indicators; and (v) provide information to management institutions. In this direction, three research lines were presented to the meeting in order to be commented upon and discussed. The first proposal aims at describing the spatial distribution of demersal resources in relation with environment and fishery characteristics, in order to

provide information on stock recognition and delineation. This would be with regard to the different life stages of commercial fish (recruits, adults and any significant age group), in particular, of species considered as forming shared stocks, and those that are supposed to belong to separate stocks. The Project is structured around five tasks focusing on physical environment, benthic biocenosis, fishing pressure, spatial distribution and combination of the total information within GIS for the synthesis of the information. It is planned, that the methodology would take into account the analysis of previous studies in order to identify gaps, specifically in terms of data available (historical series, on-going programmes). Benefit can be taken from results or initiatives of the CopeMed Project. The second proposal focuses on oceanographic processes influencing the abundance and the spatial distribution of small pelagic fish. The objective is to locate the main spawning and nursery areas in relation with the hydrographic regimes of the study area. The distribution of the pre-recruitment phase is considered as a crucial point. Emphasis would be placed on the transport of early life stages and patterns conditioning the recruitment success. These goals would be achieved by using both available historical data and echo-survey data provided by on-going programmes (catches, biomass estimates, sea surface temperatures, chlorophyll, etc.). Finally, the use of areas subject to different fishing efforts to explore aspects of the dynamics of inshore and offshore webs was proposed. One basis that could be used, is the result obtained in the Gulf of Castellammare on size structure of the benthic fish assemblage. Importance would be given to examining the change of diet, the trophic level according to the fishing pressure and the description of trophodynamic consequences of closure areas to fishing (e.g., in recovering populations). The proposed tools include size spectra method, stable nitrogen isotope analyzes and trophodynamic models.

13. The Scientific Coordinator of MedSudMed expressed his satisfaction also as director of the host institute. The Committee was called on to offer suggestions or comments on the proposed research programmes. It was stressed that the proposals can feasibly be applied to all countries concerned. All the knowledge in the area can be integrated for mutual benefit. However, the country representatives were asked to comment on their impressions of the implementation of the programmes in each country. Further proposals were also called for in line with the goals of MedSudMed.
14. The report on the MedSudMed Database and Information System (Document CC1/03, Annex G) was introduced by the FAO, FIRM backstopping officer. It was recalled that one of the expected outputs of the Project is a computerized-based package (information system) with the capacity of storing, analysing and representing the main factors describing fish stocks, their environment and the fisheries depending upon them. In the presentation, particular attention was given to the general architecture of the information system and the importance of the definition of the standard parameters. The methodological reference framework, as well as the network configuration, the database composition and other relevant tools for the implementation of the information system were also presented.
15. The meeting was also informed on the Fishery Statistics and Information System in the Mediterranean, MedFiSIS Project proposal, and its interaction with MedSudMed (Document CC1/04, Annex H). A regional project proposal for the data collection system

in the Mediterranean was formulated in the framework of the GFCM-SAC Sub-Committee on Statistics and Information. The proposal was presented and endorsed during the Twenty-sixth GFCM meeting. It was also endorsed by the EU, with the understanding that it would co-finance it. The Three-year MedFiSIS Project is expected to create a Fishery Statistics and Information System in the Mediterranean with the aim at helping countries develop their national fishery statistics system, to promote the sustainable management and development of their fisheries. The two ongoing sub-regional Projects AdriaMed and CopeMed presently support respectively the Republics of Albania, Croatia, Slovenia, Algeria, Libya, Malta, Morocco and Tunisia in the implementation of the Fishery Statistics System. Having a geographical limitation at Mediterranean level, MedFiSIS will assist the national statistical system of the Mediterranean countries not covered by the two sub-regional projects. A common structure will be presented for the sake of harmonization and standardization of the data collection and the methodology applied. MedFiSIS could also act as a leader Project for the support of the Fishery Statistics and Information System for all Mediterranean countries. Interaction with the MedSudMed Project is established through the support of the development, strengthening and coordinating data and information domain among the FAO Mediterranean Projects and SAC.

16. The plans for national capacity building (Document CC1/05, Annex I) were introduced to the meeting by the Project staff. It was recalled to the participants that this represents one of the main components of the Project and is fundamental in order to carry out the planned activities and to fulfill its objectives. All the research activities that will be implemented will include specific training focused on laboratory techniques, data collection and data treatment as well as implementation of the information system component. The national capacity building will be carried out by organizing seminars, training courses, or training periods in institutes participating in the Project activities for field and/or laboratory tasks.

Discussion and review of the proposed project work programme (Agenda Item n. 6)

17. The General Outline of Research (Document CC1/02, Annex F) was discussed by the participants. They insisted on the satisfactory level of information provided by the document. However, as stress was put on shared species rather than on their habitat, the Tunisian participant expressed the wish to give more importance to fish habitats (in particular marine phanerogams). The identification of essential fish habitat and the protection measures appear to be an essential component in fisheries ecology, and cartography is considered as a relevant tool for such studies.
18. The question on the possibility to include the northern coast of Sicily (southern Tyrrhenian Sea) in the study area was discussed. It was stated that the northern coast presents different hydrological characteristics compared to the Straits of Sicily, and for this reason, it cannot be fully integrated in the study area. However, we can take advantage of the results obtained in the Gulf of Castelammare, which can be considered as one of the pilot zones in the Mediterranean when it comes to studies on marine protected areas. Moreover, rather than focusing on diet and trophodynamic models, consideration will be given to Marine Protected Areas as a tool for fisheries management.

19. The importance of harmonization and standardization of the data collection was brought to the attention of the meeting. This would allow their better use at national and international level for research activities.
20. It was commented that the content of Document CC1/02 is in line with the new generation Projects dealing with fisheries, the marine resources system being coherent with the structure presented by the FAO guidelines on sustainable fisheries. The five steps mentioned reflect the Ecosystem Approach to Fisheries. Even though other specifications should be taken into account, the document satisfies the new needs of ecological approach to fisheries. However, the new activities and the information gathering of existing data should be distinguished. It is to the advantage of the Project that the institutes involved have a historical tradition in research. Therefore, there is important knowledge to exploit. This knowledge, however, is often fragmented and the Project represents an opportunity to gather all the existing information and produce a synthesis.
21. The delegate from Malta suggested that the first activity which could take place would be the review of available data and exploration of the possibilities of representing them in a standard way. Therefore, it was proposed to organize a workshop to agree on how to compile these data. In Malta, valuable data from a trawl survey conducted in the seventies are available (sediments, biomass indices, trawl surveys, etc.). It was suggested to conduct a small pilot exercise on compilation of data and present it at the mentioned workshop. The same exercise could be repeated by other countries.
22. The meeting was advised about the risk of diluting information. It was underlined, that gaps do exist in all fields and considering that all countries have people trained in GIS, Project activities should focus on the final products, such as work sheets or a CD synthesizing ecological parameters of the different species, rather than on exhaustive inventories of existing data.
23. It was decided by the participants that for each of the three research Project activities identified in Annex F, an Expert Consultation could be organized. The information on the activity of this Expert Consultation could be presented at the next meeting of the GFCM if considered appropriate.
24. The Expert Consultation will consist of regional and extra-regional experts and will provide an overview of available knowledge on fisheries ecology. It will write the terms of reference for the activities to be implemented; identify basic common methodology and propose pilot study cases. Furthermore, the Expert Consultation could also identify the needs in national and regional expertise. The Expert Consultation will be the opportunity to define criteria for data collection. Among other aspects, particular attention will be paid to the identification and description of fish habitats. Results will be presented to SAC and to the SAC Sub-Committees.
25. It was concluded that the Project would carry out one Expert Consultation for each research proposal. In addition, one will also be held for the aspects related to data and

information systems. The question was raised on the work to be carried out before the consultation. The meeting decided that each country would prepare a synthesis of information available for each topic (knowledge for research proposals including already published results and existing databases).

26. The delegates expressed extreme satisfaction for the level of the document (CC1/03, Annex G) presented and its applicability. However, more detail was requested by the meeting on the information flow in terms of libraries and virtual information systems. Some clarification was given on the difference between a database and an information system as described in the document. The complexity of the relationship among the components of this issue was acknowledged; it was further underlined that ecological data should be treated differently from other types of fisheries data. The *ad hoc* Expert Consultation could advise on this matter.
27. It was proposed to present to the Expert Consultation an initial inventory of the type and organization of data available in each country on databases and information systems. This inventory would be conducted according to the following criteria: oceanography; sedimentology; stock assessment; ecological parameters; impact of fisheries on the environment. The Expert Consultation could be the opportunity to discuss the areas for further data collection to be carried out in each country.
28. It was specified that the information system Project centre would manage the server which is to be the repository of the shared data. This server would be physically placed in the Mazara del Vallo FAO office, under the auspices of the agreement between the Italian authorities and FAO whereby all FAO offices and intellectual property belong to FAO until termination of the Project activity. Access to shared data would be guaranteed to all the Project counterparts. During the Expert Consultation the minimum level of aggregation of data will be defined, as well as specific terms of reference (private and common data, and type of data to be included).
29. The meeting noted that existing relevant data banks should be considered and that there was also a lack of library managers and expertise in data input and research. It was resolved for the Project to give the countries additional support in this area, such as access to ASFA and relevant training.

Discussion of other topics relevant for the Coordination Committee: Relations at regional level (*i.e.*, EU, FAO and FAO Projects, GFCM) (Agenda Item n. 7)

30. It was recommended that the MedSudMed Project considers the work already undertaken and the experience acquired by AdriaMed and CopeMed, using the background information produced as a springboard for the implementation of scientific activities.
31. It was stressed by the Secretary of the GFCM that the MedFiSIS proposal is complementary to MedSudMed activities; indeed MedSudMed is considered a pilot initiative for the GFCM area information system.

32. In order to reinforce the cooperation and exchange of experience, the Director of the CopeMed Project proposed an official meeting between the three FAO regional projects (MedSudMed, AdriaMed, CopeMed) and GFCM Secretariat, this suggestion was welcomed by the participants.

Terms of Reference for the MedSudMed Coordination Committee (Agenda Item n. 8)

33. The Terms of Reference (Document CC1/06, Annex J) were presented by the Project staff and submitted for discussion. The document explained the aims and functions of the Coordination Committee. It also presented the structure and membership of such a meeting, as well as its periodicity and venue. The document was adopted with no changes.

Terms of Reference for the MedSudMed National Focal Points (Agenda Item n. 9)

34. After some discussion on the role played by the National Focal Points (Document CC1/07, Annex K), it was agreed that a point would be added to the document as follows: the National Focal Points, in collaboration with the research institutions, could produce a roster of national specialists to be involved in Project activities. The names of the National Focal Points nominated by the countries will be communicated to the Project.

Adoption of the work programme and attribution of tasks (Agenda Item n. 10)

35. The National Focal Point in Malta will work closely with the nominated coordinator for the research proposal on spatial distribution of demersal resources in the Straits of Sicily according to environment and fishery characteristics, to organize and coordinate an Expert Consultation on this issue. In preparation of the Expert Consultation, a preliminary study focusing on the use of GIS to aggregate existing data related to all disciplines of marine science will be undertaken by the Malta Centre for Fisheries Sciences in collaboration with the Mapping Unit in Malta.
36. This study is expected to instigate discussions on the standardization of data and information representation and the subsequent correlation of data sets. It will also help identify gaps in information and data series, which would need to be addressed through the relevant research within the framework of MedSudMed. The participating experts will be identified by the National Focal Point of Malta, in accordance with the terms of reference defined by the Scientific Director and Project staff.
37. In relation to the four Expert Consultations agreed on by the Coordination Committee, one expert will be nominated as team leader whose task will be to coordinate the group activities. The Scientific Coordinator of MedSudMed was called on to define the terms of reference for the Expert Consultations and the profile of the person responsible for each area in collaboration with the four countries.
38. During the meeting it was suggested that each country would host one of the Expert Consultations, such as on information system in Mazara del Vallo; spatial distribution of

demersal resources in Malta; small pelagics in Libya and marine protected areas in Tunisia. This would be finalized during the two-week period following the meeting.

Finalization of the Draft Report (Agenda Item n. 11)

39. The draft report was finalized with a few minor changes.

Date and venue of the next Coordination Committee meeting (Agenda Item n. 12)

40. The Libyan delegation proposed the next meeting of the MedSudMed Coordination Committee be held in Libya. This suggestion was welcomed and applauded by the participants of the meeting.

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Agenda

1. Opening of the meeting, speeches and statements from the representatives of the participating countries
2. Election of the Chairman
3. Adoption of the Agenda
4. Brief introduction of the MedSudMed Project
5. Outline of the main Project components
 - 5.1 Presentation of the proposed activities:
 - Research activities related to fisheries ecology in the Straits of Sicily
 - Information system
 - MedFiSis Project proposal and its interaction with MedSudMed
 - National capacity building
6. Discussion and review of the proposed Project work programme
7. Discussion of other topics relevant for the Coordination Committee: Relations at regional level (*i.e.*, EU, FAO and FAO Projects, GFCM)
8. Terms of reference for the MedSudMed Coordination Committee
9. Terms of references for the MedSudMed national focal points
10. Adoption of the work programme and attribution of tasks
11. Finalization of the draft report
12. Date and venue of the next Coordination Committee meeting

List of Documents

FAO-MedSudMed: CC1/01	Brief Report on the Status of the MedSudMed Project Activities (Preparatory Phase)
FAO-MedSudMed: CC1/02	General Outline of Research
FAO-MedSudMed: CC1/03	MedSudMed Database and Information System
FAO-MedSudMed: CC1/04	MedFiSIS Project Proposal and its Interaction with MedSudMed
FAO-MedSudMed: CC1/05	National Capacity Building
FAO-MedSudMed: CC1/06	Terms of Reference for the MedSudMed Coordination Committee
FAO-MedSudMed: CC1/07	Terms of Reference for the MedSudMed National Focal Points
FAO-MedSudMed: CC1/Info 1	List of Participants
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FAO-MedSudMed: CC1/Info 4	Project Document

Brief Report on the Status of the MedSudMed Project Activities

Introduction

This paper summarizes the most relevant elements of the MedSudMed preparatory phase and is synthesized per point below.

1. Start-up of the Project (April 2001)

The FAO MedSudMed Project was officially declared operational in April 2001. The Project Headquarters was established in Mazara del Vallo (Trapani, Italy) and hosted by the Institute for Research on Marine Resources and the Environment of the Italian National Research Council (IRMA-CNR). Logistic matters were organized, such as the choice of office space, telephone lines, Internet provider and other routine matters for the smooth-running of the Project.

2. Recruitment of Project staff (from May to October 2001)

The selection of the candidate for the post of Fishery Monitoring Expert was finalized in July and entry on duty took place on 1 October 2001. The local staff (Computer Clerk and Secretary/Clerk) was also appointed at the beginning of October 2001.

3. Briefing meeting

A briefing meeting was held on 28 and 29 November 2001 in Tunis, and the Project objectives were presented to the local authorities. As a result of this meeting, the following areas were outlined for the Project work programme: discussion and definition of the areas for intervention; establishment of bilateral meetings between the Project staff and scientific institutions in order to set up a regional scientific network; prepare an inventory of available scientific information related to fisheries in the four participating countries; and review the existing data banks.

4. Contacts with the participating countries

The MedSudMed Project established contacts with the participating countries and prepared plans for missions to be conducted in Libya and Malta in February 2002 and Tunisia in June 2002. The meetings were held at the IRMA-CNR at Mazara del Vallo, Italy; the MBRC at Tajura, Libya; the General Directorate of Fisheries (GDF) at Marsaxlokk, Malta and the Institut National des Sciences et Technologies de la Mer (INSTM) at Salammbô, Sfax and La Goulette, Tunisia.

The aim of the missions was to establish a formal contact between the Project and the participating countries and to meet the researchers of the different institutes collaborating with

the Project; to identify other possible partners that could provide data and/or services to the Project, and have personal contact with local FAO representatives to keep them informed on the Project activities.

Meetings were also held in Italy with researchers of the IRMA-CNR. Different topics such as demersal and small pelagic resources, artisanal fisheries, GIS, marine protected areas, and data for a web site were discussed as well as other relevant matters related to project operations.

In Libya, the Project staff met 21 researchers from the MBRC of Tajura as well as the national focal point of the FAO CopeMed Project. Meetings were held in all four departments of the institute (benthos, fisheries, plankton, chemistry). Visits were also made to two fishing ports (artisanal and industrial).

In Malta, besides the Department of Fisheries and Aquaculture, several contacts were made with other institutions such as the Mapping Authority, Remote Sensing Centre, International Oceanographic Institute, and the Environmental Department. The intention of these visits was to introduce the Project and to set up possible scientific collaboration with MedSudMed. In principle, the institutions visited gave their agreement to provide data, either free of charge or paying for some services, and/or collaboration with research topics that could be developed in the framework of the Project.

The meetings held with the Tunisian partners involved researchers from the INSTM of La Goulette, Salammbô and Sfax and a total of 21 persons were met. The objective was to establish a contact, present the Project and have an overall view of the field research of these persons/experts. Main elements of the Project were also presented at FAO office, where a formal contact was established to assist with all future collaboration.

5. Contacts at regional level

The Project was presented to the GFCM meeting held in Ischia (10-13 September, 2001). The Project staff participated in the SAC Working Groups on demersal and small pelagics (March 2002, Rome). A presentation was made to the SAC Sub-Committee on Ecosystems and Marine Environment and to the Sub-Committee on Statistics and Information (Barcelona, May 2002). The Project also participated in the Fifth-session of the SAC in July 2002.

At the request of the Regional Activity Centre for Specially Protected Areas (RAC/SPA), the Project participated in the workshop on Ecosystem Approach and Biodiversity Indicators in the Mediterranean (28 and 29 June 2002, in Tunis). The objective of the Working Group was to review a series of biodiversity indicators drawn-up by the United Nations Environment Programme (UNEP) and to evaluate their applicability to the Mediterranean Sea.

6. MedSudMed web site

After the creation of the MedSudMed web site, in collaboration with FAO AdriaMed staff, web pages were introduced to present the Project. Apart from a brief presentation of the Project, the web site will be linked to the participating institutions and will also offer a review of other web sites that provide information on GIS. Links are available for both general and interactive maps. The basic physical and political maps and those containing selected data can

be downloaded when available (hydrology, climatology). A selection of sites offers free softwares that allow users to redraw maps, add information, and perform data interpolation, etc. A list of relevant bibliographic references is also available on the web, including fisheries ecology, Ecosystem Approach to Fisheries, and environmental effects on fishery resources. This list will be updated accordingly, depending on contributions and publications. Access will be given to any document (not protected by copyright laws) that can be downloaded.

7. Environmental data on the web

Data available on the web were listed, and categorized in environmental measurements, such as temperature, salinity, wind force, direction and speed, and dissolved material, etc. A catalogue was produced, indicating the availability and cost of the data, periods covered, geographical zones, and the resolution of measurements. Most of the free data can be downloaded but its format cannot be easily read. Therefore, the next step will be to obtain these data, write the *ad hoc* programmes that will allow the use of the data, and draw up maps that can be considered as primary material for the description of the zone, which can then help to identify the gaps and plan future collection of data, if the case arises.

8. Technical Meeting

The main research priorities were discussed during a Technical Meeting held on 5 July 2002 at FAO Headquarters in Rome. As discussed during a Working Group organized by FAO and held in Reykjavik in September 2002, the meeting stressed that topics related to ecosystem considerations in fisheries are quite new and still to be clarified. It was agreed that in the framework of MedSudMed, priority should be given to the relationship between fishery resources and environmental factors. As soon as they are accessible, the guidelines produced by the Reykjavik Working Group will be used as a support to the Project activities. All the participants agreed that scientific research should be defined at regional level and should note the priorities of the GFCM. This could also be the guidelines for MedSudMed, in accordance with the Project mandate. An outline of a document, identifying the scientific issues (definition, scale, hypothesis to be formulated and verified, expected results, interactions between components, outline of the activities, etc.) will be prepared and presented at the first meeting of the Coordination Committee .

FAO/GOVERNMENTS COOPERATIVE PROGRAMME

PROJECT DOCUMENT

Project Title: Scientific Cooperation to Support Responsible Fisheries

Project Symbol: **GCP/RER/010/ITA**

Project Component Title: **Assessment and Monitoring of the Fishery Resources and the Ecosystems in the Straits of Sicily (MedSudMed)**

Participating Countries: Italy, Libyan Arab Jamahiriya, Malta, Tunisia

Donor: Government of Italy
(Ministero per le Politiche Agricole,
Direzione Generale della Pesca e dell'Acquacoltura)

Donor Contribution: US\$ 2 000 000
(First year: US\$ 500 000)

Governments' Implementing Agencies:
Italy: Istituto di ricerca sulle Risorse Marine e l'Ambiente (IRMA)
Libyan Arab Jamahiriya: Marine Biological Research Centre (MBRC)
Malta: General Directorate of Fisheries (GDF)
Tunisia: Institut National des Sciences et Technologies de la Mer
(INSTM)

Project Component Headquarters: IRMA, Mazara del Vallo, Trapani, Sicily, Italy

Duration: 4 years

Estimated Starting Date: June 2000

Brief Description

The objective is to enable the fisheries institutions of the four participating governments, by mid 2004, to carry out the continuous dynamic assessment and monitoring of the status of the stocks of fish plus other living resources, as well as of the ecosystems in this area of the Mediterranean. This will enable them to rapidly provide ongoing advice to senior levels of government, on appropriate adjustments needed in their national and regional mechanisms for the management of the fisheries, aimed at ensuring sustainability of fish production at an optimum level.

This is to be achieved through the development of a modern powerful computerized modular “package” using Geographic Information Systems (GIS) technology, with the capacity to store, analyze and present quickly all the basic parameters used to describe the changing status of the fish stocks, their environment and the fisheries dependent upon them. The package will be installed and brought into operation in each participating institution (with the assistance of national experts specially trained under the project), so that each will have an independent, but compatible module covering the resources of its own national Exclusive Economic Zones (EEZ), as well as part of a common international module covering the shared ecosystems and resources.

The “package” should permit these institutions to more rapidly exchange information and analyze the status of the stocks within their EEZs, as well as those shared stocks which spread across adjacent zones and international waters. Hence, they will be able to formulate and implement appropriate agreed fisheries management measures. Higher yields (production) will be achievable in the medium and long-term, without risking major adverse effects upon the social and economic aspects of the fishing communities, or even on the consumer-markets for fish products.

PROJECT DESIGN

A. BACKGROUND TO THE PROJECT

The adoption of the Code of Conduct for Responsible Fisheries has stimulated, among other things, the awareness that future regional directives regulating fishery in the Mediterranean could be decided without the appropriate knowledge of its ecosystem as a whole. This has generated particular attention in the Region which, at the beginning of 2000, is living an extraordinary period with regard to fishery and fishery project activities.

The work of the new GFCM, together with its Scientific Advisory Committee (SAC) and several technical Sub-Committees, is supported by a few projects of Regional scope: stock assessment (MEDITS with EU assistance – International bottom Trawl Survey in the Mediterranean); and by two Sub-Regional projects, one in the Western and Central sector (COPEMED, Spain/FAO assistance - Advice, Technical Support and Establishment of Co-operation Networks to facilitate Coordination to Support Fisheries Management in the Mediterranean), the other in the Adriatic sector (ADRIAMED, Italy/FAO assistance – Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea), as well as a number of other national and multi-national initiatives. However, the work of SAC, COPEMED and ADRIAMED is multi-disciplinary, focused on modern management measures for the fish-stocks, and the fishermen's' livelihoods, thus covering many activities but with different levels of precision, involvement and integration.

The Government of Italy is convinced that in order to make further improvements in fishery management in the Mediterranean, the GFCM and its national entities need support in the assessment and dynamic monitoring of the fishery resources as part of the whole marine ecosystem. Thus Italy supports the recommendation by the scientific community that a modern technologically-advanced tool or module should be developed to facilitate this important overall monitoring. Such a module, based on the use of powerful modern computerized Geographical Information Systems (GIS) technology, should enhance the storage, analysis, and integrated thematic mapping of data. This will allow to be monitored more rapidly and efficiently the changing status of the ecology, fisheries, economic, social, managerial, and other critical variables which must all be taken into consideration when formulating and implementing options for fishery management.

The present project component will concentrate on common efforts by Italy, Libya, Malta and Tunisia towards expanding and utilizing the knowledge required for the responsible management of the living marine resources which are of major economic and social importance to the populations bordering the Straits of Sicily sector of the Mediterranean. Because of the apparent role of climate on marine productivity, an understanding of this variability is important to the ability to make more accurate forecasts, and hence for the responsible management of the fisheries in this core sector of the Mediterranean. The survey area will be limited to approximately the interior of GFCM major area 37.2 .2 (Sub areas 37.2.2c, e, f, g). However, the exact survey area will be defined at the beginning of the project life, in a joint effort among the parties.

B. PROJECT RATIONALE AND JUSTIFICATION

B.1. Problems to be addressed: the Present Situation

Many of the fish-stocks in the Mediterranean are apparently suffering from excessive or inappropriate levels of exploitation, the landings of fish remain below the expected maximum sustainable yield, and there may be damage to the environment, which is simultaneously being influenced by climate change.

Management of these fisheries is particularly complex because of the relatively large number of different species involved and their frequent movements across the boundaries of the many national Exclusive Economic Zones (EEZs). Without considerable inter-country collaboration and harmonisation in the collection and processing of data, the fisheries scientists in each coastal country find it impossible to adequately monitor and analyse the status of the many shared stocks or of the environment. Consequently they are unable to promptly recommend appropriate measures aimed at managing the levels of exploitation of the individual stocks by particular fisheries, without risking important adverse impacts upon the economic and social aspects on the fishing communities and even on the consumers.

B.2. Expected Situation at the end of the Assistance Project

A new powerful computer-based GIS module will have been developed and brought into operation in each participating national institution, and national staff will have been trained in its use and maintenance, thus enabling their more rapid and effective monitoring of the main fish stocks and the environment in their individual EEZs, and hence the more prompt formulation of appropriate options for management of the fisheries.

A similar module will be in operation for the monitoring of those stocks shared with neighbouring countries, and would also be available to a much wider group of Mediterranean countries, and their adoption of it as a humanized data compilation and analysis tool for the stocks and environment of the whole GFCM region.

B.3. Target Beneficiaries of the Project

The immediate beneficiaries will be the scientific staff serving in the participating national fisheries institutions, whose capacities to recommend suitable management measures will be considerably improved through the use of a new modern tool enabling them to integrate fisheries data, rapidly analyze it and report on the changing status of the main fish-stocks and the related marine environment.

The intermediate beneficiaries will be the fisheries administrations of the participating governments, both individually, and collectively under the GFCM Commission, having available up-to-date status reports and scientific recommendations required, for them to be able to decide upon appropriate adjustments in the management of the fisheries, so as to target optimum yields without harming the environment.

The ultimate beneficiaries will be the fishermen and the consumers who can be assured of sustainable yields of fish in the longer term.

B.4. Strategy

The strategy is to formulate and incorporate innovative, advanced approaches and technologies within a powerful computer-based GIS to provide a standard modular “package” that can be used (by trained officers in each of the participating national fisheries institutions) as a more efficient tool to dynamically monitor and assess the status of each major fish-stock and the related ecosystems within their respective EEZs. Use of this standard modular package would also enable effective inter-country collaboration in a similar process for assessing and managing those fish-stocks which are shared on a sub-regional basis, and would also be suitable for replication or adaptation in other adjacent countries of the Mediterranean.

B.5. Institutional Arrangements

The main collaborating institutions of the participating Governments will be:

Italy: Istituto di ricerca sulle Risorse Marine e l’Ambiente (IRMA), at Mazara del Vallo;

Libyan Arab Jamahiriya: Marine Biological Research Centre (MBRC), at Tajura;

Malta: General Directorate of Fisheries (GDF), at Valletta;

Tunisia: Institut National des Sciences et Technologies de la Mer (INSTM), at Salammbô.

At the invitation of the Italian Government, the Consiglio Nazionale delle Ricerche (CNR) will host this project component at the IRMA in Mazara del Vallo, Trapani, Sicily, in collaboration with the local authorities and the Direzione Generale dell Pesca e del’Acquacoltura del Ministero per le Politiche Agricole.

This project component will be implemented under the overall leadership of the Project Director of the mother-project (GCP/RER/010/ITA) based in Termoli, Italy, but the activities related to the research and development of a suitable GIS package will be expected to interact whenever possible with the other regional projects involved in the conservation of the environment and the fishery resources in the Mediterranean.

In order to guarantee coordination between this project component’s activities with, in primis, the ADRIAMED and COPEMED projects as well as with the SAC of the GFCM, and other regional entities, one post under this project component will be established in FAO HQ. This coordination will also facilitate future expansion and replication of the modules of the “package” in neighbouring sub-regions.

Cooperation and compatibility of the activities of this project component will also be coordinated by making regular use of computer networks for exchanges of information, and by regular annual consultations between all participating national institutions, and the project itself, through a Coordination Committee which will be established to provide advice to FAO, to monitor, and to assist in coordinating project activities. It will comprise one representative (typically the Head of each Government’s Implementing Agency) from each of the four participating countries, from the GFCM Secretariat, and from FAO (nominated by the ADG of the Fisheries Department). It will meet once a year, with the Project Director arranging for the meetings and for the preparation of reports on the meetings, which will be held under the chairmanship of the representative of the Donor Government. The Committee will meet to discuss and agree the annual workplans of the project component, and to take stock of progress in implementation. Finally it will undertake a comprehensive evaluation of the component’s activities throughout its full four-year duration.

B.6. Relationships with other Programmes

The workplan of this project component will be harmonized in consultation with the individual members of the Scientific Advisory Committee (SAC) of the GFCM Commission.

It will also consult and collaborate with the following projects:

- COPEMED (Spain/FAO) GCP/REM/057/SPA, - Advice, Technical Support and Establishment of Co-operation Networks to facilitate Coordination to Support Fisheries Management in the Mediterranean;
- MEDITS (GFCM/EU) Mediterranean - International bottom-Trawl Survey
- GRUND (Italy) – Gruppo di Ricerca delle Unità operative sulle risorse Demersali;
- SIAP (FAO/EC GCP/RAF/363/EC) - Système d'Information et d'Analyse des Pêches pour les pays membres de la Commission Sous-Régionale des Pêches.

C. **DEVELOPMENT OBJECTIVE**

The longer-term development objective is the maintenance of the yield (production) of fish from the Mediterranean at an optimum level whilst still ensuring conservation of the environment.

D. **MEDIUM-TERM OBJECTIVES, OUTPUTS AND ACTIVITIES**

D.1. Medium term Objective

The objective of this project component is to enable the fisheries institutions of the participating governments, by mid 2004, to carry out continuous dynamic assessment and monitoring of the status of the stocks of fish plus other living resources, as well as the ecosystems of the Mediterranean, so as to provide ongoing advice for appropriate rapid adjustments in their national and regional mechanisms for management of the fisheries, and so maintain fish production at an optimum level.

D.2. Outputs and Activities

Output 1 An agreed work-plan for the first, then for the successive years of the project's scheduled 4-year duration.

Activity 1.1 A Regional meeting with national and international experts to define the work-plan of the project.

Activity 1.2 Definition of the ecosystems and the ecosystem-related data required.

Activity 1.3 Design of a harmonized data-collection structure.

Output 2 An operational computer-based “modular package” with the capacity to store, analyze and present in tabular or graphic form, all the basic data and mathematical-models concerning the principal parameters used to describe the changing status over time of the main fish-stocks, their environment, and the fisheries dependent upon them.

- Activity 2.1 Construction of a basic GIS mapping module for the whole project area.
- Activity 2.2 Collection of relevant ecosystem-related data
- Activity 2.3 Integration of ecosystem-related data into the basic maps
- Activity 2.4 Collection of all available information on the biology, behaviour and stocks of the main fish species, in a geo-referenced module.
- Activity 2.5 Identification, definition and inclusion in the GIS module, of the most relevant aspects related to the interactions between a fishery and its ecosystem.
- Activity 2.6 Development of models for the maintenance of the GIS module for analysis and monitoring of the contained information.

- Output 3** Eight young scientists from the participating national institutions trained in the structure, operation and maintenance of the computer-based “modular package” developed.
- Activity 3.1 Build up a detailed on-the-job training programme for all the scientific officers involved.
- Activity 3.2 Implement and evaluate the training programme.

- Output 4** The basic modular package replicated in the four participating countries, and subsequently in additional countries of the GFCM Commission
- Activity 4.1 Consolidate the design of the project’s modular “package” and results, replicate the module, and assist participating countries in hosting it as appropriate.
- Activity 4.2 Inform the GFCM Commission and other regional bodies (FAO, EU, etc) on the availability of the modular “package” and its achievements.

E. INPUTS

E.1. Participating Governments’ Inputs

The Government of each participating country will be expected to give full cooperation through the nomination of a senior officer to act as the focal point in the appropriate institution designated as the national Implementing Agency, and to contribute inputs in-kind, represented by the active support of the staff in the national fisheries institutions, by the supply of local services, as well as by the provision of national and local data pertinent to the activities to be undertaken by this component of the project. Each participating institution will be expected to allow access by the project to its existing computer-network, and the upgrading of some components by the installation of standard hardware/software as required by the

project. Each will also be expected to nominate and then release selected national officers to participate in the projects' in-service or other training programmes.

Cash contributions towards this project component are not expected from the participating Governments (except from the Donor Government itself).

E.2. Donor Government's Inputs in-kind

The Direzione Generale della Pesca e dell'Acquacoltura, in collaboration with the Consiglio Nazionale delle Ricerche, Istituto di ricerca sulle Risorse Marine e l'Ambiente (IRMA), will place at the disposal of the project, the office space and related supporting services required for the long-term Professional and General-Service staff assigned by FAO, as well as for visiting consultants and temporary assistance, in the premises of IRMA at Mazara del Vallo, Trapani, Sicily, Italy.

The Donor Government will also place at the disposal of the project and at no salary cost to the project (apart from duty travel and accessories), the part-time services of the Director of IRMA to act as Scientific Coordinator for the project's research and development programme, and take direct responsibility for the "scientific advisory element" of the workplan. Duration 12,0 months in the first year (anticipated total 48 months), Terms of Reference in Annex 2.

E.3. Donor Government's Inputs through FAO

Government of Italy, represented by the Ministero per le Politiche Agricole, and its Direzione Generale della Pesca e dell'Aquacoltura, undertakes to provide through FAO the sum of US\$ 500 000 to cover the costs of project implementation during the first year, and has also indicated its intention to finance the remaining three years of the project's operations on the basis of US\$ 500 000 per year. This financing by the Donor Government for the second and subsequent years of the project is conditional upon the receipt of satisfactory six-monthly Project Progress Reports through the TCDM Unit in FAO HQ.

E.4. FAO's Inputs through the Regular Programme

Given the considerable overlap between the project's objectives and activities, with many of those of FAO's current Regular Programme (the Medium Term Plan 2000-2005 and the Programme of Work and Budget PWB 2000-2001), FAO's own un-costed in-kind inputs by the Fisheries Department to the project are estimated as follows:

- 2,0 work-months in the first year involved in formulation and processing of the project agreement;
- 8,0 work-months (2,0 w/m per year over four years) of technical support by RP staff (from FIRM, etc) either at HQ, or in field missions (although any related travel costs shall be chargeable to the project), in addition to the normal routine technical supervisory and administrative backstopping services.

F. RISKS

There may be some minor risks affecting the planned rate of implementation of this project component because the extent of existing staff, scientific information and supporting facilities in some of the participating countries is not fully clear, yet. However, this aspect will be examined and reported upon by the Project Director during the first year's work-plan.

One other risk is that although a powerful and technically-suitable GIS package may be designed and introduced, the scientific assessments and recommendations on fisheries management options may not in practice be accepted and applied by the decision-makers or by the fishermen, either at the national, or at the sub-regional level. However, the adoption and progressive implementation by individual governments together with the involvement of the stakeholders in many countries of the GFCM Commission of the Code of Conduct for Responsible Fisheries, indicates that this is probably not a major risk.

G. PRIOR OBLIGATIONS AND PREREQUISITES

The inputs in-kind scheduled to be provided by the Implementing Agencies of the four participating governments, particularly in terms of headquarters office facilities (both in Trapani, and in Termoli, Italy) and the availability of relevant professional staff, scientific data and general supporting facilities, including research vessels, etc, in each of the participating countries, are important prerequisites for effective project implementation.

The Project Document will be signed by FAO, and FAO assistance to the project will be provided subject to FAO receiving satisfaction that the prerequisites listed above have been fulfilled or are likely to be fulfilled. When anticipated fulfillment of one or more prerequisites fails to materialize, FAO may, at its discretion, either suspend or terminate its assistance.

H. PROJECT REPORTING, REVIEWS AND EVALUATION

H.1. Reports

The Project Director will prepare in the standard format, regular six-monthly Progress Reports on this component of the project, (separately from the ADRIAMED project component) in English and French detailing progress achieved in terms of the scheduled programme of work, the problems and constraints emerging over the period, and recommendations for correcting them, plus a detailed work plan for the following period.

Each report, covering the periods March-August and September-February, is to be sent to the ADG Fisheries Department, FAO HQ no later than 30 September and 31 March respectively, for onforwarding through TCDM to the Donor, with copies to the participating governments and to the Secretariat of the GFCM Commission. The timely receipt of such Progress Reports is a condition for approval by the Donor of its financial inputs for the second and subsequent years of the project's duration.

Technical Reports prepared by project staff and/or consultants may be issued as field documents in English, French or Arabic, under the authority of the Project Director after submission to The ADG Fisheries Department, FAO HQ for technical clearance. The Project Director may recommend that some technical reports should remain restricted and circulated only to the one country concerned. When finalized, any un-restricted technical reports will be submitted as usual to the Donor Government through TCDM and will be copied to the other participating governments, to the Secretariat of the GFCM Commission, as well as to FAO's Fisheries Library, and the other collaborating projects.

During the last three months of this component project, the Project Director shall prepare and submit to the ADG Fisheries Department, FAO HQ, a draft Terminal Report for finalization,

approval, and presentation to the Donor and the participating governments, as well as to the Secretariat of the GFCM Commission. This draft terminal report will assess, in a concise manner, the extent to which the project's scheduled activities have been carried out, its outputs produced, and the progress towards achieving the immediate objectives and the related development objective. It will also present recommendations for any future follow-up action arising out of the project.

H.2. Project Reviews

Towards the end of the second year, the Project Coordination Committee, with the participation of the Donor and FAO, will conduct a technical review and appraisal using the project's reports as its working documents. The date, place and respective budgetary allocation will be defined by mutual consultation. This review will analyze the results of the project, and may recommend any eventual complementary measures required.

H.3. Project Evaluation

Before the conclusion of the project, an evaluation will be conducted, consisting of a wide-reaching and in-depth examination of all essential aspects, including its objectives and design, its achievements and the effects it has had on the development of the sector. The evaluation will be carried out by an independent mission comprised of representatives of the Donor, the participating governments and of FAO itself, organized by the ADG of the Fisheries Department after consultation with all the parties concerned, and inclusion of an appropriate budgetary allocation. The Donor and FAO will subsequently hold joint discussions on the mission's findings, at a date and place to be agreed upon.

The Donor or FAO may request an evaluation to be carried out at any phase of the project, if they deem it necessary.

General Outline of Research¹

Preparation of the document

This document outlines a preliminary plan of general guidelines for research projects aimed at improving information on fishery resources management, biodiversity protection and ecosystem preservation in the Straits of Sicily, illustrated by three focused research proposals.

The general guidelines are in line with the so-called Ecosystem Approach to Fisheries, taking into account several ecosystem components. The proposed steps cover a large spectrum, from data and information inventory to provision of information to public institutions for the sake of successful management. As suggested during the technical meeting held on 5 July 2002 at FAO Headquarters in Rome, and for feasibility reasons, this spectrum should be narrowed to more focused topics, as proposed in the three possible research actions that illustrate this plan. These proposals should be the starting-point for common discussions and may be reviewed applied and/or targeted according to the priority species list defined by the GFCM Sub-Committee on stock assessment².

The proposals presented in this document are the result of discussions held with researchers and should be considered as a preliminary draft, giving background information. Specific objectives and methodologies will be discussed during the CC meeting. This document could be circulated for further discussions among researchers in the different institutions involved in the Project. These discussions should result in the set-up of *ad hoc* Working Groups attended by regional and international experts. These Working Groups will be an opportunity to share scientific information with researchers from the region and the invited experts, and draw up specific technical propositions.

1. Introduction

The Straits of Sicily connect the two main western and eastern basins of the Mediterranean. Four countries border the Straits: Italy, Libya, Malta and Tunisia. At its narrowest section, between Cape Bon (Tunisia) and Mazara del Vallo (Italy), it is about 130 km wide. The Straits of Sicily appear to have particular importance for fishing activities, as witnessed by the large fleet operating in the zone and the results of fish production (Table 1). The zone is one

¹ This annex was prepared with the participation and taking into consideration the discussion among the Project staff and researchers from IRMA: F. Badalamenti, A. Bonanno, F. Fiorentino, S. Mazzola, B. Patti.

² **List of priority species as mentioned in the Report of the 26th session of the GFCM (Ischia, September 2001):** *Merluccius merluccius*, *Micromesistius poutassou*, *Merlangius merlangus*, *Mullus barbatus*, *Mullus surmuletus*, *Pagellus erythrinus*, *Boops boops*, *Psetta maxima*, *Engraulis encrasicolus*, *Sardina pilchardus*, *Sardinella aurita*, *Sprattus sprattus*, *Trachurus trachurus*, *Trachurus mediterraneus*, *Thunnus thynnus*, *Thunnus alalunga*, *Xiphias gladius*, *Coryphaena hippurus*, *Aristaeomorpha foliacea*, *Aristeus antennatus*, *Parapenaeus longirostris*, *Nephrops norvegicus*, *Eledone cirrhosa*, *Acipenser sturio*.

of the most important fishing areas of the Mediterranean, which may be explained both by the fact that it is a transition zone between the western and eastern basins of the Mediterranean and the morphology of the sea bottom combined to the hydrological configuration enhancing biological productivity.

Table 1: Fleet and production data of the four participating countries of MedSudMed Project

Country	Fleet		Production		Source
	Boats	Year	Tons	Year	
Italy (Sicily)	3 743	1993	87026	1995	Relini <i>et al.</i> , 1999
Libya	3 568 3 477 artisanal, 91 industrial	1993	33500	1996	FAO Fishery Country Profile (Nov. 1996)
Malta	1 736 of which 45 > 15 m	2001	2700	2000	FAO Fishery Country Profile (Oct. 2001)
Tunisia	5 023 374 trawlers 349 purse-seiners, 4 300 small motorized craft	1996	85000	1997	FAO Fishery Country Profile (Nov. 1997)

For management purposes, the Straits of Sicily were recently divided into six geographical sub-areas (Figure 1):

- No. 12: Northern Tunisia
- No. 13: Gulf of Hammamet
- No. 14: Gulf of Gabes
- No. 15: The Island of Malta
- No. 16: South of Sicily
- No. 21: Libya (Tripoli and Gulf of Sirt)

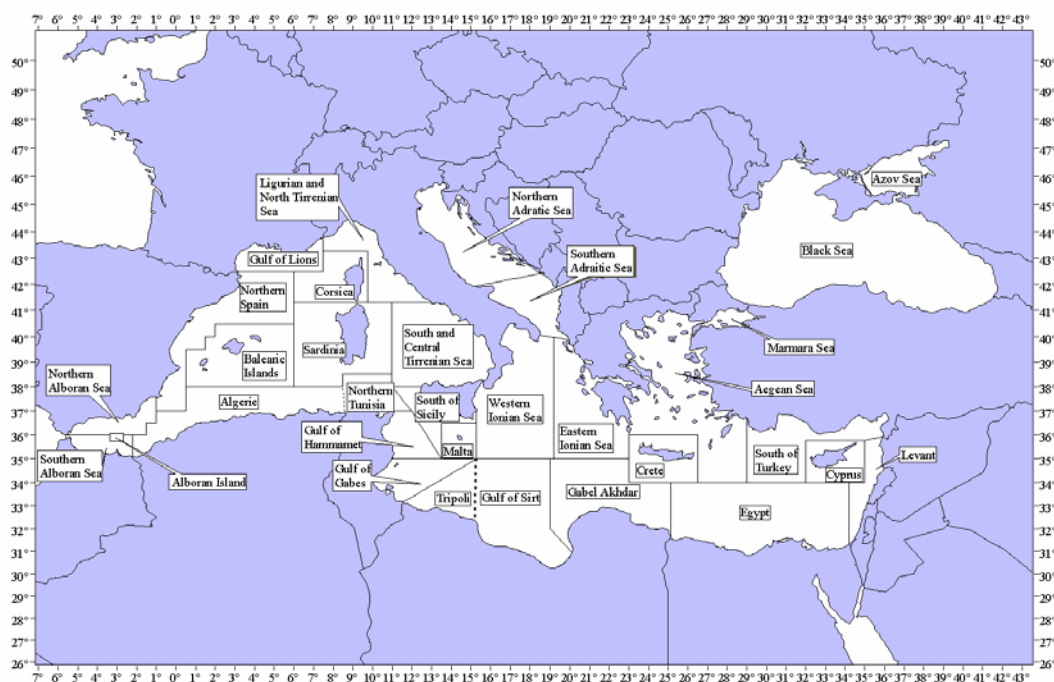


Figure 1: GFCM Geographical Sub-areas (FAO, 2001)

This sub-division is presently considered as a useful tool for fisheries management and assessment purposes (FAO, 2001b). According to the latest data, several fish stocks appear to be under heavy fishing pressure, and a reduction of fishing effort and change in patterns were recommended to ensure a recovery and/or sustainable exploitation of the resources (report of the Fifth-session of the GFCM-SAC meeting, 1-4 July 2002, Rome, Italy). The results of the latest fisheries conference (Reykjavik, October 2001), highlighted the importance of taking into account ecosystem considerations in fisheries management. These considerations should be based on scientific basis of existing and future knowledge available. Therefore, these studies would help identify and describe the structure, components and functioning of relevant marine ecosystems, the diet composition and food webs, species interactions and predator-prey relationships, the role of habitat, and the biological, physical and oceanographic factors affecting ecosystem stability and resilience, build or enhance systematic monitoring of natural variability and its relation to ecosystem productivity.

Research priorities identified by the SAC Sub-Committee on marine environment and ecosystems soundly reflect this need. After the last meeting, a proposal was made for the set-up of two thematic Working Groups with the following directives:

- Working Group on anthropogenic effects and fishing technology:
 - determine parameters that affect fish habitats, and analyze bio-ecological forms;
 - investigate artificial reefs and protected areas;
 - analyze fishing gear impacts, contaminants and waste material.

- Working group on ecology and environment:
 - investigate life cycles, consumption rates, and behaviors;
 - follow-up on ecosystem approach, biodiversity and genetics.

Therefore, in contrast with traditional fishery approaches, links and bridges between fish population dynamics and ecology are now strongly required to enable a durable and sustainable use of the living resources in a dangerously delicate Large Marine Ecosystem (LME) like the Straits of Sicily. MedSudMed also spent its first year in trying to identify research facilities available in the four participating countries and on how to best contribute to build such connections.

2. General guidelines

The terminology introduced by Bakun and Broad (2002) is adopted in this report, where the proposed term, marine resources system (MRS) refers to the entire composite system incorporating:

1. the fishery resources stocks themselves;
2. its regional marine ecosystem, including all the components of its living habitat and the entire trophic web within which the stocks are situated;
3. the “characteristic” seasonal climatology and the basic physical-chemical habitat structure (to which we expect the fish stock as well as the ecosystem are expected to be substantially adaptively tuned);
4. the fishery (or fisheries) on the resource stocks in question;
5. associated economic activities (including other interacting uses of the regional marine ecosystem) and social values;
6. the relevant management institutions and framework;
7. the political contexts in which both the management and economic activities are operated.

Thus, the MRS is considered to be an intrinsically interlinked entity, with each element feeding back on other elements and no element being immune to such feedbacks from other elements. The more limited view that is often taken of a marine resource system is assigned the term fish-habitat system (fhs). This term is intended to refer to the sub-system of the MRS consisting of elements (1), (2), and (3).

2.1. Step 1. Initial systems analysis of the MRS

As an initial step in project development, all available pertinent data and precedent studies will be gathered and assembled. This will include fishery statistics, biological data, climatological summaries, available time series of environmental data, results of process-oriented studies, information on international agreements and national management structures,

economic analyzes, trade statistics, local knowledge and folklore, etc. This information should be subject to a preliminary analysis by an interdisciplinary team of biologists, oceanographers, and fishery-oriented social scientists. This analysis should include (a) comparative studies with respect to other marine regions studied previously both in the Mediterranean and Worldwide; (b) simple modeling exercises (e.g., ECOPATH, etc.); (c) basic exploratory data analysis, etc. The team will collaborate in developing a set of reasonable alternative working hypotheses concerning the operation and variability of the MRS of this region. Comparative pattern recognition will be a primary analysis tool.

2.2. Step 2. Evaluation of potential utility of satellite remote sensing and *in situ* environmental data for studies of the fhs

The next step will be to focus on the application of available environmental measurements and satellite coverage of the area, taking advantage of the capabilities of existing environmental databases and the regional satellite centers. This will include (a) evaluation of the ability and relevance of environmental data to define the important seasonal ocean flow features of the area and to identify significant superimposed inter-annual variability; (b) analysis of available time series to evaluate ability to identify significant inter-annual variability, particularly with respect to patterns estimated to relate to important structures in the feeding and reproductive habitats of major resource species; (c) interpreting evident patterns in ocean colored images in terms of their ecosystem significance. The results would then be fed back to further define the results of Step 1.

2.3. Step 3. Process-oriented field investigations

One expects that Steps 1 and 2 will reveal key issues that may need special clarification. For example, it may be possible to formulate certain informative field tests to help choose between alternative working hypotheses. In the case of the fhs, these may require substantial process-oriented studies using at-sea collection, state-of-the-art instrumentation, etc. For the more social science-related elements of the MRS (e.g., elements 4 to 7 outlined in the above-mentioned list), needs for specific studies by competent specialists may be identified. It is recommended that the precise formulation of Step 3 largely awaits the outcomes of Steps 1 and 2. However, it is clear that certain issues (e.g., stock structure, preferred spawning grounds, etc.) are certain to be crucial ones. Consequently, it may be worthwhile, at the very beginning, to collect samples for genetic analysis immediately, and to implement some basic egg/larvae survey activities, devoting some effort to investigating food preferences (notably food-particle size preferences of early life stages and of filter-feeding adults), etc.

2.4. Step 4. Establishment of a routine regional monitoring programme

When a fairly clear conceptual framework of the operation of the regional MRS has emerged, resources may be sought for establishing routine monitoring of elements identified as controlling factors or particularly informative indicators. Examples might include (a) implementation of permanent sea-level monitoring gauges on opposite sides of the Straits of Sicily to monitor total surface through-flow; (b) establishing routine monitoring of planktonic particle-size spectra, etc. But it is to be emphasized that the nature and purpose should not be monitoring for monitoring sake, but as a direct outcome of identification via the process of Steps 1, 2, and 3, of potentially crucial junctures in the system.

2.5. Step 5. Provide forwarding information to appropriate institutions and public groups

A practical institutional framework would be devised by which the information from the monitoring efforts could then be assembled and integrated by an established regional group of experts and be formulated as advice to appropriate governmental and non-governmental institutions involved in managing the MRS and other associated human economic, cultural and social activities that derive benefit from the productivity and aesthetic qualities of the Straits of Sicily regional marine ecosystem. This might take a form somewhat similar to the proposed GOOS Regional LMR Analysis Centers (Anon., 2000), or be quite different, depending on the results achieved in the course of this Project proposal.

3. Illustrative proposals

3.1. Spatial distribution of demersal resources in the Straits of Sicily and the influence of environmental factors and fishery characteristics

3.1.1. Rationale

Despite the management framework recently adopted, very little information is available on the distribution, integrity and separation of marine fish resources in the Straits of Sicily. Besides, according to the usual assessment procedures, most of the demersal resources resulted fully exploited or overexploited in these management units; therefore, a reduction of fishing effort and change in fishing pattern was recommended to ensure sustainable exploitation of these resources (Levi *et al.*, 1998). However, most of the above-mentioned geographical sub-areas need a further description of biological processes and/or fish movements. As a consequence of this lack of information, several biological stocks of the same species may be exploited within each management unit, and stocks which enter a given management unit may have been exploited by fisheries elsewhere.

Many approaches have been adopted for the identification of stocks. These include studies on distribution and abundance of various life-history stages, marks and tags, both natural and artificial, meristics and morphometrics, calcified structures, genetics and life-history parameters. Some of these methods are expensive and time-consuming, while others may quickly give information on the identity of stocks. Among them, the spatial distribution of species populations, which are already well sampled by research surveys at various stages of their life cycle, represents a useful tool for the identification of stocks and provides advice for short-term management problems (Pawson & Jennings, 1996).

3.1.2. Objectives

The aim of this proposal is the identification of spatial distribution of the different life stages (recruits, adults and any significant age group) of commercial fish according to the environment and fishery characteristics. This study will provide the basic information dealing with the recognition and delineation of different stocks in the Straits of Sicily, as a preliminary step toward an effective stock assessment and management in the area.

The Project tasks have been divided as follows and designed to study respectively:

1. The main physical features of the area (bathymetrical, sedimentological and hydrological).

2. The main benthic biocenosis and demersal fish assemblages.
3. The fishing pressure on demersal resources in the area.
4. The spatial distribution of juvenile and adult of target demersal species.
5. The combination of all previous tasks using a GIS in order to give an overall view of the possible interactions between spatial distribution of the demersal resources and environment and the fishery features.

3.1.3. Methodology

As a general approach, previous studies will be taken as a reference. Their analysis should help identify the gaps to be filled and the pertinent data to be collected. If the case arises, remote sensing data should be favored, as they are easily obtainable and have a spatio-temporal resolution well adapted to regional issues (large zones can be covered at a relatively fine temporal scale).

Common target species to be studied can be chosen in accordance with the priority species listed by the GFCM Sub-Committee on stock assessment. However, in order to allow a comparative approach, both species which are considered as forming shared stocks in the area (such as *M. merluccius*, *A. foliacea*, *N. norvegicus*) and those supposed to belong to separate stocks (*M. barbatus*, *M. surmuletus* and *E. cirrhosa*) will be selected as target species.

The main habitat should be mainly described and characterized (type of sea bottom, typical species, etc.) at least at first, by using literature data. Then, according to the gaps and sampling possibilities, accurate descriptions can be made.

Fishing pressure has started to be described by the FAO CopeMed Project. With a general agreement, this work could be pursued and developed, in particular for the calculation of fishing pressure indicators to be used as a possible external factor influencing the spatial distribution of fish.

Spatial distribution of individuals may be drawn up, using historical data, as well as data provided by on-going national sampling programmes (trawl surveys). According to the data that will be used, an essential requirement would be either to study the possibilities of standardizing existing data or to agree upon a simultaneous and standardized sampling schedule for all parties.

As mentioned previously, all data can then be represented, combined and analyzed, using a GIS approach that would help to highlight the most relevant aspects related to the interactions between fishery resources and its surroundings. This methodology gives the possibility of adding any type of relevant information.

3.2. Small pelagic fish in the Straits of Sicily: stock identification and oceanographic processes influencing their abundance and distribution

3.2.1. Rationale

The importance of small pelagic fish is both commercial and scientific. Besides the fact that they represent an important trophic level in ecosystems, they have an ecological importance

because of competition that exists between some species like anchovy and sardinella that reproduce at the same period.

Despite annual surveys, little is known on spatial distribution, influence of physical parameters, reproduction and concentration zones, transport of eggs and larvae. In the Mediterranean, small pelagic fish stocks have experienced in the last decades very strong inter-annual fluctuations, which largely appear to be related to environmental variability during some specific key-life stage (larval and pre-recruitment phases).

3.2.2. Objectives

Research work is first targeted on the identification of the main fish stocks. First, this can be carried out through the detection of the main spawning and nursery areas by means of ichthyoplanktonic surveys, taking into account the different hydrographic regimes of the study area.

Secondly, the study aims at investigating biomass and distribution of the main small pelagic fish species by means of hydro-acoustic methods in relation to environmental factors, especially during the pre-recruitment phase.

The objectives may be summarized as follows:

1. Stock identification.
2. Influence of oceanographic processes on abundance:
 - analysis of historical data (catches, biomass estimates, sea surface temperatures, chlorophyll, etc.) when and where the cases arise;
 - echo-survey data in relation with remote sensing information.
3. Influence of oceanographic processes on distribution:
 - transport of early life stages (eggs and larvae);
 - influence on recruitment;
 - distribution of adults.

3.2.3. Methods and tasks

The studies would take place along the coastal zones of the Italian (South Sicily), Libyan, Maltese and Tunisian continental shelf. For practical reasons, it may not be possible to study the entire coast; more precise study areas should therefore be defined and agreed upon by all four partners.

To date, the main tasks identified are listed below:

1. Bibliographic review.
2. Analysis of historical data.
3. Field work:
 - ichthyoplankton surveys
 - acoustic surveys
 - physical oceanography surveys.

4. Analysis and integration of collected data.

All four partners should review the available knowledge and synthesis of the existing information in the area. Moreover, the coordination of field work between partners would be beneficial, both for sampling periods and inter-calibration of data to be collected.

3.3. MPAs and fisheries management

3.3.1. Rationale

The Straits of Sicily include almost all the typical Mediterranean coastal and pelagic habitats, with the peculiarity that in some areas they are overexploited and in some others they are almost still intact, and can be considered as Marine Protected Areas (MPAs).

For many years, research on fish stock assessment has been carried in the Straits of Sicily area, especially within the national border of each country. Data on under-exploited international areas came only recently.

The availability of several habitats under a different stage of protection, and the opportunity of creating new *ad hoc* MPAs in the region can allow the testing of a series of hypotheses on the role of the MPAs.

MPAs such as marine and fishery reserves and gear exclusion zones, are considered to be especially useful in the socio-biological complex situations where traditional approaches based on catch and/or effort control would be highly demanding in terms of data and labour. Preference is given to protected areas due to their potential role in (i) the recovery of depleted stocks; (ii) the prevention of recruitment overfishing, and (iii) the spillover of fish to adjacent fished areas (Polunin, 1990; Dugan and Davis, 1993; Dayton *et al.*, 1995; Bohnsack, 1996; Holland and Brazee, 1996; Auster and Shackell, 1997; Roberts, 1997).

3.3.2. General objectives

The general objectives of this research proposal are to use areas subject to different fishing efforts, to explore the dynamics of inshore and offshore food webs, and to make advances in the scientific-methodological under-pinnings of resource and environmental management.

3.3.3. Methodology

Recent data from the fishery reserve in the Gulf of Castellammare, include an eight-fold increase of fish biomass (Pipitone *et al.*, 2000), a general economic benefit for the small-scale fisheries of the area (Withmarsh *et al.*, 2002) and a size-structure shift of the whole benthic fish assemblage with some species increasing and others decreasing in their average size (Badalamenti *et al.*, 2002).

Because of their feeding habits fish are commonly size dependent, in that as a fish increases in size within a population (*e.g.*, Frid *et al.*, 1999), or as mean size declines in a population, subject to increased fishing mortality (Pope and Knights 1982), the diet and trophic level will also tend to change. Areas closed to fishing provide an exceptional opportunity to explore trophodynamic and other structural consequences of the recovery in previously-depleted stocks, the dynamics of biological reference points such as trophic level and the interaction

strengths in whole food webs, and the underlying state-of-the-art methodologies for these. Thus, the application of modern methods such as size spectra and stable nitrogen isotope analyzes, together with the use of trophodynamic models (Pauly *et al.*, 2000), will contribute to improving the techniques both for demersal resource assessment and ecosystem effects of fishing in the Mediterranean, so as to improve understanding of marine shelf systems on a large scale and ultimately improve the means for the management of coastal marine resources.

4. General Conclusion

Following the meeting held on 5 July 2002, whereby a general methodological approach was defined and agreed upon by all participants, the goal of this document was to propose the main priorities for research activities of the MedSudMed Project.

The next steps in the definition of a work plan will be to organize *ad hoc* Working Groups with the scope of sharing knowledge obtained and to elaborate on both the technical guidelines and the master-plan for the Project. Consultants and/or coordinators need to be identified for each Working Group; they would cooperate with the scientist-in-charge and the research institutions in the participating countries to define detailed work contributions and timing in terms of available facilities, means, man-time. Finally, the work plan will include the capacity building component to share know-how and know-what to achieve outstanding work capabilities in the research fields envisaged.

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MedSudMed Database and Information System Preliminary Conceptual Design

by

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Preface

Ecological and ecosystem studies related to fisheries require various types of data, material, facts and figures. In order to ensure a full description of the fishery resources and present the basic parameters a complex and powerful analytical tool is indispensable. As mentioned in the approved Project Document (Annex E), one of the anticipated outputs of the Project is a computerized-based package with a capacity to store, analyze and present the main factors describing the changing status of fish stocks, their environment and the fisheries dependent upon them. It was with this perspective in mind that a preliminary outline of the Conceptual Design of a database was presented to the GFCM–SAC Sub-Committees on Ecosystems and Marine Environment and on Statistics and Information (Barcelona, May 2002).

Technically, the Conceptual Design is a dynamic document which, after review and approval by all parties concerned, will be used as the basis on which to develop the whole information system. At the same time, it will be systematically reviewed when new elements are introduced into the mechanism.

Introduction

This report presents a preliminary Conceptual Design and gives the general technical architecture of the information system with a definition of standard parameters elaborated on the basis of research, analysis and development work conducted so far. In fact, the experience gained in the past in developing similar systems has provided good guidance, confidence and speed.

Great importance is given to this system because of its design, development, implementation, size, complexity and expectations of the many institutions concerned. In order to minimize risks to the resources and maximize transparency and robustness, it has been decided to work within a clear and delimited methodological reference framework, with a classical approach that would elaborate, first, a comprehensive Conceptual Design in agreement with all parties concerned. Second, to produce a development plan on the basis of the agreed document, the System Design would be drawn up in which all the ideas, expectations and requirements would match with (a) resources and skills available, (b) accessible existing data and information, and (c) the industry standards.

It is anticipated that, during its development and use, the chosen approach would allow a series of minor or major adjustments to fulfill the new requirements and timely adaptation of such changes.

1. Basic Outline of the Conceptual Design

1.1. The objective

The aim of this project is to create a system for the storage, management, analysis and information of data related to the monitoring of fishery resources and their environment. The key information would concern the biological aspects of the resources, environmental parameters, fishery statistics and accessory data. The primary motivation is to be able to cross reference several types of information, in order to have a synoptic vision of the fishery resources and their environment. In accordance with the principles adopted during the Reykjavik Conference (October 2001), use of this operational system would point towards an integrated and rational management of the fishery resources. The users and beneficiaries would be the participating countries of MedSudMed, as well as the GFCM scientific bodies and FAO.

This system will have to be conceived in such a way that it can be transposable to other geographical zones and/or other scenarios, and should offer the possibility of integrating data and information requirements of other volunteer countries. In addition, as no prototype exists, this system would be experimental, and therefore open to modifications that could improve its access, management and/or expected output.

1.2. The methodological reference framework

The methodological reference framework within which the system will be developed is defined as the ensemble of the following matters that need to be clearly defined and addressed:

- ✓ type of data and information to be handled
- ✓ national, international and institutional contexts in which the project operates
- ✓ user requirements and their role, participation and interactions
- ✓ expected output (the final product).

Furthermore, because of the participating nature of its primary users and its long-term objective, the MedSudMed information system will be developed in a modular architecture, meeting the open system conception. This is the only approach that can be applied in a situation where there are a number of uncertainties and/or constraints such as leaving to the users the possibility of using the data with different goals. User requirements will certainly evolve in parallel with implementation of the system, the uneven level of skills and resources, the international context in which the system is going to operate, and the future utilization of the system.

The system life-cycle must encompass not only data and information requirements but also, and in this case mainly, the working approach the Project will follow within its

methodological framework and its implications. Unless the technical, institutional and working procedures are considered as a single issue, the life cycle of the system will be limited to a simple exercise.

1.3. Users' identification

In all information system development, user identification is considered as an open issue. While it is very important in market-oriented applications, considering the effort and the resources spent to clearly identify users and their profiles, in many cases their importance is overemphasized. This is not the case here. In the MedSudMed Information System, the first group of end users consists of national scientists from the participating countries and institutions, the Project scientists, and other external expertise requested to participate in the Project activities. This group of users is the Scientific Advisory Group of MedSudMed, hereafter called SMAG, and is both the builder and user of the system. This group is also the most important for supplying the data to be entered into the system.

The SMAG members will be called upon to actively contribute to the common user activities but also, more significantly, to propose the initial set up, new applications and modifications to existing ones.

To better meet system requirements, the SMAG members would participate in the design and would establish objectives from their own points of view, including the types and sources of data they would like to see entered into the databases, the data entry formats, the data extraction envisaged, and the desired retrieval and output models. This includes, with appropriate elasticity, developing databases jointly with project computer experts. Each of the proposed database components must initially be described in the following format:

<u>Description and objective</u>	Stating why that item is considered to be of particular interest.
<u>Variables to be considered</u>	Type of data, units, collection method, reporting frequency.
<u>Source of data</u>	Identify secure and accessory sources of data.
<u>Users of particular interest</u>	List all expected interested end-users, and try to have their involvement in the data and functions definition exercise.
<u>Data entry format</u>	Provide the data entry forms including instructions, notations, keywords, reference codes, etc.
<u>Data manipulation</u>	List all the manipulation and treatment foreseen to achieve the proposed results.
<u>Data retrieval functions</u>	List all possible and interesting retrieval functions that the software must allow for.
<u>Constraints</u>	Highlight all possible problems and conflicts that may be envisaged in developing this database.
<u>Suggestions</u>	Design by hand (or computer assisted) the layout the output format must have to present the results. Give any suggestions that may be of use to developers.

A second group of end users is also envisaged which includes all other fishery specialists of the region and other national and international institutions that collaborate and interact with the Project in all capacities.

2. The Architecture System

From the above-mentioned situation, it is clear that the three fundamental aspects of this architecture system are: independency, modularity and interaction. The system must guarantee different speeds in application development due to the different levels of infrastructure in the participating countries and institutions and the many eventual difficulties in the gathering of information and data collection. It must guarantee a wide range of applications and exploitation of the collected data, from classical analytical ones to GIS analyzes, and Internet links that may not progress in the same manner. Finally, in order to maintain coherence, reduce redundancy and improve productivity, the system must incorporate a strong interface to enable all these applications to interact. This approach is absolutely necessary in order to integrate all the components, *sensu lato* and enable the system to develop accordingly.

A schematic view of the architecture information system is shown in Figure 1. The logical infrastructure supporting the architecture could be represented by a triangle where each vertex stands on a platform to be developed. Each platform will be developed independently, step by step, and will target the database and Internet web systems, and the GIS applications.

2.1. Operational platforms (stand alone *versus* client/server)

The development strategy will be strongly influenced by the chosen logic. From development and organizational points of view, the choice must guarantee the project's short and long-term requirements.

It is worth noting immediately that the whole system will be developed in a stand-alone format. Though the client/server approach could have been the primary option, it is not applicable in this case. The final decision is briefly based on the following main reasons:

- availability of resources
- confidentiality of certain data
- capacity building
- future sustainability.

The structure of the whole system is detailed hereafter. Four similar stand-alone national systems will be based in:

- ✓ Italy, at the Istituto di Ricerca sulle Risorse Marine e l'Ambiente (IRMA)
- ✓ Libya, at the Marine Biology Research Centre (MBRC)
- ✓ Malta, at the General Directorate of Fisheries (GDF)
- ✓ Tunisia, at the Institut National des Sciences et Technologies de la Mer (INSTM)

One project information system is alimented through automatic, built-in routines in the national systems with an agreed level of aggregation and communication protocols, and other data and information from national and international sources hosted in:

✓ Project's Headquarters, Mazara del Vallo, Italy.

After completion, the prototype will be installed in the national centers and made operational. Simultaneously, the project centre will start working and will coordinate all the data inflow/outflow activities. Both systems should basically have the same configuration (databases, Internet web, GIS system, applications and outputs). Authorized access and levels of exploitation will be decided accordingly.

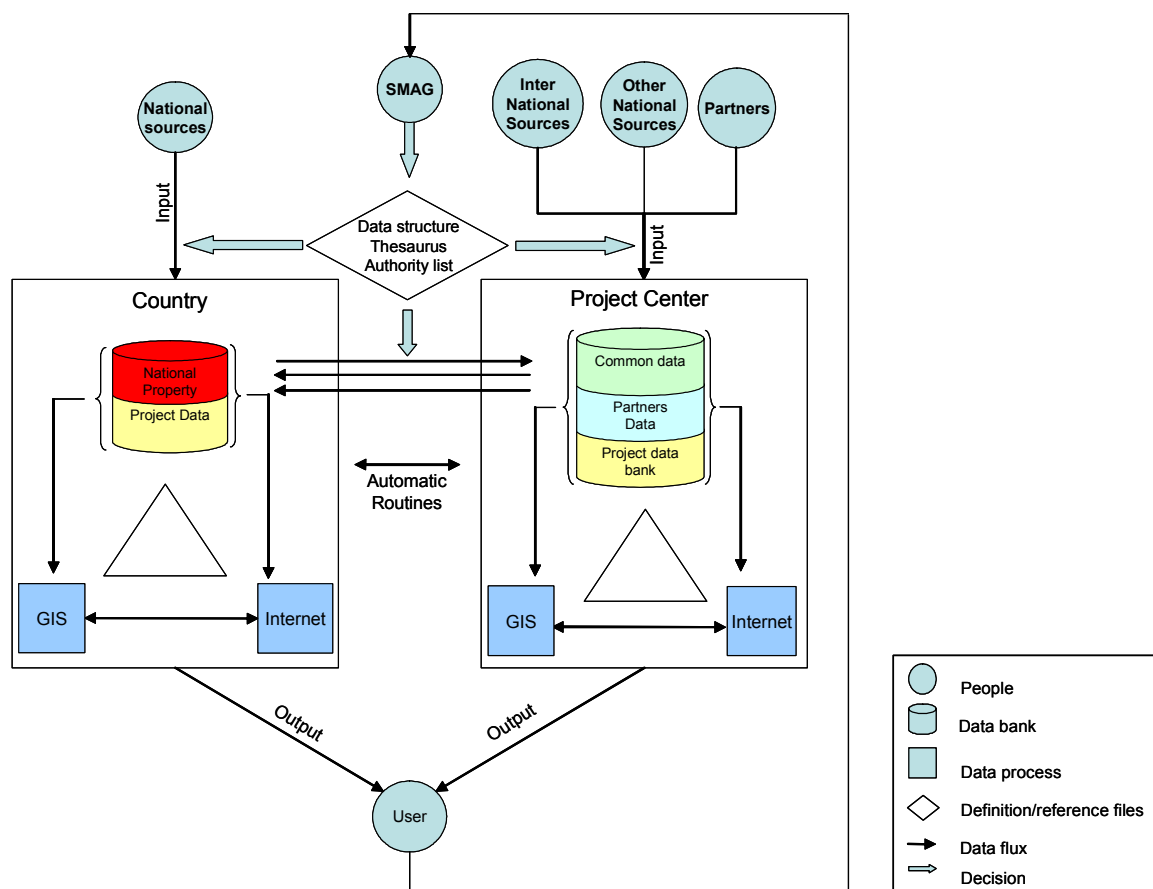


Figure 1: General architecture of MedSudMed Information System
(SMAG: Scientific Advisory Group; GIS: Geographical Information System)

2.2. Network configuration

From the development and operational points of view, and in order to strictly follow the project strategy, the system will have two operational levels, one at the project centre and the other at the national centre, thus managing two similar typical configurations, one nationally based and one project based.

The countries will manage their own systems and feel free to further expand their own databases or information system. However, as far as possible, national systems should be compatible with the regional systems and should have the same data structures and identical

authorized list and thesaurus for the indexing of stored information. The Project may eventually assist other interested countries to develop any extended parts.

On its mandate, the Project information centre will be both the repository and manager of the corporate Project information system and the service provider to meet the end-user needs, including training. It will be responsible for the organization of the overall data collection system, data verification, compilation of the regional database and distribution of the latter to the countries concerned. It will also assist the national centers in solving day-to-day problems in their data collection and compilation activities.

The corporate Project information system will essentially rely on the data input from the national centers and its own data collection and data entry.

2.3. Access to the data

The access and sharing of data is a crucial topic that must be detailed in an *ad hoc* document and agreed upon by all parties. However, as a starting point, the main guidelines are given below. According to the degree of confidentiality and the use and ownership of data, four levels of access can be envisaged:

- **Common data** are the data belonging to the public domain, accessible to all users, whether participating or not in the Project. These can be obtained through an Internet web, CD Rom production or other data dissemination media. It is anticipated that authorized regional scientists could enter data from remote stations, via Internet.
- **Other partners** will have access to their own data, as the case may be, when data are provided by an institution and have to be reorganized or reshaped for the sake of clarity. In this case, reorganization of data would be done at Project costs, provided the data are included in the database.
- **National ownership of data** will be the most restricted level of access, as they may contain confidential or sensitive information not intended for diffusion. Therefore, this level of data will only be accessible to the owners of the data. Moreover, data of different ownership will reside in the national work-stations where one owner only can access his own data.
- **Project data bank** is the corporate data bank built through the collection, aggregation and association of national data according to an established and agreed protocol, plus other data collected, acquired or generated by the Project. All the outputs produced by the Project are also part of the Project data bank. The Project data bank will reside at the Project work-station, and access to it can only be obtained by the members of SMAG and other authorized persons and entities.

3. Functional Specifications

3.1. The platforms

Each pole (vertex of triangle shown in Figure 1) consists of a series of sub-systems developed independently, containing its own scope, functions, tools and services.

The technology to be applied will be decided according to the level of difficulty encountered, the expertise, tools and software required at the moment of development.

It is envisaged that the following platforms will have:

- Database: fishery, environment, statistics, accessory database
- Internet web: dissemination tools, remote data entry, access to data banks, etc.
- GIS: map data bank, spatial applications, simulation models, thematic data bases, etc.

3.2. The database

The database would be composed of several elements briefly described below. Each database will contain a different type of information that can be used either directly or indirectly for the description of fish stocks. The starting point can be defined according to the bio-ecological forms on marine environment and ecosystems drawn-up by the SAC Sub-Committee.

- Environmental sub-system: the contents could be divided in biotic and abiotic sections, according to the nature of the information.
- Fishery sub-system: this is one of the main cores of the database, as it contains fish stock and biological related information.
- Statistical sub-system: should concern mainly fleet, catch and effort statistics.
- Accessory information: this information will not be directly related to the topic (e.g., not to be taken into account for the description of fish stocks and their ecosystems). For example, it can contain legislation data (closure dates for fishing, sampling periods, data gaps, etc).

Because of the strong interaction with the group of users and the need to meet the many requirements from non-computer scientific specialists, it is intended to strictly follow a standard methodology in the definition of databases that would bring forth a clear understanding of the following:

- ✓ concepts and definitions
- ✓ analysis of the data
- ✓ analysis of the functions
- ✓ user interface
- ✓ national/regional codification
- ✓ data files structure
- ✓ data linkages and establishment of relationships
- ✓ definition of coherence levels and control
- ✓ query procedures definition
- ✓ reporting procedure definition

3.3. The Internet web

It is expected that Internet will be used mainly for dissemination of data and as an information tool. It could also be used as a means for data collection.

3.4. The GIS environment

GIS software will allow the analysis and representation of the extracted subset of data, by levels of information.

3.5. Data elements and formats

The system will manage:

- ✓ numerical data
- ✓ textual data
- ✓ bibliographical data (mainly references to statistics and other information to be cited)
- ✓ pictorial data
- ✓ maps
- ✓ graphs
- ✓ imagery data from satellite, etc.

3.6. Geographical coverage and scale

The system will be developed to cover three geographical areas at certain scales. This point needs to be further discussed and defined. The following two or three-scale levels are expected:

- National area coverage with its scale (for the national system);
- Project area coverage with its scale (for the Project system);
- GFCM area coverage with its scale (for a possible regional system).

The Project partners will decide on the scale according to the situation. However, the system would be able to better handle a scaling system in a hierarchical progression of multipliers.

3.7. Data transfer

Data transfer involves the sharing of data between the national systems and the Project corporate system. It includes both the uploading and downloading of all data sets, and needs to be clearly defined.

3.8. Data dissemination

Data dissemination represents the delivery of data and information to the users. The users may be primary or secondary, and the method of delivery may range from a publication to a report to on-line access. In most cases, the method is dictated by the receiving users' hardware or by necessity.

The main functions of dissemination are the selection of data to be delivered to the user, the manipulation of data into a form to be used by the user, and finally, the output of the data in the format requested by the user.

3.9. Basic hardware and software configuration

The hardware of the work-stations will be based on Intel Pentium machines equipped with advanced configuration. The following is given as a guideline for national work-stations. The Project information system will be hosted in a server.

As mentioned earlier, at present only a general and basic software configuration can be listed. However, Windows Pro 2000 (English) will be the operative system and Microsoft Office XP (Word XP with French, Spanish and Italian language modules included, Excel XP, Powerpoint XP) will be the development and working environment for general and database applications. Work-station utilities such as Adobe Acrobat Reader, Microsoft Internet Explorer and Netscape should also be installed. As far as GIS applications are considered, ArcView 8.2 or a later version will be used.

Web-based applications should support both Netscape and Microsoft browsers. For information requiring universal external dissemination, the latest version of the browsers should be supported. Enhancements to basic information may be provided with a higher-level browser version. Netscape and Microsoft Internet Explorer (IE) are both FAO standard browsers. Version 4.X is recommended as the Netscape standard and Version 3.X as the Microsoft standard, to ensure compatibility for the Microsoft browser on all machines from a low to high end. Java is recommended as a web application development standard tool for simple to advanced web-based and stand-alone applications. Java best meets web and stand-alone application development tool/language criteria. Active Server Pages (ASP) is recommended for simple web database applications.

The above is only the initial stage; any special required application will have the most appropriate environment for development.

4. Resources Envisaged

Apart from the hardware specifications that will be detailed later, the following profiles on human resources are envisaged. They are listed, regardless of their full-time or part-time involvement.

- ✓ system designer;
- ✓ system administrator and data manager;
- ✓ database programmer;

- ✓ GIS specialist for the development of spatial analyzes;
- ✓ Internet web developer and web manager;
- ✓ primary users (national and international Project scientists);
- ✓ national counterparts in the specific sector who can participate in the development of the system as well as in the maintenance, data management, Internet web updates and monitoring (Training and Support, point 5 refers);
- ✓ a set of national and international partners for data building and exchange.

Hardware and software configurations are required for the development of the whole system. It is expected that all country offices will have the same applications as well as the same software and hardware.

The use of a computer server and the hiring of an Internet domain are also envisaged.

5. Training and Support

During the period leading up to the introduction of the system, the Project would need to devote considerable resources to the testing of application programmes, their performance and use. During the introduction and development of the system, extensive user support would be essential to ensure smooth implementation, and the involvement of national counterpart rights from the beginning is also considered essential. No timeframe can be anticipated for training, which would clearly depend on the rate at which progress is made, the available training resources and the level and skill of the persons involved. In order to ensure sustainability, this component should be given high priority.

6. The Expected Final Package

The long-term output is to produce a large and multidisciplinary data bank exploited by a Decision Support System (DSS) and by a GIS, with the objective to enable the fisheries institutions of the four participating Governments to carry out the continuous dynamic assessment and monitoring of the status of fish stocks and other living resources, as well as the ecosystems in this area of the Mediterranean. This will allow them to rapidly provide ongoing advice to senior levels of government on appropriate adjustments needed in their national and regional mechanisms for fisheries management, with the aim at ensuring sustainable fish production at an optimum level.

The system, exploiting GIS technology, should have the capacity to store, analyze and quickly present all the basic parameters used to describe the changing status of fish stocks, their environment and the fisheries dependent upon them. The package will be installed and brought into operation in each participating institution (with the assistance of national experts specially trained under the Project), so that each will have an independent, but compatible module covering its own national resources as well as part of a common international module covering the shared ecosystems and resources.

If successful, the final product could be used for similar initiatives in the Mediterranean region.

7. Summary of Foreseen Short-term Activities

The following are the initial planned steps that will be carried out immediately after approval of the principles contained in this report. Some of them have already been implemented. They may change according to the needs.

- Build up infrastructures for a regional information centre;
- Survey national centers computing needs and define hardware and software requirements;
- Establish an on-going Project information centre;
- Define staff in the region (national and project developers), the facilities needed, assign tasks;
- Establish contacts and working approach with the SMAG members;
- Establish data/information flow, control and security requirements;
- Prepare the working methodology for developers;
- Design the overall architecture;
- Design a series of database and stand-alone applications for each of the platforms, as required;
- Produce the first prototype and documentation.

The updating will be necessary as soon as new data are collected/provided. An agreement must be made to nominate persons who will be in charge of the updating. The possibilities are numerous, as it can be centralized or scattered among different parties. In this latter case, a standardized updating procedure, as well as a reporting system to inform other parties, should be adopted. As a consequence, the responsibility will be incumbent upon the institution that has access to the data.

8. Programme of Work

The above will be achieved through a series of purposely organized technical meetings and Working Groups where all options and decisions will be presented and discussed, and a strong link and coordination established with the development team and the Project's information centre.

MedFiSIS Project Proposal and its Interaction with MedSudMed

Background

In 2001, the GFCM-SAC Sub-Committee on Statistics and Information formulated a regional project proposal for the data collection system in the Mediterranean. The project proposal was finally approved by the SAC with the recommendation that it is submitted for endorsement to the Commission.

The proposal was presented and endorsed at the Twenty-sixth GFCM meeting from 10 to 13 September 2001 in Ischia, Italy. Furthermore, the EU endorsed the project proposal (its plan, structure and budget), with the understanding, provided other sources of financing were secured, that it would co-finance this project.

Objective

The project is expected to create a Fishery Statistics and Information System in the Mediterranean (MedFiSIS) which will contribute to the sound management of living marine resources of the large marine ecosystem in the Mediterranean.

The three-year project will help countries develop their national fishery statistics system, enabling them to better manage the sustainable development of their fisheries. Similarly, it will create an inter-nation compatible system, serving as a vital support for international bodies to monitor the state of fishery resources and the well-being of the whole ecosystem in the Mediterranean. The project would thus have to provide specific assistance to participating countries in the development of their fishery statistics systems (from data collection to data analysis) as required at national level and also to be able to ensure (i) minimum level of data quality and coverage; (ii) regional compatibility; and (iii) sustainability of the proposed system.

Summary description of work

The intention is that the proposed project does not duplicate activities currently being implemented by the ongoing sub-regional projects AdriaMed and CopeMed; *vice-versa*, the request for this project, in fact, arises from the need to complement and further expand the activities of AdriaMed and CopeMed, which have a geographical coverage limited to the participating countries.

The project will undertake a multidisciplinary evaluation of databases, statistics and information systems already existing in the region, of national statistical requirements, EU regulations and requirements of international fishery bodies.

On request, specific assistance will be provided to non-EU countries to develop their fishery statistics system accordingly, while ensuring regional compatibility, a minimum level of data quality and coverage and the sustainability of the proposed system. It is envisaged that national and regional experts will take an active role in the project, while other nationals will be trained in basic statistics, data collection systems, and data processing and analysis.

Using the processed data, periodic national reports will be prepared for top-level government officials, national entities and regional bodies. The former will be made aware of the importance of these reports to ensure the continuity of an official methodology to monitor fishing activities that will, in turn, help to maintain the proposed regional fishery statistics and information system.

The regional context

The GFCM will coordinate and harmonize the activities and will subsequently establish a Fishery Statistics and Information System by creating a network of compatible national systems, incorporating existing regional and sub-regional systems, as components of this proposed new single regional system.

The present situation

In a recent meeting between the EU representative and FAO-FI, a general agreement was reached between the EU, the FAO projects operating in the Mediterranean (AdriaMed, CopeMed and MedSudMed), and the FAO Regular Programme to produce a final project document with an initial budget of \$US 1.2 million to be shared between the EU (\$US 600 000) and FAO components (\$US 600 000).

Although the budget is not at optimal level, it is believed that this project should be initiated promptly, especially to assist the eastern Mediterranean countries that have so far not benefited from the other FAO sub-regional projects.

The interaction with MedSudMed

The proposed project has subsequently been scaled down (from its original expected budget of \$US 2. 250 million), and its formulation should now be finalized taking into consideration the following identified contributions:

- ✓ National requirements in Albania, Croatia, and Slovenia will be covered by the AdriaMed Project, with the possible eventual inclusion in the future of Serbia and Montenegro.
- ✓ The CopeMed Project will continue to cover national requirements in Algeria, Libya, Malta, Morocco and Tunisia.

- ✓ Technical expertise will be given by MedSudMed for developing, strengthening, and coordinating the data and information domain among the FAO Mediterranean projects and SAC. In this context, it is expected that MedSudMed (through the project's Fishery Resources Officer) will continue to coordinate the related statistical and data processing activities of AdriaMed, MedSudMed and CopeMed and would be the main focal point vis-à-vis this new project. Any new activity will be programmed as a useful complement to the present responsibilities.
- ✓ Technical support for collaboration and liaison with other existing fishery databases, such as FAO-GFCM database, FIGIS-FIRM, and other FAO applications, as well as for direct technical input and backstopping at national and regional levels will be provided by FAO-FI.
- ✓ Contributions from participating countries can be expected to be in-kind through the provision of infrastructures, time and computer usage of national staff or a cash contribution equivalent to some \$US 50 000-75 000.ⁱ

ⁱ S. Coppola – FIRM – September 2002

National Capacity Building

Introduction

National capacity building is one of the main Project components. It will focus on the full-time involvement of scientists from the four participating countries in the Project overall research and development programme and on ensuring that the output produced shall be useful to each beneficiary country individually and jointly in a national context, in the Straits of Sicily sub-region. Scientists from the participating countries will be offered on-the-job training assignments, and/or fellowships according to their skills and needs of their national institutions.

Objectives

When required training programmes are envisaged in order to carry out the planned activities and thereby fulfill the Project Objectives. According to the need to implement this Project activities consideration must be given to the requirements of the institutes for their training programmes in order to update the technical skills of the personnel.

Topics

Research activities may require specific training focused on laboratory techniques, data collection and processing. Moreover, the implementation of an information system and of a computerized-based modular package will probably require skills for the creation, use and maintenance of the structure. Training needs on particular topics should be evaluated according to the wishes of the researchers. Furthermore, according to the organization's ability or willingness to host trainees for short periods and provide technical help and assistance, a list should be prepared of the training possibilities offered.

Methodology

National capacity building will be carried out by organizing seminars, training courses/trips, etc. (organization of short periods to be spent in other institutes to undertake field and/or laboratory tasks). Should the case arise, this may only concern one participating country. Moreover, bilateral exchanges can be planned between countries, especially when it concerns training trips focused on specific tasks for one or several researchers. Training sessions will be organized either by qualified/ specially trained personnel who will be contracted for these courses, or researchers involved in the Project able to assist/host colleagues from other participating countries. For each research activity, the related training component will be defined.

Results

The result of the expected output of the national capacity building is to have people trained in order to homogenize the technical level of the Project activities in the four participating countries.

Duration

Training will be carried out during all the Project activities.

Terms of Reference for the MedSudMed Coordination Committee

Introduction

GCP/RER/010/ITA – Assessment and Monitoring of the Fishery Resources and the Ecosystems in the Straits of Sicily (MedSudMed) is a regional Project, financed by the Italian Government and executed by FAO. The participating countries are Italy, Libya, Malta and Tunisia. The Coordination Committee (CC) is being established to promote and advise on Project activities and participate in the formulation of the annual work plans.

Justification and aims

The CC represents the interests of the participating countries collaborating in the Project. It has an advisory and liaison function with respect to the work programme and its relevance for the study of fishery resources and ecosystems. The CC also includes as observers, or coopted members, representatives of funding agencies and other organizations that may be engaged in scientific research in the Project area.

The functions of the MedSudMed-CC are:

- to monitor and assist the Project activities;
- to discuss and reach a consensus on the annual work plans;
- to propose: pilot project studies; workshops, *ad hoc* working groups, or meetings in accordance with the Project objectives and priorities, and identify training activities;
- to guarantee at national level all the necessary backstopping service.

Structure and membership

Chairman:	The CC is under the chairmanship of the representative of the host country; in his absence the Chairman can be chosen among the members, generally a host-country member.
Permanent members:	Donor representative Representative from each of the participating countries. In his/her absence the countries can nominate a deputy. Representative of GFCM Representative of FAO Headquarters
Ex-officio members:	Project Coordinator
Permanently invited observer:	Representative of EC National Focal Points Representative from FAO regional projects

Other observers:	Representative of interested groups
Secretariat:	Project staff

Under specific request of the CC, the members of the Committee will be assisted by experts.

The Project's CC should meet at least once a year, and when possible, every six months. The provisional date and place of each CC meeting will be established at the end of the previous meeting. In some cases, and under the agreement of all members, the Project's CC can discuss and approve specific actions through the *ad hoc* mailing list.

Terms of Reference for the MedSudMed National Focal Points

In accordance with the Project Document, the National Focal Point is a high level, experienced fishery scientist who has access to his/her country's main fishery information.

He/She will be:

- in direct contact with the MedSudMed Project;
- informed by MedSudMed on the most important Project activities planned and under implementation at regional level;
- placed at the head of the mailing list and be provided with all the Project's technical outputs;
- informed on all the activities carried out at national level.

The function of the National Focal Point is to participate in the overall Project research and development programme by:

- advising on specific Project components at national level;
- representing the national scientific network;
- coordinating specific Project components at national level;
- providing all the necessary support in information gathering and data collection regarding the relevant Project components;
- ensuring effective flow of communications regarding the Project activities to and from the national scientific counterparts.