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en coopération avec la CEE, l'ONU, la FAO, l'UNESCO, l'OMS et l'AIEA

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from Land-Based Sources  
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The Mediterranean Action Plan; Information on  
the Activities of the United Nations Environment  
Programme for the Protection and Development of  
the Mediterranean Region, May 1977

The attached document, which was prepared by the United Nations  
Environment Programme, is distributed to participants for their information.

Plan d'Action pour la Méditerranée: Protection et  
Développement de la Région Méditerranéenne;  
Informations sur les activités du Programme des  
Nations Unies pour l'Environnement, mai 1977

Le présent document, préparé par le Programme des Nations Unies pour  
l'Environnement, est distribué aux participants pour information.



THE MEDITERRANEAN ACTION PLAN

INFORMATION ON THE  
ACTIVITIES OF THE UNITED NATIONS ENVIRONMENT PROGRAMME  
FOR THE PROTECTION AND DEVELOPMENT OF  
THE MEDITERRANEAN REGION



UNITED NATIONS ENVIRONMENT PROGRAMME



MAY 1977



Note: This is an updated version of an unofficial information paper on the progress achieved in carrying out the Mediterranean Action Plan.

Additional or more detailed information on any aspect of this report can be obtained from:

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1. INTRODUCTION

1.1 The United Nations Environment Programme (UNEP) was established in 1972 by the UN General Assembly to act as a co-ordinating body within the UN system to ensure that comprehensive approaches be developed to deal with the world's most pressing environmental problems.

1.2 While it was recognized that environmental deterioration was far advanced in many areas of the globe, the Mediterranean region was selected by UNEP as a "concentration area" where UNEP would attempt to fulfill its catalytic role in assisting the coastal States in an ambitious and consistent manner.

1.3 After extensive preparatory activities involving a number of UN bodies, UNEP convened the Intergovernmental Meeting on the Protection of the Mediterranean (Barcelona, 28 January - 4 February 1975). The meeting was attended by representatives of 16 States bordering on the Mediterranean Sea.<sup>1)</sup> At the end of the two-week meeting they approved an Action Plan<sup>2)</sup> consisting of three substantive components:

legal (framework convention and related protocols)

scientific (research and monitoring)

integrated planning

1.4 All components of the Action Plan are interdependent and provide a framework for comprehensive action to promote both the protection and the continued development of the Mediterranean ecoregion. No component is an end in itself. Each activity is intended to assist the Mediterranean Governments to improve the quality of the information on the basis of which they formulate their national development policies. Each should also improve the ability of Governments to identify various options for alternative patterns of development and to make rational choices and appropriate allocations of resources.

1.5 A general description of the various components of the Mediterranean Action Plan, including a report on the progress achieved in its implementation and on plans for its further development, are given in the following paragraphs.

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1) Algeria, Egypt, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Monaco, Morocco, Spain, Syria, Tunisia, Turkey, Yugoslavia

2) Report of the Intergovernmental Meeting on the Protection of the Mediterranean (Barcelona, 28 January - 4 February 1975) UNEP/WG.2/5, Annex, UNEP, 1975.

## 2. ENVIRONMENTAL LEGISLATION

- 2.1 During preparatory meetings for the 1972 UN Conference on the Human Environment the merits of a regional approach to marine pollution problems was stressed, and representatives of many Governments bordering the Mediterranean Sea recognized the value of agreements among interested States to secure regional co-operation in order to deal with common environmental problems. 3) Intergovernmental consultations began in 1974 at the Food and Agriculture Organization of the United Nations (FAO) towards an agreement on substantive guidelines for the negotiations of an international framework convention for the protection of the Mediterranean Sea. On the basis of the agreed guidelines, tentative texts of a framework convention and of two protocols were presented to Governments at the Barcelona Conference<sup>2)</sup> in January/February 1975. According to the Governments' directives, these texts were further revised by Mediterranean legal experts participating in two working groups convened by UNEP in April 1975 and January 1976.
- 2.2 In accordance with a request of the Mediterranean Governments, the Executive Director of UNEP convened the Conference of Plenipotentiaries of the Coastal States of the Mediterranean Region for the Protection of the Mediterranean Sea in Barcelona, 2 - 16 February 1976. Sixteen Governments<sup>4)</sup> attended and approved the texts of the three legal instruments<sup>5)</sup> listed below:
- Convention for the Protection of the Mediterranean Sea against Pollution
  - Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft
  - Protocol concerning Co-operation in Combating Pollution of the Mediterranean Sea by Oil and Other Harmful Substances in Cases of Emergency.
- 2.3 The Convention itself is very broad and commits States in general terms to "take all appropriate measures.....to prevent, abate, and combat pollution of the Mediterranean Sea area and to protect and enhance the marine environment in that area" (Article 4). The Convention specifies the distinct sources of pollution for which

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3)

Report of Intergovernmental Working Group on Marine Pollution (London, June 1971), A/CONF.48/IWGMP.I/5, 1971

4)

Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Monaco, Morocco, Spain, Syria, Tunisia, Turkey and Yugoslavia

5)

Conference of Plenipotentiaries of the Coastal States of the Mediterranean Region for the Protection of the Mediterranean Sea, OPI, UN, Geneva, 1976.

controls should be implemented: pollution from dumping, ships, exploration and exploitation of the continental shelf and sea-bed, and land-based sources. There are also articles on co-operation in pollution emergencies, monitoring, scientific and technological co-operation, and liability and compensation.

- 2.4 The Dumping Protocol closely follows the precedent of the 1972 London Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter, and the 1972 Oslo Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft. The Protocol prohibits the dumping of substances on the "black" list, requires a prior special permit to be issued by the competent national authority for the dumping of substances on the "grey" list, and requires a general permit for the dumping of all other wastes or other matter.
- 2.5 The second protocol adopted at Barcelona calls for co-operation among the parties "in cases of grave and imminent danger to the marine environment, the coast or related interests.....due to the presence of massive quantities of oil or other harmful substances resulting from accidental causes or an accumulation of small discharges which are polluting or threatening to pollute the sea" (Article 1). The Protocol provides for information exchange, co-ordination of communications, and assistance in emergencies. Parties to the Protocol may co-operate directly or through the Regional Oil Combating Centre.
- 2.6 When the system of legal controls was discussed, it was considered that the Convention was too broad to provide meaningful protection on its own. Therefore, no State may become a Contracting Party to the Convention without also becoming a party to at least one of the Protocols. A Protocol will enter into force when at least six States have ratified it, and the Convention will enter into force simultaneously with the first Protocol that is ratified by the requisite number of States. On the basis of national processes now under way, it can be expected that these legal instruments will enter into force in 1977.
- 2.7 At present, the Convention and two Protocols have been signed by fifteen States <sup>6)</sup> and the European Economic Community. One State has deposited its instrument of ratification. <sup>7)</sup>

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6) Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Monaco, Morocco, Spain, Tunisia, Turkey, Yugoslavia

7) Spain



2.8 As a first effort to develop other Protocols, UNEP, in co-operation with the World Health Organization (WHO), convened an Intergovernmental Consultation concerning a draft Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources (Athens, 7 - 11 February 1977). The meeting considered the principles suggested for inclusion in the draft Protocol, revised them and recommended that a second consultation be convened in October 1977 for the purpose of continuing negotiations towards a final text of the Protocol.

### 3. ENVIRONMENTAL ASSESSMENT

- 3.1 As early as 1969 the General Fisheries Council for the Mediterranean (GFCM) of FAO formed a Working Party on Marine Pollution in the Mediterranean which, in co-operation with the International Commission for the Scientific Exploration of the Mediterranean (ICSEM), produced the first comprehensive review of the state of marine pollution in the Mediterranean in 1972. 8)
- 3.2 The next important step was the UNEP-sponsored International Workshop on Marine Pollution in the Mediterranean 9), convened in Monaco (9 - 14 September 1974) by the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific and Cultural Organization (UNESCO), GFCM of FAO and ICSEM. This meeting, attended by 40 scientists from Mediterranean research centres, defined pollution of coastal waters as the main environmental problem in the Mediterranean Sea and attributed it to the general lack of adequate systems for the treatment and disposal of domestic and industrial waste, to the input of pesticides and petroleum hydrocarbons, and to the presence of disease-causing micro-organisms. The Workshop also reviewed information on current subregional programmes as well as on existing research and monitoring facilities in the Mediterranean.
- 3.3 Based on the recommendation of the Monaco Workshop and on a subsequent study of the capabilities of existing national research institutions, conducted by IOC on behalf of UNEP, the 1975 Intergovernmental Meeting in Barcelona approved a Co-ordinated Mediterranean Pollution Monitoring and Research Programme consisting of seven pilot projects (Annex I) and requested UNEP's Executive Director to implement the Programme in close collaboration with the relevant specialized UN bodies (GFCM of FAO, IOC of UNESCO, WHO, WMO and IAEA).
- 3.4 Following governmental approval for the creation of seven networks of co-operating national research centres to carry out the work on the seven pilot projects, a number of technical meetings were held

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8) The State of Marine Pollution in the Mediterranean and Legislative Controls. GFCM. Stud. Rev. 51. FAO, 1972

9) Report of the IOC/GFCM/ICSEM International Workshop on Marine Pollution in the Mediterranean (Monaco, 9 - 14 September 1974), IOC Workshop Report No. 3, UNESCO, 1975.

at which operational documents <sup>10)</sup> for the pilot projects were drawn up. At present, work is under way in a large number of institutions co-operating on the project.

- 3.5 Since the pilot projects of the monitoring and research programme deal mainly with the coastal waters of the Mediterranean, an additional pilot project dealing with pollution levels of the open waters and the biogeocycle of the most important pollutants was later added to the original seven.
- 3.6 Recently, in co-operation with UNESCO, plans have been developed to formulate conceptual models for the biogeocycle of selected Mediterranean pollutants, including models for their impact on marine ecosystems. Using data collected through the various pollution monitoring and research activities, these conceptual models should lead to the formulation of predictive models which might be useful tools for making appropriate management decisions.
- 3.7 Throughout the planning period, and in particular during the two-year pilot project phase, a high degree of co-operation has been maintained between UNEP, acting as over-all co-ordinator, and the specialized UN bodies (GFCM, IOC, WHO, WMO, IAEA and UNESCO) which have major roles in the implementation of these projects.
- 3.8 The pilot projects are being carried out by existing national institutions. Participation in the projects is open to all institutions in the region, subject to nomination by their national authorities. At present 69 research centres from 15 Mediterranean countries <sup>11)</sup> have been identified as active participants in one or more of the pilot projects, but additional nominations are still expected. The monitoring and research activities to be undertaken by the nominated research centres are specified in an agreement signed between them and the relevant specialized UN organization co-operating with UNEP on the implementation of the

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10) Report of the FAO(GFCM)/UNEP Expert Consultation on the Joint Co-ordinated Project on Pollution in the Mediterranean (Rome, 23 June - 4 July 1975), FAO, 1975

Report of the IOC/WMO/UNEP Expert Consultation on the Joint Co-ordinated Project on Pollution in the Mediterranean (Msida, 8 - 13 September 1975), IOC/MPP/3, UNESCO, 1975

Report of the WHO/UNEP Expert Consultation on Coastal Water Quality Control Programme in the Mediterranean (Geneva, 15 - 19 December 1975), EHE/76.1, WHO, 1976

11) Algeria, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Malta, Monaco, Morocco, Spain, Tunisia, Turkey, Yugoslavia

programme. As of the end of April 1977, 54 individual research agreements had been signed, 47 cleared and prepared for signature, while 77 agreements were still being negotiated. UNEP is carrying out the over-all co-ordination of the work done by the individual research centres to ensure the most effective development of the whole research and monitoring programme.

- 3.9 Substantive support has already been provided by UNEP, through the co-operating specialized UN organizations, to the participants in the programme in order to facilitate or make possible their full participation in the pollution monitoring and research activities. This support includes a large training programme, furnishing of necessary equipment, organization of a permanent intercalibration of analytical techniques mandatory for all participants, and provision of common maintenance services for the more sophisticated instruments used in analytical work.
- 3.10 As an aid to participants in the programme several technical documents, such as bibliographies, manuals and guidelines, have been prepared <sup>12)</sup> or are under preparation.
- 3.11 A Directory of Mediterranean Marine Research Centres describing more than 100 institutions was prepared and issued <sup>13)</sup> by UNEP in 1976. A second, up-dated edition of this Directory providing detailed information on more than 140 institutions, (programmes, staff, publications, facilities, etc.) will be issued in July 1977.

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12) Guidelines for the Use of Biological Accumulators in Marine Pollution Monitoring, Manual of Methods in Aquatic Environment Research, Part 2, FIRI/T 150, FAO, 1976.

Sampling and Analyses of Biological Material. Manual of Methods in Aquatic Environment Research, Part 3, FIRI/T 158, FAO, 1976.

Bases for Selecting Biological Tests to Evaluate Marine Pollution, Manual of Methods in Aquatic Environment Research, Part 4, FIRI/T 164, FAO, 1977.

Guidelines for Monitoring Public Health Aspects of Coastal Water Quality, WHO, 1977.

Health Criteria and Epidemiology of Health Risks related to Beach and Coastal Pollution, WHO, 1977.

Selected Bibliography on Studies and Research relevant to Pollution in the Mediterranean, FIRI/T 165, FAO, 1977.

13) Directory of Mediterranean Marine Research Centres, UNEP, 1976.

- 3.12 In consultation with the Mediterranean Governments, towards the end of 1976, one research centre in each of the seven networks of co-operating institutions was nominated by UNEP as a Regional Activity Centre (RAC). The role of the RAC's is to assist UNEP and the relevant specialized UN organizations in the organization and execution of the pilot projects.
- 3.13 Close collaboration has been established between the Regional Activity Centre for the pilot project on baseline studies and monitoring of oil and petroleum hydrocarbons in marine waters and the Regional Oil Combating Centre (see 4.4) making use of their complementary role in assessing the extent of the present pollution by petroleum hydrocarbons, in preparing contingency plans for dealing with oil spills and in organizing proper training relevant to their activities.
- 3.14 A related project was initiated by UNEP on pollutants from land-based sources. The project is being carried out in close co-operation with the Governments of the region and a number of specialized UN bodies, including the Economic Commission for Europe (ECE), the United Nations Industrial Development Organization (UNIDO), FAO, UNESCO, WHO, IAEA. Its objective is to provide the Governments of the Mediterranean coastal States with information on the type and quantity of pollution from major land-based sources and through rivers, and on the present status of waste discharge and water pollution management practices. The project also provides for the preparation of an inventory of land-based sources of pollutants being discharged into the Mediterranean. It is a concrete example of the linkage between environmental assessment and management in that it is intended to produce data which will assist Governments in the negotiation of the regional Protocol on land-based pollutants. The Protocol should contribute to the application of more efficient waste management practices.
- 3.15 Since 1975 UNESCO and UNEP have been undertaking a project on the role of sedimentation in the pollution of the Mediterranean Sea with special emphasis on the assessment of current knowledge in this field and on the development of guidelines for environmental impact assessment.
- 3.16 Future projects may also be considered, inter alia: (i) to study the question of airborne pollutants, (ii) to evaluate the transfer of pollutants through the air/sea interface, (iii) to assess the potential fisheries resources in the Mediterranean and the effects of pollutants on this potential, and (iv) to develop ecologically-sound guidelines and principles for the establishment and management of specially-protected aquatic areas.
- 3.17 The first results of the various projects related to the environmental assessment component of the Mediterranean Action Plan will be reviewed during mid-1977 and reported to the Intergovernmental Meeting of Mediterranean Coastal States (Monaco, 28 November - 6 December 1977).

#### 4. ENVIRONMENTAL MANAGEMENT

- 4.1 A large number of present and planned activities around the Mediterranean have impacts on the quality of the environment. Efforts are under way to identify those activities and to learn how to evaluate the severity of their likely impact, and, where indicated, how to apply additional measures to reduce either the risk or the severity of the effect. Many such activities are financed through the United Nations Development Programme (UNDP), the World Bank and other sources of international aid. UNEP, in close co-operation with these organizations and the States concerned, is studying the means to assess the likely environmental impacts, and to design and apply appropriate safeguards. Many internationally-supported projects which have clearly beneficial environmental impacts are already under way, such as the various fisheries projects of FAO the environmental sanitation activities of WHO, and the assistance in industrial waste treatment provided through UNIDD. Projects of a similar nature are also being carried out by intergovernmental organizations, such as the Organization for Economic Co-operation and Development (OECD), as well as by non-governmental organizations.
- 4.2 Within the environmental management component of the Action Plan, the most important activity is the development of what has come to be known as the Blue Plan, in which Governments, United Nations agencies, intergovernmental and non-governmental organizations will co-operate. The Blue Plan calls for systematic surveys of major development and environmental protection activities carried out in the region and prospective studies of development trends based on the collection of data from the various countries of the region. The exchange of information among countries is a fundamental aspect of the Blue Plan (At the Intergovernmental Meeting<sup>14)</sup> of the Mediterranean Coastal States in Split, Governments agreed to initiate the first phase of the Blue Plan. Delegates also recommended a number of activities which should be started in order to fulfill the objectives of the Blue Plan and agreed on methods of implementation, the phasing of the project and the geographical coverage. The Blue Plan will be administered by a small co-ordinating unit which will work with national focal points appointed by each Government. The national focal point should organize Blue Plan activities within its country. The over-all direction of the Blue Plan will be ensured through periodic intergovernmental meetings. The cost of the first phase of the project will be approximately 1.5 million dollars of which, according to a scale of contribution agreed at the Split meeting, 50 per cent will be provided by the participating countries, 25 per cent by UNEP and 25 per cent by other agencies. The meeting requested Governments to inform the Executive Director by the end of April 1977 of their formal commitment to participate in and contribute to the financing of the project.

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14) Report of the Intergovernmental Meeting of Mediterranean Coastal States on the Blue Plan (Split, 31 January - 4 February 1977), UNEP/IG.5/7, UNEP, 1977.

- 4.3 The Split meeting also agreed to initiate a Priority Actions Programme (PAP) addressed to the implementation of sound environmental management practices in selected sectors, using knowledge and experience available in the region. The meeting identified certain priority areas requiring immediate action; namely, protection of soil, management of water resources, management of marine living resources, human settlements, tourism, and soft technologies for energy including solar energy. The PAP will also be administered by a co-ordinating unit working closely with the national focal points referred to above. The question of financing the Programme will be the subject of further consultations with the Governments. PAP will involve on-going activities, supported by UNEP and others and executed by the specialized agencies, which could be adapted for Mediterranean purposes by providing additional facilities for training, observation, study tours and exchange of information. The additional elements or new activities may be financed by UNDP from the countries' Indicative Planning Figures, through the regional planning figure for Europe, the Mediterranean and the Middle East, co-operative programmes, and multilateral, bilateral and cost-sharing projects.
- 4.4 In connection with the problem of accidental spills of oil or other harmful substances in the Mediterranean, Governments at the Conference of Plenipotentiaries of the Coastal States of the Mediterranean Region for the Protection of the Mediterranean Sea (Barcelona, February 1976) decided to establish a Regional Oil Combating Centre on Malta. The primary objective of the centre is to help coastal States of the region take co-operative and timely steps to prevent damage to their coastal resources from massive and accidental pollution by disseminating information, preparing contingency plans, maintaining efficient communication systems and encouraging technological co-operation and training programmes in the region. The Malta Centre was inaugurated in December 1976. The Intergovernmental Maritime Consultative Organization (IMCO) has been entrusted with the responsibility, as co-operating agency with UNEP, for the establishment and operation of the Centre.
- 4.5 In co-operation with the International Union for the Conservation of Nature and Natural Resources (IUCN) steps were undertaken to identify Mediterranean marine parks and wetland areas which deserve greater attention and protection. In this connection UNEP convened an Expert Consultation in Tunis (12 - 14 January 1977) to review the present status of marine parks and wetlands, to discuss their importance and significance for the Mediterranean ecoregion, to formulate draft principles and guidelines for the establishment and management of specially-protected areas and to be advised on measures to be taken for the improvement of the present situation. Based on the recommendations of the Consultation <sup>15)</sup> the Executive Director of UNEP, in consultation with the Governments of the Region will initiate a programme for strengthening the protection of ecologically and economically critical aquatic and terrestrial habitats.

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15) Report of Expert Consultation on Mediterranean Marine Parks and Wetlands (Tunis, 12 - 14 January 1977), UNEP/WG.6/5, UNEP, 1977.

5. SUPPORTING ACTIVITIES, INCLUDING INSTITUTIONAL AND FINANCIAL ARRANGEMENTS

- 5.1 A review of present and planned activities reveals numerous examples of the need for initial support to institutions and Governments, especially those of developing countries, to enable them to participate in environmental activities so that in due course they can take on fuller responsibility. In accordance with the wishes of the Mediterranean Governments, UNEP has developed the infrastructure necessary for the co-ordination of the agreed joint activities, and national institutions have been helped to participate in regionally co-ordinated activities in spite of the economic conditions in many Mediterranean States which do not yet permit adequate national funding. The support by UNEP rests on the assumption that the Governments of the region will themselves gradually cover the operating costs of such activities as UNEP's initial catalytic role is completed. Examples of this support are given in the following paragraphs.
- 5.2 UNEP, as the organization responsible for carrying out the secretariat functions of the Convention (Article 13), and in accordance with Resolution 2 "Interim Arrangements" of the Barcelona Conference of Plenipotentiaries, 5) established, with the assistance of the Government of Spain, an Interim Secretariat for the Convention in Madrid in August 1976.
- 5.3 The operational costs of the Regional Oil Combating Centre, which was inaugurated in December 1976 in Malta (see 4.4) for the initial period of 28 months, are shared between UNEP and the Government of Malta, with the Government of Malta contributing in kind.
- 5.4 To ensure the harmonious development of the environmental assessment component of the Mediterranean Action Plan (see 3) a Unit, responsible for the over-all co-ordination of the work undertaken by national institutions in the framework agreed at the 1975 Barcelona Conference<sup>2)</sup>, was established at UNEP's Geneva office in September 1975. The Unit works in close co-operation with selected specialized UN organizations which, on behalf of and under guidance of UNEP, maintain the day-to-day direct contacts with the national institutions participating in the work. Negotiations are under way with the Government of Monaco to transfer the Unit to Monaco.
- 5.5 In addition to a large-scale direct financial support of the participants in the Co-ordinated Mediterranean Pollution Monitoring and Research Programme (3.9), through the IAEA International Laboratory of Marine Radioactivity, UNEP has secured a common maintenance service for analytical instruments used by national institutions for the Programme, and has organized a permanent intercalibration of analytical techniques mandatory for all participants using certain methods in order to ensure the comparability of obtained results.



- 5.6 In August 1976 seven national marine research centres were nominated by UNEP as Regional Activity Centres for the seven pilot projects of the Co-ordinated Mediterranean Pollution Monitoring and Research Programme (see 3.12 and Annex II). The ultimate aim is to create nuclei for centres which may eventually play a regional role in co-ordinating the work in the post-pilot-project phase of the Programme. Under general guidance from UNEP the technical operation of the Regional Activity Centres is entrusted to the relevant specialized UN organizations (GFCM of FAO, IOC of UNESCO, WHO).
- 5.7 After the offer of the Governments of France and Yugoslavia to host secretariat sub-units which would help in the implementation of the Blue Plan and the Priority Actions Programme (see 4.2 and 4.3), the Executive Director of UNEP is currently having discussions with these Governments with regard to the modalities of the establishment of these sub-units.

## 6. FUTURE DEVELOPMENTS

- 6.1 Since the adoption of the Mediterranean Action Plan at the 1975 Barcelona Conference (see 1.2) several expert or intergovernmental meetings have been convened to elaborate specific aspects of the three components of the Action Plan (Annex III). None of these meetings tried to produce an over-all review of the progress made in the implementation of the whole Action Plan. Therefore, an intergovernmental meeting will be held (Monaco, 28 November - 6 December 1977) to provide an opportunity for an over-all exchange of information and for discussion on the future development of joint activities relevant to the Action Plan.
- 6.2 While it is difficult to forecast future developments, particularly in the light of the many political differences among the various States in the Mediterranean region, it is apparent that by 1978 there may be a series of simultaneous developments in various aspects of the Mediterranean Action Plan.
- 6.3 Thus, if progress continues at the present pace, it can be expected that the Barcelona Convention together with one or more of the related Protocols will enter into force in 1977. This will bring about the first meeting of the Parties to the Convention in 1978 and could well coincide with the completion of the pilot project phase of the research and monitoring activities. The meeting should present an opportunity for intergovernmental consideration and decision on the establishment of an operational phase thereafter. At approximately the same time, under the environmental management component, initial results should be available from both the PAP activities and the Blue Plan studies, providing national decision-makers with an authoritative statement about short and long-term environmental implications of on-going development activities throughout the region.
- 6.4 Consequently, the results of collective assessment activities throughout the Mediterranean will begin to be available in late 1977 and will be useful to the Mediterranean Governments on whose management decisions rests the responsibility for environmentally sound and sustainable development throughout the region. Increasingly responsible roles will have been assumed by national institutions on whose co-operative endeavours the successful implementation of the programme depends. Although additional international financial and other support may be sought, the ultimate aim is to make the programme self-supporting within the regional context, that is to say, not only to develop institutional capabilities to perform the required tasks but to support these activities with training, provision of equipment, and other forms of assistance from within the region.
- 6.5 As the Mediterranean regional activity becomes self-supporting, UNEP will continue to retain a strong interest, due both to its responsibility as the organization responsible for the secretariat functions of the Convention and to UNEP's global responsibilities to which the Mediterranean programme is a major contribution. On a continuing basis UNEP will ensure that data and information generated within this region are compatible with those from other regions of the world.

Steps have already been taken to initiate comprehensive action plans in other regions: the Persian/Arabian Gulf, the Caribbean Sea, the West African Coast and East Asian Waters. The comprehensive approach developed in the Mediterranean area will be used as a model for programmes aimed at the protection and development of these regions; however, it is recognized that the approach used in the Mediterranean region cannot be copied mechanically in all areas and that each region must develop its own Action Plan based on variations in the state of knowledge, the information and human resources available, and other regional characteristics.



CO-ORDINATED MEDITERRANEAN POLLUTION MONITORING  
AND RESEARCH PROGRAMME  
(MED POL)

1. The following is a short description of the seven pilot projects which constitute the core of the UNEP Co-ordinated Mediterranean Pollution Monitoring and Research Programme.
2. MED I : Baseline Studies and Monitoring of Oil and Petroleum Hydrocarbons in Marine Waters (IOC/WMO/UNEP)
  - 2.1 The pollution of the Mediterranean by oil and petroleum hydrocarbons is a serious problem for beaches and other coastal, recreational areas, and as yet too little is known about the present levels of the pollution and about its effects on the Mediterranean ecosystem. The pilot project will involve initially the visual observation of oil slicks and other floating pollutants, tar ball sampling, survey of tar on beaches and sea water sampling for analysing the amount and composition of the dissolved petroleum hydrocarbons.
  - 2.2 The pilot project will be considered as a contribution to the Integrated Global Ocean Station System (IGOSS) organized by the Intergovernmental Oceanographic Commission (IOC) of UNESCO and the World Meteorological Organization (WMO).
  - 2.3 The measurement of present levels of petroleum in all its forms in the Mediterranean assumes greater importance in view of the reopening of the Suez Canal to the passage of oil tankers. The value of initiating the pilot project in the Mediterranean region rests mainly on three facts:
    - (i) the observational methodology has already been developed (IGOSS),
    - (ii) by using a common system of observations the various subregions of the Mediterranean can be readily compared, and
    - (iii) within a common system of observation, the Mediterranean can be truly compared with other areas (e.g. the North Atlantic) with quite different oceanographic regimes, in which the possibilities for dispersion and dilution are greater and the possibilities of evaporation generally lower.

- 2.4 The operational document for this pilot project <sup>1)</sup> was developed at a joint IOC/WMO/UNEP Consultation (Malta, 8-13 September 1975) which was attended by 36 participants from 12 Mediterranean countries.
- 2.5 The results obtained through the pilot project will be used to assess the present level of Mediterranean pollution by petroleum hydrocarbons. They will substantively contribute to the formulation of the contingency plans for actions in cases of emergency which are under preparation by the Regional Oil Combating Centre in Malta.
- 2.6 At present 11 countries <sup>2)</sup> have expressed a wish to participate in the pilot project and nominated 26 national laboratories as participants in the network dealing with the pilot project.
- 2.7 The work on this project was started during 1976 and, by the end of April 1977, 4 research agreements had been signed, 8 cleared and are ready for signature, while the remaining 14 research agreements are still being negotiated.
- 2.8 The first results obtained will be evaluated at the meeting of principal investigators from the participating research centres. This joint IOC/WMO/UNEP meeting will be convened at Barcelona, 23-27 May 1977.

3. MED II : Baseline Studies and Monitoring of Metals, particularly Mercury and Cadmium, in Marine Organisms (FAO(GFCM)/UNEP)

- 3.1 Metals, and particularly heavy metals like mercury, are more or less toxic to man and practically to all marine organisms. They can reach man through the food chain, and the source of greatest concern is, therefore, the level of concentration of such metals in fish, shell-fish and other edible marine organisms.
- 3.2 It is recognized that the Mediterranean is a tectonically rich region and that some metals may have high natural levels and great variations in their concentration in sea-water and sediments. The bluefin tuna, as well as other tuna, is known to accumulate mercury and, although there is no strong evidence that the Mediterranean stock is separate from the Atlantic stock as a whole, Mediterranean tuna apparently have much higher levels than those from the Atlantic.

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1) Report of the IOC/WMO/UNEP Expert Consultation on the Joint Co-ordinated Project on Pollution in the Mediterranean (Msida, 8-13 September 1975), IOC/MPP/3, UNESCO, 1975

2) Cyprus, Egypt, France, Greece, Israel, Lebanon, Malta, Spain, Tunisia, Turkey and Yugoslavia

- 3.3 The pilot project will deal primarily with the concentration of selected metals, particularly mercury and cadmium in marine organisms. In addition to these elements the measurement of the levels of copper, lead, manganese, selenium and zinc is recommended, particularly when detection methods providing for multi-elemental analysis are used. The striped mullet, the Mediterranean mussel and the bluefin tuna have been selected for the monitoring programme so that representative ecotypes are included. The sampling frequency is seasonal.
- 3.4 The operational document for this pilot project <sup>3)</sup> was formulated at a joint FAO(GFCM)/UNEP Expert Consultation (Rome, 23-27 June 1975) attended by 35 participants from 13 Mediterranean countries.
- 3.5 Fourteen countries <sup>4)</sup> have expressed a wish to take part in the pilot project and nominated 38 national laboratories as participants in the network dealing with the pilot project.
- 3.6 The work on this pilot project started in late autumn 1975 and, by the end of April 1977, 19 research agreements had been signed, 10 cleared and are ready for signature, while the remaining 9 research agreements are still being negotiated.
- 3.7 The first results obtained through this pilot project will be evaluated at the meeting of principal investigators from the participating research centres. This joint FAO(GFCM)/UNEP meeting will be convened at Dubrovnik, 2-6 May 1977.

4. MED III : Baseline Studies and Monitoring of ODT, PCBs and Other Chlorinated Hydrocarbons in Marine Organisms (FAO(GFCM)/UNEP)

- 4.1 Similar arguments to those advanced for the monitoring of metals apply to chlorinated hydrocarbons. They are persistent, they are usually accumulated by organisms, they are usually harmful to man indirectly, through effects on the stocks of marine organisms he exploits. Even less is known about the present concentrations of these chemicals than about the concentrations of heavy metals. Since virtually all chlorohydrocarbons are generated by man, natural background levels of these substances are not a problem in baseline studies.
- 4.2 The pilot project will deal with levels of selected organochlorine compounds which are considered as specially relevant to representative members of the Mediterranean ecosystem. DDT, PCBs, dieldrin and

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3) Report of the FAO(GFCM)/UNEP Expert Consultation on the Joint Co-ordinated Project on Pollution in the Mediterranean (Rome, 23 June - 4 July 1975), FAO, 1975.

4) Algeria, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Malta, Morocco, Spain, Tunisia, Turkey and Yugoslavia

their metabolites are singled out as falling into this category. Whenever possible, other persistent organic compounds will also be identified in analysed samples. The organisms selected as monitoring targets (striped mullet, Mediterranean mussel, pink shrimp) are representative of the different Mediterranean ecotypes, of great economic importance and almost ubiquitous for the whole Mediterranean. The sampling frequency is seasonal.

- 4.3 The operational document for this pilot project <sup>3)</sup> was developed by the same Expert Consultation which formulated the preceding pilot project.
- 4.4 Currently, 13 countries <sup>5)</sup> have nominated 28 national laboratories to participate in the pilot project.
- 4.5 The work on this pilot project started in late autumn 1975 and, by the end of April 1977, 12 research agreements had been signed, 8 cleared and are ready for signature, while the remaining 8 research agreements are still being negotiated.
- 4.6 The first results obtained through this pilot project will be evaluated at the meeting of principal investigators from the participating research centres. This joint FAO(GFCM)/UNEP meeting will be convened at Dubrovnik, 2-6 May 1977).

5. MED IV : Research on the Effects of Pollutants on Marine Organisms and their Populations (FAO(GFCM)/UNEP)

- 5.1 The marine environment is characterized by relatively constant physical and chemical conditions. Most marine organisms are therefore not adapted to sudden changes in their environmental conditions, to certain substances not normally present in sea water, or to unusually high concentrations of substances which normally appear only as sea water microconstituents.
- 5.2 The project will not deal with acute toxicity experiments unless the organisms cannot be kept long enough under culture conditions to allow long-term toxicity tests. Instead, long-term experiments are envisaged with the aim of investigating the sub-lethal effects of potential pollutants, and functional as well as morphological changes.
- 5.3 The experiments will not be limited to individual organisms but should rather cover populations where subtle changes in the behavioural pattern could serve as early warning signs and lead to the possibility of predicting the moment at which the organisms will be harmed at the population level. The influence transmitted

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5) Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Malta  
Morocco, Spain, Tunisia, Turkey and Yugoslavia



through the trophic chains, particularly in experiments on populations, will not be neglected.

- 5.4 Due attention will be paid to establishing the most sensitive stages in the life cycle of the tested organisms. Physiological and biochemical studies will be conducted in order to provide information on the mechanisms involved in the effects and transport of pollutants.
- 5.5 Damage due to the genetic material of individuals and their populations will also be studied.
- 5.6 The ultimate aim of all these tests is to develop the necessary background for biological monitoring and to contribute data required for the development of water quality criteria. Naturally, these criteria cannot be based solely on biological tests, but the expected results might provide a basis for a better understanding of the potential hazard for the ecosystem, including man, from the increased level of pollutants in the marine environment.
- 5.7 The operational document for this pilot project <sup>3)</sup> was developed at a joint FAO(GFCM)/UNEP Expert Consultation (Rome, 30 June - 4 July 1975) attended by 25 participants from 13 Mediterranean countries.
- 5.8 At present, 11 countries <sup>6)</sup> have expressed a desire to participate in the pilot project and nominated 23 national laboratories as participants in the network dealing with the pilot project.
- 5.9 The work on this pilot project started in late autumn 1975 and, by the end of April 1977, 7 research agreements had been signed, 5 cleared and are ready for signature, while the remaining 11 research agreements are still being negotiated.
- 5.10 The first results obtained through this pilot project will be evaluated at the meeting of principal investigators from the participating research centres. This joint FAO(GFCM)/UNEP meeting will be convened at Dubrovnik, 9-13 May 1977.

6. MED V : Research on the Effects of Pollutants on Marine Communities and Ecosystems (FAO(GFCM)/UNEP)

- 6.1 Theoretically several types of marine communities and ecosystems could be studied in the framework of the proposed pilot project. For practical purposes, the project will deal with natural marine communities and ecosystems under stress in coastal waters, including lagoons and brackish coastal lakes, in areas where ecosystem changes may be anticipated as a consequence of man's activities, and with ecosystems in relatively unpolluted areas, such as marine parks, for reference.

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6) Cyprus, Egypt, France, Greece, Israel, Lebanon, Malta, Morocco, Spain, Turkey and Yugoslavia

- 6.2 Ecosystems will be particularly investigated in areas which have been repetitively studied in the past in order to detect long-term changes.
- 6.3 To the largest possible extent the ecosystems will be studied as integral units, taking into account the dynamic interactions among their various components. Special attention will be paid to the role of those organisms, which will be used in the monitoring pilot projects (MED II and MED III), in the transport of pollutants through the trophic levels.
- 6.4 The parameters and effects to be studied will vary, depending on the community and ecosystem. The most common ones will be: community structure, functional indices and body burden of pollutants.
- 6.5 The operational document for this pilot project <sup>3)</sup> was formulated at the same Expert Consultation which developed the previous pilot project.
- 6.6 At present, 12 countries <sup>7)</sup> have expressed a wish to participate in the project and nominated 21 national laboratories as participants in the network dealing with the pilot project.
- 6.7 The work started in late autumn 1975 and, by the end of April 1977, 8 research agreements had been signed, 8 cleared and are ready for signature, while the remaining 7 research agreements are still being negotiated.
- 6.8 The first results obtained through this pilot project will be evaluated at the meeting of principal investigators from the participating research centres. This joint FAO(GFCM)/UNEP meeting will be convened at Dubrovnik, 9-13 May 1977.

7. MED VI : Problems of Coastal Transport of Pollutants (IOC/UNEP)

- 7.1 The general pattern of sea surface transport in the Mediterranean is cyclonic (counterclockwise) in both the eastern and western basins. Pollutants discharged into coastal waters tend to be transported along the coasts, thus restricting advection from the coasts towards the open sea. At the same time, floating marine litter and tar balls in the open sea tend to be centrifuged towards the coasts. Water leaves the Mediterranean at depth and enters at the surface through the Straits of Gibraltar. Since the majority of pollutants are most abundant in the upper layers of the sea, the loss by transport through the Straits is relatively small. The average residence time of entering seawater is estimated to be about 80 years, on the basis of the general hydrography of the Mediterranean and of mass transport measurements in the Straits, although the duration probably ranges from a few years to several hundred.

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7) Algeria, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Morocco, Spain, Turkey and Yugoslavia

- 7.2 Although the general nature of the mass transport of seawater in the Mediterranean is reasonably well understood, the knowledge of local circulation patterns is still sparse. The former may serve in studies of the distribution of pollutants entering the sea via the atmosphere, but the latter is much more important in studies of the distribution of pollutants entering the sea via rivers.
- 7.3 The main objective of this pilot project will be the investigation of water circulation in coastal areas and exchange of water between the coastal and offshore regions in order to provide the necessary information on the physical processes contributing to the transport of pollutants in the Mediterranean Sea.
- 7.4 The operational document for this pilot project <sup>1)</sup> was developed by the same Expert Consultation which formulated the pilot project on Baseline Studies and Monitoring of Oil and Petroleum Hydrocarbons in Marine Waters.
- 7.5 At present, 12 countries <sup>8)</sup> have expressed a desire to participate in the project and nominated 23 national laboratories as participants in the network dealing with the pilot project.
- 7.6 The work on this project started in 1976 and, by the end of April 1977, 4 research agreements had been signed, 9 cleared and are ready for signature, while the remaining 10 research agreements are still being negotiated.
- 7.7 The first results will be evaluated at the meeting of principal investigators from the participating research centres. This joint IOC/WMO/UNEP meeting will be convened at Barcelona, 23-27 May 1977.

#### 8. MED VII : Coastal Water Quality Control (WHO/UNEP)

- 8.1 The serious and rapidly-growing pollution of the coastal waters of the Mediterranean is having an increasing impact on the social and economic well-being of the countries bordering it. In addition to the millions of inhabitants living along the coastline of the Mediterranean, millions of tourists spend their holidays on the shores of this sea, and there is a considerable potential for exchange of disease-causing micro-organisms. The present situation constitutes a significant health hazard in many places: salmonellosis, dysentery, viral hepatitis and poliomyelitis have all been endemic in the Mediterranean area, and during recent years there have been a number of cholera outbreaks. There is a distinct need for better statistics concerning correlation between diseases and water pollution.

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8) Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Malta, Morocco, Spain, Turkey and Yugoslavia

There is ample evidence that contaminated shellfish are an important concern to public health. It is also certain that contamination of seafood by chemicals and heavy metals has to be taken into consideration, but this aspect is dealt with by other pilot projects (MED II and MED III) within the framework of the Co-ordinated Mediterranean Pollution Monitoring and Research Programme. The risk of infection from swimming and other recreational activities in coastal waters is enhanced in certain areas by the absence or inadequacy of beach sanitary facilities. Thus, the actual and potential health effects are of prime importance.

- 8.2 The over-all objective of the pilot project is to produce statistically significant data, scientific information and technical principles which are required for the assessment of the present level of coastal pollution as it concerns human health. The most important immediate objectives are to design and implement a programme for the sanitary and health surveillance of coastal recreational areas and of shellfish-growing waters in selected coastal areas and to initiate a scientific study on the epidemiological evidence of health effects caused by inadequate sanitary conditions in coastal areas.
- 8.3 The operational document for this pilot project <sup>9)</sup> was prepared at a joint WHO/UNEP Expert Consultation (Geneva, 15-19 December 1975), attended by 35 participants from 15 countries.
- 8.4 At present, 8 countries <sup>10)</sup> have expressed a desire to participate in the project and nominated 18 national institutions as participants in the network dealing with the pilot project.
- 8.5 The work on this pilot project started in late autumn 1976 and, by the end of April 1977, 18 research agreements were still being negotiated.
- 8.6 The first results obtained through this project will be evaluated at the meeting of principal investigators from the participating research centres. This joint WHO/UNEP meeting will be convened at Rome, 30 May - 1 June 1977.

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9) Report of the WHO/UNEP Expert Consultation on Coastal Water Quality Control Programme in the Mediterranean (Geneva, 15-19 December 1975) EHE/76.1, WHO, 1976

10) Greece, Israel, Italy, Lebanon, Malta, Monaco, Turkey and Yugoslavia

LIST OF THE REGIONAL ACTIVITY CENTRES  
FOR THE SEVEN POLLUTION MONITORING AND RESEARCH PILOT PROJECTS

1. For pilot project on Baseline Studies and Monitoring of Oil and Petroleum Hydrocarbons in Marine Waters:

*University of Malta*  
*Msida*  
*Malta*

2. For pilot project on Baseline Studies and Monitoring of Metals, particularly Mercury and Cadmium, in Marine Organisms:

*Centre for Marine Research*  
*"Rudjer Boskovic" Institute*  
*Rovinj*  
*Yugoslavia*

3. For pilot project on Baseline Studies and Monitoring of DOT, PCBs and other Chlorinated Hydrocarbons in Marine Organisms:

*Marine Sciences Department*  
*Middle East Technical University*  
*Ankara*  
*Turkey*

4. For pilot project on Research on the Effects of Pollutants on Marine Organisms and their Populations:

*Station Marine d'Endoume*  
*Marseille*  
*France*

5. For pilot project on Research on the Effects of Pollutants on Marine Communities and Ecosystems:

*Centre de Recherches Océanographiques*  
*et des Pêches*  
*Alger*  
*Algérie.*

6. For pilot project on Problems of Coastal Transport of Pollutants:

*Institute of Oceanography and Fisheries*  
*Mediterranean Branch*  
*Alexandria*  
*Egypt*

7. For pilot project on Coastal Water Quality Control:

*Istituto Superiore di Sanità*  
*Roma*  
*Italia*