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**EVALUATION OF MED POL PHASE III PROGRAMME
(1996 – 2005)**

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We would like to thank all those we met directly, or we contacted by phone, and those who have contributed to this evaluation, for their valuable time, insight, and frank and constructive comments. We have endeavoured to reflect their opinions within the comments and suggestions of this report in the most objective manner; while being aware of the difficulties to express the sometimes conflicting opinions which have been expressed through out our meetings and conversations.

We also extend our thanks to the MEDPOL Secretariat for the time allocated for addressing our inquiries, and for their support and kind hospitality throughout this evaluation

PART I

1. EXECUTIVE SUMMARY

At their meeting held in Catania on 11-14 November 2003, the Contracting Parties to the Barcelona Convention adopted a recommendation “to evaluate the MEDPOL Programme and formulate a new phase of MEDPOL (2006-2013) responding to the needs of the Mediterranean countries in terms of the assessment, prevention, and control of marine and coastal pollution, including the impacts of rivers on the marine environment”.

In response to this recommendation, the MAP Secretariat initiated in 2004 the implementation process for evaluation of the MEDPOL Phase III Programme. Three experts were selected. The objective was to assess MEDPOL’s performance with a view to improving its role in achieving programmes’ objectives, and to provide elements for use in the formulation of MEDPOL Phase IV, which will be submitted to the Contracting Parties in 2005 for adoption.

The scope of the evaluation covers the activities carried out in the framework of the MEDPOL Phase III Programme between 1996 and 2005. The evaluation entailed the performance of visits to eight countries and the EU where meetings were held with representatives of the National Authorities, the scientific community, NGOs, and other stakeholders, in addition to four formal meetings with MEDPOL officers in Athens, Greece.

The “process approach” to management was adopted as the basis for this evaluation. A major advantage of this approach is the control that it provides over the linkage between the individual activities within the system of processes, as well as over their combination and interaction.

A model for a process-based management system which links MEDPOL’s processes and activities was developed as a basis for conducting this evaluation and for interpreting its results. The process model relates the needs of the Contracting Parties, Conventions, and Protocols to the process of setting strategies for realization of the various work programmes while making use of available resources in order to identify programmes’ objectives and the processes necessary to achieve these objectives. The outputs of these programmes are monitored and examined, in turn by the Contracting Parties who, by means of regular evaluations, assess MEDPOL’s ability to achieve its objectives, and adopt concrete proposals for improving the effectiveness of its work processes.

The system model distinguishes between tasks and activities based on five types of core processes which correspond in full to the terms of reference of this evaluation. These are:

- a. Management Responsibility: Activities related to developing MEDPOL’s strategies and objectives for undertaking the work programmes. These activities are based on:
 - i. the requirements stipulated in conventions and protocols;
 - ii. Rio principles and Johannesburg implementation plan;
 - iii. the context environment within which MEDPOL functions; and
 - iv. the needs of the Contracting Parties;
- b. Realization of Work Programmes: Activities related to the achievement of the objectives of MEDPOL’s work programmes, including:
 - i. implementation of the monitoring programmes, LBS Protocol, Dumping Protocol, and Hazardous Waste Protocol;
 - ii. ability to undertake the necessary mitigation measures to overcome and remediate constraints facing activities of the work programme; and

- iii. implementation of work programmes in a cost effective manner.
- c. Monitoring of Work Programmes: Activities related to the monitoring of the effectiveness of the work programmes including:
 - i. impact of the outputs of the work programmes as perceived by stakeholders;
 - ii. perception of the Contracting Parties of the programmes' outputs; and
 - iii. perception by other stakeholders including scientists and the general public.
- d. Resource Management: Activities related to the mobilization and effective management of available resources such as:
 - i. managerial and scientific competence and efficiency of the Secretariat's coordination of the Programme;
 - ii. financial resources that can be made available through funding agencies;
 - iii. technical resources that can be made available through other MAP structures (Regional Activity Centres); and
 - iv. technological instruments that can increase the effectiveness of achieving programmes' objectives such as information technology.
- e. Improvement: Activities related to the formulation of proposals and concrete suggestions to improve MEDPOL's role and processes.

Results of MEDPOL's evaluation for each task and activity in the above noted areas are summarized in the attached table in a visual form, and assessed on the basis of:

- a. Dark grey background; indicating overall "satisfactory" performance
- b. Light grey background; indicating overall "unsatisfactory" performance
- c. White background; indicating insufficient information to make the evaluation

A "satisfactory" performance signifies that *most* tasks in a process are implemented in a satisfactory or effective manner. An "unsatisfactory" performance indicates that the *majority* of the tasks or some *critical components thereof* are *not* implemented in a satisfactory or effective manner.

In general, and as can be seen from the attached table, the principal processes in the MEDPOL programme which are carried out in a "satisfactory" manner are:

- a. The management of the MEDPOL Programme's objectives and strategies;
- b. The management of the MEDPOL Programme resources;
- c. The planning, implementation, and the consequent positive perceptions by the stakeholders, of the LBS Programme; and
- d. The planning of the programme for the monitoring activities.

The specific tasks and activities that are being performed in an "unsatisfactorily" manner are:

- a. Implementation of the monitoring programme and the consequent negative perceptions from national authorities and other stakeholders;
- b. Implementation of the programme for the Dumping Protocol;
- c. Planning of work activities and implementation of the programme for the Hazardous Waste Protocol;
- d. The inability of MEDPOL to deal with administrative constraints encountered during monitoring programme implementation; and
- e. The inability of MEDPOL to make effective use of resources provided by information technology (IT).

Problems identified in these findings are interrelated, and typically one problem leads into another; with the consequent unfavourable perception by some stakeholders of the results and outputs of some of MEDPOL's programmes.

Details of the evaluation are shown in the attached table, for each of the four core processes:

Management Responsibility: The activities constituting the "management responsibility" process are related to the setting of objectives, visions, strategies, and principles for MEDPOL. Based on our evaluation, we find that these activities are being implemented in a "satisfactory" manner. In that respect, we make the following comments:

1. Concerning the appropriateness of the objectives of MEDPOL, we find that the MEDPOL Phase III Programme is legally in line with the Barcelona Convention and the currently in force LBS, Dumping, and Hazardous Waste Protocols. Concerning the EU marine strategy, MEDPOL objectives are globally in line with this strategy even though the EU adopts a more exhaustive approach to the marine environment problems, namely the "ecosystem approach".
2. In relation to the visions and strategies of MEDPOL and its ability to adapt to changes, we find that MEDPOL III has successfully shifted from pollution monitoring in Phase II to pollution control, and moved towards assisting the Mediterranean Countries in the formulation and implementation of pollution monitoring and reduction programmes. Furthermore, specific measures were incorporated in MEDPOL Phase III in response to the shortcomings observed and reported in the evaluation carried out in 1993.
3. Concerning MEDPOL's contribution to sustainable development, a close examination of the scope of the Johannesburg Implementation Plan indicates that the MEDPOL Programme and specifically the SAP fulfil most of the relevant requirements for sustainable development. Some aspects need to be addressed like the ecosystem approach, and the assessment of marine and coastal waters.
4. Finally, with respect to the appropriateness of MEDPOL objectives to needs of the region, we conclude that MEDPOL Phase III objectives correspond in general to what the Contracting Parties were ready to accept at the time of adoption; although two conflicting issues were noted by the Contracting Parties; (1) the monitoring programme is faced with a fundamental problem concerning the ultimate objective it is actually attempting to achieve; and (2) there is a need to recognize, when setting targets for pollution reduction, the difference in levels of development between the developed coastal States and the economic and social imperatives of the developing countries.

process		Summary Evaluation of Tasks and Activities						process	
Management Responsibility	MEDPOL objectives and LBS Protocol	MEDPOL and Dumping Protocol	Contribution of the Programme to the process of achieving sustainable development in the region	Planning for monitoring activities	Planning for LBS Protocol	Planning for Dumping Protocol	Planning for Hazardous Waste Protocol	Realization of Programmes	
	MEDPOL and Hazardous Waste Protocol	MEDPOL and EU marine strategy		Implementation of monitoring activities	Implementation of LBS Protocol	Implementation of Dumping Protocol	Implementation of Hazardous Waste Protocol		
	Overall visions and strategies of MEDPOL, and the ability of the Programme in their formulation as well as to adaptations and changes		Appropriateness of MEDPOL's objectives to the needs of the Contracting Parties	Dealing with constraints (monitoring)	Dealing with constraints (LBS Protocol)	Dealing with constraints (Dumping)	Dealing with constraints (Haz. Waste)		
				Cost effectiveness for monitoring	Cost effectiveness for LBS	Cost effectiveness for Dumping	Cost effectiveness for Haz. Waste		
Resource Management	Managerial competence and efficiency of the Secretariat's coordination of the Programme	Scientific competence and efficiency of the Secretariat's coordination of the Programme	Cooperation established by MEDPOL with the other MAP structures or regional activity centres (RAC); other Institutions; programmes; UN bodies; Conventions	Impacts of outputs from the monitoring programmes	Impacts of outputs from implementation the LBS Protocol	Impacts of outputs from implementation the Dumping Protocol	Impacts of outputs from implementation the Hazardous Waste Protocol	Monitoring of Programmes	
	MEDPOL ability in fund raising		Information technology (IT) performance of MEDPOL	Perception of stakeholders of the outputs of the monitoring programmes	Perception of stakeholders of programme for implementation of the LBS Protocol	Perception of stakeholders of programme for implementation of the Dumping Protocol	Perception of stakeholders of programme for implementation of the Hazardous Waste Protocol		

Realization of Work Programmes: The activities constituting the process for “realization of work programme” address the extent to which the expected results and outputs of the work programmes have been achieved; MEDPOL’s ability to deal with constraints and remediate, and cost-effectiveness in programmes’ delivery. MEDPOL is involved in four work programmes; marine pollution monitoring activities, implementation of the Strategic Action Programme, the technical arm of the Land-Based Sources Protocol, implementation of the protocol for the prevention and elimination of pollution of the Mediterranean sea by dumping from ships and aircraft, and implementation of the protocol for the prevention of pollution of the Mediterranean Sea by transboundary Movements of hazardous Waste and their disposal. Between 1996 and 2000, MEDPOL’s activities were concentrated mainly on the planning and implementation of the monitoring activities. Starting in 2000 to date, MEDPOL’s work load gradually shifted to the planning and implementation of the LBS Protocol. Insignificant or little amount of work was carried out on the implementation of the dumping and hazardous waste protocols. Following are the results of our assessment for each of these programmes: Monitoring Activities In relation to the extent to which the expected results and outputs of the monitoring activities have been achieved, we conclude that:

- With respect to preparation for programme implementation such as the setting up of the operational procedures (e.g. reference methods, quality criteria and standards, materials for capacity building, monitoring database), performance is “satisfactory”.
- Concerning the success that MEDPOL achieved in monitoring programme implementation; performance is “unsatisfactory”; MEDPOL was effective or successful in convincing only about one half the Mediterranean countries to formally finalize their bilateral agreements with UNEP/MAP for monitoring and assessment. On the positive side, a number of EU-MED countries have signed these agreements.

Concerning MEDPOL’s ability to deal with constraints, we note that remedial measures for some critical issues, which were adopted by MEDPOL, were ineffective in solving the problems facing the monitoring programme. Hence, performance is “unsatisfactory”. With respect to the cost-effectiveness in the delivery of monitoring programmes, we note the cost of the programme is far outweighed by the perceived benefits. The monitoring programme has contributed to a change in attitude with the local population and politicians towards pollution issues, with positive impacts on the environment. Hence, we conclude that MEDPOL’s performance in the financial management of its monitoring programme is “satisfactory”.

Implementation of the LBS Protocol In relation to the extent to which the expected results and outputs of the programme for implementation of the LBS Protocol have been achieved, we make the following comments:

- Concerning the preparation work for programme implementation by MEDPOL such as the setting up of guidelines for the preparation of NDA and NBB, training courses, and related guidance documents for preparation of sectoral and national action plans, we find MEDPOL’s performance to be “satisfactory”.
- In relation to the preparation and undertaking of support activities for programme implementation by WHO/MEDPOL such as the prioritization of hot spots and sensitive areas; preparation of guidelines for sewage treatment; preparation of guidelines on environmental inspection systems; in addition to related capacity building activities and training courses, we find WHO/MEDPOL’s performance to be “satisfactory”.
- With respect to the achievements of MEDPOL in the implementation of the LBS Protocol, i.e. 17 out of a total of 21 countries submitted the NDA and NBB reports to date, and the number of countries that are actively participating in the preparation of

the sectoral and national action plans, we find MEDPOL's performance to be "satisfactory".

Concerning MEDPOL's ability to deal with constraints, we note that remedial measures which were adopted by MEDPOL varied from moderately effective to highly effective in dealing with the problems facing the programme for implementation of the LBS Protocol. Hence, we conclude that MEDPOL's ability to deal with constraints is "satisfactory". With respect to the cost-effectiveness in programme's delivery, and based on a cost benefit analysis, we note that the benefits accrued by the implementation of the LBS Protocol to date are far reaching with short- and long-term impacts. This, in turn, serves towards the achievement of MEDPOL's ultimate goals and objectives in pollution reduction and control for the Mediterranean Sea. Hence, we conclude that MEDPOL's performance in the financial management of its LBS implementation programme is "satisfactory".

Implementation of the Dumping Protocol: In relation to the extent to which the expected results and outputs of the programme have been achieved, we find that even though MEDPOL has made some significant work in preparation for the implementation of the Dumping Protocol, however, given that the revised protocol was signed in 1995, the secretariat has not given enough attention to the follow-up on the implementation. In fact, MEDPOL has no specific work programme for implementation of this protocol. Hence, we conclude that MEDPOL's efforts for implementing the Dumping Protocol are "unsatisfactory". We should note that due to the lack of outputs from the programme for the implementation of the Dumping Protocol, there was insufficient information to assess the ability of MEDPOL to deal with constraints, and cost effectiveness in programme's delivery. Hence, these activities were excluded from the scope of our evaluation.

Implementation of the Hazardous Waste Protocol: Concerning the extent to which the expected results and outputs of the programme have been achieved, we find that insufficient work has been accomplished by the secretariat for the planning and implementation of the Hazardous Waste Protocol. We therefore conclude that MEDPOL's performance in the achievement of outputs for the implementation of the Hazardous Waste protocol is clearly "unsatisfactory".

We should note that due to the lack of outputs from the programme for the implementation of the Hazardous Waste Protocol, there was insufficient information to assess the ability of MEDPOL to deal with constraints, and cost effectiveness in programme's delivery. Hence, these activities were excluded from the scope of our evaluation.

Process Approach to Management: With respect to the adoption of the process approach in the implementation and management of the work programmes, we note the following points:

- MEDPOL has not established specific, measurable, and timely objectives for the realization of its work programmes in relation to the implementation of the monitoring programmes, and dumping and hazardous waste protocols as evidenced from the unsatisfactory performance for the activities related to the implementation of these programmes.
- MEDPOL has not identified the processes required for achieving the work programme's objectives concerning the Hazardous Waste Protocol as evidenced from the lack of work progress in the implementation of this Protocol.
- MEDPOL has not established a formal process for dealing with constraints and monitoring outcomes, as evidenced from the fact that remedial measures are generally moderately effective.

Monitoring of Work Programmes: The process for “monitoring of work programmes” is related to evaluating the impact of work programmes’ outputs; in addition to the perception of national authorities and other stakeholders. In that respect, we make the following comments:

- Concerning the Monitoring Programme, and after a close examination of the impacts and perceptions made by National Authorities and scientists, we find that the impacts were generally positive. Capacity building activities were also perceived in a positive manner by all stakeholders. In contrast, when one analyzes the negative issues raised, particularly by national laboratories, it becomes clear that there are some serious management issues hampering the programme from achieving its objectives. Since this aspect is considered to be of crucial importance to the success of the monitoring programme, we conclude that the perception of the various stakeholders reflects an “unsatisfactory” performance for the management of MEDPOL’s monitoring activities.
- With respect to activities for the implementation of the LBS Protocol, and based on the perceptions made by stakeholders, we find that the impacts of the LBS implementation activities were generally positive. Furthermore, activities carried out to date for the implementation of the LBS Protocol (NDA, NBB, capacity building) are perceived favourably by all stakeholders, indicating a “satisfactory” performance for MEDPOL’s implementation of the LBS Protocol.

Process Approach to Management: With respect to the adoption of the process approach in the monitoring of the work programme processes, we note the following points:

- MEDPOL has not established a monitoring system for factual decision making which provides programme officers with sufficient data and information on the performance of the work processes vis-à-vis the programmes’ targets and objectives.
- MEDPOL has no process in place for seeking feedback from national authorities and stakeholders and for dealing with complaints in order to ensure that negative perceptions of work activities are contained and dealt with at an early stage of the process.

Resource Management: The activities constituting the “resource management” process are related to the managerial and scientific competence and efficiency of the Secretariat’s coordination of the work programmes; cooperation with other MAP structures, ability in fund raising, and effective use of information technology. Based on our evaluation, we make the following comments:

- Concerning the competence and efficiency of the Secretariat’s coordination of the work programmes, we conclude that there are a number of issues which point out to deficiencies in the managerial and scientific competence of MEDPOL. These include effectiveness of the communication processes, general organizational aspects, and efficiency of the reporting system. However, upon close examination of these issues, it is concluded that none is of critical nature to the detriment of the work programmes’ performance. In fact, MEDPOL has established processes for internal and external communications; review of activities; publication of reports and documentations, in support of its foreseen responsibilities. Hence, it is our conclusion that the scientific and managerial competence of MEDPOL’s staff in the coordination of the work programmes is “satisfactory”.
- Concerning the cooperation with other MAP structures for the performance of the monitoring activities, we note that cooperation with scientific institutions and UN bodies has continued since the start of the MEDPOL Phase III Programme to date. This is indicative of the “satisfactory” performance and efforts undertaken by MEDPOL in order

to ensure that cooperation is not interrupted for the benefit of achieving the programme's objectives.

- With respect to the cooperation between MEDPOL and the RACs, it is noted that this cooperation commenced in 2000 when the operational plan for the implementation of the SAP was initiated and is continuing to date with the relevant RACs. This fact is indicative also of the "satisfactory" performance by MEDPOL in order to ensure that technical cooperation is put to best use for advancing the objectives of MEDPOL for the effective implementation of the LBS Protocol.
- In relation to fund-raising activities, MEDPOL has been quite successful in mobilizing funds from external bodies which amounted to about 70 percent of the funds allocated by UNEP for programme's management. This represents a substantial amount and reflects a sound commitment by MEDPOL to achieve its programmes' objectives. Hence, we conclude that MEDPOL's performance in fund-raising is quite "satisfactory".
- With respect to MEDPOL's ability to make effective use of information technology (IT), we find that MEDPOL has not made any significant effort, until recently, to effectively utilize the resources related to information technology. For this reason, we conclude that MEDPOL's performance in this domain was over the period of evaluation rather "unsatisfactory".

Process Approach to Management Finally, and concerning the adoption of the process approach in the effective management of available resources, we note the following points:

- MEDPOL has not established specific, measurable, and timely objectives for determining if it is making effective use of its human and IT resources; and
- Due to the absence of formal monitoring processes that would assist the MEDPOL coordinator to predict problems prior to their occurrence, MEDPOL was rather late (in the case of IT resources) in the planning of corrective measures to rectify the situation.

Improvement

A number of proposals and concrete suggestions were formulated for assisting MEDPOL to improve its processes and to achieve its work programmes' objectives effectively and efficiently. The proposals address activities whose performance was found to be "unsatisfactory", and activities where improvements can be introduced even though the overall process performance was "satisfactory". The proposals should be considered in the formulation of the MEDPOL Phase IV Programme. They are divided among the four core processes; management responsibility; realization of work programmes; monitoring of work programmes, and resource management. Details of these proposals are included in Section 8.3 of this evaluation report.

PART II

2. INTRODUCTION

2.1. MANDATE FOR THE EVALUATION

At their meeting held in Catania on 11-14 November 2003, the Contracting Parties to the Barcelona Convention adopted the following recommendation to be implemented during the 2004-2005 biennium:

To evaluate the MEDPOL Programme and formulate a new phase of MEDPOL (2006-2013) responding to the needs of the Mediterranean countries in terms of the assessment, prevention, and control of marine and coastal pollution, including the impacts of rivers on the marine environment...

This new initiative comes after a series of three separate evaluations of the MEDPOL Programme made between 1989 and 1999. The first one was made in 1989 by four independent scientists, addressing the monitoring data obtained by MEDPOL by 1989. The second evaluation was made in 1993 by a team of five independent scientists addressing the ongoing implementation of MEDPOL Phase II. The third evaluation was made in 1999 by two independent scientists, addressing the results of MEDPOL Phase II.

In order to respond to the request of the Contracting Parties, the MAP Secretariat initiated in 2004 the implementation process for evaluation of MEDPOL Phase III from 1996 to 2005. The objective of this evaluation is to assess MEDPOL's performance with a view to improving its role in achieving programmes' objectives, and to provide elements for use in the formulation of MEDPOL Phase IV, which will be submitted to the contracting parties in 2005 for adoption.

2.2. BACKGROUND OF THE MEDPOL PROGRAMME

The Programme for the Assessment and Control of Pollution in the Mediterranean region (MEDPOL) was created in 1975 as the environmental assessment component of the Mediterranean Action Plan (MAP)¹ in order to assess, qualify and quantify the marine environmental problems of the Mediterranean Sea. MEDPOL is one of the components of the MAP Structure². Based in Athens, MEDPOL is responsible for the reduction of land-based pollution. It has evolved since its inception in three phases. Currently, MEDPOL Phase III is responsible for the follow-up of the implementation of the Land-Based Sources Protocol, in addition to the Dumping and the Hazardous Wastes Protocols. These commitments have been translated into four work programmes:

- Marine pollution monitoring activities. This programme has been in effect before the beginning of MAP III in 1995;
- Implementation of the Strategic Action Programme (SAP), the technical arm of the LBS Protocol. This programme has been in effect since the approval of the SAP in 1997;
- Implementation of the protocol for the prevention and elimination of pollution of the Mediterranean sea by dumping from ships and aircraft. Major work activities were initiated in 2003; and

¹ Background on the Mediterranean Action Plan is included in Annex II.

² The MAP Structure consists of the 22 MAP members, known as Contracting Parties to the Barcelona Convention, National Focal Points, A rotating Bureau of six representatives of the Contracting Parties, the Map Coordinating Unit (MEDU), the Mediterranean Commission on Sustainable Development (MCSD), The MEDPOL Programme, and the six MAP Regional Activity Centres (RACs).

- Implementation of the protocol for the prevention of pollution of the Mediterranean Sea by transboundary Movements of hazardous Waste and their disposal.

2.3. PERFORMANCE OF THE EVALUATION

In response to the request of the Contracting Parties, three independent experts were recruited: Mr. Jean-Marie Massin; Project Coordinator and former MEDPOL National Coordinator from France; Mr. Panos Panagopoulos; Consultant and President of ECOS Consulting S.A. from Greece; and Mr. Mohamad Kayyal; Professor at the University of Damascus and Lead Quality Auditor from Syria.

Four consultation meetings were held in the MEDPOL office in Athens between February 2004 and January 2005 for discussions with relevant Officers involved in the MEDPOL Programme, and for review of available documentation and relevant information produced by MEDPOL between 1996 and 2004.

In addition, visits were conducted to nine of the 21 Contracting Parties to the Barcelona Convention. Countries consisted of Croatia, Cyprus, Egypt, France, Greece, Syria, Tunisia, Turkey and the EU. Visits itinerary included meetings with stakeholders participating in the MEDPOL Programme such as scientific institutes, national authorities, NGOs, UN bodies, and other stakeholders. A full list of organizations, institutes, NGO's and other stakeholders which participated in this evaluation from each country are included in the "Details of Visits" in Annex I.

This report was prepared by Mr Jean-Marie Massin and Mr Mohamad Kayyal with inputs from Mr Panos Panagopoulos.

2.4. TERMS OF THE EVALUATION

The evaluation covers the activities carried out in the framework of the MEDPOL Phase III. According to the mandate given to the experts, the scope of the evaluation is expected to cover the following terms:

1. Determination of the extent to which the expected results and outputs of the MEDPOL Programme have been achieved;
2. Assessment of the quality and the usefulness/impact of the results and outputs achieved;
3. Determination of the appropriateness of the objectives and work programme of MEDPOL in relation to the objectives of the Barcelona Convention; the Protocols; and the role of MEDPOL within the MAP structure;
4. Evaluation of the scientific and managerial competence and efficiency of the Secretariat coordination of the Programme;
5. Evaluation of the overall visions and strategies of MEDPOL, and the ability of the Programme in their formulation as well as to adaptations and changes;
6. Evaluation of the cooperation established by MEDPOL with the other MAP structures or regional activity centres (RAC); other Institutions; programmes; UN bodies; Conventions; etc.;
7. Evaluation of the ability of MEDPOL in fund raising;
8. Evaluation of the information technology (IT) performance of MEDPOL;
9. Comparison of the over all cost of the Programme with the actual results and determination of the cost effectiveness of Programme delivery;
10. Assessment of the contribution of the Programme to the process of achieving sustainable development in the region;
11. Assessment of how the Contracting Parties and relevant authorities perceive MEDPOL in relation to its implementation and their expectations;
12. Assessment of how the MEDPOL Programme is perceived by scientists and other concerned partners (such as the Civil Society and the private industrial sector);

13. Identification of any technical, administrative and/or operational constraints encountered during MEDPOL programme implementation, and examination of actions taken to remedy them and to draw lessons;
14. Proposing concrete suggestions and recommendations which may benefit and improve the MEDPOL role, giving due consideration to the developments at the regional level, including the EU Strategies, and at the global level, including the Johannesburg Plan of Implementation; and,
15. Presentation of an overall analysis of the appropriateness of the principles and objectives of MEDPOL as initially adopted and as modified and adapted during its implementation, as compared to the actual needs of the region, to be used as the basis for the formulation of MEDPOL Phase IV.

2.5. ORGANIZATION OF THE EVALUATION REPORT

The evaluation report is organized in four parts. Part I is the executive summary. Part II the introduction and details of the evaluation process including the basis for this evaluation, MEDPOL system model, identification of processes and activities, and method and criteria for evaluation. In Part III, we present our findings concerning MEDPOL's performance divided into four areas; management responsibility, realization of work programmes, resource management, and monitoring of work programmes. In Part IV, we present proposals and concrete suggestions to improve MEDPOL's role for achieving its programme objectives.

3. THE EVALUATION PROCESS

3.1. INTRODUCTION

The basis for our evaluation of the MEDPOL Phase III Programme is the “process approach” to management. The “process approach” offers an organization the opportunity to function effectively by the application of a system of processes, together with the identification and interactions of these processes, and their management. Hence, the “process approach” provides an appropriate platform for evaluating the effectiveness of the current management practices at MEDPOL. A major advantage of this approach is the control that it provides over the linkage between the individual activities within the system of processes, as well as over their combination and interaction.

The “process approach” to management is advocated by the International Standard for quality management systems (ISO9001:2000). The Standard states that when the “process approach” is adopted within an organization, it emphasizes the importance of:

- a. understanding and meeting requirements;
- b. the need to consider processes in terms of added value;
- c. obtaining results of process performance and effectiveness; and
- d. continual improvement of processes based on objective measurement.

According to the International Standard (ISO9001:2000), in order to adopt the “process approach” to management, an organization shall:

- a. identify the processes needed for the management system and their application throughout the organization;
- b. determine the sequence and interaction of these processes;
- c. determine criteria and methods needed to ensure that both the operation and control of these processes are effective;
- d. ensure the availability of resources and information necessary to support the operation and monitoring of these processes;
- e. monitor, measure and analyze these processes; and
- f. implement actions necessary to achieve planned results and continual improvement of these processes.

3.2. MEDPOL'S SYSTEM MODEL

The model for a process-based management system which illustrates the linkages and interactions of MEDPOL's processes³ and activities is depicted in Figure 3.1. This model offers a suitable platform for conducting the evaluation and for interpretation of results. As can be seen from Figure 3.1, the Contracting Parties, Conventions, Protocols, in addition to the context environment within which MEDPOL operates, all play a significant role in defining MEDPOL's mission and requirements. As a result of these inputs, the MEDPOL coordinator sets strategies for realization of the various work programmes. And, by making use of available resources such as staff, consultants, funding agencies, other MAP structures (RACs), in addition to material tools, such as information technology; the MEDPOL coordinator in conjunction with the programmes' officers set programmes' objectives and identify the processes necessary to achieve these objectives. The programme officer is given the necessary authorities and responsibilities so that he/she can manage the programme's activities. The outputs of these programmes are monitored and examined, in turn, by the Contracting Parties who, by means of regular evaluations, assess MEDPOL's ability to achieve its objectives, and adopt concrete proposals for improving the effectiveness of its operational processes.

³ A process is an activity equipped with resources and managed in order to enable the transformation of inputs into outputs such as to achieve process objectives.

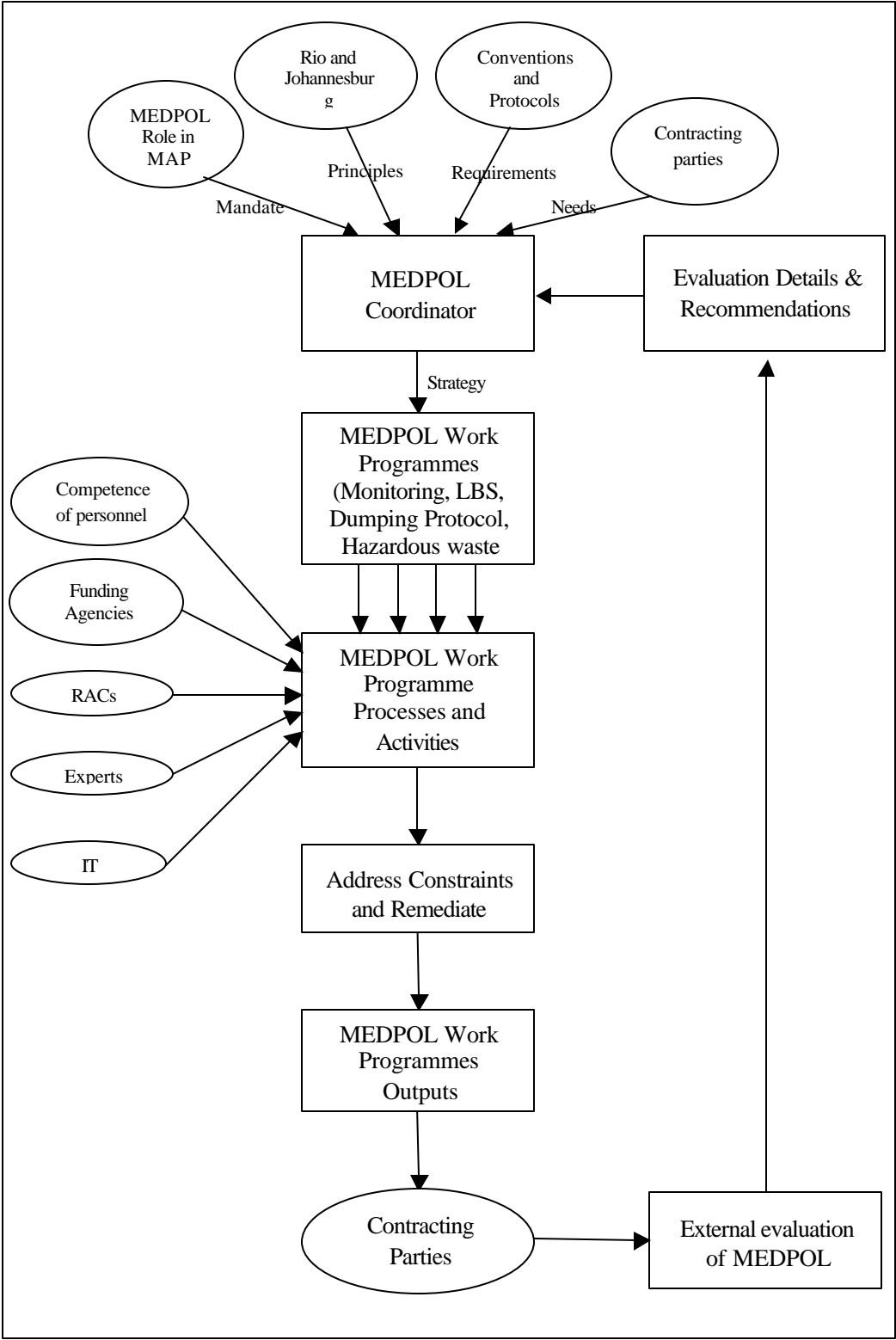


Figure 3.1: Model for a Process-Based Management System for MEDPOL Phase III

3.3. MEDPOL'S PROCESSES & ACTIVITIES

Based on the system model shown in Figure 3.1, we identify a number of activities in the MEDPOL system that can be grouped under five core or principal processes. These processes are synonymous with those found in the International Standard ISO9001:2000⁴. The activities and their corresponding processes are:

- a. Activities related to developing MEDPOL's strategies and objectives based on:
 - i. the requirements stipulated in conventions and protocols;
 - ii. Rio principles and Johannesburg implementation plan;
 - iii. the context environment within which MEDPOL functions; and
 - iv. the needs of the Contracting Parties;for the effective realization of the work programmes' objectives. These activities fall under the umbrella of the first core process known as "management responsibility";
- b. Activities related to the effective realization and achievement of the objectives of MEDPOL's work programmes, including:
 - i. implementation of the monitoring programmes, LBS Protocol, Dumping Protocol, and Hazardous Waste Protocol;
 - ii. ability to undertake the necessary mitigation measures to overcome and remediate constraints facing activities of the work programme; and
 - iii. implementation of work programmes in a cost effective manner.These activities comprise the second core process known as "realization of work programmes".
- c. Activities for monitoring the effectiveness of the work programmes including:
 - i. impact of the outputs of the work programmes as perceived by stakeholders;
 - ii. perception of the Contracting Parties of the programmes' outputs; and
 - iii. perception by other stakeholders including scientists and the general public.These activities, which are external to the internal MEDPOL activities, constitute the third core process known as "monitoring of work programmes".
- d. Activities related to the mobilization and effective management of available resources such as:
 - i. managerial and scientific competence and efficiency of the Secretariat's coordination of the Programme; including the ability to undertake prospective analysis and assessment of work programmes' performance for formulating as well as adapting new measures for improving work programmes' effectiveness;
 - ii. financial resources that can be made available through funding agencies;
 - iii. technical resources that can be made available through other MAP structures (Regional Activity Centres); and
 - iv. technological instruments that can increase the effectiveness of achieving programmes' objectives such as information technology.for the effective realization of the work programmes' objectives. These activities constitute the fourth core process known as "resource management".
- e. Activities related to the formulation of proposals and concrete suggestions to improve MEDPOL's role and processes. These activities constitute the fifth core process known as "improvement".

⁴ Monitoring and improvement constitute in the International Standard ISO9001:2000 a single core process

3.4. Adaptation of MEDPOL's Processes to the Terms of Evaluation

Based on the foregoing, we present in Table 3.1 the relationship between the activities, as deduced from the system model and the terms of the evaluation as listed in Section 2.4.

As can be seen, the terms of the evaluation correspond in full to the identified activities and core processes. Thus, our report not only provides an evaluation summary for each activity as stated in the terms of the evaluation, but also includes concrete proposals and recommendations concerning MEDPOL's management practices as detailed under the fifth core process "improvement". This presents a real opportunity for MEDPOL to deal with management problems common to different activities; and to implement remedial measures with common goals, a prospect which cannot be accomplished when activities are evaluated in isolation of each other.

3.5. METHOD & CRITERIA FOR EVALUATION

Based on the information provided in Table 3.1, our evaluation is conducted following the process depicted in Figure 3.2. First, and for a specific core process, we evaluate the individual activities as stipulated in the terms of evaluation. Two basic criteria are utilized in our activity evaluation. These are:

- i. Satisfactory if *most* tasks in a process are implemented in a satisfactory or effective manner
- ii. Unsatisfactory if the *majority* of the tasks or some *critical components* constituting a process are *not* implemented in a satisfactory or effective manner

If activities' performance is satisfactory, then process evaluation is complete. If activities' performance is "unsatisfactory", we proceed to conduct an in-depth analysis of process management in order to identify key areas which have led to the activities not performing satisfactorily or effectively.

Process analysis is conducted in accordance with the methodology proposed in the ISO9001:2000. In principle, the effectiveness of process implementation can be determined based on the methodology known as the "Plan-Do-Check-Act" (PDCA) where:

- i. Plan to establish objectives and process requirements necessary to deliver results
- ii. Do to implement the activities
- iii. Check to monitor processes and measure results against objectives and requirements
- iv. Act to take actions to continually improve process performance

Results of the PDCA process analysis would lead to proposals for improving MEDPOL's management practices, as stipulated in core process "improvement".

In Part III of this report, we proceed to evaluate the activities and core processes in relation to the corresponding terms of evaluation as outlined in Table 3.1.

Table 3.1: Activities and Corresponding Terms of Evaluation			
processes	Activities	Term	Terms of Evaluation
Management Responsibility	<p>Developing MEDPOL's strategies and objectives for the effective realization of the work programmes' objectives based on:</p> <ul style="list-style-type: none"> - the requirements stipulated in conventions and protocols; - the context environment within which MEDPOL functions; - Rio principles and Johannesburg implementation plan; and - the needs of the Contracting Parties. 	3	Determination of the appropriateness of the objectives and work programme in relation to the objectives of the Barcelona Convention; the Protocols ; and the role of MEDPOL within the MAP structure
		5	Evaluation of the overall visions and strategies of MEDPOL, and the ability of the Programme in their formulation as well as to adaptations and changes
		10	Assessment of the contribution of the Programme to the process of achieving sustainable development in the region
		15	Presentation of an overall analysis of the appropriateness of the principles and objectives of MEDPOL as initially adopted and as modified and adapted during its implementation, as compared to the actual needs of the region , to be used as the basis for the formulation of MEDPOL Phase IV
Realization of Work Programmes	<ul style="list-style-type: none"> - Effective implementation of the four MEDPOL work programmes: <ul style="list-style-type: none"> ▪ monitoring; ▪ the LBS Protocol ▪ the Dumping Protocol; and ▪ the Hazardous Waste Protocol - Ability to undertake the necessary mitigation measures to overcome and remediate constraints facing work programme activities; and - Implementation of the MEDPOL work programmes in a cost effective manner 	1	Determination of the extent to which the expected results and outputs of the MEDPOL Programme have been achieved
		13	Identification of any technical, administrative and/or operational constraints encountered during MEDPOL programme implementation, and examination of actions taken to remedy them and to draw lessons
		9	Comparison of the over all cost of the Programme with the actual results and determination of the cost effectiveness of Programme delivery
Monitoring of Programmes	<p>Monitoring and improvement of the effectiveness of the work programmes and outputs based on:</p> <ul style="list-style-type: none"> - impacts as perceived by stakeholders; - perception of the Contracting Parties; and - perception by other stakeholders including scientists and the civil society. 	2	Assessment of the quality and the usefulness/impact of the results and outputs achieved
		11	Assessment of how the Contracting Parties and relevant authorities perceive MEDPOL in relation to its implementation and their expectations
		12	Assessment of how the MEDPOL Programme is perceived by scientists and other concerned partners (such as the Civil Society and the private industrial sector)
Resource Management	<p>Mobilization and management of available resources for the effective realization of work programmes' objectives. Resources include:</p> <ul style="list-style-type: none"> - managerial competence and efficiency of the Secretariat's coordination of the Programme; including prospective analysis and assessment of performance for formulating as well as adapting new measures - technical resources that can be made available through other MAP structures (RACs); - financial resources that can be made available through funding agencies; - technological instruments that can increase the effectiveness of achieving programmes' objectives. 	4	Evaluation of the scientific and managerial competence and efficiency of the Secretariat coordination of the Programme
		6	Evaluation of the cooperation established by MEDPOL with the other MAP structures or regional activity centres (RAC); other Institutions; programmes; UN bodies; Conventions; etc.
		7	Evaluation of the ability of MEDPOL in fund raising
		8	Evaluation of the information technology (IT) performance of MEDPOL
Improvement	Formulation of proposals and concrete suggestions to improve MEDPOL's role and processes	14	Proposing concrete suggestions and recommendations which may benefit and improve the MEDPOL role, giving due consideration to the developments at the regional and global levels

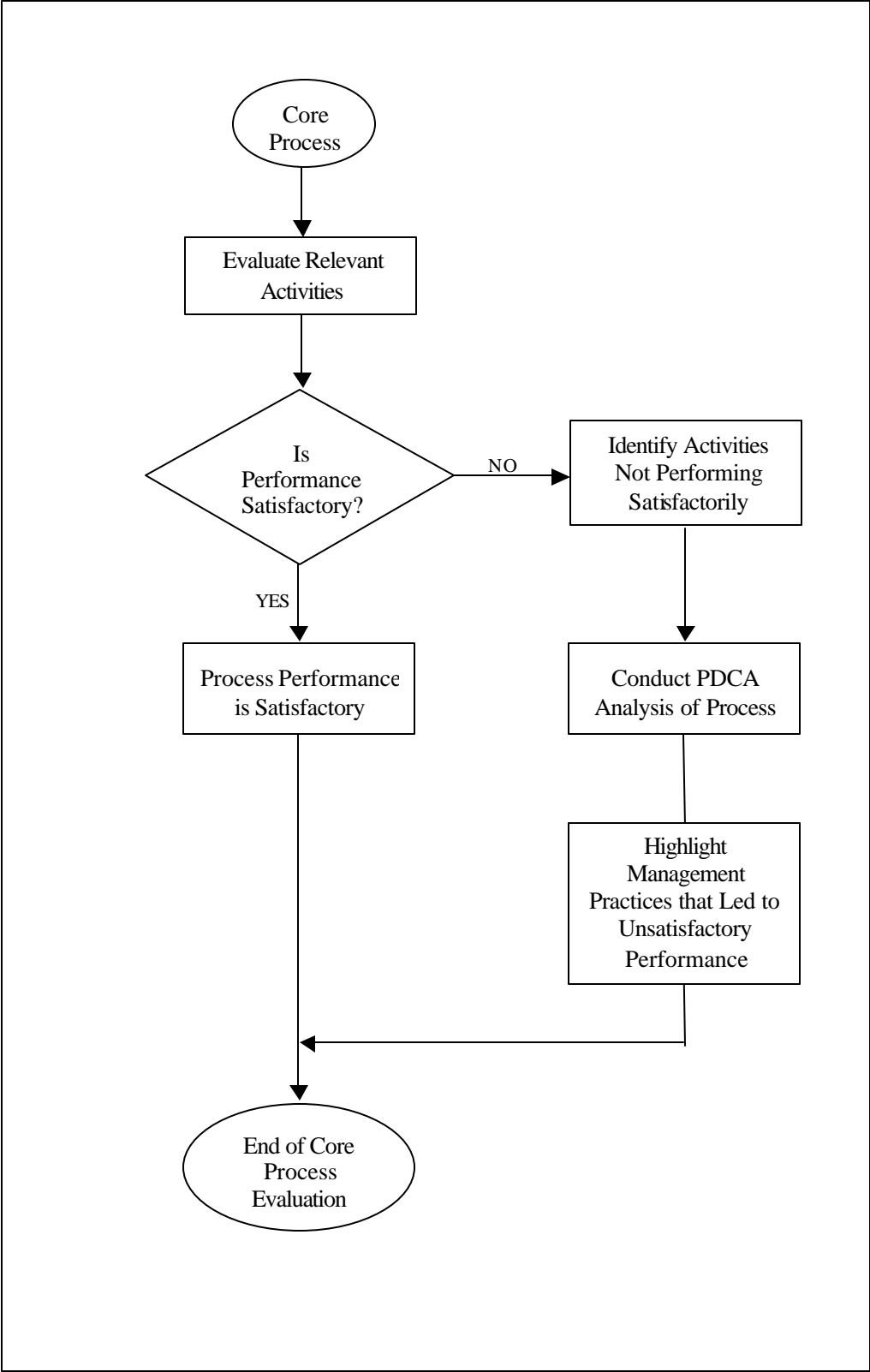


Figure 3.2: Evaluation Methodology for MEDPOL's Activities and Processes

PART III EVALUATION OF THE MEDPOL PHASE III PROGRAMME

4. MANAGEMENT RESPONSIBILITY

4.1. INTRODUCTION

In this section, we evaluate the activities related to the following issues:

- a. Appropriateness of the objectives and work programme in relation to the objectives of the Barcelona Convention; the Protocols; and the role of MEDPOL within the MAP structure;
- b. Overall visions and strategies of MEDPOL, and the ability of the Programme in their formulation as well as to adaptations and changes;
- c. Contribution of the Programme to the process of achieving sustainable development in the region; and
- d. Overall analysis of the appropriateness of the principles and objectives of MEDPOL as initially adopted and as modified and adapted during its implementation, as compared to the actual needs of the region, to be used as the basis for the formulation of MEDPOL Phase IV.

As noted previously, activities related to the setting of objectives, visions, strategies, and principles for MEDPOL fall under the core process titled “management responsibility”. In this section, we present our evaluation for each of the above noted issues. We also assess our findings in the framework of the core process “management responsibility” in order to identify key areas which have led to activities not performing satisfactorily, with the objective of formulating in Section 8 specific proposals for improving MEDPOL’s performance in this domain.

4.1.1. Applicable Conventions and Protocols

The 1976 Barcelona Convention⁵, amended in 1995, has given rise to six protocols or legal instruments addressing specific aspects of the Mediterranean environmental conservation. MEDPOL is responsible for the implementation of three Protocols⁶:

- The Protocol for the protection of the Mediterranean Sea against pollution from land-based sources⁷;
- The Protocol for the prevention of pollution of the Mediterranean Sea by dumping from ships and aircraft⁸; and
- The Protocol on the prevention of pollution of the Mediterranean Sea by transboundary movements of hazardous waste and their disposal⁹.

Concerning specifically the MEDPOL Phase III Programme, these Protocols constitute the legal component of the Mediterranean Action Plan (MAP).

The 1996 LBS Protocol, which was adopted by the Conference of Plenipotentiaries held in Syracuse in March 1996, provides MEDPOL with the legal framework concerning the actions to be carried out for pollution prevention and control, thus signifying the strategy and mechanism for implementation of the Programme. By virtue of Article 15, 2, of the 1996 LBS Protocol, the regional action plans and programmes (including timetables) are formulated by the MAP Coordinating Unit and, after examination and approval by the relevant technical

⁵ Information on the 1976 Barcelona Convention and its 1995 amendments are presented in Annex III

⁶ Regional Activity Centres are responsible for the implementation of the remaining three protocols

⁷ Information on the 1980 LBS Protocol and its 1996 amendments are presented in Annex IV

⁸ Information on the Dumping Protocol and its amendments are presented in Annex V

⁹ Information on the Hazardous Waste Protocol are presented in Annex VI

bodies, are adopted by a two thirds majority of the Contracting Parties. Subsequently, the regional plans and programmes become binding to all Contracting Parties which accept the Protocol within 180 days; exception is provided for the Contracting Parties that notify their objection within this time period.

As of the 1st of July 2004, thirteen Contracting Parties have ratified the LBS protocol, officially named as the "Protocol for the Protection of the Mediterranean Sea against pollution from land-based sources and activities", and thus are bound by it. The amended 1996 LBS Protocol has not yet entered into force. To enter into force, i.e. to be binding, the 1996 LBS protocol requires the ratification of at least fifteen Contracting Parties.

The Dumping Protocol entered into force in 1978 and was amended in 1995. Nine countries have ratified the Protocol. To enter into force, i.e. to be binding, at least 15 Contracting Parties have to ratify it. Consequently, the amended Protocol has not yet entered into force.

The Hazardous Waste Protocol was signed by 11 Mediterranean countries in 1996 and has not yet entered into force (only 5 countries ratified it) due to the position of the European countries regarding the consideration of radioactive waste as hazardous

4.1.2. Objectives of MEDPOL Phase III

The ultimate and overall objective of MEDPOL Phase III is the elimination of pollution of the Mediterranean Sea from all activities that cause such pollution, in particular land based activities *through the full implementation of the LBS Protocol* (UNEP 1999, § 3.2).

The specific objectives of MEDPOL Phase III are in particular [UNEP, 1999a, section 3.2]:

- Assessment of all (point and diffuse) sources of pollution, the load of pollution reaching the Mediterranean Sea, and the magnitude of problems caused by the effects of contaminants on living and non-living resources, including human health, as well as on amenities and uses of the marine and coastal regions;
- Assistance to countries, including capacity building in the development and implementation of national actions plans for the elimination of marine pollution, in particular from land-based activities;
- Assessment of status and trends in the quality of the marine and coastal environment as an early warning system for potential environmental problems caused by pollution;
- Formulation and implementation of actions plans, programmes and measures for the prevention and control of pollution for the mitigation of impacts caused by pollution and for the restoration of systems already damaged by pollution; and
- Monitoring of the implementation of the actions plans, programmes, and measures for the control of pollution and the assessment of their effectiveness.

4.2. APPROPRIATENESS OF MEDPOL'S OBJECTIVES TO CONVENTIONS & PROTOCOLS

In the following section, we evaluate the appropriateness of MEDPOL's objectives to the Barcelona Convention and the three aforesaid protocols, in addition to the European Union Marine Strategy.

4.2.1. Barcelona Convention and LBS Protocol

By comparing the objectives of MEDPOL Phase III stated above with the general terms, principles and obligations to which the Contracting Parties to the LBS Protocol subscribe, namely to protect and enhance the marine environment so as to contribute towards its sustainable development (SAP - Principles & Obligations); and specifically the precautionary and polluter pays principles, environmental impact assessment, integrated

pollution control, integrated management of the coastal zones, Best Available techniques (BAT) and Best environmental Practices (BEP)], it is concluded that the MEDPOL Phase III Programme is *in line* with the objectives of the Barcelona Convention and its LBS Protocols. From a *legal* point of view, and considering that the 1996 LBS Protocol has not to date entered into force, MEDPOL Phase III is also *in line* with the *specific requirements* of the 1980 LBS Protocol. Nevertheless, when considering that the 1996 LBS Protocol will soon be ratified, it is necessary to make the following remarks:

- **Protocol Area:** By comparing Article 3 of the 1980 LBS Protocol with Article 3 of the 1996 LBS Protocol, it is evident that the 1996 LBS Protocol extends the area to which this Protocol will apply, when entering into force, from the Mediterranean Sea to the entire watershed area within the territories of the Contracting Parties, draining into the Mediterranean Sea Area (“hydrologic basin”) and to the brackish waters, coastal salt waters including marshes and coastal lagoons, and ground waters communicating with the Mediterranean Sea. The Strategic Action Plan (SAP) limits its field of action to the coastal zone and do not foresee any specific measures for marshes, coastal lagoons and ground waters¹⁰.
- **Protocol Application:** According to Article 4 of the 1996 LBS Protocol, inputs of polluting substances transported by the atmosphere to the Mediterranean Sea Area from land-based sources or activities within the territories of the Contracting Parties shall be considered. The experience gained in other international fora shows not only the importance but also the great complexity of such an issue which requires very specific measures without any connection with the activities carried out to evaluate and monitor aqueous discharges. Only four Mediterranean countries have at present airborne pollution component in their monitoring programme.

4.2.2. The Dumping Protocol

By comparing the objectives of MEDPOL Phase III stated above with the general terms, principles and obligations to which the Contracting Parties to the Dumping Protocol subscribe, namely:

- to take all appropriate measures to prevent, abate, and eliminate the fullest extent possible pollution of the Mediterranean Sea caused by dumping from ships and aircraft or incineration at sea (Article 1);
- to prohibit the dumping of wastes or other matter, with the exception of those listed (Article 4); and
- to draw up and adopt criteria, guidelines and procedures for the dumping of wastes or other matter listed in Article 4.2 so as to prevent, abate and eliminate pollution.

It is concluded that, in general, the objectives of MEDPOL Phase III Programme are *in line* with the requirements of the Dumping Protocol.

4.2.3. The Hazardous Waste Protocol

By comparing the objectives of MEDPOL Phase III stated above with the general terms, principles and obligations to which the Contracting Parties to the Hazardous Waste Protocol subscribe, namely:

¹⁰ It is important to note that the lack of work on the hydrological basin complies with a specific request of the Contracting Parties which for technical and political reasons clearly indicated that MEDPOL should not “enter into the rivers” in spite of clear proposals made by the secretariat in line with the LBS protocol. Nevertheless this issue is softly approached through a GEF Project (activities on river monitoring and river basin management) which partly responds to the LBS requirements.

- to take all appropriate measures to prevent, abate and eliminate pollution of the Protocol area which can be caused by transboundary movements and disposal of hazardous wastes (Article 5, 1);
- to take all appropriate measures to reduce to a minimum, and where possible eliminate, the generation of hazardous wastes (Article 5, 2);
- to cooperate as far as possible in scientific and technological fields related to pollution from hazardous wastes, particularly in the implementation and development of new methods for reducing and eliminating hazardous waste generated through clean production methods (Article 8, 1); and
- to take appropriate measures to implement the precautionary approach based on prevention of pollution problems arising from hazardous wastes and their transboundary movement and disposal. To this end, the Parties shall ensure that clean production methods are applied to production processes (Article 8, 3).

It is concluded that, in general, the objectives of MEDPOL Phase III Programme are *in line* with the requirements of the hazardous waste Protocol.

4.2.4. European Union Marine Strategy

In 2002, the European Commission presented to the Council and the European Parliament a new project entitled “*Strategy to protect and conserve the marine environment*” requiring a pragmatic cooperation and coordination of activities of all institutions and organisations, which are concerned with the protection and sustainable use of the marine environment.

Ambitious objectives and correlatively a coherent set of measures, founded on the application of an ecosystem based approach, have been proposed concerning the progressive reduction of discharges, emissions and losses of substances hazardous to the marine environment; the elimination of human induced eutrophication problems by 2010; the progressive and substantial reductions of radionuclides by 2020; and the setting up of a more effective coordination and cooperation between the different institutions and regional and global conventions, commissions and agreements governing marine protection.

Accordingly, in an official communiqué dated 15 September 2003, the Commission informed a total of 34 European Countries and some 30 international governmental and non-governmental organisations – including the MEDPOL Unit - about its plans regarding the development of the marine strategy, and invited the recipients to nominate experts/contact persons for the four working groups it was about to establish concerning, respectively, the following issues:

- *Ecosystem Approach to Management of Human Activities (EAM)*, the mandate of which being to develop guidance on the implementation of an ecosystem approach to oceans, as proposed by the World Summit on Sustainable Development held in Johannesburg;
- *European Marine Monitoring and Assessment (EMMA)*. Considering that the existing monitoring programmes of the regional marine conventions are not very coherent in terms of scope, content (issues covered), and detail (geographic and temporal density); even if some of the observed divergence can be attributed to differences in environmental conditions and differences in socio-economic and political situations in the countries bordering the seas, the aim of such working group is to develop, in the context of the European Marine Strategy, a common approach towards monitoring and assessment of the quality status of the European marine environment – including the Mediterranean Sea taken as a whole - and to facilitate the implementation of this approach;
- *Strategic Goals and Objectives (SGO)*; and

- *Hazardous Substances*(HS) led by the European Commission Directorate General for the Environment (DG Environment). The function of this working group is to identify ways and means to facilitate and improve cooperation and coordination regarding (i) the selection and prioritisation of hazardous substances, (ii) the development of measures to control such substances and (iii) assessment of the effectiveness of their implementation, and to establish a concrete programme of work (including a timetable) for this purpose.

The EU marine strategy will be implemented through the existing regional structures. This means that MAP/MEDPOL will have important role to play in the implementation of this strategy in the future. For this reason, MEDPOL has been a member of the Inter-Agency Forum established by the European Environment Agency in the 1990s and has attended all the meetings where information on programmes and objectives were exchanged regularly (including reporting harmonization) between all regional Conventions. MEDPOL is also member of the IOCF, a committee established by the European Commission to prepare and follow up the European Union Marine Strategy. The committee is meeting twice a year and is composed by all Regional Conventions.

Based on the foregoing, and as compared with the EU strategy goals and foreseen activities, it can be concluded that the MEDPOL objectives are *globally* in line with the EU views, even if the EU strategy adopts a more exhaustive approach to the marine environment problems. Furthermore, the EU strategy introduces the “ecosystem approach”, as a fundamental tool in the marine protection processes. This aspect is not addressed in MEDPOL Phase III (but is planned to be incorporated into MEDPOL Phase IV).

4.3. VISIONS AND STRATEGIES OF MEDPOL & ADAPTATION TO CHANGES

MEDPOL's responsibilities have gradually shifted its focus over the last decade towards the effective reduction of marine pollution from land-based sources and the integration of its activities as a key tool to sustainable development in the region. The MEDPOL programme has evolved, while adapting to changes, over three phases:

MEDPOL Phase I was the first phase of the MEDPOL Programme (MEDPOL - Phase I), implemented from 1975 to 1980, was formulated and coordinated by UNEP with technical and scientific cooperation of UN specialised agencies: FAO, WHO, WMO, IOC of UNESCO and IAEA.

The MEDPOL Phase I objectives were mainly to set up baseline studies covering the major marine pollution problems in the Mediterranean.

During this period, the Contracting Parties started to formulate and carry out a coordinated pollution monitoring and research programme taking into account the goals of the Mediterranean Action Plan and the capabilities of the participating Mediterranean research centres. However, since only few laboratories were able to perform the required analyses, emphasis was mainly placed on strengthening and upgrading the technical capabilities of national laboratories, mostly in developing Mediterranean countries, so that all countries would be able to participate in the Programme.

In view of the inexperience of many laboratories, and difficulties inherent to the programme, the data collected during the first phase of MEDPOL could not be considered of good quality, mainly due to the validity and comparability of the data and the uneven and inadequate geographical coverage of the Mediterranean Sea. Nevertheless, not only the Contracting Parties became aware of how important was the Mediterranean pollution but also they acquired some experience in marine pollution measurements and research and began to compile data on baseline levels of contaminants in the Mediterranean Sea.

MEDPOL Phase II was initiated in 1981 on the basis of the experience gained in MEDPOL Phase I. Basically, MEDPOL Phase II was organised on a national level and orientated towards the design and implementation of national monitoring programmes that satisfy local needs and conditions. In this framework, not only the gains of the first phase were consolidated, but also a series of initiatives were taken in order to respond to the Contracting Parties' requirements and needs to move forward. Referring to MAP Technical Series Report No. 120, published in 1999, the MEDPOL Phase II Programme had succeeded in accomplishing the following:

- Intensification of the monitoring activities of the levels and effects of contaminants while gradually shifting to compliance monitoring and pollution control measures;
- Implementation of a broad research programme contributing to the improved understanding of the requirements for pollution control measures;
- Initiation of a detailed survey (inventory) of pollutants from land based sources;
- Building-up of consistent databases resulting from monitoring, research and survey activities, which included, by the end of Phase II, a large inventory related to chemical contaminants in biota and micro-organisms in seawater;
- Preparation of a regional assessment on the possible implication of expected climate changes;
- Preparation of an in-depth analyses of 13 specific problems related to the control of individual contaminants (or group of contaminants) covered by the LBS Protocol; and
- Input of all activities into the Coastal Areas Management Programme (CAMP) carried out within the framework of the Action Plan [UNEP, 1999a, § 2.4].

Nevertheless, the programme faced some difficulties. Based on the evaluation carried out by external experts and scientists in 1993 (UNEP, 1993a), it was concluded that the monitoring results of MEDPOL Phase II could not provide a complete and representative description of the state of the Mediterranean marine environment and could not allow an estimate of the balance of inputs. Different reasons were advocated including:

- temporal and geographical gaps in the samples collection and distribution;
- areas monitored usually near the polluted areas on the coastline;
- data stored in the MEDU data bank was not properly screened;
- data originated mostly from polluted areas and not covering large parts of the Mediterranean; and
- inconsistent collection, preparation, and chemical analyses of collected data concerning heavy metals and halogenated hydrocarbons.

As a result, preparations were made to refocus the MEDPOL Programme, and thus, a new phase of the programme (MEDPOL Phase III, 1996-2005) was initiated.

MEDPOL Phase III took into consideration the experience gained during MEDPOL Phases I and II, as well as the documents adopted by the Ninth Ordinary Meeting of the Contracting Parties (Barcelona, 5-8 June 1995), the Rio Declaration on Environment and Development, Agenda 21, the Barcelona Resolution, the Priority Fields of Activities (1996-2005), and the amended 1995 Barcelona Convention and Protocols. This outlined a different and more integrated dimension in the approach to marine pollution control programmes.

MEDPOL Phase III was adopted by the Extraordinary Meeting of the Contracting parties to the Barcelona Convention held in Montpellier in July 1996, but became fully operational only in 2000. MEDPOL Phase III provides the basis for action related to three main and complementary components:

- Assessment of pollution (monitoring was recognized as a fundamental tool for this assessment);
- Pollution control; and
- Supporting measures;

With Phase III, MEDPOL's objectives¹¹ shifted from pollution monitoring to pollution assessment, prevention, and control. This objective sets the appropriate framework for the programme, i.e. to actually achieve an improvement in the quality of the Mediterranean Sea; and represents a significant evolution from MEDPOL Phases I and II Programmes, which were almost entirely directed to pollution assessment [UNEP, 1999a, Section 2]. Hence, MEDPOL moved towards assisting the Mediterranean Countries in the formulation and implementation of pollution monitoring and reduction programmes. While Phase III still foresees the monitoring of trends and biological effects; and places some emphasis on the effectiveness of national pollution control measures, it includes also an assistance component to ensure the quality of monitoring data, and to provide equipment and training, both for the interpretation of data and for managerial aspects, such as the operation of sewage treatment plants. Hence, it may be concluded that these measures were incorporated in MEDPOL Phase III in response to the shortcomings observed and reported in the evaluation carried out in 1993.

4.4. CONTRIBUTION TO SUSTAINABLE DEVELOPMENT

Since the beginning of the MEDPOL Phase III Programme, new developments have taken place at the global level, through the implementation plan adopted by the World Summit on Sustainable Development in 2002. This plan came into being based on the achievements made since the United Nations Conference on Environment and Development (UNCED), held in Rio in 1992, which provided the fundamental principles and the programme of action (Agenda 21) for achieving sustainable development.

In its implementation plan, the World Summit on Sustainable Development held in Johannesburg in 2002 agreed, *inter alia* to:

- Encourage the application by 2010 of the "ecosystem approach", which lies in the integration of sometimes conflicting demands in protecting and exploiting the marine environment in such a way that it can continue to support these demands in the long-term;
- Advance implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities and the Montreal Declaration on the Protection of the Marine Environment from Land-based Activities, with particular emphasis in the period 2002-2006 on municipal wastewater, the physical alteration and destruction of habitats, and nutrients, by actions at all levels to:
 - a. Facilitate partnerships, scientific research and diffusion of technical knowledge; mobilize domestic, regional and international resources; and promote human and institutional capacity-building, paying particular attention to the needs of developing countries;
 - b. Strengthen the capacity of developing countries in the development of their national and regional programmes and mechanisms to mainstream the objectives of the Global Programme of Action and to manage the risks and impacts of ocean pollution;

¹¹ The specific objectives of MEDPOL Phase III address the assessment of all sources of pollution; assistance to countries; assessment of status and trends in the quality of the marine and coastal environment; formulation, implementation and monitoring of actions plans, programmes and measures for the prevention and control of pollution

- c. Elaborate regional programmes of action and improve the links with strategic plans for the sustainable development of coastal and marine resources, noting in particular areas which are subject to accelerated environmental changes and development pressures; and
- d. Make every effort to achieve substantial progress by the next Global Programme of Action conference in 2006 to protect the marine environment from land-based activities.

And, at least,

- To improve the scientific understanding and assessment of marine and coastal ecosystems as a fundamental basis for sound decision-making, through actions at all levels to, inter alia:
 - a. Increase scientific and technical collaboration, including integrated assessment at the global and regional levels, including the appropriate transfer of marine science and marine technologies and techniques for the conservation and management of living and non-living marine resources and expanding ocean-observing capabilities for the timely prediction and assessment of the state of marine environment;
 - b. Establish by 2004 a regular process under the United Nations for global reporting and assessment of the state of the marine environment, including socio-economic aspects, both current and foreseeable, building on existing regional assessments;
 - c. Build capacity in marine science, information and management, through, inter alia, promoting the use of environmental impact assessments and environmental evaluation and reporting techniques, for projects or activities that are potentially harmful to the coastal and marine environments and their living and non-living resources; and
 - d. Strengthen the ability of; inter alia, relevant international and regional and sub-regional organizations to build national and local capacity in marine science and the sustainable management of oceans and their resources.

A close examination of scope of the Johannesburg Implementation Plan indicates that the MEDPOL Programme fulfils most of the relevant requirements in the aforesaid plan. For example, the implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities and the Montreal Declaration on the Protection of the Marine Environment from Land-Based Activities, as required by the Johannesburg Plan are, in principle, carried out through the MEDPOL Programme and the Strategic Action Programme (SAP). Specifically, the SAP addresses requirements such as diffusion of technical knowledge; strengthening the capacity of developing countries; elaborating regional programmes of action; increasing scientific and technical collaboration; and building capacity in marine science.

Nevertheless, at least two aspects leading to sustainable development are not addressed in MEDPOL Phase III; the "ecosystem approach", and the improvement of the scientific understanding of assessment of marine and coastal waters. These two aspects have also been identified in a study commissioned by MEDPOL in 2004 to assess whether the SAP could be improved to be a better vehicle for sustainable development of the Mediterranean marine environment¹². The study concluded, among others, that the SAP fails to base its future actions on the results of a risk assessment of serious or irreversible

¹² "Integrating the Strategic Action Programme (SAP) to Address Pollution from Land-Based Activities into the Socio-Economic Policies and Practices of Sustainable Development in the Mediterranean Region", Mohamad Kayyal, May 2004.

environmental damage posed by the evolving land-based activities on the critical marine ecosystem factors of the Mediterranean Sea, in other words the ecosystem approach.

4.5. APPROPRIATENESS OF MEDPOL'S OBJECTIVES TO NEEDS OF THE REGION

Based on our meetings with representatives from National Authorities during the course of this evaluation, the following issues, which reflect actual needs of some countries of the region, were raised:

- Clarification on the fundamental objective of the monitoring programme and the real sense, full implications, and limits of what the MEDPOL Phase III objectives describe as "to provide the Contracting Parties, and other interested parties, with information available on the state of the Mediterranean environment" [UNEP 1999, Tech. Rep. Series, n° 120, §5.2.f], taking into consideration the fact that in some specific cases (e.g. estuaries, offshore activities, ...) pollution is not limited to coastal waters but may affect the offshore areas.
- The need to deal with uncertainties that might arise in the process of implementation of the NAPs. It is the opinion of some of the Contracting Parties that MEDPOL has not formulated a clear strategy to address uncertainties that might arise during the process of implementation, and has not identified the ensuing risks that might jeopardize process ability to achieve objectives.
- The need to address the internal administrative hurdles which National Coordinators will face in the process of implementation of the NAPs. For example, the implementation of pollution control measures requires the full cooperation of all concerned Ministries, e.g. the Ministry of Industry, the Ministry of Agriculture, the Ministry of Tourism; the Ministry of the Environment. Such cooperation is often very difficult to achieve. It is the opinion of some National Coordinators that MEDPOL needs to intervene more aggressively in order to assist in overcoming these obstacles.
- The need to address the significant financial burden which the local economies of developing Mediterranean countries involved in the implementation of the NAPs will experience. Accordingly, some Contracting Parties (particularly developing countries), expect a significant financial contribution and external funding, which if not secured, it will hinder the implementation of a realistic NAP. MEDPOL's assistance in securing these funds is required.
- The need to transform the Strategic Action Programme from a plan based on objectives expressed in terms of reduction of emissions and discharges of pollutants; to a plan which is based on the ecological approach, a concept advocated by the Johannesburg declaration, and which takes into account the state of the marine environment and the initial socio-economic conditions of the individual countries. In this context, pollution targets are typically defined after full analyses of the status and trends of all types of pollution effects; the compilation of pollution sources; and the establishment of links between pollution causes and effects. Based on this analysis, an evaluation of the effects of alternative pollution reduction measures on the quality of the environment and their corresponding costs is undertaken. Consequently, the appropriate levels of pollution reduction can be established depending on available funding and desired objectives.
- The need to implement the Strategic Action Programme while accounting for the differences in the levels of development between the developed and developing Mediterranean states and their economic and social imperatives. This issue is included

in the preamble to the 1996 LBS Protocol and in the objectives of the SAP¹³, but is not stated explicitly in the MEDPOL Phase III Programme (UNEP 1999). For the developing Mediterranean countries, the lack of mention of the differentiated approach comes in conflict with their developmental needs.

When analyzing the above noted issues, we reach the following conclusions concerning the appropriateness of the needs of the countries to MEDPOL's principles and objectives:

- Needs which were raised concerning the National Action Plans are related to the implementation of a future activity, and hence should be included in the formulation of MEDPOL Phase IV.
- The need to define the objective of the monitoring programme is based on questions raised about the contribution of monitoring data to the determination of the state of the marine environment in the Mediterranean Sea. This is a valid issue, and reflects a deficiency in the monitoring objectives of MEDPOL, especially when considering the different types of monitoring activities currently undertaken.
- Needs related to comments questioning the basis and principles of the Strategic Action Programme. In the preparation of the SAP, a transdiagnostic analysis (TDA) was undertaken to identify pollution targets; compile pollution sources; and establish links between pollution causes and effects. Based on this analysis, target dates and amounts for pollution reduction were established. The original TDA remained the basis of the SAP since its inception. Only recently has work been undertaken to update the TDA. More significantly, as the costs for pollution reduction were not assessed, Contracting Parties may find it impossible to abide to these targets within the specified time frame. Thus, the SAP in its present context is commendable from an environmental point of view, but may be unrealistic in some of its expectations. These comments, nevertheless, are outside the scope of work of the MEDPOL programme, since it is the Contracting Parties themselves who have the power to institute any revisions addressing these concerns. Nevertheless, the ecological approach is planned for adoption by MEDPOL Phase IV¹⁴. The differentiated approach was proposed, discussed, and argued against by developed Mediterranean countries.

Therefore, it is concluded that, in general, and taking into account the current issues of relevance to the MEDPOL Phase III Programme, the MEDPOL objectives and principles correspond to what the Contracting Parties were ready to accept at the time of adoption. Monitoring activities, however, are faced with a fundamental problem concerning the ultimate objective the programme is actually attempting to achieve.

4.6. EVALUATION SUMMARY

Based on the foregoing, we find that the activities constituting the "management responsibility" process which are related to the setting of objectives, visions, strategies, and principles for MEDPOL, are being implemented in a "satisfactory" manner. Specifically, we make the following comments:

1. Concerning the appropriateness of the objectives of MEDPOL, we find that the MEDPOL Phase III Programme is legally in line with the Barcelona Convention and the currently in force LBS, Dumping, and Hazardous Waste Protocols. Concerning

¹³ The SAP states that "the timing for targets and for activities may also be different for different countries, taking into account e.g. of the capacity to adapt and reconvert existing installations, the economic capacity and the need for development"

¹⁴ Personal communication with the MEDPOL coordinator

the EU marine strategy, MEDPOL objectives are globally in line with this strategy even though the EU adopts a more exhaustive approach to the marine environment problems, namely the “ecosystem approach”.

2. With respect to the visions and strategies of MEDPOL and its ability to adapt to changes, we find that MEDPOL III has successfully shifted from pollution monitoring in Phase II to pollution control, and moved towards assisting the Mediterranean Countries in the formulation and implementation of pollution monitoring and reduction programmes. Furthermore, specific measures were incorporated in MEDPOL Phase III in response to the shortcomings observed and reported in the evaluation carried out in 1993.
3. Concerning MEDPOL’s contribution to sustainable development, a close examination of the scope of the Johannesburg Implementation Plan indicates that the MEDPOL Programme and specifically the SAP fulfil most of the relevant requirements for sustainable development. Some aspects need to be addressed like the ecosystem approach and improvement of the scientific understanding and assessment of marine and coastal waters.
4. Finally, with respect to the appropriateness of MEDPOL objectives to needs of the region, we conclude that MEDPOL Phase III objectives correspond in general to what the Contracting Parties were ready to accept at the time of adoption; although two conflicting issues were noted by the Contracting Parties; (1) the monitoring programme is faced with a fundamental problem concerning the ultimate objective it is actually attempting to achieve; and (2) there is a need to recognize, when setting targets for pollution reduction, the difference in levels of development between the developed coastal States and the economic and social imperatives of the developing countries.

Given that the activities which constitute the “management responsibility” process are performing in a “satisfactory” manner, we conclude that the process performance is also “satisfactory”. This finding precludes us from the need to carry any in-depth process analysis based on the PDCA methodology.

5. REALIZATION OF WORK PROGRAMMES

5.1. INTRODUCTION

In this section, we evaluate the activities related to the following issues:

- a. Extent to which the expected results and outputs of MEDPOL have been achieved;
- b. Ability to deal with any technical, administrative and/or operational constraints encountered during MEDPOL programme implementation, and examination of actions taken to remedy them; and
- c. Overall cost effectiveness in programme delivery.

As noted previously, activities related to the implementation of MEDPOL programmes fall under the core process titled “realization of work programmes”. In this section, we present our evaluation for each of the above noted issues. We also assess our findings in the framework of the core process “realization of work programmes” in order to identify key areas which have led to activities not performing satisfactorily, with the objective of formulating in Section 8 specific proposals for improving MEDPOL’s performance in this domain.

5.2. SCOPE OF WORK PROGRAMMES

The MEDPOL Programme is responsible for the follow-up of the implementation of the Land-Based Sources Protocol, in addition to the Dumping and the Hazardous Wastes Protocols. Accordingly, MEDPOL Phase III is involved in four work programmes. The two major programmes are:

- Marine pollution monitoring activities including ambient or state monitoring, compliance monitoring, trend monitoring, biological effects monitoring, eutrophication monitoring, and related capacity building activities. This programme has been in effect before the beginning of MAP III in 1995, with the setting up of the operational procedures and strategies in the first two years, and the implementation phase being initiated in 1999; and
- Implementation of the Strategic Action Programme (SAP)¹⁵, the technical arm of the LBS Protocol, which also includes a number of capacity building activities to assist the Contracting Parties in the implementation of action plans, programmes, and measures for the control of pollution. This programme has been in effect since the approval of the SAP in 1997. No work was done on SAP prior to that date.

The two minor programmes are:

- Implementation of the protocol for the prevention and elimination of pollution of the Mediterranean sea by dumping from ships and aircraft. Major work activities were initiated in 2003; and
- Implementation of the protocol for the prevention of pollution of the Mediterranean Sea by transboundary Movements of hazardous Waste and their disposal.

5.3. PROGRAMME FOR THE IMPLEMENTATION OF THE MONITORING ACTIVITIES

The general objectives of the MEDPOL Phase III monitoring activities as approved by the Contracting Parties can be summarized as follows:

¹⁵ Information on the Strategic Action Programme is presented in Annex VII

- To determine temporal trends of some selected contaminants in order to assess the effectiveness of action and policy measures;
- To present periodical assessments of the state of the environment in hot spots and coastal areas (assessments needed to provide information to decision makers on the basic environmental status of the areas which are under anthropogenic pressures); and
- To enhance the control of pollution by means of compliance to national/international regulatory limits.

5.3.1. Achievement of Results and Outputs

a) National Monitoring Agreements

Requirements : The implementation of marine pollution monitoring activities (ambient or state monitoring) is a legal obligation for the Contracting Parties to the 1976 Barcelona Convention (Article 10); and according to Article 8 of the (original) 1976 LBS Protocol, is also an obligation for the Contracting Parties that have ratified the Protocol, though without the legal requirements as to the scope (substances and locations) and frequency thereof. Thus, each country decides on the parameters to be monitored, beyond the mandatory aspects related to the locations where the parameters are to be monitored, and based on the characteristics of its marine and coastal environment. This same legal obligation, i.e. marine pollution monitoring, also appears in Article 12 of the 1995 Barcelona Convention, as amended, and from Article 8 of the 1996 LBS Protocol, which enjoins that the Parties “shall carry out at the earliest possible date monitoring activities and make access to the public of the findings in order to:

- Systematically assess, as far as possible, the levels of pollution along their coasts, in particular with regard to the sectors of activity and categories of substances listed in Annex I, and periodically to provide information in this respect; and
- Evaluate the effectiveness of action plans, programmes and measures implemented under this Protocol to eliminate to the fullest possible extent pollution of the marine environment.”

The Contracting Parties are required to “establish, in close cooperation with the international bodies which they consider competent, complementary or joint programmes, including, as appropriate, programmes at the bilateral or multilateral levels, for pollution monitoring in the Mediterranean Area and shall endeavour to establish a pollution monitoring system for that Area”. Monitoring activities are undertaken by competent authorities (institutions) responsible for pollution monitoring within the areas under their national jurisdiction, which the Contracting Parties designate and provide funding for. Nevertheless, the MEDPOL Programme can provide:

- Financial assistance for the purchase of consumables and equipment;
- Assistance to countries through the implementation of data quality assurance programmes; and
- Technical support by experts to laboratories in case of difficulties.

Outputs: The national monitoring agreements which are prepared by the individual Mediterranean countries take into account the varying goals of each form of monitoring. These are based on common monitoring criteria (parameters, matrices, sampling frequencies ...) and include a list of pollution hot spots, coastal stations, and the participating

institutes. The status of national monitoring agreements for the various Mediterranean Countries is presented in Table 5.1.

Eleven national programmes were finalized during the period of 1999-2004 (from 1999 to 2000 six programmes were adopted, and between 2000 and 2004, five programmes were adopted). Six programmes were revised during 2002 and 2004 in order to avoid inconsistencies faced during implementation.

So, with regard to the present situation, only eleven countries have finalized their bilateral agreements with UNEP/MAP for monitoring and assessment. This number represents about 50 percent of the total number of Contracting Parties. In this context, it is worth noting that some of the countries which have not signed the bilateral agreements, and are not actively participating in the MEDPOL monitoring programme, are European Countries and these already operate well established and functioning monitoring networks.

Country	<i>Drafted</i>	<i>Finalized</i>	<i>Revised</i>
Albania	1998	1999	2003
Algeria	2001, 2004	2004	
Bosnia & Herzegovina			
Croatia	1998	2000	2002
Cyprus	1998	1999	2002
Egypt			
France			
Greece	1999	2000	2003
Israel	2002	2002	
Italy			
Lebanon	2000		
Libya			
Malta	2001		
Monaco			
Morocco	1999, 2003	2004	
Serbia & Montenegro			
Spain			
Slovenia	1998	1999	2002, 2004
Syria	2000, 2003	2003	
Tunisia	2001	2001	
Turkey	1999	2000	2003

Source: MEDPOL Programme Officer

b) State Monitoring

Requirements: Ambient or state marine pollution monitoring activities have been among the basic activities of MEDPOL since its inception, and have continued in Phase III of MEDPOL. State monitoring i.e. the monitoring of water quality and associated effluents including eutrophication monitoring, involves the regular measurement of a set of parameters. Each country agrees, based on the aforementioned monitoring agreements, on the parameters to be monitored beyond the mandatory and the locations where the parameters are to be monitored, on the basis of the characteristics of its marine and coastal environment. Both the

frequency of measurements and the timescale of surveillance can vary from days to years, depending upon the purpose. Similarly, the media examined can include water, sediments and biota. The data can be used to estimate transboundary transport of contaminants.

The results of state monitoring are sent in the form of raw data to MEDPOL in a format that is specified by MEDPOL. In response, MEDPOL undertakes:

- Entry of the data into its database;
- Performing validation in cooperation with the designated scientific institutions; and
- Performing trend analyses;

Surveys are also scheduled in order to complement the state monitoring data and facilitate decision-making for management purposes. These consist of:

- Routine surveys of health-related effects (e.g. occurrence of disease in humans exposed to polluted bathing waters or consumed contaminated seafood); and
- Surveys of point and diffuse land-based sources of pollution needed for the development, compilation and maintenance of inventories.

Outputs: State monitoring of water quality is presently performed solely on biota and sediment. This activity which existed since the beginning of MEDPOL Phase II was further developed in MEDPOL Phase III through National Monitoring Programmes (NMP's), whereby emphasis was placed on the quality of the data. To this end, criteria for monitoring were prepared in 1997, which included a list of the mandatory and recommended parameters to be monitored; the monitoring frequencies; the species to be used; and the required number of samples.

Reference documents which define methods of sampling and mainly methods of analysis were prepared for all parameters. Reference methods for all measurements performed in biota were developed in Phases I and II. Reference methods for sediment measurements, on the other hand, are being revised; [UNEP, 2003a, section 4].

c) Compliance Monitoring

Requirements: The World Health Organisation (WHO) is responsible for those aspects of marine pollution monitoring programme that have a direct relation to human health, i.e. coastal recreational and shellfish waters, and pollution sources (municipal and industrial effluents).

Compliance monitoring is defined as the collection of data through surveillance programmes to verify that the regulatory conditions for a given activity are being met. In the case of identifying an incident of non-compliance, appropriate enforcement can be established which can be escalated until compliance is achieved [UNEP/MAP, Tech. Series, Rep. n°20, Ann., § 2.]. Compliance monitoring involves measurements at the point of discharge.

The compliance monitoring activities of Phase III refer to health-related conditions in bathing and shellfish/aquaculture waters; effluents; and hot spots. Compliance monitoring represents the pollution control component, which is planned as part of the pollution prevention and control strategies to be applied for the implementation of the SAP [UNEP 2003a, section 2.1]. Thus compliance monitoring basically aims to complete the baseline studies for the types and amounts of pollutants dumped/discharged to the marine environment.

Depending of the matrices and parameters included in the programme, compliance monitoring includes:

- Compliance monitoring of health-related conditions (e.g. sanitary quality of bathing areas and waters used for aquaculture, quality of seafood);
- Compliance monitoring of effluents to determine whether the adopted common measures concerning concentrations of contaminants in effluents (e.g. mercury, cadmium) are complied with; and
- Compliance monitoring at hot spots areas to verify whether the environmental quality objectives (EQO) or limit values set in the relevant regulations are being complied with (e.g. DDT in water).

Monitoring activities are undertaken by institutions that the Contracting Parties select, with funding from the Contracting Parties.

As opposed to state monitoring, the Contracting Parties are obliged to submit to MEDPOL an annual compliance monitoring report within the framework of the Monitoring Agreements signed with MAP/MEDPOL. The report should assess whether the water quality, on the one hand, and emissions on the other, are in conformity with their legislation. In addition, they are also invited to provide this information to MEDPOL even if an agreement has not yet been finalized.

Outputs: WHO/MEDPOL manages the compliance monitoring programme and all health related aspects of pollution monitoring, assessment, and control. Table 5.2 presents a list of participating Mediterranean countries to the various components of the compliance monitoring activity. Based on the tabulated information, it is concluded that the number of countries that consistently submitted compliance reports is rather low. Only six countries have submitted their first compliance reports for one or maximum two issues. Yet, some countries only submitted raw data.

In the field of coastal recreational waters, intensive work was carried out during the period under review, in order to amend and finalize the "interim quality criteria and standards for coastal recreational waters", adopted in 1985. Following a number of meetings and consultations, the draft quality criteria and standards were developed by WHO/MEDPOL, taking also into consideration the new developments on the subject on a worldwide scale and within the European region.

Country	Bathing waters	Shellfish aquaculture waters	Effluents	Hot Spots	Number of participating institutes
Albania	..				1
Algeria					20
Bosnia & Herzegovina					
Croatia			8
Cyprus		3
Egypt					
France					
Greece	..				9
Israel					2
Italy					
Lebanon					
Libya					
Malta					
Monaco					
Morocco					6
Serbia & Montenegro					
Spain					
Slovenia	..				2
Syria					4
Tunisia	..				5
Turkey					1

Source: MEDPOL Programme Officer

.. Symbol designates that a compliance report was submitted
Shaded area designates country participation

d) Trend Monitoring

Requirements: Trend monitoring is defined as the repeated measurement of concentrations or effects over a representative period of time, to detect possible changes¹⁶ in the environment in response to policy implementation.

The specific aim of trend monitoring within the MEDPOL Phase III Programme framework is to detect site-specific temporal trends of selected contaminants at hot spots and coastal/reference areas.

This type of monitoring provides information which can be used for the assessment of the state of the environment and the effectiveness of pollution control measures taken. If the effectiveness of measures is deemed inadequate, additional activities may be initiated such as the formulation of new measures or the revision of existing ones [UNEP/MAP, Tech. Series, Rep. n°20, Ann., § 3.].

¹⁶ Observing a change depends on statistical limits (95% confidence limit); number of samples analyzed (locally, nationally); relative standard deviation of the mean concentration (environmental and analytical variability); rate of environmental improvement. All Mediterranean countries agreed on an objective that is to detect a minimum linear trend of 10% per year in 10 years with a 90% power.

Depending of the matrices and parameters included in the programme, trend monitoring includes:

- Coastal zone trend monitoring, through a regional network of selected fixed coastal stations, of parameters that contribute to the assessment of trends and the overall quality status of the Mediterranean Sea;
- Trend monitoring in "hot spots" areas (intensively polluted areas) and high risk areas that are likely to become heavily polluted, are subject to harmful phenomena -such as algal blooms -, or where control measures have been taken; and
- Trend monitoring of loads, e.g. from land based sources of pollution in general or from identified sources; pollutants transported by atmosphere; pollutants carried by rivers; and assessment of loads originating from diffuse sources.

Outputs: As trend monitoring is a repeated measurement over a long period of time, the fulfilment of this type of programme as agreed with MAP/MEDPOL is crucial in order to maintain consistency for data interpretation. Any slight changes or failures in carrying out the adopted sampling strategy can introduce additional variance to sampling results which would fail the realisation of the objective of this monitoring activity.

It appears from the 2003 review of implementation of MEDPOL Phase III monitoring activities [UNEP, 2003], and from the first assessment of data report which was made in 2003 and presented in a meeting in Saronida that:

- *Concerning the trend monitoring of contaminants in sediments;* the sampling strategy used by all the countries participating to the MEDPOL Phase III Programme is not sufficient to address trends. So, a new sampling strategy need to be developed in accordance with the statistical needs related to trends' evaluation.
- *Concerning the trends monitoring with biota;* the main problems identified during this evaluation, which dealt with the consistency of programmes; fulfilment and submission of data, revealed that all the countries involved have more or less serious problems with trend monitoring activities. Some of the problems are of technical nature (difficulties in sampling, inconsistencies occurred in the implementation of declared sampling strategies, instrumentation, data exchange...); others are more related to the countries' organisational structure (number of laboratories involved, change in participants...).

Table 5.3 shows details of participating Mediterranean countries to the various components of trends and state monitoring activities. As can be seen, about 50 percent of the Mediterranean countries have participated in the main components of the trend monitoring programme. In this context, it is worth noting that some of the countries which have not signed monitoring agreements are European Countries and these already operate well established trend monitoring activities.

e) Biological Effects' Monitoring

Requirements: Biological effects' monitoring (monitoring with biomarkers) is the only monitoring activity to provide information on the direct impact of pollutants on marine flora and fauna. Biomarkers are generally considered as "impact" indicators used for the evaluation of toxic effects of pollutants on coastal marine life. As such, the biological effects monitoring was included in the MEDPOL Phase III monitoring programmes and launched as a pilot activity; [UNEP, 2003a, section 2] to test the methodology as well as its utilisation as an early-warning tool to detect destructive effects of pollutants on marine organisms at initial stages of exposures.

Three main elements were taken into account: the choice of the sentinel organisms; the use of a battery of biomarkers (for stress and exposure); and the development of a quality assurance programme.

Table 5.3: Participating Mediterranean Countries to the Various Components of Trends and State Monitoring

Country	Coastal Areas & Hot Spots			Point and Diffuse Sources	Number of Participating Institutes
	Biota	Sediment	Different matrices	Monitoring of loads	
Albania					2
Algeria					10
Bosnia & Herzegovina					
Croatia					4
Cyprus					2
Egypt					
France					
Greece					12
Israel					2
Italy					
Lebanon					
Libya					
Malta					
Monaco					
Morocco					6
Serbia & Montenegro					
Spain					
Slovenia					2
Syria					5
Tunisia					2
Turkey					1

Source: MEDPOL Programme Officer

Shaded area designates country participation

Outputs: Three main elements constitute the biological effects monitoring programme: (1) the choice of the sentinel organisms; (2) the use of a battery of biomarkers (for stress and exposure); and (3) the development of a quality assurance programme. This QA programme involved in particular distributing a UNEP/MAP Manual for biomarker utilisation; circulating a video produced by Ramoge which is the organisation of intercalibration activities¹⁷ at the University of Alessandria's Di.S.A.V. laboratory; and conducting a training course at the research laboratory of the Centre for Interuniversity at Genova University (Italy), which attracted researchers from 16 Mediterranean countries [UNEP(DEC)MED WG.243/4, 3 March 2004].

¹⁷ The results of the 2001 inter-calibration exercise bore witness to the high quality and comparability of data obtained by the laboratories participating in the bio-monitoring programme for three biomarkers: lysosomal membrane stability, metallothionein content, and EROD activity.

In addition to the training course realised in Genova, and in order to enhance and further develop the bio-monitoring programme, MEDPOL arranged for conducting three inter-calibration exercises in 2001. The results of the 2001 training course and inter-calibration exercises show that bio-monitoring activities are on the rise along the Mediterranean coast.

To this date, only four countries (Croatia, Greece, Slovenia and Tunisia) submitted data to MEDPOL, and participated to the first inter-calibration exercise, nevertheless, the 2001-2003 activity report indicates that laboratories in countries are ready to launch bio-monitoring; a credit to the quality of training provided to laboratory technicians by the MEDPOL Programme.

Table 5.4 includes details of participating Mediterranean countries to the various components of the biological effects monitoring activities.

Country	Type of Biomarkers			Number of Participating Institutes
	General stress	Specific stress	Others	
Albania				2
Algeria				1
Bosnia & Herzegovina				
Croatia				1
Cyprus				2
Egypt				
France				
Greece				3
Israel				
Italy				
Lebanon				
Libya				
Malta				
Monaco				
Morocco				3
Serbia & Montenegro				
Spain				
Slovenia				1
Syria				1
Tunisia				2
Turkey				

Source: MEDPOL Programme Officer
Shaded area designates country participation

As can be seen, only eight Mediterranean countries are involved, however, in MEDPOL III, biological effects monitoring is a pilot activity and when considering that seven out of the eight countries are non-European (which already have such activity).

f) Monitoring of Eutrophication

Requirements: Monitoring of eutrophication was recently introduced in the MEDPOL work programme. The monitoring sites are selected where the eutrophication phenomena is most evident, and/or where this is a significant risk of eutrophication as a result of the direct impact of anthropogenic nutrients and organic material inputs [UNEP, 2003a, Section 2].

Outputs: As a first step for introducing the monitoring of eutrophication, IAEA/MEL prepared in 2003 a draft reference methods' manual [UNEP 2003c] describing the mandatory and recommended parameters to be monitored (Ref. Table 1). Guidelines are also being produced for monitoring of eutrophication [UNEP 2003b, section 2].

A Data Quality Assurance (DQA) system is being also established for eutrophication monitoring, in cooperation with ICRAM, an Italian institute. A first training program was organised in Italy in June 2003. Researchers from eight countries attended the course. A second training programme was performed in November 2004. Eleven countries participated. Overall for both activities, 21 people from 18 institutes located in 14 Mediterranean countries were present.

MEDPOL is also planning to initiate a short-term strategy through the launching of a number of pilot programmes, with priority given to countries proposing sites that exhibit clear eutrophication symptoms. The ultimate goal of MEDPOL is to gradually include all eutrophication hot spots within the regional programme for monitoring of eutrophication. The formulation of pilot monitoring programmes was initiated in 2004.

g) Database Management

Requirements: MEDPOL began re-structuring its monitoring database in 2001 in order to:

- increase its data storage and management capabilities according to the needs of MEDPOL Phase III and to achieve internet access to the database;
- establish routine data loading after each data submission period and to apply a data verification/validation procedure accordingly;
- provide frequently updated information on monitoring activities and a data inventory to be published in the internet;
- provide a set of basic reports which would allow for a quick assessment of the data base, hence, that of monitoring programmes and their results; and
- provide validated monitoring data on trends and status for regional assessments and to achieve a well functioning data flow.

Further to these restructuring efforts, the Contracting Parties approved the "Conceptual Design of the MEDPOL Phase III Database" in 2002. (Doc. UNEP(DEC)/MED WG.202/2, rev.9/4/2002).

Outputs: After the Contracting Parties approved the "Conceptual Design of the MEDPOL Phase III Database" as a basis for the development and finalization of the database, the database and its modules were developed and tested.

Available monitoring data for the 1999-2002 periods were then loaded. In early 2003, an internet version of the database was published and updated several times with new incoming information and data.

Priority was given to loading of all available MEDPOL Phase III data submitted, and thus to establishing a standard way for data storage and to testing the database. A standard data verification/validation procedure was performed after the first loading of the database for all accumulated data, which was in 2003. This process is being routinely applied ever since (i.e. in 2004).

h) Data Quality Assurance

Requirements: A fundamental requirement for monitoring and assessment of marine contamination is accurate analytical data for pollutants' concentrations in the various environmental compartments. For this purpose, the analytical methods used by the laboratories need to be validated and tested. Moreover, laboratories must adopt Quality Assurance/Quality Control (QA/QC) practices, and participate regularly in blind inter-laboratory analytical comparison exercises. Inter-laboratory comparisons are not only essential for checking the accuracy of the analytical results, but also are indispensable for ensuring comparability between the participating laboratories in the network, in addition to stimulating better analytical performance.

Outputs: A Data Quality Assurance (DQA) system was set up in cooperation with the IAEA for state/trend monitoring, which included:

- *Training of laboratory personnel:* The Contracting Parties submitted applications for candidates to attend the training programmes. The applications were reviewed, and a specific number of trainees are selected to attend; travel and accommodation expenses are covered;
- *Inter-calibration exercises:* These are set-up, mainly for trend monitoring. Samples with known pollutants' concentrations were sent to various laboratories for analysis; and
- *Technical support:* This is provided in the form of laboratory visits of experts and analysis of split samples.

The IAEA is scheduled to evaluate the overall performance of the laboratories in the framework of Phase III. To our knowledge, evaluation was being performed at the time of preparation of this report.

The Data Quality Assurance which related to compliance monitoring for coastal bathing waters was preformed with the cooperation of WHO/MEDPOL and included training of laboratory personnel along with inter-calibration exercises performed in microbiological laboratories. Reports on the training courses are included in Annex IX. Technical support in the form of consumables was provided to a limited number of microbiological laboratories.

i) Capacity Building

Requirements: The objective of the capacity building element of the MEDPOL Phase III Programme is "to facilitate the full participation of all the Contracting Parties in MEDPOL, including the implementation of the action plans, programmes and measures for the control of pollution and the recommendations adopted by the Contracting Parties" [UNEP/MAP, Tech. Rep. Series n° 120].

According to the MEDPOL Programme [UNEP/MAP, Tech. Rep. Series n° 120, Chapter 7], the achievement of the stated objective, vis-à-vis the monitoring activities, is obtained by providing countries requesting assistance with:

- Technical advice on the most suitable institutional arrangements that may be needed for the implementation of the MEDPOL Programme;
- Advice and technical assistance in all aspects of design and implementation of national MEDPOL Programmes;
- Preparation of individual and group training (e.g. seminars, workshops) of national experts (administrations, technicians, scientists) in all subjects related to the MEDPOL programme;
- Equipment and material donated to the National MEDPOL collaborating institutions;
- Preparation of guidelines, manuals, documents and reference publications relevant to the implementation of the MEDPOL Programme; and
- Assistance in maintaining the analytical equipment used in national pollution monitoring programmes.

Outputs: Concerning the implementation of the national monitoring programmes, capacity building activities are carried out under the technical supervision of the Marine Environmental Laboratory of the IAEA (IAEA/MEL)¹⁸ through joint inter-comparison and inter-calibration exercises and training courses in various aspects of analytical chemistry as part of an integrated programme of quality assurance for Member States.

The Marine Environmental Laboratory (IAEA/MEL) carried out a number of capacity building activities (training, data quality assurance and inter-calibration) for the implementation of the national monitoring programmes. The scope of these activities included:

- *Implementation of national monitoring programmes:* Two training courses on analysis of organic contaminants in which twelve scientists were trained, and inorganic contaminants in which three scientists were trained, were held in Monaco in 2002. These courses were conducted once in 2003 and twice in 2004. Capacity building included the provision of analytical instrumentation, together with chemicals and general laboratory tools and chemicals.
- *Conducting inter-comparison exercises* on trace organic compounds for over twenty years as part of its contribution to UNEP's Regional Seas Programme, and, occasionally, in association with the Intergovernmental Oceanographic Commission (of UNESCO), and the GIPME (Global Investigation of the Pollution in the Marine environment) programme. These exercises are organized yearly on a continuous basis. The last inter-comparison exercise was organized in September 2002 and devoted to the determination of organochlorine compounds and petroleum hydrocarbons in mussel

¹⁸ The marine environmental laboratory responds regularly to requests for technical assistance from any other United Nations agency, international organizations and governments. Within the UN, cooperative activities are formally established with the UNEP and IOC-UNESCO. There is also extensive collaboration with the World Meteorological Organization, the World Health Organization, the World Bank, the UNDP, the UN Food and Agriculture Organization and the International Union for the Conservation of Nature in programmes of assistance for developing countries. A focal point for this cooperation is being provided by the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities, which is supported by Member States and requires the services of the marine environmental laboratory for analytical capacity building.

tissue. Forty-one laboratories representing 14 Mediterranean countries¹⁹ participated [IAEA/MEL Report n° 74, March 2004]. Results of the inter-comparison exercise revealed for the organochlorine compounds some serious difficulties for many laboratories to obtain comparable data. Errors were associated with the analytical procedures. Concerning petroleum hydrocarbons, a large number of the laboratories achieved satisfactory performance. Inter-Calibration Exercises for contaminants in biota and sediments were carried out in 2002 to 2004.

- *Management of a data Quality Assurance Programme for chemical analysis.* This programme has been in place since the outset of the monitoring programme. Its objective is to ensure accurate analytical data for pollutant concentrations in the various environmental compartments by validating the analytical methods used by the laboratories.

j) Evaluation of Implementation of Monitoring Programme

Based on the foregoing, and in relation to the extent to which the expected results and outputs of the monitoring activities have been achieved, we make the following comments:

- With respect to preparation for programme implementation such as the setting up of the operational procedures (e.g. reference methods, quality criteria and standards, materials for capacity building, monitoring database), performance is “satisfactory”.
- Concerning the success that MEDPOL achieved in monitoring programme implementation, it is clear that MEDPOL’s performance is “unsatisfactory”. For example, MEDPOL was effective or successful in convincing only one half the Mediterranean countries to formally finalize their bilateral agreements with UNEP/MAP for monitoring and assessment.

5.3.2. Ability to Deal with Constraints and Remedial Measures

In the course of implementation of the monitoring activities, the MEDPOL programme officer faces various problems in programme implementation. These problems often result in negative impacts on the monitoring programme’s objectives. Problems may be caused from administrative, operational, or technical constraints. Following in Table 5.5, we explain the types of problems facing the monitoring programme, types of constraints, adopted remedial measures, and their effectiveness.

As can be seen, administrative problems, based on inputs provided by MEDPOL programme officer, are the hardest to deal with. Remedial measures typically vary from moderately ineffective to moderately effective. In contrast, problems of operational nature are simpler to deal with, resulting in highly effective remedial measures. This may be explained by the fact that operational problems can be resolved directly between the MEDPOL programme officer and the party facing this problem, whereas administrative problems require the involvement of persons in the higher political hierarchy or from national governmental authorities.

Based on the foregoing and taking into consideration that some remedial measures adopted by MEDPOL were ineffective in addressing constraints of critical nature to the success of the monitoring programme (i.e. the number of countries which signed monitoring agreements); we conclude that the ability of MEDPOL to deal with constraints for the monitoring programme is “unsatisfactory”.

¹⁹ Albania, Croatia, Cyprus, Egypt, France, Greece, Italy, Monaco, Morocco, Slovenia, Spain, Syria, Tunisia and Turkey

Table 5.5: Constraints Facing the Monitoring Programme and Remedial Measures

Problems	Type of Constraint			Remedial Measures	Highly Effective	Moderately Effective	Not Effective
	Technical	Operational	Administrative				
Lack of feedback from CP on need for information on scientific and technical issues				Search for publications available on the internet, and inform scientists and experts of available resources			
Inability to convince CP to formalize national monitoring agreements with MEDPOL				Contact the countries continuously, and raise issues in routine meetings every 2 years, and publicize issue on internet			
There are no routine and timely submission and processing of monitoring data				Annual timetable for data submission was established and as a result data was reported in standard format and loaded in database and verification procedure was applied			
There are some difficulties in the exchange of monitoring data and transfer from EU-MED countries				It was agreed with EEA that data already submitted to MEDPOL will be transmitted to EEA from MEDPOL's database from 2003 to 2004 and this will continue thereafter ²⁾			
There are delays and gaps in monitoring data submission dates				Ask countries to submit accordance to the timetable noted in their monitoring agreements. Contact NC to follow-up			
Some countries cannot make effective use of allocated fund in the implementation of the monitoring agreements due to administrative and bureaucratic constraints from MEDPOL and the government				Define constraints clearly in the memorandum of understanding. In the correspondence, MEDPOL reminds countries on necessary steps to undertake in order to facilitate the process of mobilizing funds			

5.3.3. Cost Effectiveness in Programme Delivery

One possible means for evaluating cost effectiveness for the monitoring programme is to analyze a specific activity in that programme in terms of its costs and benefits. Following is an example for the costs and benefits for the monitoring programme in Cyprus for the year 2002. The programme consists of state, trend, and compliance monitoring for the coastal marine waters. Table 5.6 provides full details on the costs and associated benefits. Figures on costs were provided to MEDPOL by Cyprus national authorities. As can be seen, the total cost of the programme amounts to 60,000 USD per year. In this case, MEDPOL finances 25 percent of the cost. The final cost per analyzed sample is 375 USD.

The benefits accrued from this monitoring programme are best expressed by a statement made by one of the stakeholders we met in Cyprus in the course of our evaluation *“UNEP/MAP introduced the concept of environmental protection in Cyprus in 1975 at a time when politicians did not dare introduce this topic in their political agenda. Monitoring programmes were the means by which everyone was becoming aware of the need for protecting our coastal marine waters”*.

Hence, we conclude that monitoring programmes are cost effective in the long run (particularly since MEDPOL finances only 25 percent of the cost) in terms of the change in

²⁾ This is not a formal agreement, but only stated in correspondence and minutes of meetings. This will be included in a package with MAP in the future

attitude they generate with the local population towards pollution and the environment. This, in turn, serves towards the achievement of MEDPOL's ultimate goals and objectives in pollution reduction and control for the Mediterranean Sea.

Table 5.6: Costs and Benefits of the Monitoring Programmes in Cyprus	
Description of Activities	Associated Costs or Anticipated Benefits
Cost of conducting the analysis <ul style="list-style-type: none"> ▪ Instruments and equipment ▪ Chemicals ▪ Consumables 	35,000 USD
Cost of sampling <ul style="list-style-type: none"> ▪ Ship time ▪ Sampling vehicle ▪ Personnel 	10,000 USD
Additional expenses contributed by MEDPOL ²¹ <ul style="list-style-type: none"> ▪ Equipment and laboratory expenses ▪ Administrative costs 	8000 USD 7000 USD
<i>TOTAL COSTS</i>	<i>60,000 USD</i>
Number of measurements per year	700
Number of individual tested parameters	35
Total number of samples	160
COST PER SAMPLE	375 USD

5.4. PROGRAMME FOR THE IMPLEMENTATION OF THE LBS P ROTOCOL

In the past four years, “the main task” of MEDPOL has become the integration of all present activities and acquired capacities for the implementation of the Strategic Action Programme (SAP), the technical arm of the LBS Protocol; adopted by the Contracting Parties in 1997 according to the commitment of Articles 5, 6 and 7 of the 1980 LBS Protocol to set up pollution reduction programmes.

General Requirements of the LBS Protocol: Article 5 of the 1996 LBS Protocol (General Obligations) provides that in order to fulfil the LBS Protocol requirements concerning the elimination of pollution deriving from land-based sources and activities, in particular to phase out inputs of the substances that are toxic, persistent and liable to bio-accumulate, the Contracting Parties “shall elaborate and implement, individually or jointly, as appropriate, national and regional action plans and programmes, containing measures and timetables for their implementation”.

Article 15 of the LBS Protocol related to the adoption of action plans, programmes and measures, provides that the Contracting Parties shall adopt, by a two-thirds majority, the short-term and medium-term regional action plans and programmes containing measures and timetables for their implementation provided for in Article 5 of this Protocol (Article 15, 1). Such measures and timetables “become binding (...) for the Parties which have not notified the Secretariat of an objection (...)” (Article 15, 3).

Thus, introduced by Article 5 of the LBS Protocol, the concept of “binding measures and timetables” is confirmed by Article 15 of the Protocol.

General Requirements of the SAP : The SAP includes targets and activities for selected areas and categories of pollutants, and provides details of accompanying activities and provisions for assistance. Actions and targets in the SAP are prioritised in accordance with

²¹ Figure obtained from the monitoring agreement with Cyprus

the Global Programme of Action (Washington, 1995). These are grouped in three main areas, and subdivided into a number of categories within each area:

- a) Urban environment, including municipal sewage; urban solid waste; and air pollution;
- b) Industrial development including i) toxic, persistent organic pollutants and heavy metals; ii) other heavy metals; iii) organo-halogen compounds; iv) radioactive substances; v) nutrients and suspended solids; and vi) hazardous wastes; and
- c) Physical alterations and destruction of habitats, with activities targeted on the national and regional levels.

In order to fulfil these requirements, the following accompanying activities directly addressing pollution are envisaged:

- Specifying targets for pollution reduction of a broad range of substances; dates for the reduction of pollution up to 2025, with intermediate targets set for 2010²². Industries that comply with existing regulations can be exempt from these pollution reduction targets.
- Compilation of hot spots and sensitive areas for all countries (with an obligation for each country to at least include five such areas), with an assessment of the necessary measures and associated investments for pollution reduction and control²³;
- Compilation of National Action Plans (NAPs) [SAP, Section 10], with the objective of formulating measures, timetables and priorities for action and investment. For the formulation of the NAPs, the compilation of National Diagnostic Analysis (NDAs) and National Baseline Budgets of pollutants are envisioned; and
- Commitment for regulation of pollution sources [section 10.6], as well as compliance monitoring and enforcement [section 10.8].

Additional activities are planned also for monitoring, capacity building, public participation and reporting.

5.4.1. Achievement of Results and Outputs

a) Hot Spots

Requirements: As underlined by the MEDPOL Phase III Programme, the preparation of inventories of point and diffuse sources of pollution, particularly land-based sources, has been given high priority, since such information is necessary for making management decisions. Within this context, and in order to enable the contracting parties to prioritise interventions for decreasing pollution from land-based activities, the Contracting Parties agreed to focus their efforts on:

- The identification of point sources on the coast, from which high levels of pollution loads are discharged and which potentially affect, in a significant manner, human health, ecosystems, biodiversity, sustainability, or the economy. These point sources

²² By the year 2025, point source discharges and air emissions from industrial installations shall be in conformity with provisions of the protocol of 1996; in the interim "by the year 2010", discharges, emissions and losses of substances that are toxic, persistent and liable to bio-accumulate from industrial installations must be reduced by 50%.

²³ This information was updated in 2001 with 150,000 USD spent from the GEF funds. The work on hot spots was followed by pre-investment studies, about one for each country with the exception of the European Union countries, Monaco, Malta, Cyprus and Israel, which are not eligible for financing by the GEF.

- include coastal cities and urban agglomerations with more than 100,000 inhabitants, and major industries discharging directly into the sea; and
- the identification of coastal areas where the coastal marine environment is subject to pollution from one or more point or diffuse sources, which potentially affect, in a significant manner, human health, ecosystems, biodiversity, sustainability or the economy.

This so called "hot spots" approach is based on "indicators" (primary) which include: biochemical oxygen demand (BOD); nutrients (phosphorus, nitrogen); total suspended solids; oil (petroleum, hydrocarbons); heavy metals; persistent organic pollutants (POPs); radioactive substances (if relevant); litter; micro-organisms (faecal coliforms, E. coli, faecal streptococci); and organisms (e.g. macroalgae, for the soluble phase, mussels for the particulate phase and a detritus feeder for the sediments phase).

Outputs: The first activity carried out between July 1996 and May 1997 was the identification of 103 major pollution "Hot Spots". All countries, except Monaco, have identified about four to five hot spots, as well as the costs for remediation.

On the basis of this inventory -which also included the proposed remedial actions and their cost- and after formally adopting by the Contracting Parties the criteria for the prioritisation of the pollution hot spots taking into consideration the potential risk of transboundary effects, a final priority list of pollution hot spots for the preparation of pre-investments studies was adopted in March 2002. The overall activity for setting up the indicators, the evaluation of the national reports, and the preparation of national lists of pollution hot spots, as well as their transboundary aspects, was entrusted to WHO/MEDPOL. This list takes into account the socio-economic criteria, as prepared by METAP and specifically required by the GEF Project management.

Preparation of pre-investment studies for pollution hot spots is supported by the GEF Project. FFEM, as the main partner for this action, has decided that it would directly support the preparation of pre-investment studies in four countries (Algeria, Lebanon, Morocco and Tunisia). Unfortunately, these activities were not initiated. In order to resolve this problem, a framework agreement between FFEM and MEDU concerning their contribution to the GEF Project was signed in 2003.

In order to revalidate the prioritized pollution hot spots (i.e. to prepare terms of reference for the preparation of the pre-investment studies, and assess the costs for the preparation of pre-investment studies including the identification of the implementing agency), five countries (Albania, Bosnia and Herzegovina, Egypt, Syria, and Turkey) were selected, and visits were conducted between May and September 2002. Egypt, Syria, Albania and Turkey signed a letter of agreement for the preparation of a pre-investment study. Generic terms of reference (TOR) were prepared by METAP, which were used to prepare the TOR for each country.

The exercise was completed in 2003 and all the countries (GEF eligible and non-eligible countries) updated their national pollution hot spots areas by providing the necessary information. The collection of information regarding the national hot spot areas, including the hot spots' natural characteristics and pressures, as well as a comparison between old and updated data, was published in document UNEP(DEC)/MED WG.231/5.

ICS/UNIDO is directly supporting the preparation of one pre-investment study in Croatia. The contract between ICS/UNIDO and the Croatian authorities for the preparation of the study has been signed and the activities on the preparation of the study were recently initiated.

b) Pollution Sensitive Areas

Requirements : Sensitive areas of the Mediterranean basin are of great importance because of their potential capacity to become, if not protected, future pollution hot spots. If such a development takes place, sensitive areas will require huge investments for their rehabilitation, instead of very moderate ones for their actual protection.

In the document on the "Identification of Priority Pollution Hot Spots and Sensitive Area in the Mediterranean Sea" (MAP technical Report Series No. 124, UNEP, 1999), sensitive areas are described as "estuaries and coastal waters of natural or socioeconomic value ... if they are at higher risk to suffer negative impacts from human activities". Human activities determine the level of risk hence planned development may increase the risk of environmental degradation. Both vulnerability and risk contribute to the "sensitivity" of a particular area or system in the context of this assessment".

The identification and ranking of sensitive areas is included in the framework of the development of the Strategic Action Programme (SAP) for the Mediterranean Sea, as a follow-up to the signing of the Protocol for the Protection of the Mediterranean Sea against pollution from Land Based Sources and Activities.

Outputs: WHO/MEDPOL prepared a working paper in order to establish a series of criteria and to develop a ranking system for the evaluation of the pollution sensitive areas in the Mediterranean Sea. The ranking system is capable of describing the pollution effects and their severity on the sensitive areas, taking into consideration both the environment and human health. The identification and ranking of sensitive areas is included in the framework of the development of a Strategic Action Programme (SAP) for the Mediterranean Sea, as a follow-up to the signing of the Protocol for the Protection of the Mediterranean Sea against pollution from Land Based Sources and Activities.

In November 2002, a consultation meeting on the criteria for the prioritisation of pollution sensitive areas was held in Athens. Following this meeting and after receiving the MEDPOL National coordinators' comments and reports, a document was produced by WHO/MEDPOL on the revised national pollution sensitive areas in the Mediterranean Sea indicating the immediate measures to be taken. This report has been presented as information document at the meeting of the MEDPOL National Coordinators at Sangemini, in May 2003 (Doc. UNEP(DEC)/MED WG.231/Inf.14).

c) National Diagnostic Analyses

Requirements : According to the 1997 Strategic Action Programme, the National Diagnostic Analysis is the first step for elaborating National Action Plans. In fact, it is one of two major inputs for the preparation of these plans.

The basic objective of the NDA is to identify and assess the national conditions and major environmental and health issues concerning pollution resulting from all industrial and urban coastal sources; emissions being compiled by sectors. This approach combines six elements: identification of the nature and severity of problems, contaminants, physical alterations and destruction of habitats, sources of degradation, significance of impacts, and areas of concern.

The purpose of the NDA is the association of pollution sources with observed pollutants in the environment, i.e. the establishment of the cause-effect relationship, which is of primary importance for the formulation of pollution control policies.

Outputs: Due to the complexity of the NDA issue, the secretariat produced "Guidelines for the preparation of National Diagnostic Analysis" by making use of the Mediterranean GEF Project funds. Five sub-regional meetings for the national experts responsible for the preparation of NDA were held to explain the NDA process. A report pinpointing the

difficulties met by the national experts and the assistance needed was prepared for consideration by the MEDPOL coordinators.

To the date of preparation of this report, the Secretariat received 17 National Diagnostic Analysis (of the 21 Mediterranean countries)²⁴ from the countries noted below:

Albania	Greece	Slovenia
Algeria	Israel	Syria
Bosnia and Herzegovina	Lebanon	Tunisia
Croatia	Libya	Turkey
Cyprus	Malta	Palestinian Authority
Egypt	Morocco	

In order to harmonize the information included in these reports, the secretariat is reviewing them with the assistance of a regional expert. Comments are being sent to the national experts for consideration and finalisation.

France, Italy and Spain are in the process of preparing their NDA reports. Indeed, these countries have similar obligations to the NDA under the EU Directive 96/61/EC on Integrated Pollution Prevention and Control (IPPC) which provides for the setting up of a public European Pollutant emission register (EPER). This register is intended to address the requirement of policy-makers, as well as the public at large, for better information on the amounts of pollution that different installations are responsible for, and to provide environmental information on major industrial activities. It may contain the reported emission data from national governments of all EC member States. The governments are required to maintain inventories of emission data from specified industrial sources and to report emissions from individual facilities to the European Commission.

d) National Baseline Budgets

Requirements: The National Baseline Budgets elaboration constitutes the basis and the first step for the preparation of the National Action Plans. Applying a National Budget Approach means that each Mediterranean country undertakes to reduce by (x%) their aggregate releases of a targeted pollutant by the year “y” with a reference to a National Baseline Budget of release for each SAP targeted pollutant. The National MEDPOL coordinators agreed to adopt the year 2003 as the year for calculating the budget of releases of each targeted pollutant in order to initiate the agreed reductions and monitor progress in subsequent years.

The National Baseline Budget (NBB) is essentially a database of emissions of all point sources in the coastal areas of the Mediterranean, grouped by regions, with the purpose of serving as reference points for pollution reduction. They represent an intermediate step in pollution reduction.

Outputs: During the biennium 2002-2003, and in order to help the Mediterranean countries to formulate their National Action Plans, the secretariat made use of the Mediterranean GEF Project funds, and prepared “Guidelines for the preparation of the Baseline Budget of Releases”. In addition, and in cooperation with RAMOGE, a software database programme was prepared to be used by national experts and authorities in the estimation of releases from the industrial sectors included in Annex (1, a) of the LBS Protocol. These guidelines provide a detailed methodology for the compilation of the NBB [UNEP, 2002a], including emission factors for the assessment of pollution from industrial processes where effluent pollution data are not available. The output of the NBB includes pollution streams from all

²⁴ Personal communication with MEDPOL Programme Officer

point sources located in coastal administrative regions, and covers all substances included in the Strategic Action Programme to address pollution from land-based activities (SAP).

In order to increase the prospects for the successful preparation of the baseline budgets, a number of training courses were organised in five sub-regions intended, not only to review and discuss the guidelines, but also to harmonize the outputs of the national experts; to enhance the horizontal cooperation between experts from different countries who might face similar problems; and to constitute a Mediterranean SAP hub which could play a major role in the preparation of the National Action Plans. For these courses, training materials were prepared. The course materials included software facilitating the evaluation of emissions through the use of emission factors.

At the conclusion of the training activities, a report was prepared for consideration by the MEDPOL Coordinators pinpointing the difficulties and the assistance needed by the national expert and means to overcome these difficulties (UNEP(DEC)/MED WG.231/INF.4).

The National Baseline Budget reports were submitted by the following 17 countries²⁵:

Albania	Greece	Slovenia
Algeria	Israel	Syria
Bosnia and Herzegovina	Lebanon	Tunisia
Croatia	Libya	Turkey
Cyprus	Malta	Palestinian Authority
Egypt	Morocco	

The NBBs of the remaining countries are under preparation.

The Secretariat is currently in the process of preparing an award for the compilation of a database of pollution emissions to the Mediterranean on a regional basis, i.e. the records of the database will be the total emissions per region as evaluated in the NBBs. Thus, the Secretariat will soon be in a position to evaluate the total baseline pollution input from point sources in coastal administrative regions in the Mediterranean.

e) National Action Plans

Requirements: Considering that the MEDPOL Phase III Programme was clearly prepared in order to implement the amended 1995 Barcelona Convention and 1996 LBS Protocol (UNEP, 1999, § 3.1), the general objective for the National Action Plans, in accordance with Article 5 of the 1996 LBS Protocol, is “to eliminate pollution deriving from land-based resources and activities, in particular to phase out inputs of the substances which are toxic, persistent and liable to bio-accumulate” listed in Annex (1, c) of the Protocol.

The aforesaid Annex draws up an exhaustive list of 19 categories of substances and sources of pollution selected with regards to a series of 13 different criteria including persistence, toxicity (or other noxious properties – e.g. carcinogenicity, mutagenicity, teratogenicity – and bio-accumulation), without specifying exactly which substances or group of substances are addressed by Article 5.

Once prepared, the NAPs will have to be officially adopted by the relevant national authorities and bodies in order to ensure the necessary legal basis; resources; and institutional arrangements for their implementation.

²⁵ Personal communication with Programme Officer

The Strategic Action Programme (UNEP, 1999, § 10.1) stipulates that the Contracting Parties have to develop (or review) their National Actions Plans within 5 years and take action to implement these programmes.

The industries to be considered for future pollution reduction in the National Action Plans will not include those that use Best Available Techniques (BAT) and are in compliance with national environmental legislation [UNEP, 2003d].

Outputs: On the basis of the SAP implementation work plan, Mediterranean countries are expected to formulate their Sectoral and National Action Plans to address pollution from land-based activities by mid 2005, with a view at making them fully operational by the end of year 2005. Consequently, at the time of preparation of this report, action plans were still being prepared by the Mediterranean countries and were not yet submitted to the secretariat. In order to assist the national experts prepare the sectoral and national action plans, a set of regional guidelines and plans were discussed and adopted in an expert meeting which was held in Split, Croatia, on 18-20 March 2003. These consisted of regional guidelines for reduction of BOD and for application of BAT, BEP and CT. These guidelines were assembled on CD ROM titled "Regional Plans and Guidelines related to the implementation of the SAP to address pollution from land-based activities", and were included with other related documents which were prepared by WHO/MEDPOL, including *inter alia* the guidelines on (a) municipal Wastewater reuse, (b) environmental compliance and enforcement, (c) management of industrial wastewater, (d) sewage treatment and disposal, and (e) management of coastal litter.

The kick-off of the process for preparation of the sectoral plans and national action plans was initiated in a meeting held in Izmit, Turkey, between 4 and 6 March 2004. National experts from all Mediterranean countries were invited and provided with hands-on training on the preparation of the Sectoral Plans and National Action Plans. Related documents were also distributed, such as guidance for conducting stakeholders' meetings. Experts from MEDPOL are currently visiting Mediterranean countries which have embarked on this process in order to assist national experts successfully complete this first phase of the process (stakeholders' meetings) for the preparation of the sectoral and national action plans. An explanatory note on the preparation of the sectoral and national action plans was also recently provided for clarifying specific issues and the entire process as a guidance to experts and national authorities.

f) Pollution Inspection and Control

Requirements : In compliance with Article 6 of the LBS Protocol regarding the authorization of regulation system for the point sources that discharge into the Protocol Areas and for the releases into water or air that reach and may affect the Mediterranean area, the Contracting Parties shall provide for systems of inspection by their competent authorities.

In addition, the Contracting Parties may be assisted by the Organization upon request, in establishing new, or strengthening existing competent structures for inspection of compliance with authorizations and regulations. Such assistance shall also include special training of personnel, capacity building of local authorities, and implementation of pilot projects such as "Pollutants Release & Transfer Registers" (PRTR) from industrial sources. In 1997, the Strategic Action Programme (SAP) introduced new types of monitoring, which have to be taken into account at the regional and national levels in order to meet the SAP targets and objectives. Monitoring activities related to the implementation of SAP are organized within the framework of MEDPOL Phase III Programme, adopted in 1996. The respective proposed targets are related to the establishment of:

- Programmes for monitoring inputs of priority pollutants;
- Permanent river water quantity/quality registers;

- Inspection systems; and
- Programmes for monitoring discharges and emissions of priority pollutants.

In addition, these programs include the monitoring of the quality of the marine environment.

Outputs: In order to assist substantially the Contracting Parties on the inspection systems, a number of activities were performed. These include:

- Implementation of two projects titled "Pollutants Release & Transfer Registers" in Egypt and Syria (PRTR) with the objective of establishing records of emissions of pollutants from industrial sources and capacity building for local authorities for updating and maintaining these records. In Egypt, the project was completed with the participation of 10 public and private industries. A PRTR unit is set-up at the environmental agency - Alexandria branch. Training was conducted with the participation of ICS-UNIDO on quantification of releases and PRTR reporting. The PRTER has been extended to other areas of Egypt and currently includes other SMEs. In Syria, the project has just been initiated. Two experts have been trained in Italy on the use of the PRTR software. A workshop was conducted last November with the presence of 7 industries. Data collection of emission releases has just been initiated.
- Implementation of a project for the preparation of a framework plan for the set-up of an industrial inspectorate in Syria by WHO/MEDPOL.
- Preparation of guidelines on Environmental inspection systems for the Mediterranean region by WHO/MEDPOL.
- Reference Handbook on Environmental compliance and enforcement in the Mediterranean region.
- Upon request by two Contracting Parties, namely Libya and Syria, support was provided by WHO/MEDPOL for the enhancement and reinforcement of environmental inspections in these two countries by implementing tailored made technical programme that included visits and consultation by experts, assessment and suggestions for future activities and national training courses.
- A number of guidelines were also prepared by WHO/MEDPOL related (a) to the treatment of effluents prior to discharge into the Mediterranean sea, (b) to the authorization for the discharge of liquid wastes into the Mediterranean and (c) to monitoring land-based sources of marine pollution.

The Contracting Parties in their twelfth ordinary meeting in Monaco requested the preparation of an assessment on wastewater use practices in the Mediterranean, which was performed by WHO/MEDPOL by compiling a report on wastewater recycling and use practices in all Mediterranean countries. The information was collected from national experts in each country which provided all available information on the subject. The final report was presented to the MEDPOL Coordinators meeting in Sangemini in May 2003.

Finally, and in order to provide solid basis for future activities related to pollution control, a report on the Municipal Wastewater Treatment Plants in Mediterranean coastal cities was also prepared by WHO/MEDPOL in 1999. The report contained information on the population of the city served, on the quantity of wastewater treated, on the degree of treatment, on the way of discharge, as well as on the evaluation of the existence or not of treatment plants in Mediterranean coastal cities with more than 10,000 inhabitants. An updated report on the subject was published in 2004 providing more recent information and

the developments achieved during the five years period. Details of guidelines and reference documents prepared by WHO/MEDPOL are included in Annex IX.

g) Capacity Building

Requirements : In compliance with Article 10 of the LBS Protocol, “the Contracting Parties with the assistance of competent regional organizations shall cooperate to formulate and implement programmes of assistance to developing countries. Technical assistance would include in particular the training of scientific and technical personnel, ...”.

In accordance with Section 7 of the SAP, it is foreseen that capacity building activities will be grouped in two categories:

- to support, promote, and facilitate programmes of assistance in the area of scientific, technical and human resources; and
- to support, promote and facilitate, as appropriate, the capacity to apply, develop and manage access to cleaner production technologies as well as the best available techniques (BAT) and the best environmental practice (BEP).

The activities to be implemented for each category are to be considered at both national and regional levels. All the competent MAP structures will be used for their implementation.

Outputs: Capacity building activities in relation to the implementation of the LBS Protocol were conducted by MEDPOL, WHO/MEDPOL and the regional activity centre on clean production (CP/RAC).

MEDPOL conducted a number of training courses in five sub-regions in order to increase the prospects for the successful preparation of the baseline budgets, and to explain the guidelines for use of software facilitating the evaluation of emissions through the use of emission factors.

MEDPOL also organized a training course in Izmit, Turkey, between 4 and 6 March 2004 where national experts from all Mediterranean countries were invited and provided with hands-on training on the preparation of the Sectoral Plans and National Action Plans. Related documents were also distributed, such as guidance for conducting stakeholders' meetings.

The WHO/MEDPOL organized twenty-two regional and national training courses with partial financial assistance from GEF. The subjects of the courses were related to wastewater treatment plants' operation and management, pollution monitoring and inspection, and wastewater reclamation and use. Six of the courses were regional with the aim of training the trainers. The remaining sixteen courses were national courses held under the responsibility of the trained trainers in the national languages. Courses dates and venues are provided in Annex IX.

Finally, the Regional Action Centre on Clean Production (CP/RAC) organized a training course on the application of cleaner production techniques which took place during the biennium 2002-2003.

h) Evaluation of the Implementation of the LBS Protocol

Based on the foregoing, and in relation to the extent to which the expected results and outputs of the programme for implementation of the LBS Protocol have been achieved, we make the following comments:

Difficulties that national coordinators face in coordinating and follow-up of national activities and reporting to MEDPOL			Assign experts to assist national coordinators, and organize seminars and training courses on the sub-regional level		
Contracting Parties nominate persons not qualified for training planned by MEDPOL			Highlight to national coordinators the purpose of the training, and its objectives and the specify qualifications and responsibilities of the persons who need to attend the course		
Lack of data necessary for the implementation of Protocols, and problems with accuracy			Conduct training and capacity building activities to persons in charge of generating data, and develop support materials (software, programmes, reference manuals, guidance documents) to ensure accuracy of data		
Delays in reporting information and technical data to MEDPOL from the part of national coordinators or assigned experts			Follow-up on status of work and reminders to national coordinators and request progress reports. Organize progress meetings of national coordinators and experts when necessary		

Performance of NDA and NBB Surveys : In accordance with the requirements of the SAP, the Contracting Parties are required to prepare National Diagnostic Analyses and National Baseline Budget of pollutants as the first step for elaborating National Action Plans. Due to the complexity of the issue, MEDPOL prepared guidelines for preparation of NDA and NBB. Also, and in cooperation with RAMOGE, a software database programme was prepared to be used by national experts and authorities in the estimation of releases from the industrial sectors. This was accompanied by the organization of five sub-regional training courses to harmonize the outputs of national experts and enhance cooperation.

As a result of this effort, and with the assistance of local experts, MEDPOL received, by the time of preparation of this report, 17 NDA and NBB reports. Three country reports are still under preparation and are expected before April 2005.

The total cost for undertaking the aforementioned activities was 220,000 €, including costs of experts (two per country), and the five sub-regional meetings/training courses. As a ratio of MEDPOL's average yearly budget for activities of 1,775,000 USD, this cost represents 15 percent of the aforesaid budget²⁶.

²⁶ One Euro is equivalent to 1.25 USD

The expected benefits from this survey are as follows:

- The NDA information will be used to prepare MAP/MEDPOL/EEA synthesis report on the status of marine environment in the Mediterranean environment sea focusing on the most important national issues.
- The NBB information will be used by the countries to plan their input reduction measures, and to estimate their cost in order to reach the SAP targets; both as a basis for the formulation of the National Action Plans.
- The NBB will be used in the future for the implementation of the differentiated approach for achieving sustainable development in each of the Mediterranean countries.
- If divided over the 20 countries, the cost for both the NDA and NBB for each country is 11,000 €

Survey for Determination of Priority Pollution Hot Spots and Sensitive Areas: For the implementation of the project and the preparation of the country reports and the lists of priority pollution hot spots and sensitive areas, which was entrusted to WHOM/MEDPOL, ten consultants from ten different countries participated along with 19 national MEDPOL coordinators. The surveys were carried out with the assistance of country National Coordinators. The project was completed in 6 months (July 1996 to May 1997) and the expenses related to travel and fees were 20,000 USD and 12,000 USD, respectively. The total cost of 32,000 USD represents less than 2 percent of MEDPOL's average yearly budget for activities of 1,775,000 USD.

The expected benefits from this survey are as follows:

- National Coordinators were assisted by experts in their field with dual benefits in producing country reports with the required information and capacity building for data collection and evaluation.
- The financial aspect of the remedial measures was included in the survey reports providing an estimate of the total funds required for the rehabilitation of the pollution hot spots in each country.
- All Contracting Parties to the Barcelona Convention submitted the country reports on national Pollution Hot Spots and Sensitive areas.
- The country reports were edited and translated and later used as a basis for developing the NDA and the National Action Plans.

Capacity Building; Performance of Training Courses: WHO/MEDPOL organized 22 regional and national training courses in partial financial assistance from the Global Environmental Facility (GEF). The subjects of the courses were related to wastewater treatment plants' operation and management, pollution monitoring and inspection, and wastewater reclamation and use. Six of the courses were regional with the participation from all Mediterranean countries. The aim was to prepare trainers capable of organizing national courses and training local staff. The remaining 16 courses were national courses held under the responsibility of the trained trainers in the national languages. The training material was translated to national languages, and courses were held in nine different languages; Albanian, Arabic, Bosnian, Croatian, English, French, Slovenian, Spanish and Turkish. The total number of trainees was four hundred and eighty one persons. Courses dates and venues are provided in Annex IX.

The expenses related to the regional training courses for the training of national trainers were 200,000 USD. Expenses related to the national courses were 150,000 USD. It is to be noted that with less funds, a considerably higher number of national training courses was held. In addition, more people had the opportunity to be trained in their national languages, thus providing an added value and making more efficient use of the allocated funds.

As a ratio of MEDPOL's average yearly budget for activities of 1,775,000 USD, the project's cost of 350,000 USD represents about 20 percent of the activities' budget, or less than 1 percent per course, leading to a total cost of 728 USD per trained person.

Hence, we conclude that programme components for the implementation of the LBS programmes are cost effective if one considers the benefits accrued by their implementation in the short and long term. This, in turn, serves towards the achievement of MEDPOL's ultimate goals and objectives in pollution reduction and control for the Mediterranean Sea.

5.5. PROGRAMME FOR THE IMPLEMENTATION OF THE DUMPING PROTOCOL

The protocol for the prevention and elimination of pollution of the Mediterranean sea by dumping from ships and aircraft" so called dumping protocol has been in force since 1978. This protocol prohibits the dumping of a number of substances and materials specified in Annex I of the protocol and allow the dumping of special waste and other matter which require special care and permit. Contracting Parties should inform the secretariat according to Article (7) of the protocol of any dumping activities.

In 1995, the protocol was amended to prohibit all types of dumping except for:

- dredge materials
- fish waste
- vessels until 31 December 2000
- platforms and manmade structures
- inert uncontaminated geological materials.

The amended protocol has not entered into force, three ratifications are still missing. Thus far, only few countries informed the secretariat about their dumping activities and no country declared nil reports.

5.5.1. Achievement of Results and Outputs

Requirements: The 1995 Dumping Protocol stipulates that the Contracting Parties to the Protocol shall take all appropriate measures to prevent, abate and eliminate to the fullest extent possible pollution of the Mediterranean Sea caused by dumping from ships and aircraft - or incineration - at sea (Article 1). It includes the obligation for the contracting parties to:

- Deliver a prior general permit (Article 6) (Records of these permits have to be sent to the secretariat); and
- To take careful consideration, before issuing any general permit of matter at sea, of all the criteria set forth in the Annex to this Protocol (Article 7):
 - a. The characteristics and the composition of the matter;
 - b. The characteristics of the dumping site and method of deposit; and
 - c. General considerations and conditions, including, *inter alia* the possible effects:
 - i. On amenities;

- ii. On marine life, fish and shellfish culture, fish stocks and fisheries, sea-weed harvesting and culture; and
- iii. On other uses of the sea (e.g. impairment of water quality for industrial use, protection of areas of special importance for scientific or conservation purposes).

When issuing a permit for dumping, the Contracting Parties shall endeavour to determine whether an adequate scientific basis exists for assessing the consequences of such dumping in the area concerned, in accordance with the Protocol provisions and taking into account seasonal variations.

To this end, it is foreseen that the Contracting Parties shall draw up and adopt criteria, guidelines and procedures for a series of significant issues (dumping of dredged materials, fish waste or organic materials resulting from the processing of fish and other marine organisms, platforms and other man-made structures at sea, inert uncontaminated geological materials), so as to prevent, abate and eliminate pollution (Article 6b).

Outputs: MEDPOL followed a proactive approach and did not wait for the entry into force of the protocol and went ahead in the framework of the preparation of the field for the entering into force of the amended Protocol.

MEDPOL developed Guidelines for the management and dumping of dredge materials, fish waste, platforms and man made structure and inert uncontaminated geological materials. A first meeting was convened in Valencia in 1996, followed by a second meeting in Malta in November 1998. The Contracting Parties adopted the guidelines for dredge material in October 1999; for fish waste in November 2001; for platforms in November 2003. The guidelines for inert materials will be submitted to the consideration of Contracting Parties on November 2005.

MEDPOL also undertook an assessment of the dumping activities in the region for the period of 1995-2001 which shows that several countries are still considering the Mediterranean Sea as the most convenient site for the disposal of their waste and matters. Few countries stopped their dumping activities.

A meeting will be convened in February 2005 in Cyprus to review and discuss the implementation of the Protocol and to review the application of the guidelines from a technical point of view in cooperation with the London Convention.

5.5.2. Summary Evaluation

Based on the foregoing, we find that even though MEDPOL have made some significant work in preparation for the implementation of the Dumping Protocol, however, given that the revised protocol was signed in 1995, the secretariat has not given enough attention to the follow-up on the implementation. In fact, MEDPOL has no specific work programme for implementation of this protocol. Hence, we conclude that MEDPOL's efforts for implementing the Dumping Protocol are "unsatisfactory".

5.6. PROGRAMME FOR THE IMPLEMENTATION OF THE HAZARDOUS WASTE PROTOCOL

The Protocol on the "Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Waste and their Disposal" was adopted by the Contracting Parties in 1996 and has not yet entered into force; only five countries have ratified it. Six additional ratifications are required before the afore said protocol enters into force.

5.6.1. Achievement of Results and Outputs

Requirements: The Protocol stipulates in Article 5 that the Contracting Parties shall take all appropriate measures to prevent, abate, and eliminate pollution, reduce to a minimum the generation and transboundary movement of hazardous wastes.

To achieve this goal, the Parties shall cooperate with United Nations agencies, and relevant international and regional organizations.

Pursuant to Article 8, and in conformity with Article 13 of the Convention, the Parties shall:

- Cooperate as far as possible in scientific and technological fields related to pollution from hazardous wastes, particularly in the implementation and development of new methods for reducing and eliminating hazardous waste generated through clean production methods;
- Submit annual reports to the Organization regarding the hazardous wastes they generate and transfer within the Protocol area; and
- Ensure that clean production methods are applied to production processes.

Outputs : To date, MEDPOL has not developed a specific work programme detailing the actions for implementation of the Hazardous Waste Protocol due in part to the fact that only five countries has ratified it (four countries between 1998 and 2001 and one country in 2004). Work in this area has been partly accomplished in the framework of the implementation of the Strategic Action Plan. MEDPOL, in cooperation of CP/RAC, developed the regional plan for the reduction by 2010 of 20 percent of the generation of Hazardous Waste from industrial sources. This plan was adopted by the Contracting Parties in their 13th meeting in Catania. MEDPOL also developed inventories for Hazardous Waste in the region. MEDPOL foresees the development of activities and training courses for the Mediterranean Region in the near future in cooperation with the Basel Convention and its Regional centres.

5.6.2. Summary Evaluation

Therefore, we find that insufficient work has been accomplished by the secretariat for the planning and implementation of the Hazardous Waste Protocol. We therefore conclude that MEDPOL's performance in the achievement of outputs for the implementation of the Hazardous Waste protocol is clearly "unsatisfactory".

5.7. OVERALL EVALUATION SUMMARY FOR THE FOUR MEDPOL WORK PROGRAMMES

Based on the foregoing, we make the following general evaluation comments on the activities related to the realization of MEDPOL's monitoring programme, and implementation of the LBS, Dumping, and Hazardous Waste Protocols:

1. Concerning the extent to which the expected results and outputs of the activities have been achieved; we distinguish between two phases of process implementation; the planning phase, and the actual implementation phases:
 - a. For the planning phase, we find that the performance of activities related to the monitoring programme, and the LBS and Dumping Protocols to be "satisfactory". For the Hazardous Waste Protocol, planning work was "unsatisfactory".
 - b. For the implementation phase, we find that implementation of the monitoring programme, and dumping and hazardous waste protocols to be "unsatisfactory". The implementation activities related to the LBS Protocol were "satisfactory".

2. In relation to the ability of MEDPOL to deal with constraints that prevent from achieving programmes' objectives, we find that remedial actions for some critical issues were ineffective for the monitoring programme; while varying from moderately effective to highly effective for the LBS implementation programme. We translate these findings into an "unsatisfactory" performance for the monitoring programme, and "satisfactory" performance for the LBS programme.
3. Concerning the overall cost effectiveness of programmes' delivery, we find that benefits of most programmes outweigh the actual costs; hence a "satisfactory" performance.

Given that some activities are not performing in a "satisfactory" manner, we proceed to analyze further the process for the "Realization of Work Programmes" based on the PDCA methodology.

As noted earlier, the PDCA methodology calls for (i) establishing objectives and process requirements, (ii) implementing activities, (iii) monitoring processes, and (iv) taking actions to continually improve process performance. Based on these criteria, we note the following shortcomings in the process approach to the management of the work programmes:

1. MEDPOL has not established specific, measurable, and timely objectives for the realization of its programmes in relation to the implementation of the monitoring programmes, and dumping and hazardous waste protocols as evidenced from the unsatisfactory performance for the activities related to the implementation phase.
2. MEDPOL has not identified the processes required for achieving the work programme's objectives concerning the Hazardous Waste Protocol as evidenced from the lack of work progress in the implementation of this Protocol.
3. MEDPOL has not established a formal system for dealing with constraints and monitoring outcomes, as evidenced from the fact that remedial measures are generally moderately effective.

These issues constitute a failure in the process approach to MEDPOL's management which we address in Section 8.

6. MONITORING OF WORK PROGRAMMES

6.1. INTRODUCTION

In this section, we evaluate the activities related to the following issues:

- a. Impact of the outputs of the work programmes as perceived by stakeholders;
- b. Perception of the Contracting Parties of the programmes' outputs; and
- c. Perception by other stakeholders including scientists and the general public.

As noted previously, activities related to the monitoring of processes for the realization of MEDPOL's work programmes' objectives fall under the core process titled "Monitoring of Work Programmes". In this section, we report on our findings concerning each of the above noted issues for the activities related to the monitoring programme, and the implementation of the LBS Protocol²⁷. We also assess our findings in the framework of the core process "monitoring of work programmes" in order to identify key areas which have led to monitoring activities not performing satisfactorily, with the objective of formulating in Section 8 specific proposals for improving MEDPOL's performance in this domain.

6.2. PROGRAMME FOR THE IMPLEMENTATION OF THE MONITORING ACTIVITIES

In the last section, we described the requirements of the monitoring programmes, and the extent to which the outputs have been achieved vis-à-vis the stated requirements. In this section, we evaluate the effectiveness of programme implementation from an external perspective by assessing the impacts of the outputs and how these outputs/impacts are perceived by the Contracting Parties and other stakeholders. The findings we state in this section constitute the external monitoring component on the effectiveness of implementation of the work programmes. These findings would ultimately enable MEDPOL to improve the processes related to the monitoring programme, as discussed in Section 8.

6.2.1. Impacts of Outputs

While the monitoring component of MEDPOL Phase III did not result in the firm establishment of national marine pollution monitoring programmes in all Mediterranean countries, in line with the requirements of Article 10 of the Barcelona Convention and Article 8 of the Land-Based Sources Protocol, it is undeniable that a great deal of improvement, previously observed at the end of MEDPOL Phase II, was made, either in the enhancement of the already-existing relevant national infrastructures, or in the establishment of new monitoring programmes.

From a historical point of view, it is obvious that MEDPOL introduced the principle of monitoring the marine environment to national governments, i.e. integration of environment and development, when no political figure would ever endorse such practices. This is a tribute to the impact of MEDPOL on the development programmes of the Mediterranean countries.

MEDPOL also introduced quality assurance to the work of laboratories, and guidelines and ways for undertaking laboratory tests at a time when there were no clear methodologies or systematic ways for performing these tests.

²⁷ Monitoring information of other programmes is not available due to lack of implementation activities.

6.2.2. Perception of Contracting Parties

Monitoring Activities and Agreements: Based on our meetings with representatives of the Contracting Parties, a number of issues were raised reflecting positive and negative perceptions they have about the outputs of the monitoring programmes and related activities. On the positive side, and in relation to the monitoring activities and agreements, National Authorities consider the MEDPOL monitoring programme as a positive contribution in pollution prevention for the benefit of the Mediterranean riparian countries. In particular, National Authorities of the developing Mediterranean countries consider that such a programme introduced a positive attitude of the governments towards the protection of the marine environment, even if the political weight of the environmental stakeholders was relatively weak with regards to economical and political stakes. MEDPOL acted as a catalyst in pushing governments to conduct regular monitoring, and to adopt strategies in line with integrated coastal zone management. Moreover, the MEDPOL monitoring activities, helped to introduce a culture of cooperation between the various agencies involved in the monitoring of the quality of seawater around the Mediterranean Sea.

On the negative side, a number of issues were raised by National Authorities reflecting a negative perception about the monitoring programme's outputs, including:

- MEDPOL has no defined strategy to increase the number of countries participating in the monitoring agreements, particularly the European Union countries. This was substantiated by the fact that only about one half of the Contracting Parties has signed agreements for monitoring and assessment. In response to this claim, the MEDPOL coordinator notes that "the need to prepare monitoring programmes was always raised at official meetings; during country missions; and in correspondences".
- MEDPOL is not managing its monitoring programme effectively as evidenced from the following:
 - a. There is no verification of the quality assurance system in the laboratories performing inter-calibration exercises;
 - b. There is no appraisal of whether the monitoring database serves the purpose it was intended for; and
 - c. There is no evaluation on the effectiveness of the inter-calibration exercises in achieving the results intended. National authorities justify this claim by the fact that these exercises only work because care is taken and skill is provided in performing them; there is no guarantee that persons performing these exercises will undertake the analysis of monitoring data.

Capacity Building: Concerning capacity building activities, the representatives of the Contracting Parties also raised a number of issues reflecting positive and negative perceptions they have about the outputs of these activities.

On the positive side, National Authorities of the developing Mediterranean countries reported that MEDPOL training activities are extremely beneficial both at national and regional levels. Recognition and appreciation was in fact unanimous. These training programmes were believed to have contributed to the development of expertise in these countries by, *inter alia*:

- Improving the technical skills of the laboratory technicians through training courses conducted by IAEA whether in Monaco or locally.
- Promoting the exchange of experience and information between neighbouring countries.

- Harmonizing the approaches and techniques used by the national experts when their activities relate to separate and distant regions.

On the negative side, most countries see in the limited finances and budgetary constraints as the reason for the limitations in the implementation of the training programmes; although, the IAEA/Marine Environment Laboratory reports that funds are available for training, and often these remain unused.

6.2.3. Perception of Stakeholders

Concerns on the different aspects of the monitoring programme were expressed by the scientific institutes which are in charge of carrying out the monitoring activities for the national authorities, and for transmitting their data to the MEDPOL database. These concerns are related to the set-up and management of the monitoring activities. Specifically, the following negative issues were raised:

Trend monitoring: Due to the lack of comprehensive data, some laboratories regret that there is no assessment of collected data that would serve for evaluating whether these data serve the purpose for trend monitoring (the first assessment was made in 2003).

Compliance monitoring (health-related issues): In most countries, coordination problems exist between the Environment Agency and the Ministry of Health for the transfer of past and current data related to compliance monitoring for bathing waters, hot spots, and effluents.

Biological effects monitoring: Some concerns have been expressed by Slovenia concerning the biological effects monitoring developments, and particularly the introduction of new biomarkers, which could create problems for the European Union Member States insofar as, under the Water Framework Directive, they were moving in a different direction using simple eco-toxicological tests.

Management of the Monitoring Database: Some concerns were expressed by some stakeholders concerning public awareness of the MEDPOL database; and in particular with regards to the operational problems which appeared.

Divergent points of view were expressed also concerning the processing and transfer of results to the MEDPOL database. For countries which have started and developed their monitoring activities within the MEDPOL framework, no difficulty has been noted so far on processing and data transfer. For the European Union countries, which have a relatively long experience with the monitoring activities, the formats used to transmit collected data to different national and international institutions (European Environmental Agency (EEA), and ICES (within the OSPAR framework) are incompatible with the format adopted by MEDPOL.

Some institutes have also expressed concern about the time-consuming process for extracting the data from the existing more or less sophisticated systems adopted by the EEA. It is believed that the quality of data will be sacrificed when the EEA format is adapted to the format used by MEDPOL. Moreover, the experts are not really enthusiastic in putting valuable time and effort for extracting the data for the benefit of MEDPOL, due to the fact that they see no added value to be acquired from such conversion.

Capacity Building: In the opinion of the IAEA, and despite all past efforts, competence among laboratory technicians in the Mediterranean region is still below acceptable levels. Furthermore, most laboratories lack a quality assurance system in their laboratory.

With respect to training activities undertaken by MEDPOL, the national laboratories claim:

- There is a general lack of coordination by MEDPOL to find out what kind of training is needed on the local level.
- There is a lack of follow-up on the effectiveness of delivered training and fate of those trained, especially that many laboratories are faced by the problem of loss of trained staff and depletion of skilled and competent technicians.
- There is a lack of continuity in the performance of training programmes; a problem amplified by the fact that the MEDPOL monitoring programme is awarded yearly after a bidding process. So there is no certainty about the duration of the monitoring programme.

Material Resources: These consist of equipment, instruments, consumables, reference documents, and guidelines. Problems in this domain are most visible in developing Mediterranean Countries. The following issues were raised:

- The maintenance of laboratory equipment is a constant constraint for participating laboratories, mainly when there is no agent of the manufacturer and/or no after-sale service in the country. In the past, maintenance was ensured by IAEA. Presently, the absence of a maintenance service is strongly and badly felt by the laboratories participating in the MEDPOL monitoring programmes, in so far as it affects the quality and accuracy of generated data.
- Despite the fact that about 80 percent of the financial contribution to countries for monitoring is to purchase consumables, the purchase of consumables is an every day constraint and a limiting factor.
- Lack of equipment is a constraining factor for the new monitoring programmes. Unless funds can be found, the laboratories, though willing, claim that they are not able to undertake such monitoring tasks.
- Although guidelines and reference manuals published by MEDPOL (some in the national language) are readily available to the participating laboratories, some countries regret that MEDPOL has not carried out an assessment of the effectiveness of these documents. Furthermore, MEDPOL has not conducted an appraisal concerning their ease of use, comprehension and need.

Coordination with the EU: Concerns were expressed by EU countries in relation to the MEDPOL monitoring policy vis-à-vis the European Union's policy. In principle, the monitoring strategies adopted by MEDPOL are not in line with the EU's water framework directive and EU strategy and test parameters, even if some efforts have been made by MEDPOL to harmonize programmes' reporting and parameters, despite the fact that the EU does not always cover the specificity of the Mediterranean region, which MEDPOL needs to address in the interest of many countries which are not EU members. The feeling of the Mediterranean EU members is that if MEDPOL keeps on insisting on its own monitoring strategies, monitoring results will be negatively impacted in timing and quality.

6.2.4. Evaluation Summary

Based on the foregoing, and after a close examination of the impacts and perceptions made by National Authorities and scientists, we find that the impacts of the monitoring activities were generally positive. Capacity building activities were also perceived in a positive manner by all stakeholders. In contrast, when one analyzes the negative issues raised, particularly by national laboratories, it becomes clear that there are some serious management issues hampering the programme from achieving its objectives. Since this

aspect is considered to be of crucial importance to the success of the monitoring programme, we conclude that the perception of the various stakeholders reflects an “unsatisfactory” performance for the management of MEDPOL’s monitoring activities.

Given that some stakeholders have negative perceptions about the management of MEDPOL activities, and by making use of the PDCA analysis, we note the following:

1. MEDPOL has not established a monitoring system for providing programme officers with sufficient data and information on the performance of the work processes vis-à-vis programmes’ targets objectives for factual decision making.
2. MEDPOL has no process in place for seeking feedback from national authorities and stakeholders and for dealing with complaints in order to ensure that negative perceptions of work activities are contained and dealt with at an early stage of the process.

These issues constitute a failure in the process approach to MEDPOL’s management which we address in Section 8.

6.3. PROGRAMME FOR THE IMPLEMENTATION OF THE LBS P ROTOCOL#

We presented earlier the requirements for implementation of the LBS Protocol, and the extent to which the outputs have been achieved vis-à-vis the stated requirements. In this section, we evaluate the effectiveness of programme implementation from an external perspective by assessing the impacts of the outputs and how these outputs/impacts are perceived by the Contracting Parties and other stakeholders. The findings we state in this section constitute the external monitoring component on the effectiveness of implementation of the LBS Protocol. These findings would ultimately enable MEDPOL to improve the processes related to the implementation programme, as discussed in Section 8.

6.3.1. Impacts of Outputs

The compilation of national diagnostic analyses (NDA) and national baseline budgets of pollutants (NBB) reports represent a significant step forward for the MEDPOL programme with potential positive impacts because:

- For the first time, the major environmental issues have been identified systematically for the entire Mediterranean basin, classified on a country basis, which will serve for setting national environmental action priorities;
- A complete assessment is made of the relative contribution of the various sectors to the Mediterranean Sea, classified based on types and quantity of emitted pollutants. Again this information will be the basis for determining types of input reduction measures and estimating their costs as part of the National Action Plans; and
- The prescribed methodology by MEDPOL for the formulation of National Action Plans provides public officials with a practical example on the approach that should be adopted for developing action plans including objective analysis, role of public participation, importance of financial issues, and necessity of economic instruments.

Furthermore, the survey conducted by WHO/MEDPOL for determination of priority pollution hot spots and sensitive areas in the Mediterranean basin resulted in a number of positive impacts including:

- Preparation of pre-investment studies in five countries (Albania, Bosnia and Herzegovina, Egypt, Syria, and Turkey) for reducing the high levels of pollution loads discharged to the marine environment;

- Brining to the attention of public officials the location of point sources from which high levels of pollution loads are discharged and which affect, in a significant manner, human health, ecosystems, biodiversity, sustainability, or the economy, in order to incorporate these hot spots in their action plans;
- Brining to the attention of public officials the location of sensitive areas which need to be protected from becoming potential hot spot areas in order to incorporate these areas in their environmental protection plans; and
- Capacity building for the National Coordinators in the field of data collection and evaluation. This was accomplished in the process of assistance through specialized experts provided by WHO/MEDPOL for conducting the surveys for the determination of priority pollution hot spots and sensitive areas in their respective countries;

6.3.2. Perception of Contracting Parties and Stakeholders

The National Actions Plans including the National Diagnostic Analysis and National Baseline Budgets of pollutants are generally considered by all the Contracting Parties and stakeholders as positive contributions by the MEDPOL Programme. In the same way, so were the regional training courses organized by the World Health organization (WHO) particularly those related to wastewater treatment and wastewater reuse practices.

Nevertheless, reservations have been expressed about the foreseeable mechanism for implementation of the National Actions Plans. However, since these comments are not related to MEDPOL's programme outputs, and due to the fact that the NAPs are not completed yet, and hence will not enter the implementation stage until some time in the future, we regard these comments as related to "specific needs" that the Contracting Parties wish to see addressed by MEDPOL, which is currently working on the formulation of MEDPOL Phase IV. Hence, we captured these comments in Section 4.5 which deals with the "appropriateness of MEDPOL's objectives to satisfying the needs of the Mediterranean countries".

6.3.3. Evaluation Summary

Based on the perceptions made by various stakeholders, we find that the impacts of the LBS implementation activities were generally positive. Furthermore, activities carried out to date for the implementation of the LBS Protocol (NDA, NBB, capacity building) are perceived favourably by all stakeholders, indicating a "satisfactory" performance for MEDPOL's implementation of the LBS Protocol.

7. RESOURCE MANAGEMENT

7.1. INTRODUCTION

In this section, we evaluate the activities related to the following issues:

- a. The managerial and scientific competence and efficiency of the Secretariat's coordination of the Programme; including the ability to undertake prospective analysis and assessment of work programmes' performance for formulating as well as adapting new measures for improving work programmes' effectiveness;
- b. Cooperation established by MEDPOL with the other MAP structures or regional activity centres (RAC), institutions, programmes; UN bodies and conventions;
- c. Ability of MEDPOL in fund raising; and
- d. Information technology (IT) performance of MEDPOL.

As noted previously, activities related to the mobilization and management of available resources for the realization of MEDPOL's work programmes' objectives fall under the core process titled "resource management". In this section, we present our evaluation for each of the above noted issues. We also assess our findings in the framework of the core process "resource management" in order to identify key areas which have led to activities not performing satisfactorily, with the objective of formulating in Section 8 specific proposals for improving MEDPOL's performance in this domain.

7.2. COMPETENCE OF THE SECRETARIAT

Managerial and scientific competence of the secretariat is evaluated based on a number of issues, including communication processes, management of programmes, and perception of stakeholders. Below we describe these issues in the context of MEDPOL's responsibilities as stipulated for in the MEDPOL Phase III programme.

Responsibilities: Taking into account the objectives it aims to achieve, MEDPOL Phase III Programme foresees the following general responsibilities for the MEDPOL Secretariat [UNEP 1999a, Section 4.6]:

- Management of the programme (i.e. implementation of monitoring programmes, LBS and the SAP, dumping, and hazardous waste protocols) in close consultation and collaboration with all the stakeholders supporting or participating in the programme;
- Organisation of Data Quality Assurance Programmes (DQA's), and evaluation and analysis of "monitoring and pollution" data through the MEDPOL National Coordinators (NCs);
- Organisation and implementation of training and capacity building activities when needed and requested by developing countries;
- Organisation, and periodic meetings, of the MEDPOL National coordinators (and any other ad hoc committees and groups of experts); and
- Preparation of technical and policy documents, including guidelines, for the Contracting Parties, based on data and information received through the National Coordinators for MAP; MEDPOL collaborating institutions; other research institutions; and open scientific literature. These documents include reports on the state and trends of the

environmental quality of the marine and coastal areas, in addition to proposals for action plans, programmes and measures for pollution control to prevent or abate the environmental degradation of these areas, or to contribute to the restoration of the areas affected by degradation.

Communication Processes: Communication in MEDPOL occurs on two levels. Internally, within the MEDPOL organization, and externally, with other MAP structures.

Internally, MEDPOL conducts regular monthly meetings between the MEDPOL coordinator and MEDPOL programme officers to discuss progress in work programmes' implementation. These meetings are informal and no minutes of meetings are produced.

Externally, MEDPOL participates in a number of meetings to coordinate work programmes within the activities of the various organizations that constitute the MAP structure. These meetings consist of:

- Meetings between the MEDPOL coordinator and the RAC directors. This meeting convenes twice to three times a year;
- Meetings between the MAP coordinator and other officers responsible for coordinating activities from the Athens office;
- Meetings with MEDPOL National Coordinators. Discussions in these meetings are limited to issues of technical nature in addition to discussions of MEDPOL's budget lines;
- Meetings with MAP focal points to discuss issues approved in the meetings with the National Coordinators; and
- Meetings with the Contracting Parties organized at the end of each biennium. Next meeting will be held in November 2005 (end of the 2004-2005 biennium). These meetings are limited to dealing with issues of political nature.

Management of Work Programmes: On a yearly basis, the MEDPOL coordinator prepares a mid-term review of the activities approved by the Contracting Parties; funds actually allocated to each activity; possible external funds to be obtained for each activity; funds committed to review; and the objective of activity for the current and following years within the biennium approved by Contracting Parties. This review is prepared for use by the MAP coordinator in order to follow up on work progress, and for the Contracting parties to verify how the programme is being implemented. For each activity, the MEDPOL coordinator might add some remarks to explain, for example, why a certain activity was not accomplished.

Concerning the management of work programmes, informal meetings are convened whenever a need arises between the MEDPOL coordinator and the relevant programme officers. There is no clear process in place for internal monitoring and review of work programmes' objectives in order to follow-up of the status of implementation.

Perception of MEDPOL's Managerial and Scientific Competence: Concerning the organisational aspects of MEDPOL, some countries face some problems in managing, following-up, and coordinating the actions which are carried out within the MEDPOL framework. For example, some MEDPOL National Coordinators are not able to know in advance dates and subjects of the various meetings, workshops, which are scheduled all along the year.

Some concerns have been also raised by the National Authorities concerning both the plethora number of guidelines and reference manuals, and their system for

documentation and record keeping. National Authorities have some difficulties to register and go through the abundant literature which has been published by the MEDPOL Unit. In fact, an exhaustive a list of such documents, ranked by categories, is not available on the website of MEDPOL. Furthermore, there are no published abstracts on the web summarizing the contents of these documents in order to simplify the work of scientific experts, and laboratory technicians.

Other concerns have been expressed concerning the difficulties met by some developing countries in disseminating some of UNEP's valuable reports which are produced in the English language only. The main cause of this problem is, of course, the lack of foreign language skills among some local stakeholders. Indeed the Secretariat has picked up on this issue and is organising more and more training courses in local and national languages.

Correlatively, some concerns have also been expressed concerning the plenary meetings' reports, which do not fully satisfy the Contracting Parties who do not attend such meetings and have the responsibility to implement the Contracting Parties' requirements. Through the very general wording generally used by UNEP bodies, they have some difficulties to evaluate how the different issues have progressed in the different countries, and what specific measures have been retained.

Evaluation Summary: Based on the foregoing, we conclude that there a number of issues which point out to deficiencies in the managerial and scientific competence of MEDPOL. These include effectiveness of the communication processes, general organizational aspects, and efficiency of the reporting system. However, upon close examination of these issues, it is concluded that none is of critical nature to the detriment of the work programmes' performance. In fact, MEDPOL has established processes for internal and external communications; review of activities; publication of reports and documentations, etc., in support of its foreseen responsibilities. Hence, it is our conclusion that the scientific and managerial competence of MEDPOL's staff is "satisfactory".

7.3. COOPERATION WITH OTHER MAP STRUCTURES AND INSTITUTIONS

Existing MAP structures that may potentially provide sources of technical information and assistance to MEDPOL in achieving its overall goals and objectives consist of six regional activity centres (RACs)²⁸. Of relevance to the MEDPOL programme is CP/RAC (Cleaner Production Regional Activity Centre), and PAP/RAC (Priority Actions Programme Regional Activity Centre).

Below we assess cooperation with the RACs; institutions; programmes; and other UN bodies for the two major programmes currently at work at MEDPOL, namely, the monitoring programme, and the implementation of the LBS Protocol²⁹.

Monitoring Programme: Cooperation in the field of monitoring is mainly related to capacity building activities. The marine environmental laboratory of the IAEA is the main partner with MEDPOL in this field. Cooperation started in the MEDPOL Phase II programme and is continuing to date. Capacity building activities included training, data quality assurance and inter-calibration exercises for the implementation of the national monitoring programmes. These activities were carried out under the technical supervision of the Marine Environmental Laboratory (IAEA/MEL).

Cooperation was also undertaken with the World Meteorological Organization (WMO) from 1995 until 2003. WMO would propose research projects to the Contracting Parties on

²⁸ Information on the Regional Activity Centres are presented in Annex VIII

²⁹ Implementation of the dumping and hazardous wastes protocols is still at the very early stages

specific topics for example of relevance to atmospheric emissions impacting the marine environment. MEDPOL would fund jointly with WMO these projects. Reports are then published as MAP technical series.

Furthermore, cooperation with the World Health Organization is manifested by the assignment of a full-time staff member, attached to the MEDPOL Programme, who is responsible for managing health-related aspects of pollution monitoring, assessment, and control, in addition to the management of the compliance monitoring efforts.

Cooperation is also ongoing with UNESCO-IOC from 2002 to date. The subject of the cooperation was estimation of inputs of nutrients from the watersheds of the Mediterranean.

No cooperation activities were undertaken with any of the six RACs due to their substantial involvement in the implementation of the LBS Protocol.

Hence, we conclude that cooperation with scientific institutions and UN bodies in the monitoring field has continued since the start of the MEDPOL Phase III Programme to date. This is indicative of the "satisfactory" performance by MEDPOL in order to ensure that cooperation is not interrupted for the benefit of achieving the programme's objectives.

Implementation of the LBS Protocol When adopting the Strategic Action Plan (SAP), the Contracting Parties to the Barcelona Convention agreed that "for the implementation of the SAP at the regional level, the MAP coordinating Unit will make full use of the capabilities and technical competence of its Regional Activity Centres (RAC) and of other competent intergovernmental organizations".

Accordingly, two RACs have been extensively involved with MEDPOL in the implementation of the Strategic Action Programme (SAP). Starting in 2000, when the operational plan for the implementation of the SAP was initiated, MEDPOL entered into cooperation with CP/RAC by formulating a number of training courses on clean production aspects for industries addressing SAP target pollutants. In 2003, CP/RAC was given the mandate to prepare a regional plan for the reduction by 20 percent of the generation of hazardous waste from industrial installations in the MAP countries. This plan was prepared by the Centre within the Mediterranean GEF project, and was conceived for aiding the implementation of the SAP. CP/RAC later introduced this plan to MEDPOL National Coordinators in a meeting held in Sangemini (Italy) in May 2003. In fact this meeting marked the first time when a RAC actually participated with MEDPOL in one of its meetings. CP/RAC took this advantage of this occasion to introduce the Centre's activities to all participants.

PAP/RAC (Priority Action Plans) also participated in a meeting held in Izmit (Turkey) in March 2004 for training national experts on the preparation of sectoral and national action plans for the implementation of SAP. PAP/RAC presented its contribution on the types of economic incentives most applicable in the Mediterranean region for the successful implementation of priority actions as envisaged in the SAP. PAP/RAC and MEDPOL are currently cooperating in this issue by funding the work of national experts for the successful completion of the national action plans. This work, which was initiated in 2001, is also undertaken in the framework of the GEF project.

PAP/RAC also conducted pilot projects in GEF eligible countries and training courses in the subject of application of economic instruments for the implementation of the SAP. This task was accomplished between 2001 and 2004.

MEDPOL is also assisting PAP/RAC in the framework of the implementation of CAMPs which were carried out by PAP/RAC. Specifically, MEDPOL is managing the pollution part of the CAMPs for Slovenia, Lebanon and Egypt.

Finally, MEDPOL is cooperating with BP/RAC (Blue Plan) which is preparing the environment and development report. In this report, a chapter on pollution of coastal areas is presented. The chapter offers a prospective analysis of the status of coastal areas and marine environment in relation to pollution issues in the future. MEDPOL is drafting this chapter.

With respect to cooperation with the World Health Organization, a full-time staff member, attached to the MEDPOL Programme, is responsible for the preparation and undertaking of support activities for programme implementation such as the prioritization of hot spots and sensitive areas; preparation of guidelines for sewage treatment; preparation of guidelines on environmental inspection systems; in addition to related capacity building activities and training courses.

So in conclusion, it is clear that the cooperation between MEDPOL and the WHO has been pursued in an effective manner as was called for in the Barcelona Convention. Cooperation with the relevant RACs commenced in 2000 when the operational plan for the implementation of the SAP was initiated and is continuing to date. These facts are indicative of a "satisfactory" performance by MEDPOL in order to ensure that technical cooperation is put to best use for advancing the objectives of MEDPOL for the effective implementation of the LBS Protocol.

7.4. FUNDRAISING

MEDPOL's expenses consist of operational costs for the realization of its work programmes, and administrative costs for support staff. The MEDPOL staff consists of 9½ persons: 3 MEDPOL Officers and 3 MEDPOL secretaries, one WHO/MEDPOL Officer, one WHO/MEDPOL Secretary, one IAEA Laboratory Assistant and ½ IAEA Assistant.

In order to cover its expenses, MEDPOL relies on two sources of funds. The first is financed by the Mediterranean Trust Fund to which all MAP Contracting Parties contribute according to a mutually agreed level in line with a UN assessment scale. The second is based on external sources. Table 7.1 presents a summary of acquired external funds utilized between 1996 and 2003. Table 7.2, includes details of MEDPOL's funding for activities and personnel based on UNEP's contribution from 1996 to 2003. Also shown are average yearly budgets from UNEP and external funds for activities and personnel.

TABLE 7.1: Acquired External Funds Utilized in MEDPOL Phase III Programme
500,000 USD in 1995 (but utilized in 1996) from the Italian Ministry of Foreign Affairs, Department of Cooperation for Development. Funds were provided to MEDPOL for developing data processing capabilities, including hardware and software, in addition to preparing data reporting formats, and organizing training for national experts
400,000 USD in 1996 from the Italian Ministry of Environment and the Town of Syracuse. Funds were provided to fully sponsor a technical meeting to prepare the amended LBS Protocol, and to convene the Plenipotentiary meeting to adopt the aforesaid protocol
110,000 USD in 1997 from the European Commission (Environment Directorate-General). Funds were provided to MEDPOL to prepare Guidelines for Dumping of Dredged Material and to organize a technical meeting to discuss and validate the Guidelines
500,000 USD between 1999 and 2003 from various Italian towns (Reggio Calabria, Catania (2), Sorrento, Venice, Rome, Forlì, Sangemini) through the Association "Amici per la Vita". Funds were provided to partly sponsor eight MEDPOL meetings (both political and technical)
Between 2001 and 2003, a GEF Project was implemented by MAP. Out of the total contribution of 6 million USD from GEF and 2 million USD from FFEM, the amount of 5,721,000 USD was directly utilized by MEDPOL for activities related to the implementation of the Strategic Action Programme (SAP)

TABLE 7.2: MEDPOL Budget (1996-2003) (in USD)			
Year	Activities	Administration	Total
1996	900,000	514,000	1,414,000
1997	963,000	816,000	1,779,000
1998	705,660	763,000	1,468,660
1999	576,751	781,000	1,357,751
2000	699,000	697,000	1,396,500
2001	630,000	708,600	1,338,600
2002	730,000	967,500	1,697,500
2003	765,000	708,600	1,473,600
TOTAL Funding (UNEP)	5,969,411	5,956,200	11,925,611
TOTAL Funding (External)	8,231,000	-	8,231,000
TOTAL Funding	14,200,411	5,956,200	20,156,611
AVERAGE Yearly Expenses	≈1,775,000	≈ 750,000	≈ 2,500,000

As can be seen, external funds acquired by MEDPOL between 1996 and 2003 amounted to 8.2 million USD. Funds allocated by UNEP for the same period amounted to approximately 11.9 million USD. Thus, external funds constituted approximately 70 percent of UNEP's allocated funds. This represents a sizeable contribution to MEDPOL's budget, which clearly shows that MEDPOL is quite effective in locating available resources externally, and hence its performance in this area is quite "satisfactory".

7.5. INFORMATION TECHNOLOGY

We evaluate the effective use of information technology in the implementation of MEDPOL's work programmes in three areas: (1) use of an automated database system for selection and evaluation of experts and consultants; (2) use of information technology in document control, management, and dissemination of guidelines and reference manuals; and (3) use of information technology in the design of a web site accessible on the internet that serves to advance MEDPOL's ultimate goals and objectives.

System for Experts' Evaluation: MEDPOL maintains a roster of experts which numbered 156 experts at the end of 2004. The system for maintaining this roster works as follows:

- If an expert is located, he is requested to submit his Curriculum Vitae (CV) to MEDPOL to include in the roster
- Each CV is updated once an expert is selected to undertake a specific task
- Experts are evaluated at the end of every task. An evaluation sheet is prepared and included in the expert's file which includes:
 - a. timely completion of study;
 - b. compliance with TOR;
 - c. quality of work; and
 - d. Concluding remarks as to whether the expert should be selected for future tasks or not.

Selection of experts is the sole responsibility of the programme officer who is responsible for managing all aspects of his programme.

The roster system is manual, and requires that the MEDPOL officer searches through the CV paperwork to select the suitable expert. There is no electronic database of experts

which enables the programme officer to access information on experts based on skill and competence. Furthermore, the database of experts is not renewed on a regular basis, rather based on times when an expert is selected for undertaking a specific task. The secretariat is currently in the process of establishing an electronic database for registered experts.

Guidelines and Reference Manuals: Some concerns have been raised by the National Authorities concerning both the plethoric number of guidelines and reference manuals, and their system for documentation and record keeping. National Authorities have some difficulties to register and go through the abundant literature which has been published by the MEDPOL Unit. In fact, an exhaustive a list of such documents, ranked by categories, is not available on the website of MEDPOL. Furthermore, there are no published abstracts on the web summarizing the contents of these documents in order to simplify the work of scientific experts, and laboratory technicians.

Some concerns have been also raised concerning the reports produced for the plenary meetings. Many thought that these documents are nothing but “empty documents”, and are of little help to those who need to follow-up on the day-to-day implementation activities for the Barcelona Convention.

Other concerns have been expressed concerning the difficulties met by some developing countries in disseminating some of UNEP’s valuable reports which are produced in the English language only. The main cause of this problem is, of course, the lack of foreign language skills among some local stakeholders. Indeed the Secretariat has picked up on this issue and is organising more and more training courses in local and national languages.

Web Site: The basic problem that stakeholders have against the web site of the Mediterranean Action Plan, and in particular the part devoted to MEDPOL, is the lack of necessary information in type and volume, and the recurrent difficulties for access to the site, or for downloading some documents. And this problem is encountered with web site in both the French and English versions. Specifically, the following observations were made:

- The diary of the events and meetings is not accessible;
- The document retrieval system is complex;
- Texts of the conventions and the protocols are not readily available in French;
- The site is predominantly in English;
- Lack of an organisational structure map showing the respective positions and responsibilities for staff of the MEDPOL Unit.

It is our understanding that MEDPOL has created a specific and direct URL on the MAP website where information on monitoring activities is found. Furthermore, MAP is currently updating its web site, and as part of this process, a meeting was convened in November 2004 in Athens with the objective of outlining an information system, to be to be developed in 2005 in cooperation with RAC/ERS (Environment Remote Sensing Regional Activity Centre). This information system will be integrated in the MEDPOL database and will contain information on level sources effects of pollution and any other country-relevant information.

Based on the foregoing, it may be concluded that MEDPOL has recognized, even prior to this evaluation, that there are major gaps in its ability to make effective use of available information technology (IT) resources. However, at the time of this evaluation, MEDPOL had not achieved the goal it had set for rectifying this situation. For this reason, we conclude that MEDPOL’s performance in this domain was rather “unsatisfactory” over the past period. Performance will be satisfactory when stakeholders are of the opinion that IT resources are effectively contributing to the ultimate goal of the MEDPOL programme. Recommendations for dealing with this issue are presented in Section 8.

7.6. EVALUATION SUMMARY

Based on the foregoing, we make the following comments on the activities related to the mobilization and management of available resources for the realization of MEDPOL's work programmes' objectives:

1. In relation to the managerial and scientific competence and efficiency of the Secretariat's coordination of the Work Programmes, we find MEDPOL's level of competence "satisfactory";
2. Concerning the cooperation activities with other MAP structures, institutions, and UN bodies, we find that MEDPOL's performance is rather "satisfactory". MEDPOL programme officers have attempted since the start of their respective programmes to maintain continuous cooperation with relevant RACs and other institutions;
3. With respect to fund-raising activities, MEDPOL has been quite successful in mobilizing funds from external bodies which amounted to about 70 percent of the funds allocated by UNEP for programmes' management. This represents a substantial amount and reflects a sound commitment by MEDPOL to achieve its programmes' objectives. Hence, we conclude that MEDPOL's performance in fund-raising is quite "satisfactory".
4. Concerning the ability of MEDPOL to make effective use of available IT resources, we find that MEDPOL has not made any significant effort, until recently, to effectively utilize the resources related to information technology. For this reason, we conclude that MEDPOL's performance in this domain was over the period of evaluation rather "unsatisfactory".

Given that one of the evaluated activities is not performing in a "satisfactory" manner, we proceed to analyze further the "resource management" process based on the PDCA methodology.

The PDCA methodology calls for (i) establishing objectives and process requirements, (ii) implementing activities, (iii) monitoring processes, and (iv) taking actions to continually improve process performance. Based on these criteria, we note the following shortcoming in the process approach to management of IT resources:

1. MEDPOL has not established specific, measurable, and timely objectives for determining if it is making effective use of its human and IT resources; and
2. Due to the absence of formal monitoring processes that would assist the MEDPOL coordinator to predict problems prior to their occurrence, MEDPOL was rather late (in the case of IT resources) in planning of corrective measures to rectify the situation.

PART IV IMPROVEMENT OF THE MEDPOL PHASE III PROGRAMME

8. EVALUATION SUMMARY & RECOMMENDATIONS

8.1. INTRODUCTION

In Part IV, we evaluated MEDPOL's performance in relation to the four core processes; management responsibility, realization of work programmes, monitoring of work programmes, and resource management. Based on this evaluation, we identified a number of issues which impact MEDPOL's performance and ability to achieve its ultimate objectives. In this section, we make use of our evaluation to formulate proposals and concrete suggestions to improve MEDPOL's role and processes in achieving its programmes' objectives. This constitutes the fifth core process known as "improvement".

8.2. EVALUATION SUMMARY

As part of our evaluation exercise which was presented in Part IV, we assessed the following tasks and activities:

- a. Activities constituting the "management responsibility" process and related to developing MEDPOL's strategies and objectives based on:
 - i. the requirements stipulated in conventions and protocols;
 - ii. Rio principles and Johannesburg implementation plan;
 - iii. the context environment within which MEDPOL functions; and
 - iv. the needs of the Contracting Parties;
- b. Activities constituting the "realization of work programmes" process and related to the achievement of the objectives of MEDPOL's programmes, including:
 - i. implementation of the monitoring programmes, LBS Protocol, Dumping Protocol, and Hazardous Waste Protocol;
 - ii. ability to undertake the necessary mitigation measures to overcome and remediate constraints facing activities of the work programme; and
 - iii. implementation of work programmes in a cost effective manner.
- c. Activities constituting the "monitoring of programmes" process and related to the monitoring the effectiveness of the work activities including:
 - i. impact of the outputs of the programmes as perceived by stakeholders;
 - ii. perception of the Contracting Parties of the programmes' outputs; and
 - iii. perception by other stakeholders including scientists and the general public.
- d. Activities constituting the "resource management" process and related to the mobilization and effective management of available resources such as:
 - i. managerial and scientific competence and efficiency of the Secretariat's coordination of the Programme;
 - ii. financial resources that can be made available through funding agencies;
 - iii. technical resources that can be made available through other MAP structures (Regional Activity Centres); and
 - iv. technological instruments that can increase the effectiveness of achieving programmes' objectives such as information technology.

These tasks and activities are summarized in a cellular form in Table 8.1 for each of the four core processes. For each cell, we assessed the results of our evaluation based on:

- a. Dark grey background; indicating overall “satisfactory” performance
- b. Light grey background; indicating overall “unsatisfactory” performance
- c. White background; indicating insufficient information to make evaluation

process	Table 8.1: Summary Evaluation of Tasks and Activities							process
Management Responsibility	MEDPOL objectives and LBS Protocol	MEDPOL and Dumping Protocol	Contribution of the Programme to the process of achieving sustainable development in the region	Planning for monitoring activities	Planning for LBS Protocol	Planning for Dumping Protocol	Planning for Hazardous Waste Protocol	Realization of Programmes
	MEDPOL and Hazardous Waste Protocol	MEDPOL and EU marine strategy		Implementation of monitoring activities	Implementation of LBS Protocol	Implementation of Dumping Protocol	Implementation of Hazardous Waste Protocol	
	Overall visions and strategies of MEDPOL, and the ability of the Programme in their formulation as well as to adaptations and changes		Appropriateness of MEDPOL's objectives to the needs of the Contracting Parties	Dealing with constraints (monitoring)	Dealing with constraints (LBS Protocol)	Dealing with constraints (Dumping)	Dealing with constraints (Haz. Waste)	
				Cost effectiveness for monitoring	Cost effectiveness for LBS	Cost effectiveness for Dumping	Cost effectiveness for Haz. Waste	
Resource Management	Managerial competence and efficiency of the Secretariat's coordination of the Programme	Scientific competence and efficiency of the Secretariat's coordination of the Programme	Cooperation established by MEDPOL with the other MAP structures or regional activity centres (RAC); other Institutions; programmes; UN bodies; Conventions	Impacts of outputs from the monitoring programmes	Impacts of outputs from implementation the LBS Protocol	Impacts of outputs from implementation the Dumping Protocol	Impacts of outputs from implementation the Hazardous Waste Protocol	Monitoring of Programmes
	MEDPOL ability in fund raising		Information technology (IT) performance of MEDPOL	Perception of stakeholders of the outputs of the monitoring programmes	Perception of stakeholders of programme for implementation of the LBS Protocol	Perception of stakeholders of programme for implementation of the Dumping Protocol	Perception of stakeholders of programme for implementation of the Hazardous Waste Protocol	

As can be seen, evaluation findings show the following tasks and activities to be performed “unsatisfactorily”. These are:

- a. Results and outputs in the implementation phase of the monitoring programme resulting in negative perceptions from the Contracting Parties and other stakeholders
- b. Results and outputs of the Dumping Protocol programme in the implementation phase
- c. Results and outputs of the Hazardous Waste Protocol programme in the planning and implementation phase
- d. Administrative constraints encountered during monitoring programme implementation, and actions taken to remedy them
- e. Information technology (IT) performance of MEDPOL

Problems identified in these findings are interrelated, and typically one problem leads into another. For example, the inability of the monitoring programme (and also other programmes) to achieve the expected outputs and results is due in part to the inability of the Secretariat to deal with constraints encountered during programme implementation. This in turn is due to the absence of formal monitoring processes, which also explains why some available resources (such as IT) are not being used effectively to achieve programmes’ objectives. Ultimately, the consequences are seen in the unfavourable perception of MEDPOL’s stakeholders.

8.3. PROPOSALS & SUGGESTIONS

In the following subsection, we present a number of proposals and concrete suggestions for assisting MEDPOL to improve its role and processes in the aforementioned areas in order to achieve its work programmes’ objectives effectively and efficiently. The proposals are intended to address activities and tasks whose performance was found to be “unsatisfactory”, and activities where improvements can be introduced even though the overall process performance was “satisfactory”. The proposals form part of the fifth and last core process “improvement”. They should be considered in the formulation of MEDPOL Phase IV Programme. They are classified in accordance with the four core processes indicated in Table 8.1.

8.3.1. Management Responsibility

Based on our evaluation of the management responsibility process; we recommend that:

- MEDPOL plan for expanding the LBS Protocol Area to include the hydrologic basins of the Mediterranean as stipulated for in the 1996 LBS Protocol. Plans should address foreseeable technical and legal issues. Special consideration should be given to polluting substances transported by the atmosphere and diffuse agricultural sources (nutrients and pesticides) transported by river and water runoff.
- MEDPOL consider the adoption of the “ecosystem approach”, as stated in the Johannesburg Plan of Implementation is incorporated within the framework of MEDPOL Phase IV as a tool for implementing environmental impact assessments and environmental evaluation and reporting techniques for projects and activities which are

potentially harmful to the coastal and marine environments and their living and non-living resources.

- MEDPOL undertakes the task of conducting regular assessments of marine and coastal waters similar to what the EU marine strategy calls for.
- MEDPOL transform the Strategic Action Programme from a plan based on objectives expressed in terms of reduction of emissions and discharges of pollutants; to a plan formulated based on full analyses of the status and trends of all types of pollution effects; pollution sources; links between pollution causes and effects; in addition to cost-benefit analyses of the alternative pollution reduction measures in order to define the appropriate levels of pollution reduction that can be established depending on available funding and desired objectives.
- MEDPOL recognizes when setting targets for pollution reduction the difference in levels of development between the developed coastal States and the economic and social imperatives of the developing countries as noted in the preamble to the LBS Protocol.

8.3.2. Realization of Work Programmes

Based on our evaluation of the process for the realization of work programmes; we recommend that:

- MEDPOL critically review and clearly define the overall goal of the monitoring activities, and the objectives the programme is actually attempting to achieve when formulating the MEDPOL Phase IV Programme. In that respect, it is recommended that “state” and “compliance” monitoring programmes be integrated into a single programme dealing with both the environmental and health related aspects of monitoring.
- MEDPOL strengthens the quality assurance component for pollution monitoring through an intensive training programme and technical support for local scientists and technicians.
- MEDPOL should consider, in the process preparation of the SAP, a transdiagnostic analysis (TDA) was undertaken to identify pollution targets; compile pollution sources; and establish links between pollution causes and effects. Based on this analysis, target dates and amounts for pollution reduction were established. The original TDA remained the basis of the SAP since its inception. Only recently has work been undertaken to update the TDA. More significantly, as the costs for pollution reduction were not assessed, Contracting Parties may find it impossible to abide to these targets within the specified time frame. Thus, the SAP in its present context is commendable from an environmental point of view, but may be unrealistic in some of its expectations. These comments, nevertheless, are outside the scope of work of the MEDPOL programme, since it is the Contracting Parties themselves who have the power to institute any revisions addressing these concerns. Nevertheless, the ecological approach is planned for adoption by MEDPOL Phase IV³⁰. The differentiated approach was proposed, discussed, and argued against by developed Mediterranean countries.
- MEDPOL Secretariat conducts a survey in order to clearly define the objective of training; available competence and skills; in addition to training needs. This process should be accompanied by a feedback on the results of training activities, which serves to provide the necessary information for future policy changes.

³⁰ Personal communication with the MEDPOL coordinator

- MEDPOL assign specific tasks and responsibilities to its programme officers in order to actively pursue the implementation of the Dumping Protocol.
- MEDPOL investigates the underlying reason as to why the Mediterranean countries are not ratifying the Hazardous Waste Protocol, and to recommend amendments to be incorporated if necessary.

8.3.3. Monitoring of Work Programmes

In order to ensure that activities carried out within the MEDPOL framework including monitoring, pollution control, capacity building, etc., will achieve the intended objectives, we recommend that:

- For every major task to be carried out within the MEDPOL framework, a process model is developed specifying the following issues:
 - a. Objectives of the task or activity;
 - b. Processes required for achieving the objectives ;
 - c. Human and material resources necessary to achieve these objectives ;
 - d. Monitoring processes and indicators that would provide concrete evidence as to whether the specified objectives have been met ;
 - e. Processes for monitoring performance and for streamlining feedback from national authorities and stakeholders;
 - f. Quantifiable targets set against a specific timeframe ultimately leading to achieving the objectives;
 - g. Performance assessment based on the monitoring indicators and defined against the specified targets; and
 - h. A formal system for dealing with constraints, and for suggesting remedies to be undertaken when MEDPOL fails to achieve the prescribed targets.

8.3.4. Resource Management

Based on our evaluation of the resource management process; we recommend that:

- The status of the MEDPOL Programme is upgraded so that the MEDPOL Coordinator can become proactive in initiating contacts and coordinating with higher government authorities on the political scene. Evidence shows that limiting contacts to the MEDPOL National Coordinators is not sufficient to ensure MEDPOL's success in achieving its ultimate objectives.
- The system for documentation and record keeping of MEDPOL's documents is revised to include an abstract of the document including purpose and content.
- MEDPOL revises the scope and content of the plenary meetings' reports in order to make them attractive and of practical use to the target officials. MEDPOL should further assess on a regular basis the usefulness of their reports in achieving the goals for which they were produced.
- MEDPOL pursue and strengthen its policy for conducting capacity building training courses, and for publication of scientific documents in the local and national languages.

Funds should be allocated for translating valuable UNEP documents if they are deemed to be of value for the protection of marine environment.

- MEDPOL revises its website design. The revised MEDPOL website should, not only provide access to technical documents and guidelines, but also become a platform for communicating to stakeholders the latest developments - and results - of the different issues and meetings which are relevant to MAP/MEDPOL activities, and particularly to the Barcelona Convention.

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IAEA/MEL, 2004e, Review of Marine pollution monitoring and Assessment in UNEP's Regional Seas Programmes (Stephen de Mora, May 13, 2004)

ANNEX I

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ANNEX II

Background of the Mediterranean Action Plan

Following the United Nations' Conference on the Human Environment held in Stockholm in 1972, which identified the Mediterranean as among the "particularly threatened bodies of water", the Mediterranean states requested the United Nations Environment Programme (UNEP) to set up an activity framework for environmental co-operation in the Mediterranean region.

a) The Mediterranean Action Plan I

In 1975, an Intergovernmental Meeting was held in Barcelona between January 28 and February 4, 1975. It was attended by 16 Mediterranean countries and the European Union. As a result of this meeting, an Action Plan for protection and development of the Mediterranean basin was adopted. It was referred to as the "Mediterranean Action Plan" (MAP). The MAP included provisions for:

- Integrated planning of the development and management of the resources in the Mediterranean Basin;
- Coordinated programme for research and monitoring in the Mediterranean;
- A framework convention and related protocols with their technical annexes for the protection of the Mediterranean environment; and
- Institutional and financial implications of the Action Plan.

One year after the legal framework for this cooperation was adopted pursuant to the third of the above provisions in the Conference of Plenipotentiaries of the Coastal States of the Mediterranean Sea convened by UNEP in Barcelona on 16 February 1976. Three instruments were simultaneously adopted:

- The Convention for the Protection of the Mediterranean Sea against Pollution (Barcelona Convention), which came into force in 1978;
- the Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft (Dumping Protocol), which came into force in 1978; and
- the Protocol concerning Cooperation in Combating Pollution of the Mediterranean Sea by Oil and Other Harmful Substances in Cases of Emergency (Emergency Protocol), which came into force in 1978 (It will be replaced by the new Prevention and Emergency Protocol which was only recently adopted on 25 January 2002 and therefore has not yet entered into force).

With its ensuing Protocols, the Barcelona Convention transferred the Action Plan into legally binding commitments. Later on, four other Protocols were adopted:

- The Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources (LBS Protocol), which came into force in 1983 (the Protocol was modified in 1996 but the modifications have not yet entered into force);
- The Protocol concerning Mediterranean Specially Protected Areas (SPA Protocol), which came into force in 1986;
- The Protocol on the Prevention of Pollution of the Mediterranean Sea by transboundary Movements of Hazardous Wastes and their Disposal, which was adopted in 1996 but has not yet come into force; and
- The Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from the Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil (Offshore protocol) which was adopted in 1994 but has not yet come in force.

b) The Mediterranean Action Plan II

A typical offspring of the environmental policy of the 1970s, MAP I was mainly concerned with assisting governments to control marine pollution by targeting the different pollutants in a limited sectoral approach. But pursuant to the 1992 Earth Summit in Rio (UN Conference on Environment and Development) and the requirements of the Rio Declaration on Environment and Development (Agenda 21), MAP attempted to translate the results of the summit onto the regional Mediterranean level, and adapted Agenda 21 to the Mediterranean context by setting up Agenda MED 21, which led to the adoption of the Action Plan for the Protection of the Marine Environment and Sustainable Development of the Coastal Areas of the Mediterranean (MAP II) on 10 June 1995. MAP II reflected both the increasing concern for the pressures exerted on the Mediterranean environment and the allegiance of Mediterranean States to the ideal of sustainable development.

With the adoption of MAP II, a second phase in the MAP process was launched, changing its classical pollutant-centred policy approach to an integrative strategy of environmental protection and sustainable development. This was further substantiated by the parallel commitments to “the protection of the environment” (MAP II, Objectives Points 2 & 3), and “the improvement of the quality of life in the Mediterranean region” (MAP II, Objectives Point 6) which effectively describe the overall new goal of MAP as “environmentally sustainable socio-economic development”.

In connection with the launching of the MAP II process, the Barcelona Convention was amended in 1995. Furthermore, the Mediterranean Commission on Sustainable Development (MCSD) was created. The Protocols have since been revised and supplemented. Most of the amendments, including the new Barcelona Convention, are still in the process of ratification.

ANNEX III

The Barcelona Convention

a) The 1976 Barcelona Convention

The 1976 Barcelona Convention for the Protection of the Mediterranean Sea against Pollution is concerned to limit the adverse effects of pollution on the marine environment. Thus, the "general undertaking" of the 1976 Convention was to formally invite the Contracting Parties "to individually or jointly 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 [1]).

Under Article 2(a) pollution is defined as "the introduction by man, directly or indirectly, of substances or energy into the marine environment resulting in such deleterious effects as harm to living resources, hazards to human health, hindrance to marine activities including fishing, impairment of the quality of sea water and reduction of amenities." This commitment is applicable in the "Zone of the Mediterranean Sea" and this includes all "the maritime waters of the Mediterranean as such, with all its gulfs and tributary seas, bounded to the west by the Strait of Gibraltar and to the east by the Dardanelle Strait. Nevertheless, the application of the Convention (or of any Protocol) can be extended to the coastal areas decided by each Contracting Party (CP) within its own territory" (Article 1.2).

The parties give particular attention to four types of pollution:

- Pollution caused by dumping from ships and aircrafts;
- Pollution from ships;
- Pollution resulting from exploration and exploitation of the continental shelf and the seabed and its subsoil; and
- Pollution from land-based sources.

The Convention lays down provisions on cooperation and information among the parties in the event of a critical situation causing pollution in the area of the Mediterranean Sea in order to reduce or eliminate any resulting damage.

The parties also undertake to endeavour to establish continuous pollution monitoring. They cooperate in the fields of science and technology and work out appropriate procedures for the determination of liability and compensation for damage resulting from pollution deriving from violations of the provisions of the Convention.

For the settlement of any disputes arising between the parties as to the interpretation or application of the Convention, the text of the Convention provides for the settlement of disputes and for arbitration. Furthermore, the parties must cooperate in working out procedures to supervise the application of the Convention.

The United Nations Environment Programme will carry out secretariat functions in the framework of the implementation of the Convention (convening and preparing meetings, coordination, etc.).

As of the July 1st 2004, the countries that ratified the 1976 Barcelona Convention are:

Albania	Greece	Morocco
Algeria	Israel	Slovenia
Bosnia and Herzegovina	Italy	Spain
Croatia	Lebanon	Tunisia
Cyprus	Libya	Turkey
Egypt	Malta	E.U.
France	Monaco	

b) The 1995 Barcelona Convention

In connection with the launching of MAP II, the Barcelona Convention was amended in 1995. It is currently identified as the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, 1995. The LBS and Dumping Protocols have since been revised and supplemented.

Most of the amendments, including the new Barcelona Convention, are still in the process of ratification. As of the 1st of July 2004, only 8 countries and the EU have ratified the 1995 Barcelona Convention.

Croatia	France	Spain
Cyprus	Italy	Tunisia
Egypt	Malta	E.U.
	Monaco	

The amended texts of the Convention and the Protocols will enter into force on ratification of at least three-quarters of the Contracting Parties – i.e. 16 Parties – to the Convention or to the relevant Protocol (Article 16 [3] of the 1976 Barcelona Convention, and Article 22 of the 1995 Convention).

The aims of the 1995 Barcelona Convention are (Article 4):

- To prevent, reduce, combat and, as far as possible, eliminate pollution in the Zone of the Mediterranean Sea (Article 4.1.);
- To attain the objective of sustainable development, taking fully into account the recommendations of the MCSD (Article 4.2);
- To protect the environment and to contribute to sustainable development (Article 4.3.) by:
 - i. Applying the precautionary and polluter pays principles;
 - ii. Performing Environmental Impact Assessments (EIA); and
 - iii. Promoting cooperation between coastal States in EIA procedures.
- To promote the integrated management of coastal zones, taking into account the protection of zones of ecological and landscape interest and the rational use of natural resources (Articles 4, 3, e);
- To apply the Convention (and its Protocols) by:
 - i. Adopting programmes and measures with defined deadlines for completion (Articles 4, 4, a); and
 - ii. Using the best techniques available and the best environmental practices (Articles 4, 4, b).

- To formulate and adopt Protocols that prescribe agreed measures, procedures and regulations to apply the Convention (Articles 4, 5); and
- To promote, within relevant international bodies, measures relating to the application of sustainable development programmes and environmental protection, conservation, and rehabilitation of the natural resources of the Mediterranean Sea (Articles 4, 6).

Under Article 2(a) pollution is defined as "the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results, or is likely to result, in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities including fishing and other legitimate uses of the sea, impairment of the quality use of sea water and reduction of amenities."

Commitments are made to take *inter alia* specific measures:

- Against pollution due to dumping from ships and airplanes and against incineration at sea (Article 5);
- Against land-based pollution (Article 8);
- To protect biological diversity (Article 10);
- Against pollution due to transboundary movements of dangerous wastes and to eliminate them (Article 11);
- To monitor pollution (Article 12);
- To cooperate in science and technology (Article 13);
- To apply environmental legislation (Article 14); and
- To facilitate public access to information and public participation (Article 15).

Once the 1995 amendment enters into force, the original undertaking will explicitly aim "towards sustainable development". More precisely, the 1995 Convention commits Contracting Parties – "in accordance with their capabilities" – to compliance with the precautionary and polluter pays principles.

Furthermore, parties are committed to integration strategies such as environmental impact assessment and the integrated management of the coastal zones (Article 4 [3]).

ANNEX IV

The Land-Based Sources Protocols

a) The 1980 LBS Protocol

The original Land-Based Protocol was adopted on 17 May 1980, and entered into force on 17 June 1983. These provide the legal framework concerning the actions to be carried out to prevent and fight against land sources pollutions. The countries that have ratified the 1980 Protocol – and thus are bound by it - are:

Albania	Greece	Spain
Algeria	Israel	Tunisia
Cyprus	Italy	Turkey
Egypt	Libya	Yugoslavia
France	Malta	E.U.
	Monaco	

Under Articles 3 and 4 of the 1980 Protocol, the Protocol applies to:

- The Mediterranean Sea, including estuaries up to the freshwater limit, and to the inter-tidal zones and salt-water marshes communicating with it;
- Polluting discharges reaching the sea directly through coastal disposals, rivers, outfalls, canals, or other watercourses, including ground water flow, or through run-off and disposal under the seabed with access from land;
- Pollution from land-based sources transported by the atmosphere; and
- Fixed manmade offshore structures which serve purposes other than exploration and exploitation of mineral resources.

The Articles 5 and 6 of the 1980 Protocol define the substances from which the Contracting Parties undertake to eliminate pollution (Annex I) and strictly limit pollution (Annex II) through permitting.

To this end, it is foreseen that the Contracting Parties shall jointly or individually, elaborate and implement the necessary programmes and measures; these "shall be adopted by taking into account, for their progressive implementation, ... the economic capacity of the Parties and their need for development" [Protocol 1980, Article 7.3.].

The Protocol provides for the preparation of guidelines, standards and/or criteria for a series of significant issues [Protocol 1980, Article 7], including the control of pollution, taking into account "local ecological, geographical and physical characteristics; the economic capacity of the Parties and their need for development; the level of existing pollution; and the real absorptive capacity of the marine environment".

The Protocol includes the obligation for:

- Systematic monitoring for the assessment of the levels of pollution and the effects of measures taken for pollution reduction [Protocol 1980, Article 8];
- Regular provision of monitoring information [Protocol 1980, Article 8(a) and 13.2.b];
- Exchange of scientific information and co-ordination of research programmes [Protocol 1980, Article 9];

- Provision of technical assistance to developing countries for training and equipment acquisition [Protocol 1980, Article 10]; and
- Provision of information on permitting of pollution emissions, pollution quantities discharged into the Mediterranean and pollution control measures [Protocol 1980, Article 13.2].

The Protocol provides for the Contracting Parties to adopt by a 2/3 majority, the programmes and measures for the abatement or the elimination of pollution from land-based sources. Parties which are not able to accept a programme or measures are required to inform other Parties of the action they intend to take.

b) The 1996 LBS Protocol

The original LBS Protocol was modified by the amendments adopted in Syracuse (Italy) on 7 March 1996. These amendments not only take into account the general principles adopted by the Rio Conference – attested by the introduction of a new annex related to the criteria for the definition of the Best Available Techniques (BAT) and the Best Environmental Practice (BEP) (Annex IV), but also integrates the concept of Sustainable Development, a component of the Mediterranean Action Plan, and takes into account the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities and the Washington Declaration adopted in Washington in 1995.

Through a more comprehensive approach both in terms of the application area - extended to the hydrologic basin - and the sources of pollution regulated - including numerous land-based activities affecting the marine environment, these amendments express a radical change of the policy and strategy towards the protection of the Mediterranean seawaters against pollution originating from land based sources.

The main amendments to the LBS Protocol are:

- Extension of the area to which the Protocol applies to the hydrologic basin of the Mediterranean Sea Area (the entire watershed area within the territories of the Contracting Parties, draining into the Mediterranean Sea Area) [Protocol, Article 3, b];
- The obligation of the Contracting Parties to take all appropriate measures to prevent, abate, combat and eliminate to the fullest possible extent pollution of the Mediterranean Sea Area deriving from land-based sources and activities (Protocol 1996, Article 5, 1), giving priority to the phasing out of inputs of substances that are toxic, persistent and liable to bio-accumulate (listed in annex I), and, to this end, to prepare "... regional and national action plans and programmes containing measures and timetables for their implementation" (Protocol 1996, Article 5, 2), which take into account the provisions of the Protocol; the best available techniques; and the best environmental practice including, where appropriate, clean technologies (Protocol 1996, Article 5, 4);
- Extension - and enforcement - of the permitting responsibility of Contracting Parties to all land-based and diffuse point sources discharging directly or indirectly to the sea (with support for the establishment or strengthening of inspectorates) that may affect directly or indirectly the Mediterranean Sea Area [Protocol 1996, Article 6]; and
- Promotion of environmentally sound technology, including clean production technology [Protocol 1996, Article 9 and 10].

As of the 1st of July 2004, thirteen Contracting Parties (12 countries and the EU) have ratified the LBS protocol, and thus are bound by it. These are tabulated below. To enter into force, i.e. to be binding, the LBS protocol requires the ratification of at least fifteen Contracting Parties. Consequently, the amended Protocol has not yet entered into force.

Albania	Italy	Spain
Cyprus	Malta	Slovenia
France	Monaco	Tunisia
Greece	Morocco	Turkey

ANNEX V The Dumping Protocols

a) The 1976 Dumping Protocol

The Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft (the Dumping Protocol) was adopted on 16 February 1976 by the Conference of Plenipotentiaries of the Coastal States of the Mediterranean Region for the Protection of the Mediterranean Sea, held in Barcelona. The Protocol entered into force on 12 February 1978.

The countries that have ratified the 1976 Protocol are:

Albania	Greece	Slovenia
Algeria	Israel	Spain
Bosnia and Herzegovina	Italy	Tunisia
Croatia	Lebanon	Turkey
Cyprus	Libya	Yugoslavia
Egypt	Malta	E.U.
France	Monaco	

The Protocol applies to the marine waters of the Mediterranean Sea (Protocol, Article 1). More precisely, the Protocol applies to the marine waters on the open seaward side of the baselines from which the breadth of the territorial sea is measured.

According to the Dumping Protocol of 1976 (subsequent to Article 6 of the Convention), the dumping of a certain types of waste and matter (toxic organohalogen and organosilicon compounds, mercury, cadmium, plastics, crude oil, etc.) (Article 4, Annex I) is prohibited. Dumping of other matter or types of waste (arsenic, lead, copper, zinc, chrome, nickel, containers, scrap metal, certain types of pesticides, etc.) is subject to the prior issue of a special or general permit by the competent national authorities. Such permits may be issued only after careful consideration of a number of factors (characteristics and composition of the matter, characteristics of dumping site and method of disposal) as listed in the Protocol (Article 5, Annexes II, III). Records of permits are to be monitored by the Contracting Parties of the Protocol.

b) The 1995 Dumping Protocol

The beginning of the 1990s marked a radical change of the policy towards the dumping activities. Taking into consideration Chapter 17 of Agenda 21 of the UNCED; the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter (London, 1972) which calls upon the implementation of the necessary measures to end dumping in the ocean and the incineration of hazardous substances; and taking into account Resolution LC 49(16) which was approved by the 16th Consultative Meeting of the 1972 London Convention and prohibits the dumping of industrial wastes at sea, the original 1976 Dumping Protocol was amended on 10 June 1995 by the Conference of Plenipotentiaries on the Convention for the Protection of the Mediterranean Sea against Pollution and its Protocols, held in Barcelona on 9 and 10 June 1995.

The main amendments to the Dumping Protocol were to substitute the permissible approach expressed through Annex I (shortlist of substances and materials prohibited for dumping) and Annex II (open list of substances and materials open to permission and which require special care for dumping) of the 1976 Dumping Protocol, by a general principle of phasing out of pollution of the sea from dumping of wastes from ships and aircraft along the same lines of the London Dumping Convention, including incineration at sea. The prohibition thereafter covers all categories of waste except a very shortlist of wastes which need a special permit: including dredged material, fish waste or organic materials from the processing of fish, platforms and other manmade structures at sea, and safe geological materials (Article 4). The dumping prohibition area covers both the seabed and the marine subsoil and also includes the incineration at sea as part of the bans. Effects of these materials on marine life and uses of the sea are to be considered when granting such permits.

The countries that have ratified the Dumping protocol referred to as the "Protocol for the Prevention and Elimination of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft or Incineration at Sea", – and thus bound by it - were, as the 1st of July 2004:

Croatia	Monaco
Egypt	Spain
France	Tunisia
Italy	E.U.
Malta	

To enter into force, i.e. to be binding, at least 15 Contracting Parties have to ratify the Dumping Protocol. Consequently, the amended Protocol has not yet entered into force. It must be noted in that respect that (1) all the Mediterranean countries are also parties of the London Dumping Convention which developed a set of guidelines covering all aspects of dumping activities; and (2) through the Barcelona Dumping protocol, the internal and territorial waters are not covered. This means that only a few part of the Dumping activities are covered by the Protocol and as such reported to MEDPOL.

ANNEX VI
**Protocol on the Prevention of Pollution of the Mediterranean Sea
by Transboundary Movements of Hazardous Wastes and their Disposal**

The protocol on the prevention of pollution of the Mediterranean Sea by transboundary Movements of Hazardous Waste and their disposal was signed by 11 Mediterranean countries in 1996 and has not yet entered into force (only 5 countries ratified it) due to the position of the European countries regarding the consideration, unlike Basel convention, of radioactive waste as hazardous. These countries are:

Albania	Tunisia
Malta	Turkey
Morocco	

The 1996 Hazardous Waste Protocol stipulates in Article 4 that the Contracting Parties to the Protocol shall inform the Organization of the wastes, other than those listed in Annex I to this Protocol, considered or defined as hazardous wastes under its national legislation, and of any requirements concerning transboundary movement procedures applicable to such wastes. The Organization shall in turn inform all Parties of the information it has received from the Contracting Parties.

According to Article 5, the Parties shall take all appropriate measures to:

- Prevent, abate and eliminate pollution of the Protocol area which can be caused by transboundary movements and disposal of hazardous wastes;
- Reduce to a minimum, and where possible eliminate, the generation of hazardous wastes; and
- Reduce to a minimum the transboundary movement of hazardous wastes, and if possible to eliminate such movement in the Mediterranean.

To achieve this goal, Parties have the right individually or collectively to ban the import of hazardous wastes.

Furthermore, the Contracting Parties shall cooperate with other United Nations agencies, relevant international and regional organizations in order to prevent illegal traffic, and shall take appropriate measures to achieve this goal, including criminal punishment measures in accordance with their national legislation.

Pursuant to Article 8, and in conformity with Article 13 of the Convention, the Parties shall:

- Cooperate as far as possible in scientific and technological fields related to pollution from hazardous wastes, particularly in the implementation and development of new methods for reducing and eliminating hazardous waste generated through clean production methods;
- Submit annual reports to the Organization regarding the hazardous wastes they generate and transfer within the Protocol area in order to enable the Organization to produce a hazardous waste audit; and
- Ensure that clean production methods are applied to production processes.

ANNEX VII

The Strategic Action Programme

The Strategic Action Programme (SAP) was adopted in 1997, i.e. one year after the adoption of the new LBS Protocol, by the tenth ordinary meeting of the contracting parties as provided for in Articles 5, 6 and 7 of the LBS Protocol and in response to the danger posed to the marine environment living resources and human health by pollution from land-based sources and activities. Its commitments were not definitely approved, mainly due to opposition by France; so the contracting parties agreed that, once the 1996 LBS come into force, the Strategic Action Programme would be resubmitted for adoption according to the provisions of Article 15 of the 1996 Protocol. At that stage, a review of the Strategic Programme would be made to proceed to a possible revision of target dates and activities, if necessary.

The programmatic basis for its formulation was the Global Programme of Actions to Address Pollution from Land-based Activities (GPA) adopted in Washington in 1995, which focuses on substances known to be toxic; persistent organic pollutants; substances that bio-accumulate; wastewater treatment and management, as well as the amended 1996 LBS Protocol with a timetabled approach to tackling and eliminating the range of Mediterranean pollution problems stemming from land-based sources.

The SAP is based on the preliminary findings of a once-prepared, transboundary diagnostic analysis (TDA) that represents a regional synthesis of actions regarding the protection of the marine environment from land-based activities. The main objective of SAP is to promote and provide support to the Mediterranean countries for the formulation, adoption, and implementation of relevant national plans, as well as a scientifically-based long term programme of targets to be achieved and actions to be implemented at national and regional levels for phasing out of inputs of substances into the Mediterranean Sea which are toxic, persistent and liable to bio-accumulate. It also targets the region's 109 identified pollution hot spots and 51 sensitive areas.

The SAP requires that the Contracting Parties protect the environment and contribute to the sustainable development of the Mediterranean Sea area by:

- a) Applying the precautionary principle and the polluter pays principle;
- b) Undertaking environmental impact assessments for proposed activities which are likely to have an adverse impact on the environment;
- c) According priority to integrated pollution control;
- d) Committing themselves to promote the integrated management of the coastal zones;
- e) Implementing the convention and the LBS Protocol, whereby they shall:
 - Elaborate and implement, individually or jointly, national and regional action plans and programmes;
 - Adopt priorities and timetables according to Annex 1 of the Protocol;
 - Consider the Best Available Techniques (BAT) and the Best Environmental Practices (BEP), including clean production technologies; and

- Undertake relevant preventive measures to reduce the risk of accidental pollution.
- f) Ensuring that the public is given appropriate access to information on the environmental state and on activities or measures adversely affecting or likely to affect the environment; and
- g) Ensuring routine and standardized reporting of toxic emissions to air, water, and land by polluting facilities.

SAP is set out to have National Action Plans up and running by 2005 to help countries fulfil their pollution clean-up objectives. And although it has set common objectives for all countries, however, SAP allows for a differentiated approach in the timing of targets for its plan of activities based on the individual country's economic capacity to adapt and reconvert existing installations and need for development.

ANNEX VIII Regional Activity Centres

There are six regional activity centres (RACs) within the MAP structure. They have been set up (along with MEDPOL) to assist in the implementation of the Protocols emanating from the Barcelona Convention. They are:

1. *REMPEC – Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea:* Situated in Manoel island, Malta, REMPEC helps the Mediterranean countries to build up their national response capacities to be prepared for and to cope with major marine pollution incidents. The centre also facilitates cooperation between countries in combating accidental marine pollution from a range of hazardous substances including oil.
2. *BP/RAC - Blue Plan Regional Activity Centre:* Located in Sophia Antipolis, France, BP/RAC adopts a broad and prospective approach to Mediterranean environmental problems in its work on sustainable development solutions for the region. The centre considers the interwoven human activities such as urbanization, industry, agriculture, energy and transport that impinge on natural resources, including the coast and the sea.
3. *PAP/RAC - Priority Actions Programme Regional Activity Centre:* Situated in Split, Croatia, the main PAP/RAC objective is integrated coastal area management relating to alleviating the impact developmental problems on the environment. The aim is to address immediate problems of a developmental nature and their effects on the coastal environment and its resources through priority action in several fields, with a view of introducing sound environmental management practices.
4. *SPA/RAC – Specially Protected Areas Regional Activity Centre:* From its base in Tunis, the centre focuses on the protection of Mediterranean species, their habitats and ecosystems. SPA/RAC is also involved with habitat management, the drawing up of legislation, the establishment and management of protected areas, the implementation of action plans for the conservation of endangered species. It is also occupied with the elaboration of biodiversity conservation strategies.
5. *CP/RAC – Cleaner Production Regional Activity Centre:* Based in Barcelona, Spain, the main activities of CP/RAC include publicising the concept of clean production and pollution prevention in the industrial sector, given that industry is one of the major pollution sources in the area.
6. *ERS/RAC – Environment Remote Sensing Regional Activity Centre:* Based in Malta, and currently in charge of outlining an information system which will be integrated in the MEDPOL database and will contain information on level sources effects of pollution and any other country-relevant information.

ANNEX IX

Contribution of WHO/MEDPOL to MEDPOL Phase III Programme

Training Courses and Inter-Calibration Exercises in Microbiological Methodology 1996 – 2003

Pollution Monitoring and Inspection

- Report of the National training course on pollution monitoring and inspection, Tirana, Albania, 6-8 October 2003, EU/03/5041703/1
- Report of the National training course on pollution monitoring and inspection, Tirana, Albania, 9-11 October 2003, EU/03/5041703/2
- Report of the National training course on pollution monitoring and inspection, Opatija, Croatia, 29-31 October 2003, EU/03/5041703/3
- Report of the National training course on pollution monitoring and inspection, Teslic, Bosnia and Herzegovina, 29-31 October 2003, EU/03/5041703/4
- Report of the National training course on pollution monitoring and inspection, Nova Gorica, Slovenia, 18-20 November 2003, EU/03/5041703/5
- Report of the National Workshop on Environmental Inspections, Sancti Petri, Spain, 6-10 May 2003, EUR/02/5041703/1
- Report of the Regional “Train the trainers” course on pollution monitoring and inspection, Nicosia, Cyprus, 4-8 November 2002, EU/02/5041702/5

Wastewater treatment

- Report of the National Training course for Wastewater Treatment Plant Compliance Inspection, Haifa, Israel, 27 Nov. – 2 Dec. 1999
- Report of the National Training course on municipal wastewater treatment plant operation and management, Tripoli, Libya, 13-16 May 2002
- Report of the Second National Training Course on Municipal Wastewater Treatment Plant Operation and Management, Rijeka, Croatia, 15-18 October 2002, EUR/02/5041704/2
- Report of the National Training course on municipal wastewater treatment, focusing on the use of natural systems, Tirana, Albania, 16-17 October 2002, EU/02/5041704/3
- Report of the Fourth National Training Course on Municipal Wastewater Treatment Plant Operation and Management, Damascus, Syrian Arab Republic, 20-23 July 2003, EUR/03/5041704/4
- Report of the Regional Training course for trainers on municipal wastewater treatment plant operation and management, Athens, Greece, 16-20 October 2001, EUR/01/5022121/5

- Training material and CD-Rom presentation for the course "Training the Trainers"– Municipal Wastewater Treatment Plant Operation and Management (Volumes I, II and instruction for lecturers) English, French, Arabic, Croatian, Turkish and Greek
- Report of the National Training course for Wastewater Treatment Plant Operators, Alexandria, Egypt, 2-6 April 1999
- Report of the Regional Training courses for Wastewater Treatment Plant Managers, Sophia Antipolis, France, 21 -24 April 1999
- Report of the Regional Training course for Wastewater Treatment Plant Operators, Athens, Greece, 5-9 May 1998

Intercalibration exercises

- Report of the Intercalibration exercise on microbiological methods for coastal recreational waters monitoring, Athens, Greece, 26-29 September 2001, EUR/ICP/HEV-MED 5022115
- Instructions for the microbiology analyses of the Intercalibration exercise on microbiological methods for coastal recreational waters monitoring –Athens, Greece, 26-29 September 2001, EUR/ICP/HEV-MED 5022115/4
- Lectures of the Intercalibration exercise on microbiological methods for coastal recreational waters monitoring, Athens, Greece, 26-29 September 2001, EUR/ICP/HEV-MED 5022115/5

Monitoring programmes

- Monitoring of microbiological pollution in seawater continued within the framework of the national monitoring agreements, as well as evaluation of the data received. Twelve national monitoring agreements were signed and the part related to health aspects was discussed, reviewed and finalized with the assistance of WHO/EURO. Data were received from ten countries and were evaluated. Assistance was provided to four laboratories to enable them to undertake the monitoring activities.
- Equipment and laboratory materials were provided to institutions in Albania, Tunisia and Malta for the implementation of the national marine pollution monitoring programmes.

**Guidelines
1996 - 2003**

- Strategic Action Programme – Guidelines on Municipal Wastewater Reuse for the Mediterranean region, Meeting of MEDPOL National Coordinators, Sangemini, Italy, 27-30 May 2003, UNEP(DEC)/MED WG.231/Inf.6
- Reference Handbook on Environmental compliance and enforcement in the Mediterranean region, Part I – Organizational issues, Meeting of MEDPOL National Coordinators, Sangemini, Italy, 27-30 May 2003, UNEP(DEC)/MED WG.231/Inf.13a
- Reference Handbook on Environmental compliance and enforcement in the Mediterranean region, Part II – General Procedural Issues, Meeting of MEDPOL National Coordinators, Sangemini, Italy, 27-30 May 2003, UNEP(DEC)/MED WG.231/Inf.13b
- Reference Handbook on Environmental compliance and enforcement in the Mediterranean region, Part III – Human Infrastructure, Meeting of MEDPOL National Coordinators, Sangemini, Italy, 27-30 May 2003, UNEP(DEC)/MED WG.231/Inf.13c
- Reference Handbook on Environmental compliance and enforcement in the Mediterranean region, Part IV – Sampling, Meeting of MEDPOL National Coordinators, Sangemini, Italy, 27-30 May 2003, UNEP(DEC)/MED WG.231/Inf.13d
- Manuel de reference sur le respect et l'application effective des dispositions environnementales dans la region Méditerranéenne, Première Partie – Questions Organisationnelles, Réunion des Coordonnateurs nationaux pour le MEDPOL, Sangemini, Italie, 27-30 mai 2003, UNEP(DEC)/MED WG.231/Inf.13a
- Manuel de reference sur le respect et l'application effective des dispositions environnementales dans la region Méditerranéenne, Deuxième Partie – Questions Procédurales Générales, Réunion des Coordonnateurs nationaux pour le MEDPOL, Sangemini, Italie, 27-30 mai 2003, UNEP(DEC)/MED WG.231/Inf.13b
- Manuel de reference sur le respect et l'application effective des dispositions environnementales dans la region Méditerranéenne, Troisième Partie – Infrastructures Humaines, Réunion des Coordonnateurs nationaux pour le MEDPOL, Sangemini, Italie, 27-30 mai 2003, UNEP(DEC)/MED WG.231/Inf.13c
- Manuel de reference sur le respect et l'application effective des dispositions environnementales dans la region Méditerranéenne, Quatrième Partie – Echantillonnage, Réunion des Coordonnateurs nationaux pour le MEDPOL, Sangemini, Italie, 27-30 mai 2003, UNEP(DEC)/MED WG.231/Inf.13d
- Guidelines for the Management of industrial wastewater for the Mediterranean region, - Lignes Directrices pour la gestion des eaux usées industrielles dans la region méditerranéenne, MAP Technical Reports Series No. 153
- Guidelines on Sewage Treatment and Disposal in the Mediterranean region – Lignes directrices sur le traitement et l'élimination des eaux usées dans la région méditerranéenne, MAP Technical Reports Series No. 152
- Reference Handbook on Environmental Compliance and Enforcement in the Mediterranean region – Manuel de reference sur l'aspect et l'application effective des

dispositions environnementales dans la region méditerranéenne, MAP Technical Reports Series No. 150

- Guidelines on Environmental Inspection Systems for the Mediterranean Region – Lignes Directrices sur les systèmes d'inspection Environnementale pour la region méditerranéenne, MAP Technical Reports Series No. 149
- Guidelines on Management of Coastal Litter for the Mediterranean Region – Lignes Directrices sur la gestion des detritus côtiers pour la region méditerranéenne, MAP Technical Reports Series No. 148
- Guidelines for submarine outfall structures for Mediterranean small and medium-sized coastal communities – Lignes directrices pour les emissaires de collectivités côtières de petite et moyenne taille en Méditerranée. MAP Technical Reports Series No. 112
- Guidelines for treatment of effluents prior to discharge into the Mediterranean Sea. MAP Technical Reports Series No. 111
- Guidelines for authorization for the discharge of liquid wastes into the Mediterranean Sea – Lignes directrices concernant les autorisations de rejet de déchets liquides en mer Méditerranée. MAP Technical Reports Series No. 107
- Guidelines for Monitoring Land-Based Sources of Marine Pollution, document No. EUR/ICP/CEH 041(1).

**Principal Working and Reference Documents
1996 – 2003**

- Assessment of Wastewater Reuse Practices in the Mediterranean region, Meeting of MEDPOL National Coordinators, Sangemini, Italy, 27-30 May 2003, UNEP(DEC)/MED WG.231/Inf.5
- Récupération et réutilisation des eaux usées dans la région Méditerranéenne, Réunion des Coordonnateurs nationaux pour le MEDPOL, Sangemini, Italie, 27-30 mai 2003, UNEP(DEC)/MED WG.231/Inf.5
- Strategic Action Programme – Second report on the Pollution Hot Spots in the Mediterranean, Part I – Country Results, Meeting of MEDPOL National Coordinators, Sangemini, Italy, 27-30 May 2003, UNEP(DEC)/MED WG.231/5a
- Strategic Action Programme – Second report on the Pollution Hot Spots in the Mediterranean, Part II – Revised Country Reports, Meeting of MEDPOL National Coordinators, Sangemini, Italy, 27-30 May 2003, UNEP(DEC)/MED WG.231/5b
- Programme d'Actions Stratégiques – Deuxième rapport sur les Points Chauds de pollution en Méditerranée, Partie II – Rapports par pays révisés, Réunion des Coordonnateurs nationaux pour le MEDPOL, Sangemini, Italie, 27-30 mai 2003, UNEP(DEC)/MED WG.231/5b
- Report on Pollution Sensitive Areas, Meeting of MEDPOL National Coordinators, Sangemini, Italy, 27-30 May 2003, UNEP(DEC)/MED WG.231/Inf.14
- Revision of Pollution Hot Spots in the Mediterranean – Part I – Country Reports, EUR/ICP/HEV-MED 5022113
- Revision of Pollution Hot Spots in the Mediterranean – Part II – Hot Spots with potential risk of transboundary effect, EUR/ICP/HEV-MED 5022113
- Development of coastal water quality standards – A review and historical overview with particular reference to the Mediterranean, Athens, Greece, 27-28 November 2001, EUR/ICP/HEV-MED 5022114/1
- Overview of recent advances on bathing water monitoring criteria and standards, Athens, Greece, 27-28 November 2001, EUR/ICP/HEV-MED 5022114/2
- Final report of study of environmental health effects on tourism, MAP-CAMP Malta, 2001, EUR/ICP/HEV-MED 5022126
- Remedial Actions for Pollution Mitigation and Rehabilitation in Cases of Non-compliance with Established Criteria. MAP Technical Reports Series No. 132
- Municipal Wastewater Treatment Plants in Mediterranean Coastal Cities – Les Stations d'épuration des eaux usées municipales dans les villes côtières de la Méditerranée, MAP Technical Reports Series No. 128
- Draft Transboundary diagnostic analysis for the Mediterranean sea, UNEP(OCA)/MED WG.130/3
- (Revised) Draft Transboundary diagnostic analysis for the Mediterranean sea, UNEP(OCA)/MED IG.11/Inf.7

- Identification of main sources of pollution to the Kishon River and the determination of the Best Available Technology (BAT) for them
- Assessment of the state of eutrophication in the Mediterranean sea - Evaluation de l'état de l'eutrophisation en mer Méditerranée. MAP Technical Reports Series No. 106 (the part related to the effects on health)
- Assessment of the state of microbiological pollution of the Mediterranean Sea - Evaluation de l'état de la pollution microbiologique de la mer Méditerranée. MAP Technical Reports Series No. 108
- Survey of pollutants from land-based sources in the Mediterranean - Evaluation de l'enquête sur les polluants d'origine tellurique en Méditerranée. MAP Technical Reports Series No. 109
- Assessment of the state of pollution of the Mediterranean Sea by anionic detergents - Evaluation de l'état de la pollution de la mer Méditerranée par les detergents anioniques. MAP Technical Reports Series No. 110
- Identification of Priority Hot Spots and Sensitive Areas in the Mediterranean - Identification des "Points Chauds" et "Zones Sensibles" de pollution prioritaire en Méditerranée. MAP Technical Reports Series No. 124
- State of the Mediterranean Environment, published by the European Environment Agency. Sub-chapters refer to the following issues: (a) Discharge from sewage outfalls; (b) Microbiological contamination; and (c) Health risk from marine pollution in the Mediterranean
- Substantial assistance was provided to other collaborating UN Agencies in the completion of particular chapters related to health and included in documents of the MAP Technical Reports Series. The health-related chapters of the following documents have been prepared or reviewed by WHO/EURO:
 - - State of the Marine and Coastal Environment in the Mediterranean Region (MAP Technical Reports Series No. 100).
 - Assessment of the State of Pollution of the Mediterranean Sea by Zinc, Copper and their Compounds (MAP Technical Reports Series No. 105).
 - Assessment of the State of Eutrophication in the Mediterranean Sea (MAP Technical Reports Series No. 106).

**CONTRIBUTION OF WHO/MEDPOL TO THE MEDPOL PHASE III
TRAINING COURSES**

No.	Training courses	Venue	Dates	Convened by	Organized by	Number of Participants	Language
1	Regional training course on wastewater reclamation and use	Barcelona, Spain	22-25 November 2004	University of Catalonia	WHO/MED POL in coordination and collaboration with the University of Catalonia, Spain	17	English
2	National course on wastewater treatment plants' operation and management	Mugla, Turkey	6-9 October 2004	Ministry of Forestry and Environment of Turkey	WHO/MED POL in coordination and collaboration with the Ministry of Forestry and Environment of Turkey	30	Turkish
3	National course on pollution monitoring and inspection	Algiers, A lgeria	12-14 June 2004	Ministry of Land Planning and Environment of Algeria	WHO/MED POL in coordination and collaboration with the Ministry of Land Planning and Environment of Algeria	26	Arabic
4	National course on municipal wastewater treatment plants operation and management	Algiers, Algeria	16-18 May 2004	Ministry of Land Planning and Environment in Algeria	WHO/MED POL in coordination and collaboration with the Ministry of Land Planning and Environment in Algeria	26	Arabic
5	National course on pollution monitoring and inspection	Tunis, Tunisia	10-14 May 2004	National Agency for the Protection of the Environment in Tunisia	WHO/MED POL in coordination and collaboration with the National Agency for the Protection of the Environment in Tunisia	22	Arabic
6	National course on pollution monitoring and inspection	Nova Gorica, Slovenia	18-20 November 2003	Ministry of Environment, Physical Planning and Energy of the Republic of Slovenia	WHO/MED POL in coordination and collaboration with the Office of Inspectors of the Ministry	18	Slovenian
7	National course on pollution monitoring and inspection	Teslic, Bosnia and Herzegovina	29-31 October 2003	The MAP Coordination Office in Bosnia and Herzegovina	WHO/MED POL in coordination and collaboration with the MAP Coordination Office in B&H	27	Bosnian
8	National course on pollution monitoring and inspection	Opatija, Croatia	29-31 October 2003	Ministry of Environmental Protection and Physical Planning of Croatia	WHO/MED POL in coordination and collaboration with the Ministry of Environmental Protection and Physical Planning of Croatia	31	Croatian
9	National course on pollution monitoring and inspection	Tirana, Albania	9-11 October 2003	Albanian Ministry of Environment	WHO/MED POL in coordination and collaboration with the Ministry of Environment	16	Albanian
10	National course on pollution monitoring and inspection	Tirana, Albania	6-8 October 2003	Albanian Ministry of Environment	WHO/MED POL in coordination and collaboration with the Ministry of Environment	18	Albanian

No.	Training courses	Venue	Dates	Convened by	Organized by	Number of Participants	Language
11	National course on municipal wastewater treatment plants operation and management	Damascus, Syrian Arab Republic	20-23 July 2003	Ministry of State for Environmental Affairs of the Syrian Arab Republic	WHO/MED POL in coordination and collaboration with the Ministry of State for Environmental Affairs of the Syrian Arab Republic	27	Arabic
12	National Workshop on Environmental Inspections	Sancti Petri, Spain	6-10 May 2003	Council of Andalucia, General Directory of Prevention and Environmental Quality	WHOMED POL in coordination and collaboration with the Council of Andalucia, General Directory of Prevention and Environmental Quality	33	Spanish
13	Regional course for trainers on pollution monitoring and inspection	Nicosia, Cyprus	4-8 November 2002	WHOMED POL	WHOMED POL	14	English
14	National course on municipal wastewater treatment, focusing on the use of natural systems	Tirana, Albania	16-17 October 2002	Ministry of Environment in Albania	WHO/MED POL in coordination and collaboration with the Ministry of Environment in Albania	31	English
15	National course on municipal wastewater treatment plant operation and management	Rijeka, Croatia	15-18 October 2002	Croatian Ministry of Environment in collaboration with "Croatian Waters"	WHO/MED POL in coordination and collaboration with the Croatian Ministry of Environment	28 from Croatia and 3 from Slovenia	Croatian
16	National course on municipal wastewater treatment plant operation and management	Tripoli, Libyan Arab Jamahiriya	13-16 May 2002	Environment General Authority (EGA) of the Libyan Arab Jamahiriya	WHO/MED POL in coordination and collaboration with EGA	21	Arabic
17	Regional course for Trainers on Municipal Wastewater Treatment Plant Operation and Management	Athens, Greece	16-20 October 2001	WHOMED POL	WHOMED POL	16	English
18	Intercalibration exercise on microbiological methods for coastal recreational waters monitoring	Athens, Greece	26-29 September 2001	National School of Public Health	WHO/MED POL in coordination and collaboration with the National School of Public Health	18	English French
19	National training course on wastewater treatment plant compliance inspection	Haifa, Israel	27 Nov. – 2 Dec. 1999	Ministry of Environment of Israel	WHO/MED POL in coordination and collaboration with the Israeli Ministry of Environment	23	English
20	Regional training course for wastewater treatment plant managers	Sophia Antipolis, France	21-24 April 1999	International Office for Water	WHO/MED POL in coordination and collaboration with the International Office for Water	15	English French
21	National training course for wastewater treatment plants operators	Alexandria, Egypt	2-6 April 1999	Alexandria General Organization for Sanitary Drainage	WHO/MED POL in coordination and collaboration with the Alexandria General Organization for Sanitary Drainage	22	Arabic

No.	Training courses	Venue	Dates	Convened by	Organized by	Number of Participants	Language
22	Regional training course for wastewater treatment plant operators	Athens, Greece	5-9 May 1998	Sanitary Engineering Research and Development Centre	WHO/MED POL in coordination and collaboration with the Sanitary Engineering Research and Development Centre	17	English
Total number of delivered training courses 22						Total number of participants 481	number of languages 9