



**United Nations  
Environment  
Programme**



UNEP(DEC)/MED WG.262/4  
11 November 2004

ENGLISH



**MEDITERRANEAN ACTION PLAN**



**GEF**

Meeting of government designated experts to review the process  
of Preparation of National Action Plans

Catania, Italy, 14-16 December 2004

**STRATEGIC ACTION PROGRAMME (SAP) TO  
ADDRESS POLLUTION FROM LAND-BASED ACTIVITIES**

**ESTABLISHMENT/STRENGTHENING OF NATIONAL ENVIRONMENTAL MANAGEMENT  
CENTER FOR THE IMPLEMENTATION OF NATIONAL ACTION PLANS UNDER THE  
FRAMEWORK OF SAP PROGRAMME**



## Table of Contents

PREFACE .....	1
1. THE STRATEGIC ACTION PLAN FRAMEWORK .....	1
1.1 Historical Background.....	1
1.2 SAP targets and activities for selected areas .....	4
1.3 National Action Plans .....	6
2. SAP - NATIONAL ENVIRONMENTAL MANAGEMENT CENTER (NEMC).....	8
2.1 Objectives of SAP- NEMC .....	8
2.2 NEMC environmental targets .....	9
3. FUNCTIONS AND STRUCTURE OF A SAP -NATIONAL ENVIRONMENTAL MANAGEMENT CENTER.....	14
3.1 Technical activities .....	14
3.1.1 Support of NAPs .....	14
3.1.2 Supervision Regulatory Agency for Environmental conditions monitoring.....	20
3.1.2 Training activities and consulting services.....	22
3.1.3 Participation in Research and Development and Transfer of technology programmes .....	27
3.1.4 Incubation of environmental enterprises.....	28
3.2 Structure of a National Environmental Management Center .....	29
3.2.1 The Advisory Board .....	30
3.2.2 Personnel resources.....	31
3.2.2 The Scientific Committee.....	32
3.2.3 The Steering Committee.....	33
3.3 Mobilization of funding sources .....	34
3.3.1 National financial resources.....	34
3.3.2 External financial resources.....	35
3.4 Disemination and Policy Formulation activities .....	39
4. A ROADMAP TO THE ESTABLISHMENT OF A NATIONAL ENVIRONMENTAL MANAGEMENT CENTER.....	42
BIBLIOGRAPHIC REFERENCES.....	45



## **PREFACE**

During the 2001 meeting of the MEDPOL National Coordinators, which took place in Venice, the implementation of a Strategic Action Plan was discussed, to address pollution of the Mediterranean Sea from land based activities by taking into account developments in the scientific, technical, economic, environmental and legal fields. The establishment of national entities ("incubators") was recommended, aiming at guiding the Mediterranean countries in the long-term implementation of the SAP. It is the objective of this study to propose the primary guidelines and principles for the organization of this entity at a national level.

In preparing the document, the authors took into account the particular objectives, specific conditions and existing structures in each country, as well as the technical nature of targets and activities envisaged by SAP, their scientific base, complexity and long term character.

Chapter 1 of the document describes the conceptual framework for the implementation of the SAP, including objectives, principles, approaches and institutional arrangements. It also describes the necessary activities for the formulation of comprehensive and realistic National Action Plans (NAPs), as a major national instrument for the implementation of SAP.

Chapter 2 describes the institutional arrangements of the proposed National Environmental Management Center (NEMC) and the corresponding objectives. It also includes a detailed determination of the strategic targets of the Center, taking into account the principal objectives of the Strategic Action Plan: Urban Development, Industrial Development, Physical Alterations and Destruction of Habitats.

Chapter 3 contains a description of the NEMC activities and duties. It includes a definition of the nature and the role of NEMC to support national authorities for the implementation, evaluation and update of National Action Plans. In addition it presents the primary activities of the NEMC that will be focussed on governmental offices, the industrial sector, non-governmental associations and the scientific and technological world. Furthermore, institutional and structural aspects of the proposed entity are discussed taking into consideration the need to make use as much as possible of the existing bodies and structures at the national level. It also includes a description of the required personnel resources and a definition of the bodies which could supervise and coordinate the NEMC activities. Finally, a paragraph regarding mobilization of financial resources has been included, for the effective operation of the NEMC.

Chapter 4 describes a step-by-step mechanism for the establishment of a NEMC in a target country, which may be used as a guide tool for the start-up of a national body. It should be noted that since national bodies should build upon existing structures, and the needs and priorities of Mediterranean countries vary greatly, this study aims to identify basic elements and activities that can facilitate and strengthen the procedure for establishing a new NEMC.



## **1. THE STRATEGIC ACTION PLAN FRAMEWORK**

### **1.1 Historical Background**

The Mediterranean area is facing a number of environmental problems: between 30-45 million tons of municipal solid waste are generated by Mediterranean coastal areas each year; plastic debris comprises 75% of the Mediterranean coastal litter which ends up floating on the water surface or sinking to the seabed. In addition, overcrowded coastal areas, water scarcity, soil erosion, fragile ecosystems, widespread eutrophication, heavy metals, organic and microbial pollution, oil spills and introduction of non-indigenous species are the most evident results of the intensity of demographic pressure, the nature and intensity of development activities, the state and type of industry and the agricultural practices of the coastal zones.

The deterioration of the Marine environment drew the attention of the Governments of the Mediterranean Region and following a series of scientific meetings and environmental discussions, a comprehensive programme named the Mediterranean Action Plan (MAP) was drafted. An Inter-Governmental Meeting on the Protection of the Mediterranean Sea, convened by the United Nations Environment Programme (UNEP) in Barcelona, Spain (1975), ratified and approved the above-mentioned programme.

A year later, at a conference held in Barcelona by UNEP, representatives of the Mediterranean countries adopted the legal support needed for the implementation of MAP programme. In February 1976, the Barcelona conference adopted and signed a document known as The Barcelona Convention. This is an international agreement reached between the twenty Mediterranean coastal States and the European Union, which are the Parties to the Barcelona Convention, for the Protection of the Mediterranean Sea Against Pollution. The scientific and technical component of the MAP programme was the MED POL Programme (Mediterranean Marine Pollution Monitoring and Research Programme). MED POL - Phase I (1975-1980) was formulated and co-ordinated by UNEP with the technical and scientific co-operation of five specialised UN Agencies (FAO, WHO, WMO, IOC of UNESCO and IAEA).

The legal framework of the MAP Programme was enlarged and modified several times since the adoption of the Barcelona Convention. Among the most important legal instruments developed and approved, was the Protocol on Land-based Sources of Pollution which was adopted in 1980 within the framework of that Convention. A revision of the Protocol was adopted in 1996, in Syracuse. A subject of major concern has been the preparation of appropriate legal instruments to deal with land-based sources of pollution. Since 1995, the Contracting Parties affirmed their determination to use MAP as a tool for promoting regional sustainable development, biodiversity conservation and integrated management of the coastal areas, all in the framework of the Barcelona Convention and MAP Phase II.

MED POL Phase II (1981-1995) was approved by the Mediterranean countries in 1981 and lasted until 1995. During this second Phase the efforts concentrated on the establishment of national monitoring programmes in the Mediterranean countries, which included at the same time the provision of assistance for their implementation. A full data quality assurance programme was put in place covering not only intercalibration exercises but also other activities aiming at improving the quality of the data such as training of personnel, maintenance of instruments, good laboratory practice and the preparation of analytical reference methods. A research programme was also undertaken in support of the monitoring which resulted in more than 500 research projects carried out in 16 Mediterranean countries.

During this Phase the countries collected a large number of marine pollution data. By the end of Phase II, the MED POL data bank included a large inventory related to chemical contaminants in biota (over 15,000 samples for 50,000 analyses of heavy metals and

halogenated hydrocarbons) and microorganisms in sea water (42,000 samples for 53,000 bacterial counts).

Those data, along with others, directly contributed to a more in-depth assessment of the state of the Mediterranean and to the formulation of fifteen pollution control measures, which were later adopted by the Contracting Parties at the Barcelona Convention.

Towards the end of Phase II of the Programme, important events at the global and regional levels occurred. At the global level, these events were the adoption of Agenda 21 in Rio and of the Global Plan of Action (GPA) to address pollution from land-based sources and activities in Washington.

At the regional level, the signature of an amended and more comprehensive Protocol against pollution from land-based sources (LBS Protocol) followed by the creation of the Mediterranean Commission for Sustainable Development (MCSA), indicated the new directions and new priorities to be followed by MED POL. The MED POL Programme had to operate a gradual switch from pollution assessment to pollution control and became a concrete tool for the Governments to apply the new texts and agreements and to ultimately control and eliminate marine pollution for an appropriate coastal zone management.

MED POL Phase III, adopted in 1995 and called "Programme for the assessment and control of pollution in the Mediterranean region", presented a stronger emphasis on the managerial aspects of pollution control and a more direct link with the implementation of the relevant Protocols (Dumping and LBS).

The Parties have also adopted a strategic action plan, the Strategic Action Programme for the Mediterranean Sea (SAP), to guide them in the determination of their obligations through the identification of priorities and the adoption of national action plans containing key actions that need to be taken urgently. The Strategic Action Programme was adopted by the Tenth Ordinary Meeting of the Contracting Parties at the Barcelona Convention, held in Tunis in 1997. 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, as well as the amended Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-based Sources and activities, signed by the Contracting Parties in 1996. The project was approved by the Global Environment Facility (GEF) with the aim of assisting the United Nations Environment Programme (UNEP), as the secretariat of the Barcelona Convention and its related protocols, in the "determination of priority actions for the further elaboration of the Strategic Action Programme for the Mediterranean Sea".

Formulation and adoption of SAP were linked with:

- the revised LBS Protocol, signed in 1996 in Syracuse, as the legal and contextual basis;
- GPA, defining the global framework and context;
- the regular MED POL programme, the implementation of SAP being its integral part; and
- Conventions: (i) on the Law of the Sea, (ii) on Biological Diversity, (iii) on Climate Change, and the legal instruments/measures adopted by the Contracting Parties.

The immediate objectives of SAP are: to protect the marine environment and coastal zones through the prevention of pollution and by reduction and, as far as possible, elimination of pollutant inputs, whether chronic or accidental; and to develop and implement national programmes of action for the protection of the marine environment from land-based sources.



The implicit long-term objective of SAP is to facilitate the implementation by the Contracting parties of the provisions of the LBS Protocol Reduction. Its specific objectives are related to the implementation of the following major activities:

- formulation of principles, approaches, measures, timetables and priorities for action;
- preparation of the Priority Investment Portfolio;
- analysis of baseline and additional actions related to transboundary problems;
- identification of elements and preparation of guidelines for the formulation of NAPs;
- identification of the role and involvement of NGOs and stakeholders in its implementation.

In order to support the implementation of the Strategic Action Programme, a GEF project entitled "Determination of priority actions for the further elaboration and implementation of the Strategic Action Programme for the Mediterranean Sea", was approved by the GEF Council for a three year duration starting January 2001 and ending December 2003. The overall objective of the project was to improve the quality of the marine environment in the Mediterranean region by better-shared management of land-based pollution, through improved international cooperation in the management of land-based pollution of transboundary and regional significance. The project was directed towards the elimination of pollution hotspots, the preparation of regional guidelines and plans for the elimination and control of pollution, capacity-building, the creation of a sustainable financial platform for the continued implementation of the Strategic Action Programme, the preparation of a regional programme for public participation and the preparation, adoption and implementation of national action plans specifically related to the elimination of pollution from land-based activities. The project also aimed to the preparation and adoption of a strategic action plan for biodiversity for the Mediterranean, to serve the needs of the Protocol on Specially Protected Areas and Biodiversity.

The Strategic Action Programme (SAP) specifies the main land based pollution issues in the Mediterranean and indicates the desired targets to be reached to resolve these issues within a specific time frame. To this end the SAP also indicates the necessary pollution control, reduction and elimination measures that should be taken at the national and regional level and establishes a general schedule and time frame for their implementation.

The SAP is expected to be implemented over a long-term period, i.e. up to 2025. While the ultimate date of 2025 should be strictly maintained and considered as the main policy decision behind the SAP, the other intermediate dates indicated by the programme should be regularly verified and possibly adjusted taking into account the technical, scientific and policy developments occurring in the region. To this end, the Secretariat would present at each Contracting Party Meeting a detailed work plan for the implementation of the SAP for each two-year period examined by the Contracting Parties. This procedure was adopted in Malta in 1999.

When implementing SAP, the countries are expected to apply the following principles and approaches: the precautionary principle, the polluter pays principle, undertake Environmental Impact Assessment studies, accord priority to integrated pollution control, promote Integrated Coastal Zone Management, elaborate and implement regional and national action plans, adopt priorities and timetables according to the Protocol, take into account Best Available Techniques (BAT) and Best Environmental Practices (BEP) processes, undertake relevant preventive measures, ensure public access to information, ensure reporting on toxic emissions.

The priorities for action will be identified by taking into account: (i) the significance of degradation of the marine environment, (ii) the significance of perturbation of the biological

diversity, (iii) the land-based origin of causes, and (iv) the transboundary nature of causes and impacts.

## 1.2 SAP targets and activities for selected areas

Targets and required activities at regional and national level as identified by SAP, are structured in three areas:

- Urban environment
- Industrial development and
- Physical alterations and destruction of habitats

In addition, several sub-categories of activities are included within each area:

*1. Urban environment.* Large and even medium-size cities pose similar problems, which are burdened by small and medium-sized industries located within the cities and by industrial agglomerations at the outskirts. Significant problems and the corresponding actions should include the following aspects:

- (i) municipal sewage management;
- (ii) urban solid waste management;
- (iii) air pollution

*2. Industrial development* of the Mediterranean countries varies greatly and its capacity to generate environmental pollution is greatly recognised. The following priority issues have been associated to industrial pollution:

- (i) Toxic, Persistent and Liable to Bioaccumulate substances - TPBs: Persistent Organic Pollutants (POPs); Heavy metals Hg, Cd, Pb and Organo-metallic compounds;
- (ii) other heavy metals: Zn, Cu, Cr;
- (iii) organo-halogen compounds;
- (iv) radioactive substances;
- (v) nutrients and suspended solids, including municipal sewage, industrial waste water, impacts from agricultural and atmospheric emissions; and
- (vi) hazardous wastes

*3. Physical alterations and destruction of habitats.* The increase of populations and economic activities in coastal areas is leading to an expansion of construction and physical alterations to coastal areas and water, while at the same time important habitats are being destroyed.

The relevant activities at regional level are predominantly related to: (i) preparation of respective guidelines for environmentally sound disposal or management, (ii) establishment of Environmental Quality Criteria, emission standards, (iii) development and implementation of technical programmes for exchange of experience and provision of information, (iv) implementation of research programmes for validation of technologies, (v) preparation of guidelines for respective BAT, BEP and clean technologies, (vi) participation in selected activities, being implemented by other international organizations (FAO, OECD, others), etc. (vii) application of Environmental Audits, BEP and BAT, etc.

Furthermore, the SAP programme provides a number of accompanying activities for supporting and assisting the participating members, including monitoring, capacity building, public participation and reporting:

*4. Monitoring activities,* related to the implementation of SAP are organized within the framework of MED POL Phase III Programme, adopted in 1996. The respective targets proposed are related to the establishment of: (i) programmes for monitoring inputs of priority pollutants, (ii) permanent river water quantity/quality registers, (iii) inspection systems, and

(iv) programmes for monitoring discharges and emissions of priority pollutants; all including monitoring of the quality of the marine environment.

5. *Capacity building activities* include support, promotion and facilitation of programmes of assistance (i) in the area of scientific, technical and human resources, and (ii) related to the capacity to apply, develop and manage clean production technologies, BAT and BEP.

6. *Public participation.* For the implementation of this vital aspect of SAP, the following targets are proposed: provision of access to information to general public and stakeholders, facilitation of public access to SAP activities, and mobilization and involvement of major stakeholders in the process. The respective activities are related to: identification of potential role of Non-Governmental Organizations (NGOs) in the process and their involvement as appropriate; implementation of coordinated information campaigns, publication and dissemination of informative materials and use of media; promotion and strengthening of exchange of information and experience among stakeholders.

7. *Reporting.* According to the LBS Protocol, regular two-yearly reporting by Contracting Parties is envisaged. The activities at regional level are related to: preparation and use of a unified reporting system, collection of information on pollution trends and loads; publication at regular intervals of reports on the State and Evolution of the Mediterranean Environment; and, development of Pollutants Release and Transfer Register (PRTR).

8. Finally, the SAP programme is associated to *instructions and information* to the participating countries including guidelines for the preparation of National Action Plans and Investment Portfolio (IP) and Mobilization of Financial Resources, including:

1. Guidelines for the preparation of NAPs, providing general information and instructions related to:
  - objectives, principles and obligations, to be considered at national level;
  - preparation of National Diagnostic Analyses plans;
  - establishment of national priorities for action;
  - relevant institutional aspects, including authorization or regulation procedures;
  - monitoring, enforcement, capacity building, public participation and reporting.
2. Investment Portfolio and Mobilization of Financial Resources elaborating:
  - Mediterranean hot spots and sensitive areas, including proposed investments and estimated costs, as presented by national reports. Work on the identification of pollution hotspots has been carried out as planned; the criteria for their selection have been developed and applied in eleven of the twelve countries to update national reports and provide data on the transboundary pollution effects of these hotspots. With regard to pollution-sensitive areas, work has started with the drafting of the criteria that need to be adopted and applied at country level. Until now, a list of 103 pollution "hot spots" and 51 sensitive areas are officially recognised by the Governments as needing special attention and intervention. The list is expected to be regularly updated in order to follow the progress made in the countries in resolving the problems, hot spot by hot spot, and assist them accordingly.
  - Investment Portfolio scenaria
  - Activities proposed and associated costs, separately for: Hot spots, Sensitive areas, Cities, and for the Regional Sustainable Environmental Management Programme (the latter including capacity building, National Plans and Programmes, cleaner production, monitoring and evaluation, and information and public participation).

### 1.3 National Action Plans

The formulation of comprehensive and realistic National Action Plans (NAPs) to address pollution from land-based activities, based on the agreed principles and targets, is the major national instrument for the implementation of SAP. National action plans will be prepared in several stages according to a work-plan which includes the preparation of national diagnostic analyses, a baseline budget and sectoral plans and their integration into the national action plans. The national action plan will be the starting point for national activities and the benchmark against which progress will be measured. The activities on the preparation of national action plans at country level are coordinated by the Inter-Ministerial Committee (IMC) and seven countries have signed memoranda of understanding for financial support under the project.

The main objective of a NAP is, in accordance to LBS Protocol, the elimination of the pollution deriving from land based sources and activities, in particular to phase out inputs of the substances that are toxic, persistent and liable to bioaccumulate listed in the Protocol.

The specific objectives of NAPs are:

- formulation of principles, approaches, measures, priority actions and deadlines for the implementation of SAP within the national framework;
- preparation of a national priority list for intervention and investment, called Investment Portfolio (IP);
- analysis of expected baseline and priority activities for issues/actions of a transboundary nature;
- identification of potential roles for NGOs' and stakeholders' role in the process.

For the preparation of NAPs, national teams are encouraged to apply sustainable, pragmatic and integrated environmental management approaches, using the methodologies of Integrated Coastal Area Management (ICAM), Integrated River Basin Management (IRBM), land- and sea-use planning as tools, the Pollution Prevention Plans (PPP) for the use of Best Available Technologies (BAT) and Best Environmental Practices (BEP).

As soon as they will be prepared, 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. The process of adoption of NAPs is country specific. The official adoption of the respective NAP will be one of the prerequisites for international funding and assistance. Monitoring, evaluation and reporting on the progress of the adoption procedure should be included in the NAPs as part of the overall procedure.

It should be underlined that NAP is considered as a useful strategic tool that can assist governments, industry and local communities in the progressive prioritisation, over an extended period of time, of their sustainable development needs and goals, and in the mobilisation of both political and financial support. It provides for both a multiface, integral policy framework and a comprehensive, constantly updated, information base.

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. In addition to activities directly addressing pollution, the Programme envisages the implementation of respective capacity building actions, provision of external support according to available sources, implementation of the participatory principle, and of procedures for monitoring, evaluation, reporting, feedback information and readjustments. Due to the complexity and significance of the targets and actions envisaged, as well as the resulting financial, institutional and organizational implications, the implementation of SAP requires careful planning, harmonization and integration at the national level. Furthermore, national action plans must respond to the

unique specific circumstances and priorities established in each country. Each country must select the approach that best suits geographic characteristics, political, institutional and regulatory frameworks, best available science and technology, current assessments, inventories and data. Therefore, the individual national approaches for protecting the marine environment from land-based activities may not have the same appearance, scope or focus.

The preparation, adoption and implementation of NAPs in partner countries are specific complex, multidisciplinary and long term issues, requiring the establishment of new institutional structures in each country. Furthermore, requirements related to the initiation and the formulation of NAP phases differ widely from those related to the implementation phase. In addition, transversal activities, in particular targeted monitoring, require specific institutional and other arrangements and capacities. Finally, specific national conditions, such as already existing institutional arrangements, differences in governmental and administrative structures, degree of decentralization, organization of infrastructure and service systems, the present practice related to participatory activities, the implementation capacity and availability of funds, - all call for a flexible approach when designing the national action plans.

For the implementation of these concepts, the establishment/strengthening of SAP National Environmental Management Centers (NEMC) or SAP Incubators is proposed, **as they have been briefly described in the SAP operation document adopted by the CPs in their meeting in Monaco 2001(UNEP, 2001)**. These new entities will be established in each member state, based on existing structures, with a significant contribution to the implementation of SAP principles at national level. The responsibilities, role and activities of the NEMC will be described in the following chapters. However, it should be mentioned that, as the needs and priorities of countries vary greatly, it should be underscored that this document intends only to identify basic elements and common characteristics that can facilitate and strengthen the procedure for developing the proposed centers by describing a basic process. **It should act as a “tool box” that may be used in accordance with each country’s priorities and circumstances.** As such, it focuses on a recommended process for developing a NEMC; a detailed description for the establishment of such structure should start as soon as the foundation of this entity will be decided taking into account the specific conditions in the particular area.

## 2. SAP - NATIONAL ENVIRONMENTAL MANAGEMENT CENTER (NEMC)

The SAP National Environmental Management Centers will be regarded as national entities providing a range of technology, scientific and management services to support the implementation of the SAP activities and ensure their efficient application.

The NEMC would act as a **consultative** and "technical think-tank" body for the SAP national activities. It would elaborate and perform its activities in close coordination with the SAP national coordinator. Since the SAP NEMC will provide a wide range of **multidisciplinary** activities, local scientific and technical institutions could be the most relevant on site bodies that could set up and ensure the proper management of the Environmental Management Center.

### 2.1 Objectives of SAP- NEMC

The primary aim of a NEMC is the implementation of SAP principles, objectives and targets at national level, by supporting the corresponding MEDPOL authorities, and by promoting and developing programs, including new activities, which will ensure the achievement of the SAP targets. The specific objectives of the NEMC should focus on the following issues:

- support of national SAP authorities (SAP/MEDPOL coordinator, interministerial committee) on legal and technical issues and especially on the implementation and management of national action plans;
- design and develop plans for integrated environmental monitoring;
- provide multidisciplinary consultation services to the SAP national and local partners and technical assistance upon request, to governmental and private sector;
- ensure the dissemination and propagation of information provided by the SAP/MEDPOL actors at national and local level;
- improve the environmental performance of industry, local government and community-level enterprises;
- related to the most advanced technology necessary for resolving environmental problems;
- promote the development of applied environmental research;
- facilitate the integration of environmental legislation and the transfer of environmental variables and factors into a production process;
- stimulate the creation of new enterprises, or the development of new departments in existing small and medium companies, dealing with environmental matters;
- facilitate the implementation of SAP related investment project resulting from the implementation of the NAP and the Mediterranean Partnership
- stimulate interaction between national and local authorities, industrial sector and research laboratories;
- encourage the co-operation between specialised agencies of the United Nations, intergovernmental, governmental and non-governmental organisations.

**The structure and composition of the National SAP Center will be country specific and will be defined and adopted by the National SAP interministerial committee and national SAP/MED POL coordinator, following the recommendations of MED POL, as appropriate. The corresponding structure should reflect the legislative, technical, financial and management requirements imposed by the local conditions.**

## **2.2 NEMC environmental targets**

The environmental issues on which the NEMC will act, have been already specified by SAP, and include the following activities:

### *1. Urban development*

Urban development includes actions associated to municipal sewage, solid wastes and air pollution.

Activities of specific importance for the contribution of NEMC on the field on municipal sewage management are:

- update of national regulations on sewage discharges to the sea and rivers and harmonization to existing international guidelines (e.g. EU Directives enforcing the construction of urban wastewater collection and treatment systems in settlements);
- development of national programmes for the environmentally sound management of sewage including construction of sewage networks and wastewater treatment plants in coastal cities, efficient operation and maintenance of treatment facilities, promotion of co-treatment of municipal/industrial wastewaters, environmentally sound disposal of sewage sludge;
- preparation of national plans regarding surface and underground water management and effective use of existing water resources;
- development of wastewater reclamation and reuse guidelines, and promotion of efficient reuse programmes in areas with significant water resources deficiency (water salination, poor water quality etc).

Regarding solid waste management, NEMC's should address the following fields:

- update of national plans and programmes on urban solid waste management and harmonisation to existing guidelines (e.g. to EU Directives);
- promotion of urban solid waste reduction, recycle and reuse programmes;
- preparation of methodological tools for selecting the most appropriate locations for the formation of sanitary landfills;
- development of programmes for the survey of existing uncontrolled landfill sites and promotion of programmes for their closure, including restoration, rehabilitation, stabilization and remediation measures.

The NEMC potential contribution to urban air pollution includes the following measures:

- assessment of significant emissions from mobile sources, central heating facilities, industrial units.

- development of new facilities, and enhancement of existing ones, for continuous urban air pollution monitoring;
- assistance for the adoption of legislation and control of stationary energy generating plants;
- promotion of energy conservation and utilization of innovative low emissions technologies (natural gas, fuel cells, etc);
- development of programmes for air pollution control from mobile sources, including promotion of public transportation, improvement of traffic management, maintenance of vehicles, support of actions for the promotion of environmentally friendly fuels.

## *2. Industrial development*

In this issue, the NEMC will assist each country in the development of convenient procedures for the implementation of a National Budget Approach. This would mean that each country should reduce the aggregate releases of a targeted pollutant by a certain year with a reference to a national baseline budget for each SAP targeted pollutant.

According to SAP, a "national baseline budget" would be identified for:

### Persistent Organic Pollutants

1) The twelve substances identified by the LBS Protocol as organochlorines are divided into four groups:

- (i) pesticides: DDT, aldrin, dieldrin, endrin, chlordane, heptachlor, mirex, toxaphane and hexachlorobenzene
- (ii) industrial chemicals: PCBs;
- (iii) unwanted contaminants: hexachlorobenzene dioxins and furans;
- (iv) poly aromatic hydrocarbons

### Heavy metals and organometallic compounds:

- (i) mercury, cadmium, lead;
- (ii) organomercuric, organolead and organotin compounds;
- (iii) zinc, copper and chromium

### Organohalogen compounds:

- (i) halogenated aliphatic hydrocarbons such as chlorinated solvents: trichloroethane, dichloroethane and trichloromethane, chlorinated paraffins;
- (ii) halogenated aromatic hydrocarbons such as: chlorobenzenes, polychlorinated naphthalens, polybrominated diphenyl ethers and polybrominated biphenyls;
- (iii) chlorinated phenolic compounds;
- (iv) organohalogen pesticides;

### Radioactive substances

Nutrients: biodegradable organic matter, nitrogen and phosphorus compounds and suspended solids from anthropogenic industrial and agriculture sources released through:

- (i) industrial waste water generated by foods and beverages, textiles, tanneries and leather finishing, paper and paper pulp, phosphatic fertilizers and pharmaceutical industries;
- (ii) agriculture activities;
- (iii) atmospheric emissions especially NO<sub>x</sub> and NH<sub>3</sub>

Hazardous wastes for those listed in the annexes of the Basel Agreement and:



- (i) obsolete chemicals that include stocks of banned organochlorine compounds such as dieldrin, DDT and out-of-date chemicals;
- (ii) used lubricating oil;
- (iii) batteries: traditional zinc-carbon, alkaline, mercury, silver oxide, zinc, lithium and nickel-cadmium batteries; lead acid, nickel iron and nickel-cadmium accumulators

The contribution of NEMC on national industrial development issues, will include the following measures:

- preparation of an inventory for industrial point sources and the corresponding released amounts of industrial pollutants, including estimation of waste generation rates and identification of priority flows requiring urgent minimization;
- reduction of discharges and pollutants by promoting the implementation of environmental management and application of Best Environmental Practices (BEP) and, if possible, Best Available Techniques (BAT) in industrial installations that are sources of pollutants;
- development and adaptation of national programmes for reduction of industrial pollutants releases;
- development and adaptation of measures for regulating the emissions of pollutant chemicals including mercury, cadmium, zinc, copper and AOX in certain, high polluting, industrial processes;
- preparation of hazardous waste management plants and programmes based on initiatives/projects such as: development of integrated pollution prevention and control activities, promotion of eco-design of products, preparation of financial benefits such as grants and tax reduction for adoption of cleaner production strategies, promotion of environmental management systems.

### *3. Physical alterations and destruction of habitats*

The activities included in this section are directly related to the preservation of coastal habitats and biodiversity and the implementation of coastal zone management and should be considered in the wider context of the overall implementation of the objectives of the Barcelona system. Certain measures will include:

- support programmes for integrated coastal zone management;
- develop programs for the identification of ecosystem diversity and productivity and for the determination of habitats of socio-economic and ecological significance such as spawning grounds, breeding grounds and nurseries of marine living resources which guarantee food security of large coastal population;
- establish marine protected areas in coastal areas to maintain the integrity and biological diversity of their habitats;
- conduct assessment studies which involve the use of community based participatory approaches, to identify land based activities that threaten physical degradation or destruction of key habitats;
- formulate and promote the adoption of local -scale approaches to safeguarding critical habitats;

- encourage economic and social sectors whose activities may lead to physical degradation or destruction of such habitats in order to adjust those activities so as to reduce or avoid such effects;
- promote the development of non-destructive fishing practices;
- establish a system of prior authorization by competent national authorities for works which cause physical alterations of the natural state of the coastline or the destruction of coastal habitats;
- undertake studies on the potential effects on the environment or Environmental Impact Assessment according to the importance of the physical alterations and the destruction of habitats related to management projects;
- formulate guidelines for the preservation of habitats and normal ecosystem functions in coastal areas, particularly in the context of integrated coastal area management taking into account existing international mechanisms and agreements;
- participate in a clearing-house for providing information on technologies and experiences regarding coastal-zone-management methodology;
- cooperate with governmental organizations in the development and implementation of environmentally sound land-use techniques, planning and practices to prevent and control the negative effects of physical alterations.

Furthermore, NEMC will assist contracting Parties in a number of accompanying activities such as adoption of legislation, monitoring, capacity building, public participation and reporting.

#### *4. Monitoring*

Marine pollution monitoring activities have been among the basic activities of MED POL since its inception and are continuing, further developed, in Phase III. Types of monitoring which have to be taken into account in order to meet the SAP targets and objectives include the following practices:

- the establishment of inspection systems to ensure compliance with the conditions laid down in the authorisations and regulations;
- the establishment of monitoring programmes to evaluate the effectiveness of actions and measures implemented under SAP;
- the establishment and improvement of local air pollution monitoring programmes as a priority in large cities and urban agglomerations;
- the establishment and improvement of local and national monitoring programmes to control and assess effluent discharges from point and non-point sources and to assess the quality of the marine environment;
- the establishment of sustainable water resources management practices;
- the establishment and improvement of underground water quality monitoring programmes;

- the establishment and improvement of river pollution monitoring programmes;
- the establishment of permanent registers of river quality and quantity on selected rivers;
- the establishment of a data-bank on socio-economic indicators related to sea and river quality and pollutant fluxes associated with a Geographic Information System (GIS);
- the improvement of the inventory of major point atmospheric sources following EMEP/ CORINAIR guidelines.

#### *5. Capacity building activities*

The capacity building activities aim to improve the scientific base, environmental policy formulation, professional human resources, institutional capacity and capability, both public and private, the implementation of environmentally sound technologies, the implementation of policies for cleaner production and technical cooperation, including cooperation in the fields of technology transfer and know-how. The activities can be grouped into the following categories:

- to support, promote and facilitate programmes of assistance in the area of scientific, technical and human resources;
- to support the development of environmental legislation and to promote and facilitate its implementation in the private and public sector;
- 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 practices (BEP);
- to develop and apply appropriate plans for the dissemination of the activities.

#### *6. Public participation*

Public participation actions include the following:

- implementation of information campaigns and dissemination activities on environmental protection;
- enhancement of information and experience exchange on the environmental problems of specific regions and development of cooperation agreements;
- identification of potential roles of NGO for the implementation of National Action Plans and assistance to access the relative information;
- organization of educational and training seminars on significant environmental issues such as water resources conservation, recycling, environmental protection, energy conservation etc.

The assistance and support of NEMC to Contracting Parties will be site specific according to the particular economic, scientific and technical conditions prevailing in each country. Furthermore, the realization of the previous targets will be associated to the development of an appropriate NEMC structure and the determination of the corresponding activities and duties.

### **3. FUNCTIONS AND STRUCTURE OF A SAP -NATIONAL ENVIRONMENTAL MANAGEMENT CENTER**

The NEMC centers will assist each participating country in their effort to implement the SAP targets at the national level, by providing and allocating the necessary sources of expertise, networks and tools needed to make the venture successful. The specific activities and functions of each NEMC will be developed according to the primary targets; the aspects that will be included are of technical, legislative, structural, financial and managerial character. A conceptual diagram of the various functions/activities of a NEMC and the corresponding sub-tasks are shown in Figure 3.1. In this figure the interrelations between the various activities are also included.

#### **3.1 Technical activities**

Technical activities of NEMC will be associated with the assistance and support of governmental, industrial and non-governmental sectors, in their effort for the development and implementation of pollution reduction plans and processes in the Mediterranean area. The technical activities will consist of a number of sub-sectors such as support in the development and implementation of National Action Plans, monitoring of environmental conditions, technical assistance-consulting services, development of RTD actions and incubation of environmental enterprises.

##### **3.1.1 Support of NAPs**

The primary aim of a National Environmental Management Center will be to assist contracting parties in their effort to implement and track the compliance of the implementation of the NAP under the SAP framework. An appropriate and methodical approach should be utilised when developing the national programme of action framework in order to ensure the sustainability and continued development of the national programme over the medium and long term, while the national programme development process is made more transparent and accessible to diverse stakeholders and end-users.

The selection of an appropriate method must respond to specific national circumstances and priorities. Therefore, each country is advised to explore different methods. Examples of applicable methods and approaches, include integrated coastal zone management, integrated problem analysis or root cause analysis, hot-spot & sensitive area analysis, programmatic goal settings, system analysis, environmental impact assessment, as well as identification of sector-specific land-based activities which significantly impact the quality and function of a shared water body.

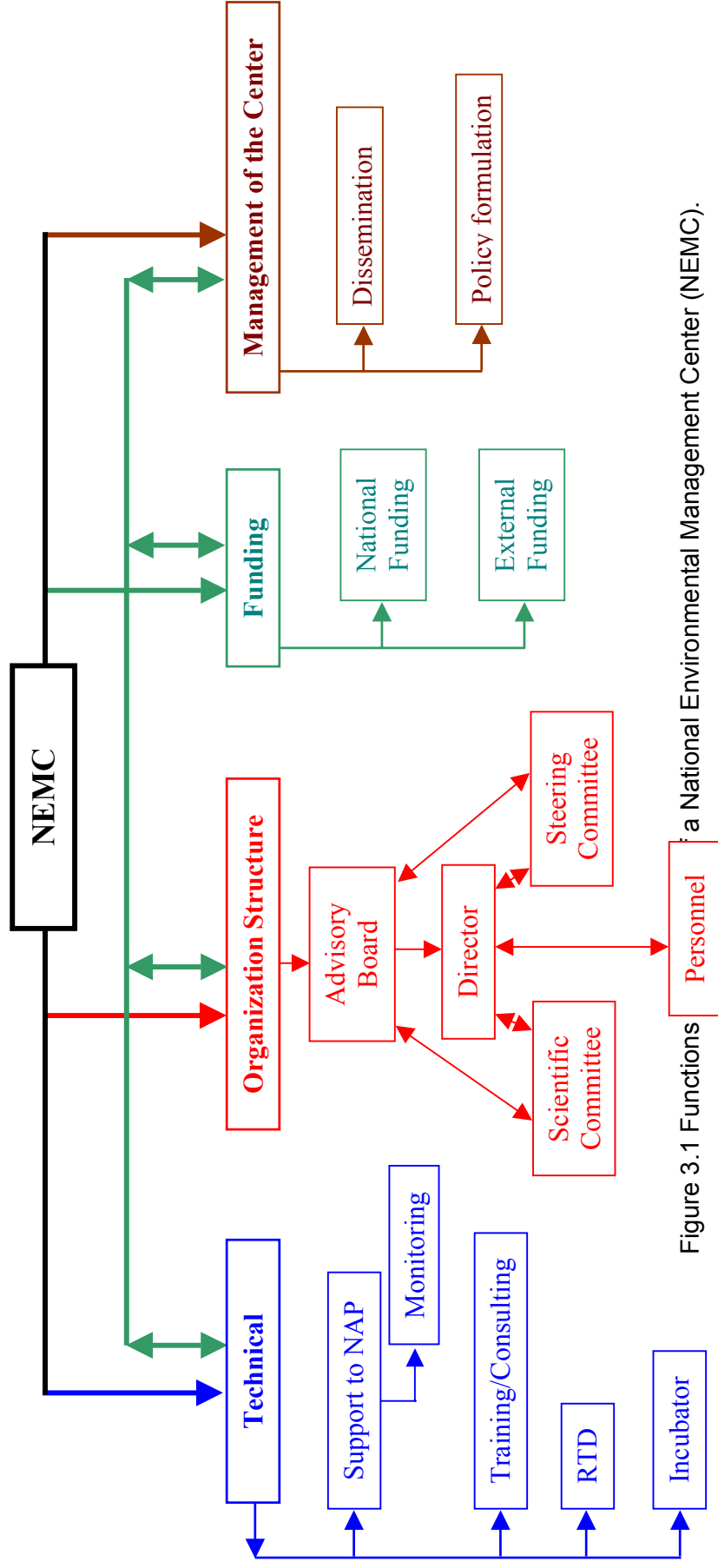


Figure 3.1 Functions of a National Environmental Management Center (NEMC).

While each of these approaches or tools could differ slightly in their application, the primary emphasis is on identifying and characterising the causes of environmental degradation (pressure on the environment), determining the resilience, robustness or health of ecosystems (state of the environment), and identifying and implementing appropriate remedial, mitigative or preventative measures (response).

A range of cross-sectoral considerations have been set by Global Program of Actions (GPA) for the implementation of NAPs that underline the strategic nature of coastal and marine resources forming the "basis for action" at the national level. These considerations follow a logical process and are cyclical in nature, as shown in Figure 3.2; each cycle should build upon the successes of the previous cycles. The following six steps for national action are recommended and have to be applied by the corresponding NEMC:

- 1. Updating the information related to identification and assessment of problems**, taking into consideration such issues as public and ecosystem health, and economic benefits and uses. A wide range of source categories and areas which may be affected or threatened by environmental degradation are suggested.
- 2. Updating the information related to the establishment of priorities** builds upon the previous identification exercise, and outlines considerations that should be taken into account, including relative severity of impacts, and linkages to freshwater environments, as well as relevant existing programmes and strategies at the national level. The application of the precautionary approach is emphasised.
- 3.** On the basis of the priorities established, **management objectives for priority problems** are required, with respect to both source categories and areas affected, that include concrete elements such as specific targets and timetables.
- 4.** The **identification, evaluation and selection of strategies** to achieve these management objectives should include steps to promote the sustainable use of marine and coastal resources, and to protect or remediate affected areas, and such measures as internalisation of environmental costs, technical assistance/co-operation, education and public awareness, identification of data-collection and research needs, identification of arrangements to undertake associated management tasks, and identification of financial sources for carrying out identified strategies and programmes.
- 5. Criteria for evaluating the effectiveness of strategies and measures** should include cross-cutting elements such as environmental effectiveness, economic costs and benefits, equity, and flexible and effective administrative structures.
- 6. Programme support elements** stress the need to ensure that the necessary administrative and management structures are in place to support the national programme over the long term, including legal and financial mechanisms, contingency plans and public participation measures.
- 7. Formal endorsement at the national and sub-national levels**, conferring legitimacy on the process and providing solid political, institutional and financial support from relevant government authorities.

Implementation of the subsequent steps required for the development of a NAP, requires a lead or coordinating agency which will spearhead the development of the national programme, and co-ordinate activities among relevant institutions and stakeholders. These actions will take place through the NEMC which should initially:

- 1.** Assess existing information, databases and inventories for the preparation of a national list of environmentally sensitive areas. Because the national programme of action

should build upon current information, assessments, databases and inventories, it is strongly recommended that a comprehensive evaluation should be undertaken in order to evaluate current status, and identify research and information gaps. The evaluation should be carried out regardless of the number of existing assessments in order to gauge their quality and level. It is necessary to develop an integrated basis of analysis because assessments, databases or inventories can overlap, present gaps, or be impossible to compare and conciliate.

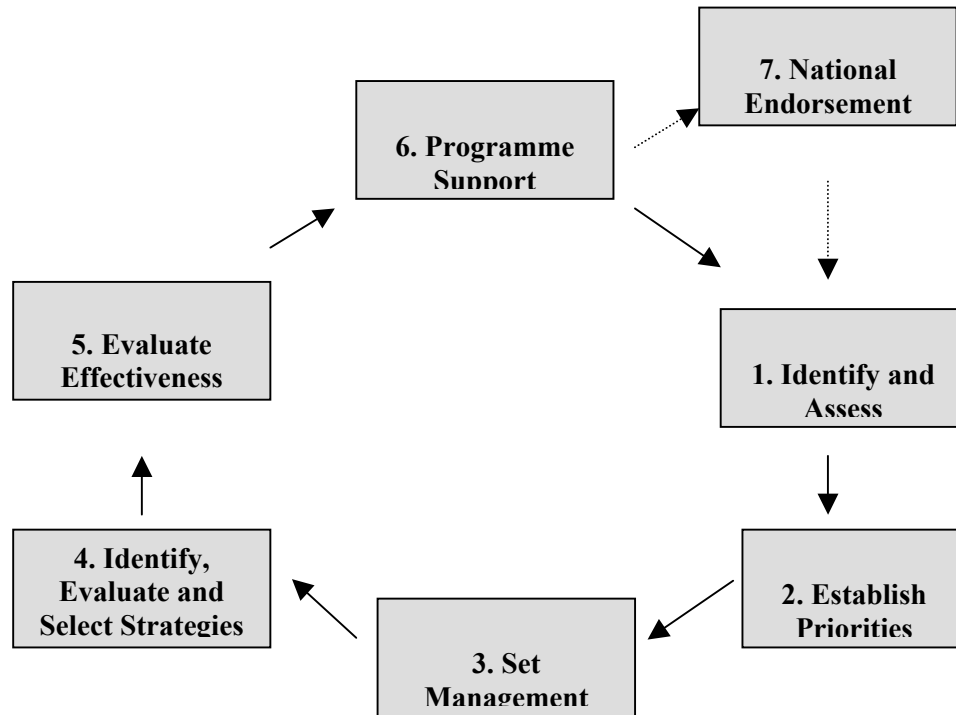


Figure 3.2. The National Programme of Action Cycle.

2. Preparation of sectoral programmes according to SAP objectives and establish a priority list of environmentally sensitive areas. In this issue, definition of criteria for prioritisation is an important factor, ensuring continuity, consistency, and coherence throughout the phased implementation of the national programme. The priority setting process should consider environmental and socio-economic issues, policy and legislative frameworks, and the management, institutional, and technical infrastructure available. Clear and explicit criteria for prioritising action will generate the following benefits:

- decisions within the process are transparent;
- a climate of equity and consistency, and therefore trust, will be created;
- effective participation by different stakeholder groups is encouraged;
- short term perspectives are transcended;
- a consistent and coherent approach to the progressive identification and characterisation of issues is generated; and,
- socio-economic considerations are included.

Criteria must reflect the circumstances and overall priorities of each country.

3. As in most participating Countries the development of National Action Plans is almost a completed project, special emphasis should be given to the review of existing plans, through renegotiation of Protocols, Conventions, development of additional guidelines and comprehensive management approaches. Given the complex and interlinked range of issues that should be addressed in a national programme of action, and the cross-cutting interactions among them, a national programme of action should be an iterative and phased process, whose scope may be progressively broadened. Two additional specific aspects may also assist in re-defining the scope of a national programme of action:

*Thematic:* It may be based, *inter alia*, on environmental issues, sectoral approaches, or pollutant source categories. A decision may be taken for including priority issues which might not constitute land-based activities but are impacted by them, such as fisheries or accessibility and quality of associated freshwater resources.

*Geographic:* This often reflects the relative size of a country. Whereas the national programme of action for a small island state might cover the entire territory, larger countries might wish to focus their action on specific sub-national region(s) or site(s), and develop a national programme progressively. It may also reflect a decision to organise the national programme on the basis of, for example, catchment areas.

4. Setting integrated management objectives and selecting appropriate strategies and measures for meeting those objectives. For the priority problems identified, integrated management objectives should be defined in terms of:
  - overall goals, targets and timetables;
  - specific targets and timetables for the geographical areas affected; and
  - specific targets and timetables for industrial, agricultural, urban and other sectors.

Management objectives can be quantitative and qualitative, realistic, and should also demonstrate a commitment to action on the ground, and generate awareness, support, and incentives for the continued development of the national programme. A specific objective that should take into account in the development of strategies and measures is the preparation of actions during urgent environmental conditions such as physical destructions, accidental events etc. Furthermore, an important factor in this stage is the support of national and local authorities in the processes for adapting the prepared NAPs, taking into account existing legislation, harmonization to international directives (i.e. EU guidelines), etc.

5. Monitor the implementation of NAPs-Evaluate the Effectiveness of National Strategies and Measures. A national programme of action should incorporate a strong monitoring and evaluation component, aiming at the following objectives:
  - ongoing monitoring and assessment of activities under the national programme is essential for their sustainability and continued relevance;
  - evaluation is necessary both during the implementation of a project, and when it is finalised;
  - evaluation of the effectiveness of proposed steps and projects sets the basis for the iterative process of adjusting and updating the national programme of action.

An important component in the assessment processes is the development of specific criteria and mechanisms for evaluating the effectiveness of proposed steps and



projects. Appropriate indicators should be objectively verifiable, clearly specified and quite easy to be managed, taking into account that in the evaluation process different groups and levels of stakeholders may participate. Evaluation criteria, according to GPA, should address:

- environmental effectiveness;
- economic costs and benefits;
- equity (costs and benefits of the strategy or programme are being shared fairly);
- flexibility in administration;
- effectiveness in administration;
- timing; and,
- inter-media effects (the achievement of the objectives of the strategy or programme creates a net environmental benefit).

In this phase particular emphasis should be given to compliance monitoring i.e. the collection of data through surveillance programmes to verify that the regulatory conditions for a given activity are being met. Two basic types of monitoring are identified within the framework of the MED POL-Phase III Programme, namely compliance monitoring and trend monitoring. Compliance monitoring includes:

- compliance monitoring of health related conditions (e.g. sanitary quality of bathing areas and waters used for aquaculture);
- compliance monitoring of effluents;
- compliance monitoring in “Hot Spots” areas

Trend monitoring includes:

- coastal zone trend monitoring;
- trend monitoring in “Hot Spots” areas;
- trend monitoring of loads;
- trend monitoring of biological effects

At this point it should be mentioned that criteria for compliance monitoring might be adapted to country specific and presently affordable conditions. In several cases, national standards may vary from one country to another; thus, it is recommended to apply regional standards i.e. standards adopted by all Mediterranean countries. Furthermore, non-compliance may have seasonal or short term characteristics, for example due to impact from tourism of highly seasonal type, or due to storm run-off, rains after dry seasons etc. In the cases of non compliance, appropriate enforcement should be put into effect until compliance will be achieved, through the development of remedial actions i.e. structured initiatives oriented at control, reduction and elimination of causes and consequences of non-compliance with environmental quality criteria and standards. The main aim of the remedial actions is the identification of causes of non-

compliance, the identification of resources/ecosystems to be protected/restored and the selection and implementation of remedial measures.

6. Preparation of reports. Monitoring and establishment of an environmental-quality reporting system imply not only the collection and analysis of information that can assist in evaluating project performance and decision-making, but also mechanisms for ensuring that such results are communicated to all interested members, given that effective participation is based on access to sufficient and relevant information. Thus, periodic reports or reviews are encouraged. Reports will be prepared covering all the corresponding activities of NEMC, i.e. measures taken, results achieved, difficulties encountered, statistical evaluation of data for pollution trend identification, pollutants loadings, together with results from action plans, corrective/remedial actions etc. Reports will be submitted to the NEMC Scientific and Steering Committees (see paragraph 3.2), the corresponding national authorities and to MEDPOL coordinator in time periods specified by each NEMC in its foundation agreement.

### **3.1.2 Supervision Regulatory Agency for Environmental conditions monitoring**

A primary target of the NEMC is to provide the framework for monitoring of environmental conditions and all the necessary information for the formulation of remedial measures for environmental pollution control, and for the development of an environmental management system of coastal areas, for the protection of marine environment, human health and sustainable development. Through monitoring of environmental conditions the NEMC will be a vital instrument to support the implementation of NAP in all phases of development, such as:

- determination of areas to be monitored;
- type of monitoring to be implemented;
- legal and technical instruments needed for the establishment of a monitoring programme;
- sources of finance;
- sectoral institutions responsible for the programme implementation.

Monitoring activities, particularly those related to monitoring of the marine environment, may become very expensive, while their development and implementation require a constant and reliable funding. In many cases the preparation of a monitoring programme would require higher funds for capacity building and for purchase of the necessary equipment than in later stages of regular implementation of the programme. As a result, NEMC should define the role of existing institutions to implement the monitoring programme or the requirements for new institutions / organizations, as well as the enforcement of the corresponding political decisions.

Establishment and implementation of an environmental monitoring programme, consists of several consecutive steps, which may take place under the coordination of NEMC:

- a) definition of monitoring objectives;
- b) definition and implementation of research activities;
- c) design of the monitoring programme;
- d) data quality assurance;
- e) implementation;
- f) data processing, quality control and data storage;

g) reporting and dissemination of data

In the first step, short- and long-term objectives of the monitoring programme should be defined, taking into account the current needs, accumulated information on pollution problems etc. NEMCs, having a general view of the environmental conditions in a country, will specify the demands for environmental monitoring in an area and the corresponding aims of the programme, avoiding thus the development of plans with broad and ill-defined objectives.

Research activities may be needed prior to the design of a monitoring programme, in order to secure a better understanding of relevant issues and to allow for the design of a rational programme. NEMC will encourage and coordinate the participation of research centers and environmental laboratories during this phase of programme development.

Anthropogenic impacts and natural variations may cause variation of many parameters of the monitoring programme. By proper design, these variations can be minimized. Design of a monitoring programme by the NEMC should define the area to be monitored, the number and location of monitoring stations, the matrix and parameters to be monitored according to the set of objectives, the monitoring frequency according to needs and specificity of relevant issues and the timetable.

In addition, the NEMC will be responsible for the preparation of the corresponding protocols of good quality practice, such as sampling techniques, preservation methods, analytical methods, and data quality control. These procedures are necessary for avoiding sample contamination (sampling techniques) and for maintaining the integrity of samples (preservation, transport and storage techniques). Good quality data control practices include such elements as properly maintained laboratory facilities, use of appropriate labware/reagents, availability of skilled staff with proper training, application of analysis methods with the required accuracy and precision, regular in-house checks using appropriate reference materials, participation in intercalibration exercises. Protocols should be designed in order to ensure that data collected from different laboratories will be comparable and there will be an agreement between the participants at the completion of the monitoring programme on various issues.

All collected data should be processed, checked for data quality and stored in appropriate databases. The storage of the corresponding data in a central data base will be one of the major duties of NEMC in order to have a complete and integrated view of the environmental conditions, required for the preparation of remedial measures and to assess liability in case of non-compliance.

Finally, regular reporting will be prepared by NEMC on the results of environmental monitoring, and the reports will be submitted to relevant local authorities, to the MED POL authorities and to the public. Furthermore, NEMC will take care about the dissemination of the results through the corresponding activities as presented in Chapter 3.4.

*Preparatory actions*

Prior to the design and implementation of any monitoring programme, a detailed survey of previous and existing monitoring projects is necessary. This process will include the collection of all monitoring programme components i.e. general and specific objectives, funding, institutional arrangements, monitoring stations, measured parameters, experimental data, quality assurance, results and conclusions drawn regarding pollution trends, potential remedial actions etc. Sources of information will be reports, journal publications, conference proceedings and personal contacts.

The outcome of such a procedure will be the development of a database containing available existing data on the environmental quality of a country. Significant information may be drawn from this database, such as:

- evolution of the environmental quality, continuously updated through the introduction of new entries;
- monitoring the fate of a specific pollutant or the environmental condition of an ecosystem by the time;
- built in experience on the precise definition of goals and objectives of a monitoring programme, based on the evaluation of reasons for the failure of other programmes;
- development of an integrated approach for monitoring on a sectoral basis (rather than an ill-coordinated distributed monitoring);
- information on updating the monitoring programmes, and enforcement of remedial actions in environmentally sensitive areas.

The implementation of a monitoring-inspection programme in a specific area will rely on the existing resources in the particular area; NEMC will be responsible for the formulation of a “network” in the target area, by identifying potential, skilled analytical personnel, existing infrastructure and monitoring stations, technical facilities etc, engaged by local and national authorities, public scientific/research centers, NGO and by coupling all the available existing sources of an area. In addition, during the design and implementation phase, NEMC will coordinate and guide the actions of the various elements of the “network” by defining the corresponding complimentary roles of each contracting party, by allocating available funds and by creating the necessary conditions for the successful implementation of the monitoring programme.

Finally, NEMC will be responsible for the enforcement of good quality data practices, the storage of the measured data and the dissemination of the corresponding results by preparation of the corresponding reports. In the last phase of each monitoring programme, a detailed report will be prepared by cooperation of all contracting parties, containing an overview of all results, predictions of future trends, proposals for minimization of pollution problems, and potential remedial actions.

### **3.1.2 Training activities and consulting services**

Training and consulting should be a key function of the NEMC in a multitude of issues, both for the private and the public sector. NEMC should provide training and consulting based on current demands, supported by an extensive “network” of trainers-consultants, which will be subcontractors to NEMC. For this reason, NEMC should establish and maintain an expert “pool”, i.e. professionals from different areas of a country (or countries), with a diverse expertise in environmental science, engineering and technology.

Consulting services will be targeted to clients such as local, state and federal agencies and nongovernmental organizations (NGOs), private companies and industrial plants offering a complete range of services for the design, evaluation, and implementation of environmental policies and projects across all environmental systems-land, air, and water. NEMC will offer assistance to the clients by sub-contracting experienced professionals, in order to support clients for the anticipation of problem solutions and for keeping them up-to-date with the latest technological developments/innovations and regulatory requirements.

An indicative list of consulting services, which will be formulated and updated according to the needs of clients, could include:

1. Implementation of Best Available Techniques (BAT), Best Environmental Practices (BEP) and Cleaner Production (CT) practices in industrial plants and technical enterprises,

consisting of a detailed determination of the following seven stages, which are necessary factors for successful operation:

- determination of key environmental aspects in the plant;
- definition of specific objectives;
- identification of options to successfully address the key environmental aspects;
- assessment of identified options;
- selection of BET, BAP and CTs for a given case;
- implementation of BET, BAT and CTs for the particular case;
- monitoring and continual improvement.

2. Environmental Risk Assessment, associated to environmental decision-making, and the related areas of toxicology, exposure/fate and transport modelling. Services include the following:

- identifying, evaluating, and managing persistent, bioaccumulative, and toxic (PBT) substances;
- conducting chemical toxicity reviews;
- modelling environmental pathways and assessing exposures for a wide variety of pollutants;
- developing methods, models, and guidance;
- assessing pesticide risk and providing registration support;
- conducting risk-based ranking, planning, and evaluation;
- providing regulatory impact assessment and support;
- assessing site-specific human health and ecological risks, in support of developing cleanup standards and selecting remedies;
- assessing risks at currently operating and planned industrial facilities;
- conducting statistical evaluations of site and background data;
- evaluating consumer product risks

3. Coastal Resources management with emphasis on the following issues

- information management and geospatial data systems;
- air and water quality modelling;
- environmental assessments;
- hazards analysis and planning;

- public-private partnerships and voluntary compliance programs

4. Hazardous waste management including issues like:

- generation rates;
- handling techniques;
- plans for prevention/minimization;
- plans for implementation of Best Available Techniques;
- accident prevention;
- emergency planning

5. Environmental Impact Assessment Studies associated to the prediction of environmental sequences during the development of a new process or the expansion of existing ones. In this case, close cooperation of NEMC with attorneys and governmental authorities responsible for issuing the corresponding authorization should be established, while NEMC will help the client to develop plans, adapted to particular clients conditions, for the minimization of the process environmental impact.

6. Environmental Compliance Programme, for improving the efficiency of environmental regulatory compliance management, especially in the private sector, making them productive and profitable. Integration of environmental compliance may be achieved by a number of programmes, like:

- local, national and international policies;
- compliance plan and program development;
- energy efficiency auditing;
- environmental cost accounting;
- recycling programs;
- compliance auditing;
- ISO 14001 registration consulting;
- pollution prevention/ waste minimization programs;
- hazardous waste management programs;
- strategic environmental management

In addition, specific customized consulting services may be offered to clients according to their needs, in issues like: technical-economical feasibility studies, solution of specific technical problems associated with the operation of solid waste and wastewater treatment plants, response to courts regarding environmental problems etc.

Clients to consulting activities may originate from the public and the private sector, such as:

a. From the public Sector:

- Ministry/Department of Environment;
- Ministry/ Department of Interior;
- Ministry/ Department of Public Works;
- Ministry/ Department of Transportation;
- Ministry/ Department of Agriculture;
- Ministry/ Department of Food;
- Ministry/ Department of Human Health;
- Ministry/ Department of Science, Research and Development;
- Ministry/ Department of Industry;
- Department of Environmental Protection;
- Emergency Management Agency;
- Local authorities (municipalities, prefectures etc);
- Public companies responsible for drinking water and wastewater treatment, solid wastes management and recycling.

b. From the Private sector:

- Private industrial clients;
- Technical enterprises;
- Technical design and construction companies;
- Technical consulting companies;
- Water supply and wastewater treatment corporations;
- Solid waste management companies;
- Hazardous waste management companies;
- Association of chemical manufacturers

During the initial stages of the NEMC operation, the personnel will be responsible for the preparation of a list of potential clients. These clients could participate/establish a network; participation of each client in this network could be through a subscription fee. NEMC network participants would have access to state of the art environmental management technologies and approaches and a priority and low cost consulting services from experts included in the NEMC “experts” pool.

Training activities of NEMC can be organized through a broad spectrum of delivery media: workshops, seminars on the job training, web based or online courses, computer based training, videos etc. During the NEMC start up, a trainer's database should be established containing scientists and professionals with experience on specific environmental issues. Clients may be professionals from the private and public sector, university students, public etc.

Potential topics which may be covered include:

- Hazardous materials management;
- Integrated Waste management;
- BAT/BEP/CT implementation;
- ISO 9000/ISO 14000;
- Eco-management and Audit Scheme (EMAS);
- Occupational Safety and Health Compliance Auditing (OSHA);
- Development of Compliance Plans;
- Customized safety training programs;
- Emergency response plans;
- Toxic release inventory reporting;
- Environmental legislation

Essential media for the successful implementation of training/consulting services and the corresponding clients are:

- The establishment of easy access to knowledge on new and innovative technologies relevant to particular environmental issues (private sector, governmental organizations).
- The promotion of technology transfer of new methods to corresponding clients, through the establishment of collaborative arrangements between suppliers and recipients of technologies (private sector).
- The enhancement to the access to patent-protected environmentally sound technologies (private sector, governmental organizations).
- The preparation and distribution of information material like technical reports, guideline manuals, leaflets and brochures, posters and newsletters and electronic media (private sector, governmental organizations, public).
- The access to environmental regulations and the preparation of information material for their implementation in production processes (private sector, governmental organizations, public).
- The access to available information on the state of the environment and improvement measures taken (public).



Finally, an important issue for training and consulting activities should be the use of electronic media and the preparation of web-based seminars on specific issues.

### **3.1.3 Participation in Research and Development and Transfer of technology programmes**

The Research and Development (R&D) activities of the NEMC aim to improve the technology transfer on environmental issues, and to establish strong links between national and international universities, research centers and industrial plants, to stimulate and promote industrial innovation by coordinating research projects meeting the specific technological needs of environmental industries. As part of the above, NEMC personnel, having an integrated knowledge of the specific environmental problems and gaps at national level, should identify the state of scientific knowledge and the corresponding research needs and priorities and can be engaged in the following R&D activities:

- active participation in National and European research networks and virtual institutes;
- active participation in European and National research projects.

Participation in research networks should be implemented in order to meet the need for a greater exchange of ideas, people and facilities between universities and industries. Benefits from this exchange will be:

- support of industrial plants by disseminating information on new environmental technologies;
- facilitate the application of new advanced technologies and ideas: This can take place by personal contact, sometimes between people working in quite different fields;
- recognise the environmental problems and aspirations of industry, and identify potential universities and research centers which may contribute to problem solving;
- formulate environmental policy building, based upon the best scientific knowledge and assessments;
- strengthen the scientific and research capacities and capabilities in areas of environmental relevance.

Proposed networks that may be established under the coordination of NEMC at national level, may be extracted from the specific NEMC targets and could include networks on sewage management, solid waste management, air pollution, industrial pollution and destruction of habitats. Participation in international research networks (e.g. European Union research networks) should also be encouraged.

Participation in research projects will be implemented primarily through coordination actions of affiliated shareholders (universities, research centers, technology parks, industrial enterprises, SMEs etc) in international scientific projects. NEMC duties should be to:

- establish links with international institutes, research organisations, technology parks, enterprises, SME's etc;
- provide guidelines and administrative support for collaborative research projects, and post-doctoral fellows;

- inform the contracting parties about new calls, deadlines, funding opportunities;
- promote dissemination and publication of research outputs

NEMC is expected to play a leading role in promoting contacts between local industry and research organisations. Its activities should include the following:

1. **Regional Development:** NEMC should promote activities which contribute to the increased competitiveness of the national industry with special emphasis on environment issues. This goal will be pursued by participation in European and national regional development programmes. Furthermore, NEMC should identify present and future industry needs within national borders and link them with technological innovation. An information network should be established and continuously expanded encompassing research institutes, industries and regional development initiatives.
2. **Technology Transfer:** NEMC should serve as Industry-Research Liaison, performing partner searches, executing assessment and exploitation of research results, assisting with RTD proposal preparation, submission and project management. It should also ensure information dissemination concerning research results, technological developments and the emergence of new technologies. Technology brokerage, technology search & assessment, technology transfer agreements, assistance for technology implementation should also be provided.
3. **Contract Research:** NEMC should promote closer links of industry to local Universities/research centres by raising funds for relevant basic and applied research related to local industry environmental needs through joint research projects both locally and internationally.
4. **International Technology Transfer:** NEMC will promote technology transfer between national research centers, the EU, USA, Japan and other developed countries.

#### **3.1.4 Incubation of environmental enterprises**

NEMC should facilitate the formation of new companies by the establishment of an environmental incubator i.e. a facility in which new or young businesses:

- will have access to shared staff and services;
- will receive a pro-active incubation program of advice, training, start-up;
- will have access to resources that may not otherwise be available to them such as computer networks, library facilities and scientific equipment, in order to reduce operational costs.

The NEMC incubator will be open to companies, individuals, or legal entities interested in transforming innovative ideas into new technology, products or services leading to a successful business. It will foster the start-up stage of newly created firms by helping to identify promising new technologies, assisting the entrepreneurs at the most critical pre-seed and seed stage, enhancing the viability on the world market and providing support in activities such as drawing up a business plan, searching financing opportunities and contacts with potential partners. The activities of the NEMC incubator should focus on the following:

- promote, stimulate, and support economic development;
- focus on emerging technology-driven companies, corporate spin-offs, and new companies, and international firms;

- provide a broad scope of services including cost-effective space and support, prototype manufacturing facilities, product realization and development services and business consultation;
- stimulate interaction with research resources;
- provide real-world experience for faculty, staff, and students in curricular innovation, research, and technology development.

The acceptance procedure for companies interested in being included into the incubator building include the following steps:

- Submission of a Questionnaire-Application along with a Company Profile.
- Positive acknowledgment from the NEMC “core” group on the following criteria:
  - ✓ innovative character of the business initiative;
  - ✓ completeness of the business plan;
  - ✓ specificity of the time schedule pertaining to research, development and technology activities;
  - ✓ benefit of the development activities to the target area especially with regard to the employment of new scientists;
  - ✓ initiative to be undertaken for the diffusion and transfer of technology and know-how in the country;
  - ✓ relationship of the expected technological developments to the economic growth of the country.
- Presentation to the NEMC Scientific Committee for final evaluation.

Services provided to the accepted companies, include:

- cooperation with the national research institutes & laboratories;
- access to International Databases;
- advanced internet services;
- information on Intellectual Property Rights and Patents;
- assistance in participating in European Union and National Programs;
- professional continuing training programs;
- financial advice & support;
- marketing services;
- secretarial support

### **3.2 Structure of a National Environmental Management Center**

The basic structural framework of a NEMC will be similar in the various Mediterranean countries, while integration of local conditions at national level will be considered during the development phase of these entities. The establishment of a NEMC can be initiated within an

already existing structure, such as an environmental national research center, a governmental environmental agency/office, a non-profit public development company followed by a widening of the targets of the selected organization and by proposal of additional duties. The NEMC development will be based on the existing structure, using the buildings, facilities and administration services of the “mother” organization.

The features of a NEMC encompass the Advisory Board, the Director, the Scientific Committee, the Steering Committee with the corresponding local sub-committees, and the personnel resources, as shown in Figure 3.3.

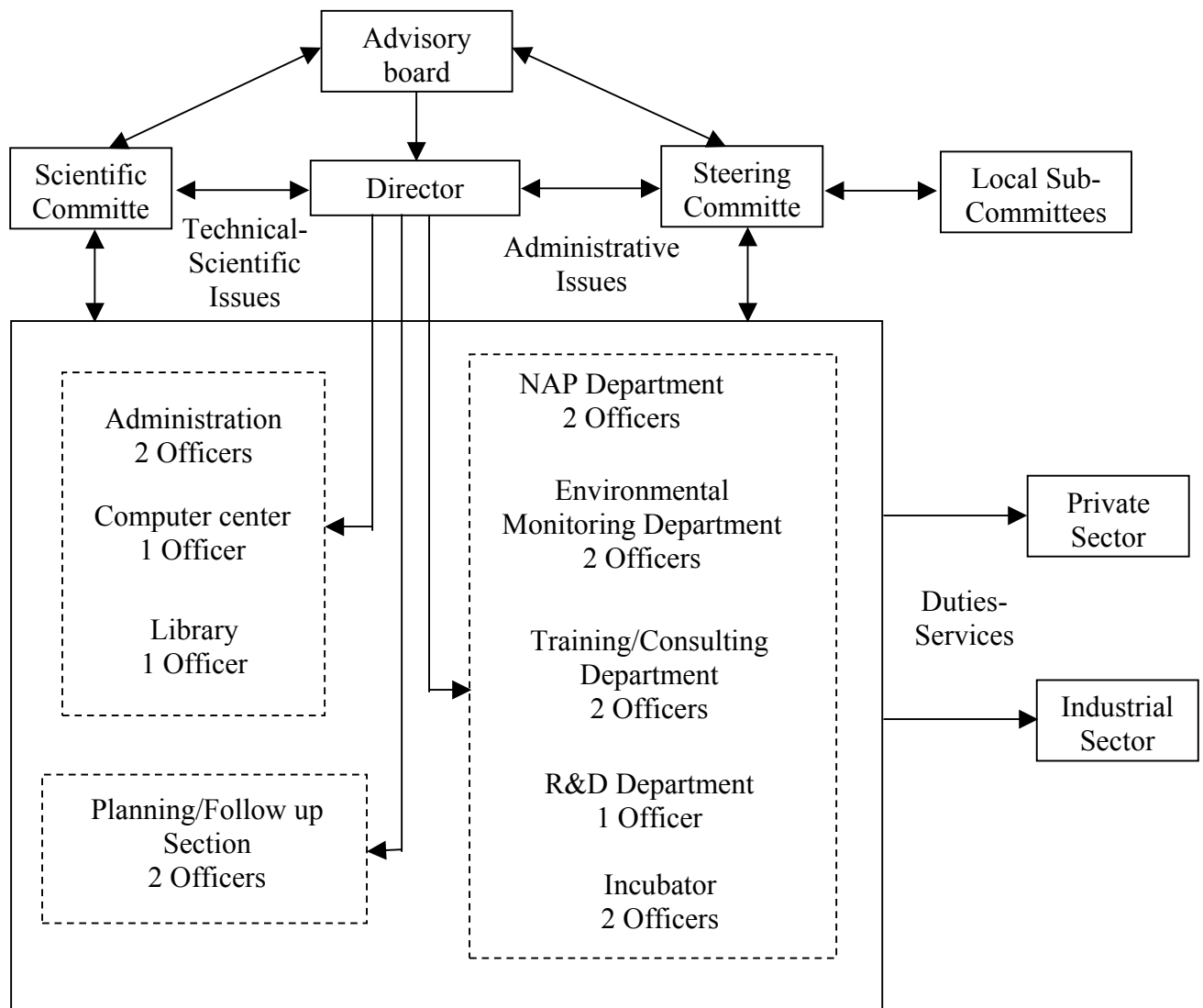


Figure 3.3 The organizational structure of a NEMC.

### 3.2.1 The Advisory Board

The NEMC Advisory Board will be the Governing Body of the Center. The primary role of the Advisory Board will be to help, advise, and direct the Center activities towards issues pertinent to the implementation of SAP programme at national level. In general, the Advisory Board's main mission includes:

- The establishment of the principal objectives and priorities and the set-up of the overall policy direction of the Center;

- The review and approval of the scientific and technical basis of applied and proposed activities;
- The support to the Center personnel on broad scientific matters in science, technology, social and economic issues, through the collaboration by the Steering and Scientific Committees;

The Advisory Board will provide leadership to the Center, develop consensus policy recommendations and advice, reflect an ongoing planning orientation, advise the Center personnel on policy and procedures affecting its activities, and focus on issues requiring collaborative solutions. It will be consisting of up to 11 members, including the director of the Center. Members of the Advisory Board may come from the members of the Steering Committee and will be representatives from the government, local authorities, university departments and research centers, technical enterprises, industrial sector, NGO, citizens and professional associations.

### **3.2.2 Personnel resources**

The “key” personnel employed in the NEMC will be a “core group” of about 15 officers, with experience in environmental management issues, while an executive manager will be appointed as the coordinator/director of the group.

The Director of the Center will be responsible for the day-to-day management of the organization, taking necessary decisions to achieve the Center objectives within the context of national plans, under the directions of the Advisory Board and in close cooperation with the Scientific and the Steering Committees.

The NEMC organizational structure will include the following departments:

- The National Action Plan Department, aiming to the support of the implementation of NAP objectives;
- The Environmental Monitoring Department aiming to the development of the surveillance regulating activities of the Center;
- The Training/Consulting department;
- The Research and Development Department;
- The Incubator Department aiming to the enhancement of the start-up of new enterprises;
- The Planning and Follow-up Department aiming to the development of policy formulation plans and to the dissemination of Center activities.

The NEMC will also include additional departments, supporting the main activities, including:

- The Administration department;
- The Computer Center;
- The Library.

The personnel of the Center will be responsible for the effective implementation of SAP objectives at the national level. Their role in the NEMC will include such functions as:

- preparation of a detailed work-plan, according to the NEMC targets, adapted to local conditions;
- cooperation with the national MED/POL coordinator and the national SAP interministerial committee;
- technical assistance for the preparation, development, implementation and evaluation of NAP;
- formulation of proposals for national SAP policies and strategy development, renegotiation and update of legislative frameworks etc.;
- surveillance of the implementation of related monitoring programs and their potential follow up;
- identification of national experts, bodies and teams that may be involved in the activities of the NEMC (training, consulting etc);
- technical assistance to private and public sector;
- preparation of reports to the national and regional MED/POL authorities regarding the implementation of SAP policies;
- Development of public awareness campaigns of environment protection issues, through different media; preparation of manuals, leaflets, brochures and web pages for the dissemination of the center activities;
- establishment of links to international environmental organizations and knowledge transfer at the national level;
- start-up support to new enterprises through the incubator;
- transfer of information regarding potential R&D programmes to interested parties and the coordination of competitive environmental projects;
- identification of potential funding resources and allocation of available funds;
- formulation of national environmental data banks by collection and evaluation of existing information; periodical update of the data banks.

The activities of the “core” group will be supervised and evaluated by two Committees: the Scientific and the Steering Committee.

### **3.2.2 The Scientific Committee**

The scientific activities of the NEMC will be coordinated by a corresponding Scientific Committee, with the following duties:

- formulation and development of the NEMC environmental strategies and policies;
- evaluation of the NEMC activities and identification of potential gaps and problems;
- supervision of the “core” group activities and scientific evaluation of the personnel;
- assistance to the preparation of proposals regarding the implementation of NAP;

- assistance to establish cooperation links with national and international organizations;
- support on the preparation of training courses and consulting services;
- approval of reports submitted to national and international MED/POL authorities;
- support the core group on the formulation, development and update of surveillance regulating plans for environmental monitoring;
- promotion of knowledge transfer activities through the organization of workshops, seminars and internet based courses.

The members of the Scientific Committee will be sought from relevant scientific institutions, such as: universities with relevant faculties, scientific and research institutes, research centers, and other institutions with recognized scientific status. The role of the Scientific Committee is essential for the formulation and implementation of the NEMC work-plan and the preparation of national environmental strategies; furthermore, the assistance to the Advisory Board is considered of significant importance on technical- scientific matters.

### **3.2.3 The Steering Committee**

The role of the Steering Committee will be to review and analyze the specific national and local activities in the framework of the implementation of the SAP activities, to identify potential funding resources and to approve/coordinate the proposals of the “core” group. This Committee should have a wide participation to ensure that its members will develop a sense of “ownership”, and, therefore, a commitment to proposed measures and activities of the national programme.

The enrolment of potential members of the Steering Committee should be tailored to address different levels, i.e. national, sub-national and local, and the needs and concerns of different members groups. Therefore, members of the Steering Committee should come from different community groups. The involvement of representatives from various groups in the Steering Committee is essential for the formulation of an environmental strategy at national level, depending upon their specific role, i.e. the type of function they perform (administrative, regulatory, research, communication, public relations etc); thus, it is necessary to identify groups relevant to the implementation of MED/POL principles at national and sub-national level. Hence, the Steering Committee should include representatives from the following groups:

- government representatives, legislators and regulators;
- private sector representatives (industry, services and financial sectors);
- potential investment partners, both domestic and international;
- non-governmental organisations with relevant expertise;
- experts from academia and scientific institutions (from scientific, technical and socio-economic backgrounds);
- the media, with a view to strengthening public awareness of the national programme and generating support for it;
- financial institutions both domestic and internal e.g. for microfinancing and entrepreneur financing.

In any case, the Steering Committee should be a small, flexible, competent group, to ensure effective decision making. Support to the activities of the Steering Committee may be offered by sub-committees that will be formulated at sub-national level, e.g. Regions, Counties or Provinces. The members of these sub-committees may come from:

- Local authorities and representatives of local communities;
- Government representatives from local offices/departments;
- Local Private sector

The duty of the sub-committees will be to identify local environmental problems and needs and to formulate proposals to the NEMC Steering Committee. These proposals will then be forwarded to the “core” group in order to evaluate and examine potential methods for realization. Such proposals will be finally discussed and adopted by the Steering Committee for implementation.

### **3.3 Mobilization of funding sources**

The identification of potential funding resources is essential for the establishment, development and operation of a NEMC. It is important to note that most of the resources should be national, and that it is the polluters, the consumers, the users and the government which should provide the resources necessary for the implementation of NEMC, knowing that the benefits of a cleaner environment would be greater than the cost. However, it will be necessary to seek external financial resources as well, and to develop new innovative financial schemes, taking into account that national financial resources are limited.

Therefore two types of mobilization of resources are considered:

- national financial resources;
- external financial resources and other alternatives.

Financing needs fall into three categories:

- funds for technical activities including: studies, demonstration and pilot projects, planning (including operational planning), training, institutional strengthening, data collection and monitoring, programme design and implementation, project identification, and preparation, and feasibility studies;
- funds for capital investment in facilities to improve management of sectors;
- funds for the incubator and the start-up of new enterprises.

#### **3.3.1 National financial resources**

Funding from national sources may come from the following:

1. Fees and taxes that may come from the implementation of National Environmental Laws according to SAP principles. Such fees may arise from:
  - the establishment and application of certain fees for municipal and/or industrial water according to the volumes consumed;
  - the establishment and application of a tax for the treatment of wastewater which covers the costs of treatment and disposal. This tax should be applied to the users of domestic or industrial water;
  - the establishment of a fee for the discharge of wastewater which complies with the regulations adopted for its discharge into public channels, rivers and the sea. This fee should take into account the volume of water discharged and



its quality, and its ultimate aim should be to help maintain and monitor the quality of the receiving water;

- the establishment of an annual tax applied to vehicles for their harmful emissions into the atmosphere;
- the establishment, where appropriate of an industrial waste management fee at rates that reflect the cost of providing the service and ensure that those who generate the wastes pay the full cost of disposal in an environmentally safe way;
- the establishment of a tax for air emissions from industrial installations. This tax could be higher in the case of industrial installations located in sensitive areas and areas of concern;
- the introduction of pollution fees and fines to reduce the environmentally harmful impact of certain activities.

Efforts to mobilize local and national resources for environmental protection through user fees or pollution charges are expected to yield results gradually.

2. Compensation for training seminars and consulting services. The NEMC should be able to subcontract such activities to third parties and specialized consultants. Training courses could take place at the NEMC facilities, thereby reducing the cost. Compensation fees should cover the sub-contract costs, the costs of courses/seminars, while part of the fees should be allocated to the NEMC for the organization of the corresponding activities. Additional funds may arise from the formulation of a network of potential clients which will receive training/consulting services on a constant basis; these clients would pay a subscription fee as described in paragraph 3.1.3.
3. National or local loans are not expected to be a significant fund source since national or local capital markets and banks are often not accustomed to support environmental improvements and services.

### **3.3.2 External financial resources**

The External financial resources are expected to play a central role to support and complement the efforts of the NEMC for the successful implementation of SAP. The principal sources of external financing are:

- A. Grant and concessionary assistance from GEF and UNDP.
- B. Loans from international and regional banks.
- C. Financial instruments of the European Union.
- D. Bilateral agreements.
- E. Alternative funding sources.

#### ***A. Grant and concessionary assistance from GEF and UNDP***

*The Global Environmental Facility (GEF)* a cooperative venture among national governments, the World Bank, UNDP and UNEP. It provides new and additional grants and funding to meet the agreed incremental costs of measures, in order to achieve agreed global environmental benefits in the following focal areas: climate change, biological diversity, international waters, ozone layer depletion. GEF also supports international environmental management and the transfer of environmentally sound technologies.

Usually projects funded by GEF must not be economically viable without support from GEF. Most GEF funding is for investment projects. Other types of projects include technical assistance, pre-investment and feasibility studies, scientific research and training.

UNDP, UNEP and the World Bank play an important role in the implementation of GEF-financed activities within their respective sphere of competence and in facilitating cooperation in GEF-financed activities by multilateral development banks, United Nations agencies and programs, other international institutions, national institutions, local communities, etc.

*United Nations Development Programme (UNDP)* support ranges from preparation of sound strategies for environmental protection and implementation of national environmental plans to the design of programs for environmental education.

Other regional initiatives include the establishment of collaborative networks in the area of water management involving supplementary irrigation and water management at the farm level, range management, and sand dune stabilization.

UNDP is expected to play a primary role in ensuring the development and management of capacity building programs and technical assistance projects.

### ***B. Loans from International and Regional Banks***

Loans may come from multilateral banks, mainly the European Investment Bank, the European Bank for Reconstruction and Development (EBRD), and the World Bank. The World Bank and regional banks can provide direct loans to the borrowing country for large projects and technical assistance, and financing through intermediaries for smaller projects. World bank rates are usually lower than those obtainable on the commercial market.

The above banks are guided by the priorities and resource allocations of governments. Environmental investment by these banks depends on the priorities of the borrowing country, its level of borrowing, and the anticipated economic conditions it can support, the balance in investment activities among priority sectors, the quality of the proposed investment, and the borrower or project sponsor. When assessing project financing proposals, these banks focus in particular on the sponsor or borrower, and on their capacity and planning for repayment of the loan. The funds of the international financial banks are available at or near market terms, frequently with longer grace periods than those available from other sources. Their use is contingent upon the willingness of the borrower to agree to service the loan, and the willingness of the state to provide guarantees for repayment according to the requirements of these institutions require.

In general, loans from international banks cover foreign currency costs only while local currency funds must be sought from other sources. The possibility of blending loan and grant money in a single project should always be examined. Maximising the involvement of the private sector takes the burden off central government and effectively implements the "polluter pays" principle.

*The World Bank* participates in the Global Environmental Facility's activities and it can provide loans to assist countries to set priorities, to improve environmental assessment, to capacity building, and to implement programs for sound environmental stewardship. It can also provide advice and help to countries for the preparation and implementation of National Action Programmes, and it can ensure that Bank lending incorporates environmental concerns at every stage of preparation, design and implementation of supported projects. The World Bank environmental activities involve policy dialogue, lending, technical assistance, research and aid coordination. The World Bank lending to the Mediterranean region is increasing for country-level institution building and for the management of critical natural resources such as forests, watersheds, freshwater, wild-life and soils.

*The European Investment Bank (EIB):* The protection of the environment is among the key priorities of EIB's lending policy; it thus acts in line with the objectives of the European Community, which puts an increasing emphasis on safeguarding the environment and in achieving sustainable growth. EIB's interest in environmental protection is pursued through three complementary components:

a) for each investment scheme, the Bank takes into account the overall environmental impact.

b) EIB provides funds for projects aimed exclusively or primarily at environmental protection, including pollution control equipment in industrial plants, or projects aimed at improving urban environment; and

c) where appropriate, the Bank supports feasibility studies and technical assistance schemes in order to help identify priority investment needs and cost efficient design solutions.

The main aim of EIB is to support projects which produce one or a number of the following benefits: improvements in drinking water supplies and waste water treatment; the introduction of environmentally sound techniques to process solid wastes, in some cases toxic, a reduction of atmospheric pollution, especially from power stations and industrial plants; the promotion of environmentally sound industrial processes and products; and the protection of the environment and improvement of the quality of life in urban/coastal areas.

### ***C. Financial instruments of the European Union***

Various sources of funds from the European Union can be mobilized in favor of environmental projects in the Mediterranean region. They consist of grant programs funded by EC and loans from the EIB, such as the following:

*The LIFE Programme:* This programme has been subdivided into three parts according to fields of action:

LIFE-Environment (applicable in the European Union territory) with eligible actions targeted on innovative or pilot actions to promote sustainable development in industrial activities, preparatory actions for the implementation of the Community environmental policy and legislation and pilot and promotional actions as well as technical assistance to local communities to foster integration of the environment into land planning and promote sustainable development.

LIFE-Nature (also applicable in the E.U. territory) aiming at nature conservation in the widest sense by supporting actions "required to preserve and restore natural habitats and populations of animal and plant species in a favorable state of conservation.;

LIFE-Third countries (applicable to Mediterranean countries) aiming at the implementation of technical assistance actions and pilot actions in the Mediterranean third countries in the following areas: technical assistance for the establishment of the necessary administrative structures in the field of the environment and for the development of environment policies and actions programmes; the conservation or restoration of important habitats hosting endangered flora and fauna; pilot actions to promote sustainable development. Among the criteria applicable to actions in third countries, it should be mentioned that these actions must contribute to an approach fostering sustainable development at international, national or regional levels and to bring solutions to well spread environmental problems in the region concerned.

*RTD supporting European policies*

The activities under this heading underpin the formulation and implementation of Community policies; in particular the common agricultural policy (CAP), the common fisheries policies (CFP), environment, energy, transport, health, development aid, consumer protection, enterprise policy etc. Research in this area is mainly carried out by means of Specific Targeted Projects (STREP) and Co-ordination Actions (CA). In duly justified cases, limited use can be made of Integrated Projects (IPs) and Networks of Excellence (NoEs). These activities include:

*New and emerging science and technologies (NEST) programme*, aiming to support unconventional and visionary research with the potential to open new fields for European science and technology.

*Specific research activities for SMEs*: SMEs are encouraged to participate in the activities implemented under the priority thematic areas within NoEs, IPs, and specific targeted research projects. Within these schemes - Collective Research and Co-operative Research ("CRAFT") - SMEs or industrial groupings where SMEs are prominent may entrust research work to research performers (research institutes, universities etc.) to solve their particular problems. As one of the measures to implement the international dimension of FP6, the SME actions are open to participation by organisations from third countries with funding included in the budget.

*Specific measures in support of international cooperation*: These measures cover specific international co-operation activities (INCO) with selected groups of countries (Developing Countries, Mediterranean Partner Countries, Western Balkan countries, Russia and the NIS (Newly Independent States of the former Soviet Union)) based on mutual interest and in support of Community external policy. The general objective of international cooperation activities carried out under the Framework Programme is to help open up the European Research Area to the world. These activities focus on the mutually beneficial efforts of the Community and its Member States on the one hand and INCO target countries and other third countries on the other. It is thus important that the ownership of the knowledge and technology developed in partnership under this activity of the Framework Programme be equitably shared and actively used to promote and contribute to the creation of knowledge and expertise as a basis for improved regional co-operation strategies, the elaboration of concepts aimed at sustainable development, and enable societal innovation. Links to education, training, innovation institutions, local government and other appropriate institutions and processes are actively encouraged with a view to ensure the highest positive impact possible in developing and other partner countries. Social dimensions, such as gender roles, ethics and social equity must be adequately addressed as a matter of ensuring such impact.

The activities under INCO aim to lend support, in the scientific and technological field to the implementation of the Community's foreign policy and development aid policy and to strengthen, develop and consolidate our Partner countries' research systems as a means of reinforcing synergies with these external policies.

Research must contribute to the solution of specific problems faced by third countries in through equitable partnerships. Diversified objectives and approaches are warranted to accommodate the specific nature and needs of the different regions of the world concerned by these specific measures in support of international cooperation.

Especially the programme for Mediterranean Partner Countries has the following characteristics: The objectives relate to the creation of a Euro-Mediterranean Research and Innovation Area as a component of the opening of *European Research Area* towards this region and target long-range sustainable development around the Mediterranean in the context of transboundary economic, environmental and socio-political problems. This

includes promoting production and exchange of knowledge, technological know-how, innovation, and investment in people and institutions in order to foster socio-economic progress throughout the Euro-Mediterranean area and thus to contribute to the objectives of the Barcelona Process. To that end, the objectives aim to boost the RTD capability of Mediterranean Partner Countries as well as to encourage the establishment of links between research centres, businesses and other stakeholders in society. Research on areas of common scientific and technical interest, and those that can be used to support the economic integration in the two sides of the Mediterranean area will be promoted.

The approach is to concentrate on a set of strategic areas of specific relevance to the region, which have been selected through an extensive Euro-Mediterranean dialogue conducted principally by the Monitoring Committee (MoCo), a group of high level officials from the EU Member States, the 12 Mediterranean Partners and the European Commission.

It should be underlined that the information on EU programmes, funding and projects is fragmented, the environment being a transversal issue increasingly dealt with by several of the Directorates General in the Commission, as an ongoing result of environmental concerns in sectoral policies and planning. Thus, information provided here should be updated, in order to have an access to information about open calls and funding opportunities.

#### ***D. Bilateral agreements***

Bilateral agreements have proved to be an important mechanism of cooperation between developed and developing countries. The European Union and many States members have signed bilateral cooperation agreements with Mediterranean countries. Environment and sustainable development are an important part of these agreements. Other OECD countries have also signed bilateral agreements with Mediterranean countries with the same interests for environmental matters.

#### ***E. Alternative funding sources***

Export credit agencies: These are a source of short-term project financing, especially for specialized equipment.

Debt-for equity swaps and eco-conversion programme: Creditors agree to convert the debts owed to them into local funds to be applied for environmentally beneficial expenditures.

Foundation grants: Private or public foundations may use their resources to support innovative approaches to environmental management or the development of human resources.

Private funding: Voluntary contributions through non-governmental channels or NGOs.

Investments from private sector institutions: Loans may be taken out from private sector institutions in the same way as from equivalent national institutions.

### **3.4 Dissemination and Policy Formulation activities**

The management issues of NEMC include all the components which will provide an overview of the center activities, the evaluation processes and the reporting duties. NEMC management activities will be realized by the "core" group personnel and will be supervised by the Scientific Committee. These activities cover two primary issues, i.e. the dissemination activities and the policy formulation, according to the following principles:

1. Dissemination of NEMC activities, includes the following:

- preparation of CD-roms, brochures and leaflets containing a description of the center targets, activities and deliverables. Distribution to regional/national authorities, industrial plants, consulting companies and construction technical enterprises dealing with related matters;
- publication of the center activities in local interest press and in national and international journals and magazines;
- presentation of activities associated to specific environmental problems (e.g. monitoring results, new technologies, remedial actions etc) in conferences and workshops;
- design of a web-site in order to include all relevant activities and available information, reports, documents etc. The site should be prepared at the early stages of NEMC establishment and should be regularly updated. A password protected part of the site will be available to affiliated members for internal communication and exchange;
- organization of workshops regarding “key” environmental issues;
- presentation of NEMC activities in environmental exhibitions.

2. Policy formulation activities include the following:

- Preparation of work-plans, timetables etc and evaluation of the implementation of set targets. Preparation of an internal assessment report and submission to the Scientific and the Steering Committees.
- Identification of potential funding resources. NEMC personnel will be responsible for seeking funding resources, as described in paragraph 4.3, in order to cover the center expenses.
- Preparation of proposals regarding environmental sensitive areas, corrective actions, update of regulations etc and submission to the national authorities for adoption.
- Preparation of activity reports on a yearly basis, and submission to the national and regional MED/POL authorities (national MED/POL coordinator, interministerial committee, MED/POL international coordinator).
- Development of collaboration agreements with national and international research centers, institutes and universities in order to keep-up-date on new and innovative environmental technologies. Establishment of cooperation with existing MED/POL-SAP regional centers.
- Organization of training seminars to specific groups and consulting services to particular clients. Preparation of a network with potential clients. Preparation of relevant documentation/information material.
- Design and implementation of the NEMC incubator.
- Organization of round table meetings especially with representatives from the private sector. At least one round table meeting, on a monthly basis, with representatives from key sectors (both private and public) and financial institutions should be organized in order to, inter alia:

- ✓learn about the industry or sector;
- ✓understand concerns, challenges and constraints;
- ✓explore opportunities for involvement; and
- ✓identify potential benefits to be derived.

#### **4. A ROADMAP TO THE ESTABLISHMENT OF A NATIONAL ENVIRONMENTAL MANAGEMENT CENTER**

Most countries considering the preparation of a national programme of action have already identified priorities, based on existing assessments, research and development plans. Addressing these priorities may not require lengthy planning exercises. Therefore, it is recommended that these countries may launch their national programme of action process by developing a project for the establishment of a National Environmental Management Center, which will support their efforts. In order to achieve the final goal of the establishment of a NEMC, it is necessary to plan a step-by-step approach which should keep into account the available resources and opportunities at the national and international level.

Initial priorities for the organization of an environmental center should be viewed as a sub-set of the methodical approach to developing and implementing a national programme of action. The implementation of the following key elements may facilitate and strengthen the development of a NEMC:

- establishment of institutional arrangements;
- establishment of a legal framework-preparation of agreements;
- identification of potential funds;
- preparation of detailed targets-definition of priorities.

##### *Establishment of institutional arrangements:*

This action is mainly targeted on the definition of the Advisory Board and the “core” group i.e. the available personnel which will be hired for the preparation of NEMC start-up and preliminary functions. To the extent possible, existing mechanisms should be used or strengthened i.e. personnel in existing research centers, governmental offices, developing agencies. Therefore, key requirements are:

- assessment of existing capacity for the allocation of human, financial and technical resources;
- identification of possible capacity building requirements;
- assessment of relevant policies, legislation, and regulations.

Initially, the core group or team needs to:

- define the necessary arrangements for the establishment of the NEMC, as well as associated management tasks;
- develop a work plan and time table;
- assign specific responsibilities.

##### *Establishment of a legal framework-preparation of agreements:*

During this phase, a framework should be developed, defining the legal form of NEMC; this should be adopted by the national authorities. In addition, an agreement contract should be prepared and signed by national and MED/POL authorities, in order the NEMC to act under the SAP framework. Aspects such as the need to harmonise legislation or to clarify agency mandates may be decisive in the successful operation of NEMC.



*Identification of potential funds-development of financial strategy:*

The NEMC must have adequate political, institutional and financial support from relevant government authorities at all appropriate levels. The center should be officially endorsed by relevant authorities, and be integrated into existing planning and budgetary processes. Similarly, the NEMC should be mainstreamed into relevant frameworks, including policy and legal provisions, enforcement mechanisms, and technical and scientific information and expertise.

In the short-term, domestic financial resources must be allocated to the NEMC from the annual budget; longer-term financial mechanisms should also be identified, or developed, to ensure sustainability. Mainstreaming at all levels is a prerequisite for the effective operation of the proposed Center.

The financial strategy should:

- assess existing domestic financial sources and mechanisms in order to identify solid funding possibilities for NEMC;
- collect information on regional multi-lateral and bi-lateral funding sources and national expenditure on environmental programmes for the purpose of identifying "national" and "incremental" investment needs;
- analyse "affordability" and cost-recovery issues in relation to the diversity of national economic and social conditions which may entail specific country-based social impacts caused by the implementation of capital-intensive environmental facilities and the consequent introduction of user charges;
- define concrete steps for the mobilisation of financial resources and partners (closely linked with the identification of members of the Scientific and Steering Committees, during the actual definition phase of the project).

Financial resource needs should be defined in detail and should be associated to proposals of initial actions and priorities. A key objective of the financial strategy should be to establish sustainability of financial mechanisms. If feasible, the financial strategy should also assess the cost of support elements such as capacity building, training, monitoring and evaluation, and enforcement.

According to paragraph 3.3, potential financial partners include:

- industry and trade sectors;
- financial institutions: national, regional (regional development banks), and global (e.g. World Bank and GEF );
- bilateral donors;
- non-governmental organisations.

*Preparation of detailed targets-definition of priorities:*

During the initial phases of the NEMC establishment, the "core" group should prepare a detailed list of the center activities and should define a priority list. Initial priorities can be organised around actions which are very visible or may have a big impact on a site or cause

degradation, but they do not imply a large financial outlay. In addition, identification of potential clients should be performed, from both the public and private sector, aiming to:

- make potential investors and/or donors aware of the benefits and scope of NEMC;
- ensure that the interests of all relevant members, including those of the private sector, are represented; and,
- generate a sense of ownership, and of commitment, to the proposed activities and measures.

A key factor in the specification of initial NEMC targets is the development of appropriate cost/benefit studies, aiming to:

- develop a practical framework for cost/benefit studies of the main priority projects and programmes based on national relevant evaluation techniques, issues and data, and utilizing to the maximum the (any) existing case studies;
- prepare more accurate cost estimates for priority projects to be used for preinvestment analysis needed by potential donors;
- identify more precisely and measure the main benefits from the implementation of the key priority projects, including proposals for overcoming data and specific measurement problems;
- prepare a more detailed investment portfolio focusing on the cluster of priority projects and programmes, aiming at the incorporation of elements concerning the social justification for donor support, the beneficiary population, funding and investment recovery mechanisms and national participation capabilities.

At the end of the preliminary operation period, a number of activities should have been established, ensuring the transfer to normal operation mode, the implementation of the principal objectives of the center, and an easy follow-up of the center's activities.

## BIBLIOGRAPHIC REFERENCES

- UNEP (1995), Global Programme of Actions to Address Pollution from Land-based Activities (GPA), UNEP(OCA)/LBA/IG.2/7, Washington 1995.
- UNEP/MAP (1995), Guidelines for Integrated Management of Coastal and Marine Areas - with special reference to the Mediterranean Basin, UNEP Regional Seas Reports and Studies, No. 161, PAP/RAC (MAP/UNEP), Split, 1995.
- UNEP/MAP (1996), Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources and Activities, approved by the Contracting Parties in 1996.
- UNEP (1999), Strategic Action Programme to address Pollution from Land-based Activities, UNEP, Athens, 1999.
- UNEP/MAP (1999), Formulation and implementation of CAMP projects, Operational Manual, MAP- PAP/RAC, Athens-Split, 1999.
- UNEP/MAP (1999), Report of the 11th Ordinary Meeting of the Contracting Parties to the Convention for the Protection of the Mediterranean sea against pollution and its Protocols.
- UNEP/GEF (2000), Determination of priority actions for the further elaboration and implementation of the Strategic Action Programme for the Mediterranean Sea, UNEP/GEF, Nairobi, 2000 (the GEF SAP project).
- UNEP (2001), Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA), UNEP Handbook on the Development and Implementation of a National Programme of Action for the Protection of the Marine Environment from Land-based Activities, UNEP/GPA Coordination Office, Hague, 2001.
- UNEP (2001), Terms of Reference for the Creation of a Regional Activities Centre for Marine Pollution from Land Based Sources, DEC/CAR IG.19/9, San Jose, 2001.
- UNEP (2001), Progress Report on the Activities of the UNEP Global Programme of Action Coordination Office During the Period 1996-2001, UNEP/GPA/IGR.1/3, Montreal, 2001.
- UNEP (2001), A Review of Binding and Non-Binding Regional Agreements Relating to the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities, UNEP/GPA/IGR.1/INF.2, 2001.
- UNEP/MAP (2001), Combating land-based pollution in the Mediterranean, Athens 2001.
- UNEP/MAP (2001), Operational Document For The Implementation of the Strategic Action Programme to Address Pollution of the Mediterranean Sea From Land-Based Activities (SAP), DEC/ MED WG. 183/6, Athens, 2001.
- UNEP/MAP/WHO (2001), Remedial Actions for Pollution Mitigation and Rehabilitation in Case of Non-compliance with Established Criteria. MAP Technical Reports Series No. 132, 2001.
- UNEP (2002). Capacity Building for Sustainable Development: An overview of UNEP environmental capacity development initiatives.
- UNEP (2004), Water Supply and Sanitation Coverage in UNEP Regional Seas, Need for Regional Wastewater Emission Targets? Section III: An Inventory of Regional Specific Data and the Feasibility of developing Regional Wastewater Emission Targets (WET), UNEP/GPA, The Hague, 2004.
- UNEP, Determination of Priority Actions for the Further Elaboration and Implementation of the Strategic Action Programme for the Mediterranean Sea, Midterm Review Report by Aldo Manos.