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Field Document

SUMMARY OF PREPARATORY PHASE

ALGERIA, CYPRUS, EGYPT, GREECE,
LIBYAN ARAB JAMAHIRIYA, MALTA, MOROCCO,
SYRIAN ARAB REPUBLIC, TUNISIA, TURKEY
and YUGOSLAVIA

REPORT ON ACTIVITIES OF THE
MEDITERRANEAN REGIONAL AQUACULTURE PROJECT

by

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This report was prepared during the course of the project identified on the title page. The conclusions and recommendations given in the report are those considered appropriate at the time of its preparation. They may be modified in the light of further knowledge gained at subsequent stages of the project.

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1. INTRODUCTION

1.1 BACKGROUND

The intergovernmental meeting on the protection of the Mediterranean held in Barcelona from 28 January to 4 February 1975, in recommending the establishment of a coordinated programme for promotion of the better utilization of marine resources, specifically mentioned aquaculture as one of the ongoing activities to be developed or expanded. An expert consultation, convened by UNEP and FAO and held in Athens in 1978, reviewed the aquaculture situation in the region and approved the proposal for a regional cooperative project. Following further discussions, a preliminary project (RER/78/004) was approved by UNDP and FAO. Under this project, an expert mission was sent to the field to work out a cooperative programme and investigate the possibilities of using existing technologies, improving techniques, of conducting research and of testing new techniques on a pilot scale.

In 1980, a preparatory phase (CRER/78/004 and RAB/79/033) was approved to investigate and select activities to be launched prior to the principal phase. The senior project specialist was recruited and, after visits to and discussions in each country of the region, he drew up an action programme for basic training of specialized personnel and support and monitoring of pilot projects financed by the countries themselves, to provide for practical training and dissemination of techniques chosen for their regional interest, a network for disseminating information, particularly through the establishment of a technical data bank, etc.

This report describes the activities and results of the preparatory phase of this project.

1.2 IMMEDIATE OBJECTIVES

The immediate objectives of the project were to carry out the preparatory activities necessary for the implementation of the main phase of the Mediterranean Regional Aquaculture Project (MEDRAP), and more specifically:

- (i) select a site for the project's headquarters;
- (ii) negotiate the agreement on responsibilities of the host government and the executing agency;
- (iii) identify candidates and undertake preparatory action for the re-cruitment of technical and administrative personnel for the project;
- (iv) take necessary preliminary action for the procurement of essential equipment and supplies for project activities;
- (v) in consultation with the participating countries, formulate in further detail activities to be carried out on a regional and national basis;
- (vi) initiate discussions with sub-contracting institutions for the implementation of relevant aspects of the project.

In addition, it was requested that discussions on additional financial support be undertaken and that project activities proposed during the main phase be initiated.

1.3 INPUTS

The preparatory phase started on 16 June 1980, with an initial duration of 12 months, and the project coordinator was recruited on this date. Due to the financial situation of UNDP and difficulties in communication between UNDP and FAO, the start

of the main phase (initially planned for July 1981) was postponed and the preparatory phase continued to December 1983. This period should therefore be considered as the beginning of project activities planned for the main phase but their execution was constrained by ad hoc extensions, resulting in difficulties in preparing and adhering to work plans.

UNDP inputs amounted to US\$ 732 550, including US\$ 120 000 for the preliminary mission (1978/79); as there was no cost-sharing, there were no government inputs. UNDP inputs covered the project coordinator post, consultants, training activities and provision of equipment.

The project was based in Tunisia (September 1981) and benefited from the hospitality of the Institut National Scientifique et Technique d'Océano-graphie et des Pêches (INSTOP), Commissariat General a la Pêche, Ministère de l'Agriculture, which provided office space and local personnel assistance (secretaries, drivers, etc.).

The project also benefited from the assistance of FAO's Technical Cooperation Programme which contributed substantially to the planning of aquaculture development in some countries of the region (Tunisia, Syria, Morocco) and assisted in initiating pilot projects in Tunisia and Morocco. FAO/TCP inputs amounted to US\$ 244 000.

The project organized a training session on marine hatchery technologies in Sète, France and gratefully acknowledges the support of France's Ministry of Foreign Affairs, and of the Université des Sciences et Techniques du Languedoc, Department of Aquaculture, which provided grants for the trainees, experts and the location for the session.

The project also received assistance from the EEC, Direction Générale de l'Environnement, which provided hydrobiology experts for studies in Greece and Morocco.

1.4 REPORTING

In addition to the UNDP standard progress reports, several reports were prepared in the form of travel reports and field documents; these are listed in Appendix 1.

1.5 ACTIVITIES

During the preparatory phase, the project carried out two priority activities:

- the implementation of pilot projects in the countries;
- the initiation of the first training activities.

The most important portion of the inputs and activities, although the budget was equally shared between the two UNDP bureaux, was devoted to the Arab countries which received about 60% of the training funds, 95% of the consultancies and 65% of the equipment (see Appendix 2). Owing to the more advanced state of aquaculture development in some of the European countries and the very high demand from the Arab countries for consultancies and training, this distribution appeared appropriate but it was proposed that for the next phase, the budget provided by the Regional Bureau for the Arab countries, be increased.

2. RESULTS AND CONCLUSIONS

2.1 SELECTION AND IMPLEMENTATION OF THE FIRST PILOT PROJECTS

MEDRAP is based upon two key activities which are essential to attain the

proposed objectives and indivisible: personnel training and setting-up of pilot projects.

The pilot projects were selected in agreement with the participating countries and were to be progressively set up in accordance with the means of the governments and the assistance given by the project. Four projects were developed and supported by MEDRAP; five others have been identified and preparatory studies have started.

2.1.1 Choice of the first projects

The choice of the first projects was made according to three criteria:

- the possibility of their inclusion in the regional network of pilot projects;
- the setting-up on the local level of the necessary financial resources for their implementation;
- the presence of a counterpart team already linked with the project.

In 1982/83, four projects satisfied these criteria:

- the National Centre for the Development and Extension of Aquaculture in Monastir (Tunisia);
- the Aquaculture Unit of Mellah and Oubeira Lakes and El Kala (Algeria);
- the marine farm of Limski Kanal (Yugoslavia);
- the marine pilot station of Paphos (Cyprus).

These four projects therefore received priority with regard to the training of counterpart teams and the provision of specialized equipment and consultancy services.

2.1.2 National Centre for the Development and Extension of Aquaculture, Monastir (CNDVA)

The objectives of CNDVA which was created with TCP and MEDRAP assistance, are:

(a) At the national level:

- to test the various technologies applicable in Tunisia for commercial production of fish;
- to serve as a national centre for training and extension services in connexion with the national research centres, the fishing school of Monastir, etc.

(b) At the regional level:

- to serve, on a medium-term basis, as a training centre for techniques that may be used in all the countries south and east of the Mediterranean: polyculture of mullets and dorades, intensive aquaculture in cages and ponds, fry production of marine fish;
- to adapt the techniques developed in the countries in the north to the particular conditions (temperature, salinity, etc.) of the countries in the south.

The overall investment granted by the Tunisian Government was D 910 000 CUSS 35 million), of which D 200 000 were used for a marine fish hatchery. The management of the centre will be entrusted to staff from the Office National des Pêches (ONP) and INSTOP, in order to constitute a first team of 5-6 senior officers.

The centre will have at its disposal: a building, including a laboratory, meeting room, food preparation room, etc., a hatchery for marine fish, ten ponds of 0.25 and 0.5 ha, 11 ponds of the raceway type, floating cages and an improved fish trap (bordigue).

The building and the floating cages were installed at the beginning of 1983, while the ponds and the fish trap were to be ready at the beginning of 1984, and the hatchery at the end of 1984.

The project assisted in designing the installations, making a preliminary study of the site and training the senior officers of ONP and INSTOP. The assistance will continue through courses planned for 1984 and 1985, and it is hoped that the centre will become fully operational in June 1985.

2.1.3 Aquaculture Unit, El Kala

The Aquaculture Unit of EL Kala which was created in 1981 as part of ENAPECHE, and which became autonomous at the beginning of 1983, has the following objectives:

(a) At the national level:

- to develop Mellah (800 ha) and Oubeira (200 ha) Lakes in east Algeria;
- to train an Algerian aquaculture team capable of guiding future development:
- to act as a field station for research teams from universities, CROP and CERP.

(b) At the regional Level:

- to improve techniques for the extensive exploitation of lagoons through the development of appropriate fish traps and fishing gears;
- to study the affinities between such exploitation and more intensive installations.

The construction of the management building was started in 1982/83, and bids were called for a feasibility study for a marine fish hatchery.

The contribution of the project included consultancy services to assist in setting up the Unit and to train the counterpart team in shellfish farming, environmental control, fry collection and cage construction. Algeria thus received the greatest number of project consultants (six in 1982).

The El Kala team was reinforced in 1983 (5 aquaculturists) and will participate according to the specialization of each of these aquaculturists in the various training sessions anticipated for 1984-1986. The final development of the activities with regard to the lakes should not, however, be completed before 1986-87, because of the importance of infrastructure organization and training problems to be solved.

2.1.4 Marine Fish Farm of Limski Kanal

The Limski Kanal farm is a unit belonging to a Yugoslav fishing cooperative (MIRNA) based at Rovinj; this project started in 1980 with the following objectives:

(a) At the national Level:

- producing several hundreds of tons of fish and shellfish by the use of mixed equipment (rafts and cages which help to keep investments at a Low Level and make the best use of food, manpower, energy, etc.);
- accommodating, thanks to Local facilities, the personnel in training or research, thus directly Linked to production.

(b) At the regional Level

- proposing to the various countries with the same characteristics (deep and protected coast), mixed production techniques for off-bottom culture;
- receiving personnel from other Mediterranean countries and providing training.

The Limski farm is presently equipped with the first series of rafts/ cages and is starting construction of the whole hatchery. The 1983 production is about 1 500 t of shellfish and a few tons of seabass.

Up to now, MEDRAP was concerned mainly with training and the supply of specific equipment. Proposals for closer cooperation in the training of aquaculturists from the other Mediterranean countries and technical assistance (availability of consultants) are under discussion.

2.1.5 Marine station of Paphos

The pilot station of Paphos was set up since 1980 by the Department of Fisheries with the following objectives:

(a) At the national level:

- to train personnel in marine aquaculture techniques;
- to finalize techniques of intensive breeding of marine fish for which there is a ready demand in the eastern Mediterranean;
- to dispose of a field unit for the demonstration and the extension of these techniques to private companies.

(b) At the regional level

- to finalize techniques of intensive breeding appropriate to the eastern Mediterranean, in particular to countries with a ready demand for marine fish and limited site potential (Syria, Lebanon, Cyprus, Malta);
- to be able, for short periods, to provide assistance to the countries of the area as a result of the experience gained in this field.

The station is presently equipped with combined facilities of floating cages and a field hatchery. The MEDRAP contribution was concerned mainly with the training of the station supervisor and with the supply of specialized equipment for the hatchery.

2.1.6 Identification of new pilot-projects

In 1982-83, the project coordinator, assisted by consultants, recruited by the MEDRAP project, funded by FAO/TCP projects (Syria, Morocco), started studies and identification of new pilot-projects in Morocco, Egypt, Syria, Turkey and Greece:

- Morocco : intensive shellfish culture of flat oysters in the Nador lagoon (11 500 ha), using rafts
- Egypt: polyculture of mullets, sea breams and tilapias in brackishwater ponds at the Raswa farm (400 h a) , near Port Said
- Syria: pilot-station of Lattakia, for intensive culture of marine fish in raceways

- Turkey: progressive improvement of the management of Izmir lagoons (modernization of fish-traps, rearing of fingerlings and restocking)
- Greece: construction of a National Aquaculture Centre, devoted to the development of integrated aquaculture (intensive + semi-intensive + lagoon aquaculture).

All these pilot-projects are or should be implemented on a commercial basis; with the exception of the Lattakia station first outlines of programmes and work plans have been drawn up and will be defined in 1984.

2.1.7 Conclusion

The establishing of the first four pilot-stations, which should be followed by those being set up, made it possible to confirm the validity of the options chosen for the development of the regional project, to use a network of pilot projects instead of only one regional centre.

This solution makes it possible:

- to limit to the maximum the basic permanent team which has to organize and contribute to the training of personnel without having to manage central installations and thus with a minimum of administrative duties;
- to adapt the finalization of techniques and training to the various geographical sub-regions of the Mediterranean;
- to ascertain the continuation of personnel training and its utilization in the field, as a result of the presence of the pilot-projects in each country.

The progressive development, during the next two or three years, of these projects and their firm and permanent link after the end of the regional project (in particular due to the planned data network) is therefore an objective which is inseparable from the training objective during the period 1983-86.

2.2 TRAINING ACTIVITIES

During 1982, various types of training were carried out: training sessions, study tours and training in the field.

2.2.1 Regional training session on hatcheries techniques (February 1982)

This training session was programmed to take into account the priority given to techniques of fry production and to take advantage of the opportunity offered by the French Government and the marine station of Sète to provide the project with installations, senior staff and complementary financing. The programme included theoretical training, practical training on hatcheries, and visits to various other public, private or cooperative hatcheries.

The training session included 11 participants from six countries as well as the same number of French participants for a period of three weeks. The training officers were French, Italian and Yugoslav scientists and technicians, some of whom were top international experts in their field. The training provided resulted in the development or the improvement of re-production techniques of marine species, in particular in Tunisia, Yugoslavia and Cyprus.

2.2.2 Study tour on lagoon aquaculture in Italy (November-December 1982)

In the field of Lagoon management, Italy is the one Mediterranean country which has not only many years of past experience but has also Launched numerous modernization programmes in recent years. From the priority given by the project to the management of the Lagoon environment (about 1 million ha in the Mediterranean) a first study tour was organized for senior staff of the counterpart projects, to selected Italian production centres in order to analyse the various techniques in use: fishing and breeding in ponds, combination of species, integration of intensive aqua-culture systems, etc.

The study tour regrouped 13 participants as well as specialists from FAO Headquarters and the MEDRAP project; a detailed report of this study tour was edited in 1983.

The conclusions were that an important part of Italian technology could be transferred to the countries in the south and east of the Mediterranean and in particular those dealing with one type of extensive or semi-intensive aquaculture. In the end, during the visit to one of the most important production centres in the south of Italy, the interest was such that it appeared most attractive to direct Italian assistance to the MEDRAP project in setting up a training centre within this production unit. Talks were held in this respect in order to set up 6-9 month technical training sessions.

2.2.3 Training in the field

During this period, five different training schemes in the field took place after a few months of consultancy; the counterpart teams in Tunisia, Algeria and Morocco were the beneficiaries of this training, as follows:

- hydrobiological study, control and follow-up of the lagoon environment in Tunisia, Algeria and Morocco;
- fry collection techniques in Algeria and Tunisia;
- construction of breeding cages (nets and structures) in Tunisia and Algeria;
- shellfish farming techniques in Algeria and Morocco;
- feed manufacture in Tunisia.

These training sessions lasted from 15 days to one month and were carried out at the same time as technical studies which were Lead by par-ticipating experts.

This type of training which was carried out as far as possible by the same experts responsible for the group training sessions, can be adapted to national or long-term training sessions.

2.2.4 Conclusion

The preparatory period in the regional project made it possible to test the various types of training contemplated for the main period, to ascertain their potential, to attain the training objectives established and to become better acquainted with the problems arising from the organization of these activities, in particular the necessary time limits and the personnel and equipment to be provided.

This type of decentralized and specialized training is much more difficult to organize and guide than the ordinary long-term training in a single regional centre, but it offers considerable advantages: great adaptability, adjustment to the field, and greater

efficiency due to the intensity of the proposed activities. The budgets presented for the period 1984-1986 do not allow for planning of long-term basic training, which will be carried out by other means.

2.3 NATIONAL DEVELOPMENT PLANS

Since the basic personnel and the number of consultant months were limited during this period, the project coordinator, with the cooperation of participating countries' authorities, tried to obtain FAO support through its Technical Cooperation Programme; this support was realized in 1982 and 1983 through three TCP projects in Tunisia, Syria and Morocco.

The MEDRAP project helped the governments to submit their requests, to prepare the project documents (revised by the FAO technical division and UNDP/FAO/ADCP), assist and participate in TCP assignments and continue subsequent assistance (pilot projects and training). In total, FAO brought to the project more than 20 months of consultants, permitting, in addition an improved preparation of the setting-up of pilot projects and definition of training priorities.

The project coordinator also took part in the first national meeting in Greece which was intended to determine a development programme; the setting-up of the programme and the choice of pilot activities are still under discussion.

2.4 PROVISION OF SPECIFIC EQUIPMENT

During the preparatory phase, the project was able to supply the field activities with specific equipment; in addition, the project headquarters was equipped with communications equipment, typing and processing systems, some training equipment and one vehicle.

Equipment provided to the pilot-projects consisted of: measuring kits (oxymeter, thermometer, multiparameter kits, Limnigraphs, etc.) for control and monitoring of water quality in the lagoons, ponds and hatcheries:

- hatchery equipment: aerators, pumps, weighing scales, etc.
- fish-culture equipment to be tested: different types of feeders, graders, nets, etc.

The total value of equipment provided to Tunisia, Algeria, Morocco, Yugoslavia and Cyprus was about US\$ 70 000.

It appeared that this possibility of providing essential equipment should be reinforced not only to collect data but also to avoid the risks of failure of pilot-projects, by permanent monitoring of rearing conditions, detection of problems and immediate action.

2.5 STRENGTHENING OF REGIONAL COLLABORATION

The regional project should also develop regional collaboration through meetings, workshops, visits and exchange of information. Such activities have also been initiated during the preparatory phase.

2.5.1 Regional Workshops and Meetings

The project participated in several meetings and workshops organized in the region: GFCM meetings in Palma de Majorca (1980) and Rome (1982), presenting reports on the MEDRAP situation.

- Workshop on lagoon management in Rome (1983), presenting reports on Lagoon aquaculture.
- Workshop on Mediterranean shellfish culture in France (1983), presenting a report on present shellfish production, problems and new developments in the region.

2.5.2 Visits of counterpart staff

Short visits of engineers and biologists of a pilot-project to another project of the area are always of more benefit than written documentation for the analysis of certain technical problems and their solution. The project therefore organized a few missions of this kind with a duration of about one week: Tunisian mission to the hatcheries in the south of France (January 1982), Algerian mission to Bizerta and Ghar El Melh (April 1982), Moroccan Mission to Bizerta and Monastir (March 1983). This type of exchange not only results in solving technical problems or visualizing the production centres but also in implementing contacts between the various pilot-projects.

2.5.3 Advisory Committee

The first Advisory Committee Meeting of the project was held in Tunisia in October 1983. This meeting not only reviewed the activities carried out during the preparatory phase or proposed for the main phase, but also provided an occasion to exchange information on aquaculture development and problems in the participating countries.

2.5.4 Conclusion

Meetings, workshops and visits have been very useful for participating institutions and should be developed. The Lack of time and personnel made it impossible to develop other types of dissemination of information (technical papers, bulletins, etc.) essential in a regional project; solutions-should be found to this problem during the main phase.

3. RECOMMENDATIONS

In view of the results obtained and the difficulties encountered during the implementation of the project, the following recommendations are made:

3.1 PILOT PROJECT IMPLEMENTATION

The regional project cannot provide all the assistance required for the implementation of present and future pilot-projects because of the limited UNDP funds proposed for the next phase (1984-86). Additional sources of funding should be found, especially from the more developed countries in the region, to support the implementation of the projects. The de-finition and the implementation studies should be carried out by MEDRAP with the assistance of FAO if possible, as was the case in Tunisia, Morocco and Syria.

It is therefore recommended that coordination between MEDRAP and FAO/TCP be continued and developed in the Mediterranean region.

During the next three years the full development of the five on-going projects (Morocco, Tunisia, Algeria, Yugoslavia and Cyprus) and the implementation of three new projects in Egypt, Greece and Turkey, should be possible.

3.2 TRAINING ACTIVITIES

Three types of training should be developed for marine aquaculture:

- long-term basic training for higher personnel, to acquire general knowledge of marine biology, zootechnics, economics, civil engineering, etc.
- medium or short-term specialized technical training for higher personnel and technicians to give them a technical basis for production, and
- field training by adapting the techniques acquired in the former two cases and training of lower-level personnel (technicians and workers).

3.2.1 Basic training

Basic training is already provided in the Mediterranean Region by several institutions and it is not recommended to develop such training within MEDRAP.

3.2.2 Specialized technical training

Specialized technical training seems to be the highest priority in all the participating countries because it is the key to aquaculture development. It may involve short, medium or long periods depending on the subject, initial basic training and the objective.

Short-term training activities (1-2 weeks) are designed to study a highly specific problem and the solutions found in similar installations in countries of the same region. This is the purpose of individual technical visits or visits in small groups which were already made during the preparatory phase and which it is recommended to continue during the main phase.

Medium-term activities (1-3 months) are directed to training production; this is done mainly through training courses with emphasis on practical training plus some theory.

Such a course was already arranged in the preparatory phase, but during the main phase these activities should receive priority.

Long-term technical training (6 months and more) can hardly be envisaged with the present UNDP funds. However, such training, of interest for technicians and producers, could be provided under other arrangements:

- additional sources of funds to MEDRAP, especially from Italy where model farms can offer facilities for practical training;
- coordination with bilateral cooperation, which can offer grants to candidates selected by MEDRAP.

It is recommended to explore all these sources of assistance to respond to all the requirements.

3.2.3 Field training

Such training is essential to put the foregoing action into practice and expand the training of technicians and workers in the countries.

It is recommended to provide such assistance in the countries through the core staff personnel and consultants already employed in the technical training sessions presented above.

In this way, training sessions and training in the field will be closely linked and coordinated. In addition, each consultancy provided to a pilot-project should be used as a training activity, not only by the country concerned but also by neighbouring countries

who could be invited to send participants to this consultancy.

3.3 STRENGTHENING OF REGIONAL COLLABORATION

In view of the similarity of the species and technologies utilized in the countries and the problems encountered in the implementation of the pilot-projects, it is recommended that some form of efficient and permanent regional collaboration be developed during the main phase of MEDRAP, in two complementary ways: exchange of information and exchange of expertise.

3.3.1 Exchange of information

In addition to the training sessions or consultancies, it is proposed to develop four activities:

- (a) organization of regional workshops in liaison with consultancies or training sessions, on various technical problems. These workshops benefit from the presence of consultants and participants of the Mediterranean countries;
- (b) issue of periodic bulletins or papers with information on pilot-projects, new advances in technological problems, equipment, etc.;
- (c) setting-up of a regional technical data centre, that could receive from the participating countries, information on production centres and disseminate them to the other countries. (This issue will be discussed in detail at the Advisory Committee Meeting to be held in Cyprus in November 1984);
- (d) organization of periodic Advisory Committee meetings, which could also be used for a review of advances in aquaculture in the various countries.

Not all these activities are possible if they are carried out by the project core staff alone; it is, therefore, recommended to use the national counterparts, not only as sources or users of information, but also as participants in the organization of these activities.

3.3.2 Exchange of expertise

It is also recommended to initiate a kind of TCDC project, perhaps at the end of the 1984-86 phase, using local expertise. This exchange could include:

- short visits by aquaculturists from one country to a pilot-project located in another country;
- priority use of experts from participating countries.

Such action has been initiated during the preparatory phase and should be developed during the main phase. Advisory Committee meetings will be instrumental in defining, on an ad hoc basis, its possible application.

3.4 PROJECT EVALUATION

The project will be evaluated from a technical point of view on a yearly basis through Advisory Committee meetings attended by representatives from all participating countries, FAO and UNDP. FAO's Development Department, through its Investment Centre (DDC), should be involved as far as investment potential possibilities are concerned.

Appendix 1

PROJECT REPORTS (not including progress reports)

TRAVEL REPORTS

- 1980
1. Report on travel to Tunisia (22-25 July 1980)
 2. Report on travel to Libya (4-6 August 1980)
 3. Report on travel to Morocco and Algeria (18-21 August 1980)
 4. Report on travel to Cyprus, Greece and Egypt (1-9 September 1980)
 5. Report on travel to Spain (GFCM session 17-25 September 1980)
 6. Report on travel to Malta (29 September-1 October 1980)
 7. Report on travel to Geneva and New York, UNDP-UNEP, (October 1980)
 8. Report on travel to Yugoslavia (8-12 December 1980)
- 1981
1. Report on travel to Syria and Turkey (12-20 January 1981)
 2. Report on travel to France and EEC (20-23 January 1981)
 3. Report on travel to Algeria (1-5 February 1981)
 4. Report on travel to Tunisia (27-30 April 1981)
 5. Report on travel to Syria (31 May-5 June 1981)
 6. Report on travel to Tunisia (4-7 August 1981)
 7. Report on travel to France (17-18 September 1981)
 8. Report on travel to Algeria (16-21 October 1981)
- 1982
- TR/82/1 - Training course on hatchery technologies, . France, March 1982
- TR/82/2 - Aménagement de La Lagune de Nador, Maroc, March 1982
- TR/82/3 - Aménagement du Lac Melleh, Algérie, March 1982
- TR/82/4 - Marine Aquaculture Development, Syria, July 1982
- TR/82/5 - Etudes préliminaires sur la lagune de Nador, Maroc, September 1982
- TR/82/6 - Reunion du CGPM à Rome, September 1982 .
- TR/82/7 - Preparation of a Workshop in Greece and Field Activities in Cyprus, October 1982
- TR/82/8 - Visits to France and Italy (Aquacultura Trade Fair), October 1982
- TR/82/9 - Projet Lac Mellah, Algérie, October 1982
- TR/82/10 - Projet Lac Mellah, Algérie, November 1982
- TR/82/11 - Aquaculture Development in Greece (Workshop) and Report on the Amvrakikos Project
- TR/82/12 - Aquaculture Development in Yugoslavia, December 1982
- TR/82/13 - Improvement of Lagoon Management in Turkey, December 1982
- TR/32/14 - Aménagement de la Lagune de Nador, Maroc, Rapports et propositions, December 1982
- TR/82/15 - Proiet de cages flottantes à Monastir, Tunisie, December 1982

- 1983 TR/83/01 - Programme de travail sur La Lagune de Nador, January 1983
- TR/83/02 - Projet du Lac Mellah, September 1983
- TR/83/03 - Mission étude sur La lagune de Nador, November 1983
- TR/83/04 - Discussions on Support from France, EEC and European Council to MEDRAP, December 1983
- TR/83/05 - Coastal Aquaculture Development in Egypt, November 1983
- TR/83/06 - MEDRAP Activities in Yugoslavia, December 1983

FIELD DOCUMENTS

- 1982 FD/82/1 - Avant-Projet d'Aménagement de La lagune de Monastir (Tunisie), March 1982
- FD/82/2 - Aménagement de La lagune de Monastir (Tunisie), May 1982
- FD/82/3 - Exploitation conchylicole du Lac Mellah (Algérie). Adaptation des techniques développées en Tunisie, July 1982
- FD/82/4 - Suivi hydrobiologique d'une Lagune aménagée pour L'aquaculture: exemple de Monastir (Tunisie), August 1982
- FD/82/5 - Avancement des travaux d'aménagement de la lagune de Monastir (Tunisie), October 1982
- FD/82/6 - Termes de références pour La construction d'une écloserie pour poissons marins, December 1982
- FD/82/7 - Analyse et développement d'une exploitation lagunaire extensive: exemple du lac Mellah . (Algérie), November 1982
- FD/82/8 - Constructions de cages flottantes pour poissons marins en domaine lagunaire, November 1982
- FD/82/9 - Aménagements d'ouverture à la mer en Méditerranée: exemples de la lagune de Nador (Maroc) et du Lac Mellah (Algérie), November 1982
- FD/82/10 - Italian Fish Farming Techniques - Development prospects in the Mediterranean, December 1982-March 1983
- 1983 FD/83/O1 - Proposals For a Training Programme Within the MEDRAP Framework, April 1983
- FD/83/02 - Analysis of Development Projects of Lagoon Exploitation in Turkey, February 1983
- FD/83/03 - Propositions pour un suivi hydrobiologique de La lagune de Khniss, Monastir, February 1983
- FD/83/04 - Etude Hydrobiologique du Lac Mellah, December 1983
- FD/83/05 - L'Aquaculture Méditerranéenne en milieu ouvert, December 1983

OTHER PAPERS

Workshops:

- GFCM session (Spain, September 1980), Presentation of MEDRAP
- GFCM session (Rome, September 1982), MEDRAP situation
- Lagoon Management (Rome, September 1983), Use of Lou Technologies for Lagoon Aquaculture

- International Symposium on Shellfish Farming (France, September 1983):
Shellfish Farming in the Mediterranean

Implementation of the Monastir project

- Propositions d'aménagement, January 1982
- Avant-projet d'aménagement, February 1982
- Bassins de grossissement intensif, March 1982
- Note technique sur Les aménagements proposés, March 1983
- Note sur Le pompage, April 1983
- Avancement des travaux, April 1983

Miscellaneous

- Situation de l'aquaculture en France, November 1981
- Situation de l'aquaculture à Bizerte et Monastir (Tunisie), April 1982
- G.1 488 - Assistance au développement de l'aquaculture dans la region méditerranéenne. Proposals for a financial assistance of Italy to MEDRAP

Appendix 2
CONTRIBUTIONS TO PARTICIPATING COUNTRIES IN
1982-1983

(CORE-STAFF EXCLUDED)

I. Training (m/m)

	<u>Training Session</u>	<u>Study Trip</u>	<u>Visits</u>
Algeria	0	1	0.25
Egypt	1.5	1	0
Libya	0	0	0
Morocco	0.75	0.5	0
Syria	0	0	0
Tunisia	1.5	1	0.5
Cyprus	0.75	0.5	0
Greece	0	0.5	0
Malta	0	0	0
Turkey	1.5	1	0
Yugoslavia	1	0.5	0

II. Consultancies (m/m and number) - excluding FAQ/TCP

	<u>m/m</u>	<u>Number</u>
Algeria	3	6
Morocco	2.5	4 (including EEC contribution of 1.5 m/m)
Tunisia	3.5	5
Greece	1	2 (EEC contribution)
Turkey	0.25	1
Egypt	0.25	1

III. FAQ/TCP Contributions

	Consultancies		Training	
	<u>m/m</u>	<u>Number</u>	<u>m/m</u>	<u>Number</u>
Syria	7	6	18	4
Tunisia	7.5	7	0	0
Morocco (1983-84)	7.5	5	18	3

IV. Equipment

Algeria	Measuring equipment in the field
Tunisia	Measuring equipment in the field
Cyprus	Hatchery equipment
Yugoslavia	Hatchery and cage-culture equipment
Morocco	Measuring equipment in the field

Appendix 3

SPECIES AND TECHNOLOGIES USED IN MEDRAP PILOT PROJECTS

<u>Species</u>	<u>Technology</u>	<u>Pilot Project</u>
<u>Molluscs</u>		
Flat - Oyster	Raft	Nador (Morocco)
	Long line	Rovinj (Yugoslavia) Ston
Mussel	Raft	Lake Mellah (Algeria)
	Longline	Rovinj (Yugoslavia) Ston
<u>Crustaceans</u>		
Peneid shrimps	Enclosure	Tunisia
	Polyculture	Raswa (Egypt)
	Restocking	Missolonghi (Greece)
<u>Fishes</u>		
Mullet	Polyculture	Raswa (Egypt)
	Ponds	Monastir (Tunisia)
Sea-bass	Cages	Rovinj (Yugoslavia)
		Paphos (Cyprus)
	Raceways	Monastir (Tunisia)
Sea-bream	Ponds	Monastir (Tunisia)
	Polyculture	Raswa (Egypt)
All species	Extensive aquaculture (restocking)	Izmir (Turkey)
		Lake Mellah (Algeria)
		Missolongi (Greece)
	Integrated aquaculture	Monastir (Tunisia)

Appendix 4
MEDRAP FRAMEWORK

Summary

Network of aquaculture centres in the Mediterranean

Development of aquaculture technologies, information and personnel for the Mediterranean region

Regional Project (RAB/79/033 and RER/78/004) between UNDP/FAO and participating Governments

Training of core personnel needed for planning and implementation of national aquaculture development programmes

Regional Aquaculture Pilot Centres that:

- participate in training activities and host train/ing sessions
- test the improved or new technologies under local conditions
- identify local problems in aquaculture and refer to MEDRAP for solution
- participate in two-way exchange of expertise and personnel

Coordinate and support multidisciplinary field research on selected fish culture systems for adaptation or improvement of technologies and for the development of new technologies

Develop an information bank on aquaculture for regional use

Supported by participating Governments, UNDP/FAO and various donor agencies.

1. MEDITERRANEAN REGIONAL AQUACULTURE PROJECT

The Mediterranean Regional Aquaculture Project (MEDRAP) is a coordinated and interlinked system of Mediterranean fish culture institutions working in close cooperation on the development of technologies, personnel and information required to achieve the Longterm objective of increasing fish production through aquaculture in the Mediterranean Region. Regional Aquaculture Pilot Centres are structured in the network to undertake activities in training research and information development.

MEDRAP, set up as a Regional Project, and in agreement between UNDP/FAO and participating governments, operates within the framework of the Technical Cooperation among Developing Countries (TCDC).

The project was formulated by the UNDP/FAO Interregional Aquaculture Development and Coordination Programme (CADCP) in response to the recommendations of an Expert Consultation on Aquaculture Development in the Mediterranean Region, convened at Athens (1978), and the Intergovernmental Review Meeting on the Protection of the Mediterranean, held at Barcelona (1975), to draw up a coordinated programme of concerted activities, aimed at better utilization of resources of the sea, especially by means of aquaculture development.

Collaboration among countries within a region was perceived by the countries themselves as an effective way of accelerating national aquaculture development. This approach allows optimal use of existing capabilities and facilities while greatly reducing duplication of effort.

MEDRAP started its operations in the latter half of 1981 with initial organization and planning activities followed by the establishment of regional aquaculture pilot centres in Tunisia, Algeria, Yugoslavia and Cyprus.

The regional head office of MEDRAP is located at the Institut National d'Océanographie et des Pêches (INSTOP), Salammbô, Tunisia. Coordination and assistance with the implementation of MEDRAP activities is provided by and through this office.

2. PILOT CENTRES

A regional aquaculture pilot centre or, in short, a pilot-centre, is the focus of MEDRAP activities which relate to specific aquaculture systems of importance to the host country and to the region. The functions of a pilot-centre are:to:

- (i) participate in the training of core personnel;
- (ii) conduct multidisciplinary and production-oriented research on selected aquaculture systems for adaptation or improvement of technologies and for the development of new technologies;
- (iii) collect, store and disseminate aquaculture information;
- (iv) accept junior aquaculturists on secondment from participating countries for in-service training and participation in research on specific aquaculture systems.

3. TRAINING ACTIVITIES

MEDRAP training activities aim at developing a core of senior aqua-culturists and technicians needed for planning and implementing aquacuLture development programmes. Eight group training programmes, which are oriented toward practical work, are presently in preparation.

Besides developing the necessary leadership for national aquaculture development, these residential training courses also provide a forum for participants to share experiences and expertise, and to establish personal and institutional contacts essential to regional cooperation in aquaculture development. The training courses are held in participating countries and especially in pilot-project facilities.

4. RESEARCH

MEDRAP research activities focus on:

- (i) filling the main gaps in the knowledge of existing farming systems, and
- (ii) the technological improvements of these systems which will facilitate monitoring the implementation of economically viable fish production programmes.

Research priorities are based on important current needs and on studies which can be undertaken over a short-term to yield immediate practical results. Research technologies are pursued under local conditions.

5. INFORMATION DEVELOPMENT

The information component of MEDRAP covers the collection, storage and dissemination of aquaculture information and data. The types of information gathered may include:

- (i) statistical data on production, area under culture, species cultured, value of products, exports and imports, manpower employed, etc.
- (ii) bibliographic and other non-numerical information such as directories of experts, institutions, research programmes, etc.
- (iii) numerical and other data relating to aquaculture production, including cost and income.

The headquarters will be equipped with mini-computers and staff trained to operate them, and will function as a data bank where the information is processed, stored and released on request.

6. OTHER ACTIVITIES

Apart from undertaking research, training and information activities, MEDRAP, within the Limits of its resources, provides ad hoc assistance to participating countries in identifying development opportunities, conducting feasibility studies and formulating suitable projects. It also provides short-term and ad hoc assistance in the implementation of projects.

MEDRAP welcomes collaboration and cooperation with other organizations sharing common objectives, so that resources available for aquaculture development in the region may be enhanced to the benefit of the Mediterranean people.

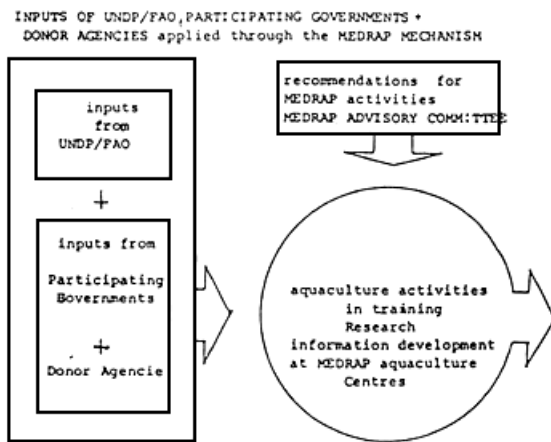
7. SUPPORT AND FUNDING

Support for MEDRAP basically rests with the participating Governments and UNDP/FAO.

Government inputs comprise the provision of national personnel, facilities, equipment and funds for research, training (including where possible fellowships for national trainees) and information development activities.

UNDP/FAO provisions to MEDRAP include a team of FAO personnel to plan, implement and coordinate MEDRAP activities, short-term consultants and instructors,

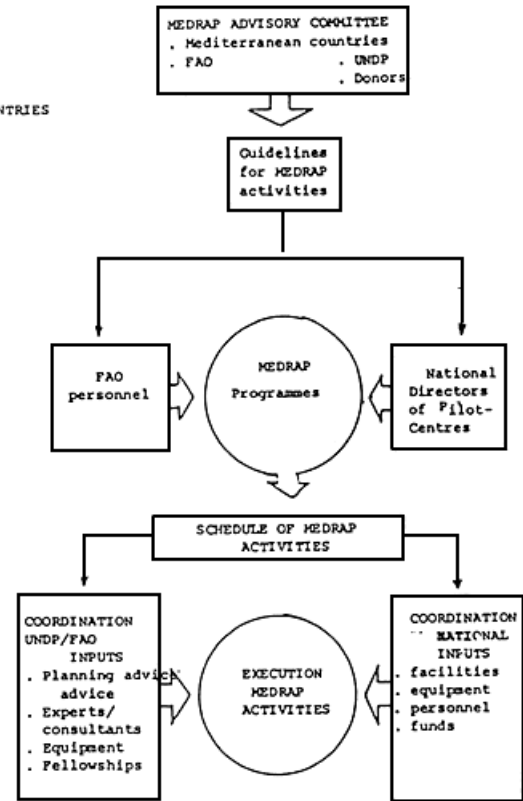
some specialized equipment and fellowships. Other sources of funding are under consideration for the enhancement of training activities and pilot-project implementation.



GENERAL SCHEME OF MEDRAP

OUTPUTS TO MEDITERRANEAN COUNTRIES

1. TRAINED PERSONNEL
 - . Senior aquaculturists to plan to direct programmes
 - . Junior aquaculturists Et Technicians to execute + extend programmes
2. AQUACULTURE TECHNOLOGIES
 - . Finfish and Shrimps
 - . Mussels + oysters
3. INFORMATION BANK
 - . Production parameters statistics and other numerical data
 - . Bibliographic and nonnumerical data
 - . Other information needed for development planning, research and training



MECHANISM OF COORDINATION ET IMPLEMENTATION OF MEDRAP ACTIVITIES

Coordinated MEDRAP activities undertaken with the Inputs of UNDP/FAO and participating Governments, supported where necessary by donor agencies, are intended to develop trained personnel, appropriate aquaculture technologies and information required for structuring fish production programmes. The general plan of MEDRAP is illustrated above.

Since regional cooperation is vital to the fulfillment of MEDRAP objectives and the established MEDRAP ADVISORY COMMITTEE COMPRISING representatives of the participating governments. FAO and UNDP and other donor agencies plays an important role in providing guidance and assistance for implementing MEDRAP activities. The mechanism for coordinating the Implementation of these activities is illustrated above.

IMPLEMENTATION OF PILOT - PROJECT

IMPLEMENTATION OF PILOT - PROJECT



Implemented

- 1 NADOR Lagoon
- 2 Lake Mellah
- 3 CNDVA at Monastir
- 4 Marine farms of Limski – Kanal and Ston
- 5 Paphos marine station

Under study

- 6 Missolongi Aquaculture Centre
- 7 Izmir Lagoons
- 8 Lattakia station
- 9 RASWA Farm