**Intergovernmental Oceanographic Commission**
*Reports of Meetings of Experts and Equivalent Bodies*

# IOC-IUCN-NOAA *Ad hoc* Consultative Meeting on Large Marine Ecosystems (LME)

Paris, France
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## PREFACE

The *ad hoc* Consultative Meeting on Large Marine Ecosystems (LME) was held on the 23-24 January 1997 in UNESCO headquarters, Paris. The consultation was convened by The Intergovernmental Oceanographic Commission (IOC), U.S. Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) and The World Conservation Union (IUCN). It was sponsored by IUCN and hosted by IOC in UNESCO, Paris. The meeting was chaired jointly by Dr Gunnar Kullenberg (IOC) and Dr Kenneth Sherman (NOAA).

This Meeting was a follow up to the first Consultative meeting on the "Report of the meeting of the *ad hoc* Committee on Large Marine Ecosystems" held at IOC, 22-23 March, 1991.

## 4. INTRODUCTION

The Executive Secretary of IOC, Gunnar Kullenberg, welcomed all participants to UNESCO , Paris, and noted the large number of organization represented and acknowledged their cooperation and effort in the LME developments. He thanked Dr. Sherman for taking the initiative to convene the LME meeting and for his efforts in promoting the LME concept.

The degradation of the marine environment and its resources worldwide requires regional and international cooperation in research and management. Results obtained by marine research and monitoring needs to be evaluated and presented in a proper context to further assess and focus the efforts of the scientific community. Jointly with other international organizations and international programmes the LME concept will address and merge the endeavors of marine science and management.

## 2. STATEMENT OF CO-CHAIRS

### 2.1 DR. GUNNAR KULLENBERG

Dr. Kullenberg noted recent developments in the application of the LME approach, and reiterated IOC support for LME activities in particular in relation to regional cooperation. He noted that the LME approach potentially relates to a number of international conventions, agreements and programs, such as Agenda 21, the FAO Code of Conduct for Sustainable Fisheries, the Intergovernmental Panel on Climate Change (IPCC) and the Global Ocean Observing System (GOOS), a well as UNCLOS. However, in many cases it is unclear how, or if, the LME concept is being applied. Dr. Kullenberg urged that these relationships be clarified and strengthened.

### 2.2 DR. KENNETH SHERMAN

Dr. Sherman indicated that the long term sustainability of coastal ecosystems as a resource for healthy economies in coastal nations appears to be diminishing. He commented on the growing awareness among marine resource managers that the quality of the coastal ecosystems is being adversely impacted by multiple driving forces resulting in an accelerated effort by scientists and program managers to assess, monitor, and mitigate coastal stressors from an ecosystem perspective.

Dr. Sherman was pleased to note that the IOC is encouraging coastal nations to establish national programs for assessing and monitoring coastal ecosystems so as to enhance the ability of national and regional management organizations to develop and implement effective remedial programmes for improving the quality of degraded ecosystems. Dr. Sherman pointed out that this was an important action on the part of IOC and could serve as the basis for a working relationship between the IOC and the International Waters programs of the World Bank and Global Environmental Facility (GEF). He indicated

that IOC could participate with the GEF in developing stronger linkages between scientifically based assessments of the changing states of marine ecosystems and resources and the management of resources for their long- term sustainability.

## 3. PRINCIPAL LME ACTIVITIES SINCE THE 1990 MONACO CONFERENCE

### 3.1 LARGE MARINE ECOSYSTEM'S REVIEW

The developments of LME since the last meeting was summarized up, taking in to account the perspective of the UNCED and post UNCED period. The importance of reaching out to the decision makers and policy community was stressed as crucial for the LME developments. The challenge to link science and management in the marine areas more closely together was considered important for the LME developments.

Major events since the last LME consultative meeting were reviewed, including: UNCED; management approach developments like Integrated Coastal Area Management and the focus on resource sustainability; the Convention on Biological Diversity; climate change-oriented programmes and the Global Programme of Action to Protect the Marine Environment from Land-Based Activities. It was specifically noted that the LME concept relates to many ongoing programmes and new initiatives and that further cooperation in this regard should be encouraged. Furthermore, it was considered important to interact with these institutions to improve the visibility of the LME concept, reaching out to the scientific as well as the lay community. It was also noted that UNCLOS had entered into force.

1998 is the International Year of the Ocean, and EXPO 98 dedicated to the Ocean will be held in Lisbon, Portugal. These events should be used as opportunities to promote the LME concept and its application.

### 3.2 COMMENTS OF EXPERTS

IUCN co-organized the Monaco International Conference on Large Marine Ecosystems (LMEs) in 1992 and was identified as one of the key institutions to follow up on the implementation of the recommendations of the Conference. In 1993, IUCN-MCP (The World Conservation Union's Marine and Coastal Programme), in collaboration with NMFS-NOAA (US National Marine Fisheries Service, National Oceanographic Atmospheric Administration) initiated a programme aimed at advancing and promoting the application of the LME approach for sustainable management of the natural resources in world oceans bordering the continental margins. The programme has provided support and has enhanced the ability of developing countries to improve assessments and management of marine living resources, habitat degradation and coastal development.

In the early years, support was provided for the preparation of case studies, development of assessments on a regional scale and exchange of information through the organization of regional workshops, publications and dissemination of information. The workshops, seminars and consultations have brought together experts from neighbouring countries sharing marine living resources (transboundary) such as fisheries, to discuss common assessment methodology and collaborative management. Assistance has also been provided for development of assessment methodologies and tools to be used in the implementation of LME programmes. The LME management approach has been accepted by GEF and is included in the operational strategy for International Waters.

During 1993 to 1995, the following LME Regional Workshops have been conducted:

- Indian Ocean Large Marine Ecosystems
- The Large Marine Ecosystems of the Pacific Rim

- The Baltic Sea Large Marine Ecosystem
- The Gulf of Guinea Large Marine Ecosystem

Efforts are now being derected towards promoting the application of LME management approach as well as development and refinement of the methodology and tools. The IUCN-NOAA collaborative programme has supported the development of the Gulf of Guinea LME Project including the planning for the US$ 6 million GEF initial phase of the project. Other LMEs for which GEF support is being requested are the Benguela Current, the Somali Current and the Baltic Sea. Outreach information on LMEs has been developed for distribution to IUCN global networks of members, partners and individuals.

The benefits of the LME management approach are beginning to be realized especially in the Gulf of Guinea. However, there is a great need to further develop and increase the application of the LME approach. Therefore, the IUCN-NOAA collaborative programme will continue to advance the LME management approach in two ways. First, work will continue in supporting developing countries bordering the Yellow Sea, South China Sea, Bay of Bengal, Humboldt Current and the Caribbean Sea to develop GEF projects under the aegis of GEF International Waters Projects in addition to those mentioned above. This is in line with the recommendations of the Monaco Conference. Second, a network of LME experts in the fields of productivity, fish and fisheries, pollution, ecosystem health, socio-economics and governance will be established to enhance the assessment methodologies and as well as integration and synthesis of information to provide improved science-based management options. By bringing these experts together, a marine ecosystem based management culture will, hopefully, emerge in parts of the developing world.

The International Council for the Exploration of the Sea (ICES) provides multi-disciplinary advice on living resource issues at the government and regional level, similar to the approach taken by the LME monitoring and assessment programs. At the present time it appears that many international programmes simultaneously address the same scientific issues. It was considered timely to coordinate and cooperate to a greater extent, and ICES suggested the development of a matrix to graphically illustrate the potential synergy. The matrix could include weather and climate forecasting programs that require the involvement of scientific understanding important to promoting greater cooperation and coordination between programmes.

A summary of the operations of ICES of relevance to the LME concept drew attention to: The increasingly interdisciplinary nature of the science and the advice required to respond to the requests of governments and regional commissions with whom ICES has formalized relationships. ICES science and advice is becoming increasingly related to area- and ecosystem-based management approaches. Sustainability issues in the sense of UNCED Agenda 21, where the rational utilisation of living marine resources is to be comprehensively integrated with protection of the marine environment, are now requiring a more unified approach to the formulation of ICES advice.

ICES had established an ICES/GLOBEC North Atlantic Regional Office in 1995 to coordinate the implementation of GLOBEC in the ICES area. GLOBEC and LMEs had common roots, and ICES encouraged further developments of science of relevance to management in both programmes. About 8 of the about 50 LMEs recognized world-wide are found within the ICES Convention area, and these LMEs served as components of North Atlantic GLOBEC which included various adjacent seas such as the Baltic Sea and Barents Sea. The countries around the border of the Baltic Sea LME have approached the GEF/World Bank requesting a Block B Grant for program planning in collaboration with the ICES scientific community that continues to give high priority to science-based management of the Baltic Sea.

The representative from Kenya Marine & Fisheries Research Institute (KMFRI) outlined the outcome of the Mombasa LME Workshop (28 March - 2 April 1993), and presented the major topic of the meeting - assessment and sustainable development of the pelagic ecosystem - through the presentation of several case studies. Management structure and the linkage to the government and decision makers

were also highlighted. Educational issues related to the development of a Somali Current LME Project were also considered and recommendations made on how to relate the LOICZ Programme to the LME concept.

The representative from the World Conservation Monitoring Center (WCMC) suggested it would be useful to develop a lay-person's overview of the LME concept for use as an introduction to public and decision makers. (This point was raised by several participants).

The NOAA representative presented several perspectives on LME developments since the Monaco meeting. He noted that the development of the LME 'core monitoring program' during the Cornell meeting, and its subsequent application to GEF projects signifies a movement from theory to an operational status, and represents a significant advancement in the program. He also highlighted the GEF-funded Gulf of Guinea LME program as the first application of the LME core monitoring and assessment approach in an operational setting.

A statement by FAO was given, concerning the organization's interest in participating in the development of the LME concept:

The Food and Agriculture Organization of the United Nations (FAO) maintains a continuing interest and supportive attitude toward the international Large Marine Ecosystem (LME) Programme. If fisheries concerns were duly addressed, the various LME projects under development appear to offer promise of significant contributions toward FAO's major goal of ensuring a sustainable contribution of fisheries to world food security.

One major set of problems that FAO faces are those connected with the effective management of the "transboundary" fish stocks that are shared by more than one coastal nation and we believe that this issue is important for the International Waters component of the GEF strategy. The LME spatial scales, which encompass integral regional marine ecosystems, are much more appropriate for consideration of these issues than the smaller scales defined by the boundaries of individual national states. Any increased recognition of the fundamental nature of these larger LME scales that may be fostered by the LME projects cannot help but be beneficial to FAO's mission. Clearly, fisheries represent an important, and often the major, source of socioeconomic impact within LMEs and this represent one of the most valid reasons for undertaking such projects.

There are many other aspects of mutual interest. To cite a few examples, the LME framework potentially (1) can act to reflect and advance the FAO concept of the 'Marine Catchment Basin (MCB)' as a basis for managing anthropogenic impacts on runoff-influenced marine areas, (2) can constitute a valuable collaborating programme in an FAO "fish component" for the Living Marine Resources Module of the Global Ocean Observing System (GOOS), (3) can provide a practical monitoring programme for sustainability of critical nursery habitats: seagrass beds, mangroves, large estuaries, coral reefs, etc. Moreover, in considering the positive and negative effects of coastal aquaculture development, the LME projects can potentially offer FAO important information on various ecosystem consequences.

Thus FAO is anxious to participate in, to support, and to beneficially influence the development of the international LME Programme activities. If there were to be additional funding resources for additional FAO involvement, then the FAO participation could be expanded accordingly. If not, since there are no available additional sources of funding available within FAO, the FAO contribution would be largely intellectual, although there may be many aspects where activities already underway in FAO programme can provide parts of the overall structure of a comprehensive LME project (for example, as mentioned above, collaboration in a "fish component" for the GOOS Living Marine Resources Module).

### 3.3 REVIEW OF THE RECOMMENDATIONS OF THE PARIS AND MONACO MEETINGS

The first Paris ad hoc LME Consultation recommendations were reviewed in light of subsequent developments. Several participants highlighted the recommendation from the Paris Meeting that public awareness of the LME approach must be enhanced. In this respect it was suggested that the 1998 Year of the Oceans and EXPO 98 in Lisbon could serve as useful vehicles for dissemination of information.

National sovereignty has been a concern in the expansion and dissemination of the LME concept. Typically, countries cooperate more readily on joint scientific cooperation than on resource management issues, and perceive an ecosystem approach as a means to usurp national authority over shared resources. It is important to link the science and management communities more closely to help allay these concerns.

As training was considered an important component in achieving a structure for the implementation of LMEs, the existing LME project in Gulf of Guinea (GOG) could serve as an example for the developments of future LME projects.

The participants at the Monaco Meeting agreed that the LME concept provides a good frame work for research, monitoring and modeling of ocean space. This will support marine research and management and further encourage regional cooperation in the development of sustainable use of the marine resources. A comprehensive approach for the establishment of LMEs on a global basis can only be achieved by coordination and inter linkages of institutions and activities at a regional level.

It was furthermore recommended to establish an LME Committee under the auspices of IOC, FAO, UNEP and IUCN, consisting of marine and coastal experts science managers along with representatives from other related organizations. It was agreed that the Terms of References (TOR) for the *ad hoc* LME Committee from the Monaco Meeting should be reviewed by IOC, IUCN and NOAA a soon as possible and subsequently circulated for further comments and suggestions.

With reference to the priority action at the Monaco Meeting, it was noted that action has been taken with respect to the following items: An LME World Map has been produced already in 1993 but now requires up dating as new LMEs have been described and to furthermore gain public visibility on the developments of LMEs. As proposed, the first LME pilot projects have been established in Gulf of Guinea (GOG) and the publication of a newsletter on the developments of this LME is now available. Furthermore, a pilot project have been initiated in the Yellow Sea-LME, and several projects proposals are currently in development. Furthermore, convening of workshops with representatives (scientists and managers) of the selected LME areas has been done both international and locally, in which training needs have been addressed.

## 4. LME PROJECT DEVELOPMENT

### 4.1 OVERVIEW

It was noted that a significant milestone was achieved in June, 1992, with the adoption by a majority of coastal countries of follow-on actions to the UNCED declarations on the ocean for the nations of the globe to: *(1) prevent, reduce, and control degradation of the marine environment so as to maintain and improve its life-support and productive capacities; (2) develop and increase the potential of marine living resources to meet human nutritional needs, as well as social, economic, and development goals; and, (3) promote the integrated management and sustainable development of coastal areas and the marine environment.*

Furthermore it was pointed out that Post-UNCED concern has been expressed over the deteriorating condition of the world's coastal ecosystems that produce most of the world's living marine

resources. Within the nearshore areas and extending seaward around the margins of the global land masses, it was noted that coastal ecosystems are being subjected to increased stress from toxic effluents, habitat degradation, excessive nutrient loadings, harmful algal blooms, emergent diseases, fallout from aerosol contaminants, and episodic losses of living marine resources from pollution effects and overexploitation.

A detailed description was given on the strategic approach developed as the Large Marine Ecosystem assessment strategy to mitigate stresses on coastal ecosystems. The remarks included the following observations: Coastal pollution, changes in biodiversity, the degraded states of fish stocks, and the loss of coastal habitat generally are limiting achievement of the full economic potential of coastal ecosystems. Present efforts to address these problems by local, regional, national, and international institutions responsible for resource stewardship has been less than successful. Informed decisions for ensuring the long term development and sustainability of coastal marine resources can best be made when based on sound scientifically- derived options. For most coastal ecosystems, existing environmental data pertinent to studies of perturbations to habitats and populations at the species, population, community, and ecosystem level is difficult to synthesize because of spatially and temporally fragmented character, lack of comparability, and inaccessibility.

To overcome these shortcomings, there is a need for a more coherent and integrative assessment of the changing states of coastal ecosystems from drainage basins to the adjacent marine ecosystems that is directly linked to institutions responsible for the governance of the ecosystems. An essential component of an ecosystem management regime is the inclusion of a scientifically-based strategy to monitor and assess the changing states and health of the ecosystem by tracking key biological and environmental parameters. From this perspective, marine ecosystem assessment and monitoring is defined as a component of a management system that includes: (1) regulatory, (2) institutional, and (3) decision making aspects relating to marine ecosystems. The system would include, therefore, a range of activities to provide management information about ecosystem conditions, contaminants, and resources at risk within the geographic extent of the ecosystem.

An ecological framework that can serve as a basis for achieving the UNCED objectives is the Large Marine Ecosystem (LME) concept. LMEs are increasingly being subjected to stress from growing exploitation of fish and other renewable resources, coastal zone damage, habitat losses, river basin runoff, dumping of urban wastes, and fallout from aerosol contaminants. These are the regions of ocean space encompassing coastal areas from river drainage basins and estuaries on out to the seaward boundary of continental shelves and the seaward margins of coastal current systems. LMEs are relative large regions on the order of 200,000 $km^2$ or larger, characterized by distinct bathymetry, hydrography, productivity, and trophically dependent populations.

The theory, measurement, and modelling relevant to monitoring the changing states of LMEs are imbedded in published reports on ecosystems with multiple steady states, and on the pattern formation and spatial diffusion within ecosystems. Based on examination of the bathymetry, hydrography, productivity, and trophic linkages of marine populations, the spatial extent of 49 distinct LMEs have been described from around the margins of the Atlantic, Pacific, and Indian Oceans. These LMEs produce 95 percent of the annual global fisheries biomass yields; reports on the changing states of biomass yields and health have been published for 29 of the LMEs. The assessments of the changing states of LMEs are based on information obtained from five operational modules that link science-based information to socioeconomic benefits for countries bordering on LMEs. The modules are focussed on ecosystem (1) productivity, (2) fish and fisheries, (3) pollution and health (4) socioeconomic conditions, and (5) governance protocols.

### 4.1.1 GEF Operational Strategy

The GEF Operational Strategy for International Waters was described. The GEF Operational Strategy calls for the development and implementation of projects in the International Waters Program

that can achieve global benefits through the implementation by countries of more comprehensive approaches for restoring and protecting the "International Waters" (IW) environment. The goal of the IW program is to assist countries in making changes in the ways that human activities are conducted in different sectors so that the particular water body and its multi-country drainage basin can sustainably support human activities. The GEF has placed priority on changing sectoral policies and activities responsible for the most serious root causes of transboundary environmental concerns and determining the expected baseline and additional actions needed to resolve each priority concern. Based on the countries' commitments to change sectoral policies or activities and to find baseline investments, the GEF may fund the agreed incremental cost of additional measures. One of the focal areas for funding by the GEF is to mitigate stressors on Large Marine Ecosystems, and promote priority actions for improving environmental quality and the sustainable development of resources within LMEs important to the economic growth and food security of developing countries in Asia, Africa, Central and South America and eastern Europe. (See Attached Annex 1 for a description of GEF Operational Programs under three funding categories: (1) Water Based Operational projects, (2) Integrated Land and Water Multiple Focal Areas, and (3) Contaminant Based projects).

It was specifically noted that project development should be country driven, emerging from a regional base. This principle must be recognized in future project development and implementation, and should be stressed to relevant regional bodies. The Gulf of Guinea LME Project was established using this process, and could be seen as a model for the project development process in other regions. The driving forces here were country driven, and personal scientist-to-scientist contacts also played a significant role in the development of the project. A similar process was used in developing the Yellow Sea LME. The significance of the country-driven approach to UNCED was also considered.

The GEF strategy for LMEs incorporates an interdisciplinary approach along with a development component to improve the management of marine resources. In order to link ongoing multi-disciplinary efforts, the GEF encourages the use of GESAMP, SCOPE and UNEP documents in the preparation of project proposals and in the implementation of LME projects.

The level of funding for LME projects is unique when compared with other types of support for international activities. Funding of US$300,000 for Western India Ocean planning of projects has have been allocated, and UNEP plans to include the whole Western Indian Ocean, not only the part originally identified. The funds will be made available to support the development of a Strategic Action Programme (SAP).

### 4.1.2 GEF Operational Programmes

It was reported that LMEs have been included as an integral component of the GEF Waterbody-based Operational Program (GEF 1997). The Operational Program recognizes LMEs as the appropriate entity within which to address marine issues, coastal zone issues and relevant freshwater basin concerns. The objectives of the Program regarding LMEs are the development of a GEF strategic approach to a specific, damaged LME, so that significant investment can be leveraged and regular programs of implementing agencies are harnessed to address priority transboundary environmental concerns in the 'highly damaged' LME.

Activities resulting from these GEF investments will include: support and technical assistance for countries to form project planning committees; advice and assistance in stakeholder/NGO participation; limited demonstration projects to determine feasibility, and; advice and facilitation in formulation of the strategic action program. Dr. Sherman reported that the GEF already has started to implement this program through the development of LME projects in the Benguela Current.

## 4.2 COUNTRY DRIVEN LME PROJECT PLANNING AND IMPLEMENTATION

### 4.2.1 The Gulf of Guinea Project

Convinced that pollution and living resources in the coastal and marine environment exist in the Gulf of Guinea without respect to political boundaries, the countries of Benin, Cameroon, Cote d'Ivoire, Ghana, Nigeria, have agreed to participate in a project entitled "Water Pollution Control and Biodiversity Conservation in the Gulf of Guinea Large Ecosystem (LME)". This is the first project funded by the Global Environmental Facility (GEF) in West Africa to be based on the Large Marine Ecosystem concept of environment and natural resources management. It is funded by GEF and implemented by the marine scientists and resource managers of the countries within the region. UNDP is the implementing Agency, while UNIDO is executing Agency with technical assistance from US-NOAA and UNEP.

The project has "united" neighbouring countries in the Gulf of Guinea region on the identification of issues of concern to their shared international waters and living resources and to adopt common policies and strategies in addressing national priorities in this regard. Within and across countries networks of scientific and social institutions as well as NGOs have been established. These networks, linked by an electronic messaging system are being reinforced through the supply of equipment and a series of group training workshops aimed at standardising methodological approaches both in studies and applied management options.

Common GIS based data management formats (as basis for later instituting national and regional decision-making support systems) have been adopted across the countries thereby facilitating regional data and information exchange. Industrial and domestic pollution is being assessed to provide a scientific basis for government actions aimed at reducing land based sources of pollution to the marine environment. The preparation of national COASTAL PROFILES, which are precursors to National Integrated Coastal Areas Management ICAM Plans, is in progress. The plans will reduce and lead to the elimination of the inevitable conflicts that result from the multiple uses of the coast and ensure an orderly development process that protects the environment and promotes the sustainable use of natural resources.

Across the board National Steering Committees have been set up to guide project implementation and to ultimately promote the multidimensional and cross-sectoral management implied in the national ICAM plans following their adoption into law by February 1998. A series of senior level regional workshops will be held to recommend a set of regional policies and strategies as the basis of regional agreements to be signed by the Committee of Ministers for safeguarding the health of the Gulf of Guinea Large Marine Ecosystem and arresting the uncontrolled exploitation of its living resources. This will help to decrease pollution pressure on International Waters and enhance the conservation of biological diversity.

The experiences from training activities in connection with the development and implementation of the Gulf of Guinea LME Project should be used as an example for the development of other LME projects. The GEF/World Bank guidelines presented in (Annex 1) could, provided used correctly, lead to a improved funding situation for the Gulf of Guinea LME Project and also for LME project proposals in general.

### 4.2.2 The Yellow Sea LME Project proposal

An overview was given on the developing Yellow Sea LME monitoring and assessment program. The program is based on three modules: pollution, fishing and productivity, and also addresses policy and management issues in the coastal zone of each country. A GEF Block B PDF proposal has been approved by the GEF and project activities will begin soon. The project has been delayed due to policy changes at the GEF since initiation of the Pilot Phase, but should be implemented in 1997.

### 4.2.3 The Somali Current LME Project

It is important to use all relevant environmental indicators in the development of LME projects. For example, critical habitat, fisheries and pollution conditions usually must all be considered in the development of projects. The current system on the East African Coast is complex and further studies on the interrelationship between a Somali-Mozambique Current and Agulhas Current Systems should be undertaken to achieve a better understanding and definition of the Somali Current LME. It was furthermore found important to provide assistance to address the problems with over fishing from foreign fishing fleets, landing catches elsewhere. As these catches are not considered in the bordering coastal country statistics, FAO could have a role to play in the improving the reporting of catches by northern countries operating in the waters of east Africa.

### 4.2.4 The South China Sea LME Project Proposal

Summary of Edgardo Gomez's presentation, adapted from document prepared by Dr. McManus and Dr. Gomez, U.P. Marine Science Institute, The Philippines.

The South China Sea (SCS) is a strategic body of water that is surrounded by nations which are currently at the helm of industrialization and rapid economic growth in the Asia-Pacific region. Bordered by China,

Hong Kong and Taiwan to the north, the Philippines to the east; Malaysia, Singapore, Indonesia and Brunei to the south; Thailand, Cambodia, and Vietnam to the west; the South China Sea has always been central to issues of political and economic stability in Southeast Asia and adjacent regions. Populations from these coastal nations states were represented by their governments at the 1992 UN Conference on Environment and Development (UNCED) and were among the 167 nations endorsing the UNCED Oceans Declaration to prevent, reduce and control degradation of the marine environment. Today, the SCS is central to defining food security for its coastal nations.

Fundamental to the ability of the South China Sea states to produce food is the sustainable utilization of their marine living resources, both near- and offshore, including those found in disputed territories such as the Spratly Islands. Because of the nature of the marine ecosystem, the dynamics of these resources remain fluid and dependent on the vagaries of nature and man. The fate of migratory fish stocks and planktonic fish and invertebrate propagules depends not only on the variability of natural recruitment processes, but also on the mechanisms of fishery and environmental management among border countries.

For too long, fishery and environmental management has been viewed as only a matter of national concern. To even think of imputing collaboration among nations bound by a common ocean patrimony would have been a clear case of foreign intervention. Today, perceptions have radically changed. As populations burgeon and coastal living resources dwindle, conflicts in exploiting the offshore fishery commons have become more real. Pollution from land-based sources along continental and insular shelves which surround 90% of the perimeter of the South China Sea is more pronounced with the increasing number of industries in the region. Heightened use of the SCS to transport goods including oil and nuclear waste underscore the fact that the SCS is a strategic waterway between the Pacific and the Indian Oceans. The management of the South China Sea and its resources can no longer be defined within the context of geopolitical boundaries and hegemony. It will have to be defined by a basic realization of shared survival.

Initiatives to submit project proposals for possible funding have been prepared but to date these have not been successful. Nevertheless, efforts are continuing.

### 4.2.5 Other candidates for GEF/LME Projects

A summary of GEF/LME candidate projects was provided. It was indicated that coastal nations that represent half the population of the world have indicated a willingness to follow the lead of the GEF in bringing about a paradigm shift in moving away from sector by sector treatment of degraded coastal environments, toward a more holistic multi sectoral approach to marine-based assessments of ecosystem health, productivity, and resource sustainability. Included in this list of nations are China, North Korea, South Korea, for improving conditions in the Yellow Sea; Ghana, Ivory Coast, Nigeria, Cameroon, and Benin for the Gulf of Guinea; Namibia, Angola, South Africa for the Benguela Current; Kenya and Tanzania for the Somali Current; Poland, Estonia, Lithuania, Latvia, and Russia for the Baltic; and Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka, and Thailand for the Bay of Bengal ecosystem.

## 5. STRATEGIES FOR ADVANCING LMEs

### 5.1 STRATEGIES FOR IMPROVING ASSESSMENT, MONITORING AND MANAGEMENT OF LMES, COMMENTS ON THE GEF OPERATIONAL STRATEGY

It was noted that the GEF operational strategy as described in the April 1997 Waterbody-Based Operational Program and the Integrated land and Water Multiple Focal Area Operational Program provide a planning framework for the design, implementation, and coordination of different sets of GEF International Waters projects that can achieve global environmental benefits. Through the programs the GEF is encouraging a paradigm shift from a sector by sector approach to International Waters projects to more comprehensive approaches for the restoration and protection of international waters. The goal of the projects to be funded is to "assist countries in making changes in the ways that human activities are conducted in different sectors so that the particular waterbody and its multi-country drainage basin can sustainably support human activities."

Projects to be funded should focus mainly on seriously threatened waterbodies and the most imminent transboundary threats to their ecosystems, including pollution, over-exploitation of living and non-living resources, habitat degradation, and from non-indigenous species. The long-term objectives of the programme are to undertake a series of projects that involve helping groups of countries to work collaboratively with the support of implementing agencies in achieving changes in sectoral policies and activities so that transboundary environmental concerns degrading "specific" water bodies can be resolved. Among the short-term objectives of the Programme for Water-Body based projects is to "initiate actions toward resolving transboundary environmental concerns with at least one freshwater basin project and one large marine ecosystem project in each of the world's development regions including sub-Sahara Africa, Asia, Latin America/Caribbean, Middle East/North Africa, and Eastern Europe/Former Soviet Union."

Various types of water bodies with their varied ecological systems and varied economic value will be the subject of GEF projects. Freshwater systems range from transboundary river and lake basins to transboundary groundwater systems. Marine waters are primarily addressed through LMEs. There are 49 of them that include the continental shelves and associated currents and these provide about 95 percent of the world's annual fish catches.

Water bodies selected for projects will be those that clearly identify transboundary concerns by neighbouring countries wherein transboundary concerns create significant threats to the functioning of the ecosystems and in case of LMEs marine issues, coastal zone issues, and relevant freshwater basin concerns are addressed.

### 5.2 LME AND GEF/UNEP OCEAN ASSESSMENTS, DISCUSSION SUMMARY

With regard to the GEF operational programmes focussed on Waterbody based and Integrated Land and Water Programmes, it was indicated that the Steering Committee of UNEP's Global International Waters Assessment (GIWA) in an initial draft outline for the project did a fine job of preparing the geographic framework for the GIWA. This was done by dividing the globe into mega-areas that include the UNEP Regional Seas Designations and the LMEs for which assessments can be made of the present state of the ecosystem, the principal risks to the ecosystem, and the principal causes leading to the risks. For example, the Steering Committee recognized that the Bay of Bengal LME is a region that has been proposed for a GEF International Waters LME project to be conducted jointly by Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka, and Thailand to address mitigation of environmental risks from unmanaged coastal development, overexploitation of marine living resources, and growing coastal pollution.

It would appear that these countries, along with the more developed countries from the Northern hemisphere would be prepared to assist in the GIWA by providing the UNEP Steering Committee with an assessment of the present state of the ecosystem off their coast, the resources at greatest risk and the sources or causes of the risk that need to be mitigated, and managed from the perspective of ecosystem resources development and sustainability.

Assessments of ecosystems adjacent to several of the more developed countries are underway, including Norway for the Barents Sea, Norwegian Sea, Icelandic Sea, and West Greenland and East Greenland shelves. An ecosystem assessment has been completed by the countries around the margins of the North Sea. Baltic and Black Sea assessments are readily available. For the seven ecosystems off the coasts of the United States Assessments of the ecosystem levels along with associated drainage basins will be readily available for the Northeast Shelf, the Southeast Shelf, the Gulf of Mexico, the California Current, the Gulf of Alaska, the East Bering Sea and the Hawaiian Islands.

These assessments, along with designations of high risk issues and their causes appear to be entirely consistent with the GEF Operational Program, and consistent with achieving the objectives of the GIWA.

For additional information on GIWA, contact Dr John Pernetta, UNEP's GEF-coordinator in Nairobi, Kenya.

## 6. LINKING LMEs TO INTEGRATED COASTAL MANAGEMENT

### 6.1 FAST TRACK ICAM-LME PROJECTS

It was indicated that a framework for linking science-based assessments of the changing states of coastal ecosystems and guiding environmentally sound economic development of ecosystem resources and management practices is now emerging from a series of regional efforts aimed at cross-sectoral integration of assessments of coastal productivity, fish and fisheries, and pollution and ecosystem health, with socio-economics and governance modules. The application of the modules is being supported, in part, by grants from the GEF in collaboration with national governments of countries bordering large marine ecosystems in Asia, Africa, Central and South America, and Eastern Europe.

The GEF Operational Strategy calls for the development and implementation of projects in the International Waters Program that can achieve global benefits through the implementation by countries of more comprehensive approaches for restoring and protecting the "International Waters" (IW) environment. The goal of the IW program is to assist countries in making changes in the ways that human activities are conducted in different sectors so that the particular water body and its multi-country drainage basin can sustainably support human activities. The GEF has placed priority on changing

sectoral policies and activities responsible for the most serious root causes of transboundary environmental concerns and determining the expected baseline and additional actions needed to resolve each priority concern. Based on the countries' commitments to change sectoral policies or activities and to find baseline investments, the GEF may fund the agreed incremental cost of additional measures. One of the focal areas for funding by the GEF is to mitigate stress on Large Marine Ecosystems, and promote priority actions for improving environmental quality and the sustainable development of resources within LMEs important to the economic growth and food security of developing countries in Asia, Africa, Central and South America and eastern Europe.

It is important to strengthen the linkages between science and management for the drainage basins and near coastal and geographic extent of the LMEs, and also to improve on the methodologies for ensuring that near coastal and drainage basin effects on the LME proper are included in the overarching strategy for a systems approach to a management strategy that includes (1) drainage basin, (2) near coastal, and (3) offshore coastal components of the LME.

Two model systems can be used to fill this need for improved assessment strategies: the Batangas Bay model in the Philippines and the Xiamen Municipality model in China. Both were developed as demonstration projects in Integrated Coastal Management (ICM). The projects are part of the Global Environmental Facility, UNDP, International Maritime Organization's Regional Programs for the Prevention and Management of Marine Pollution in the East Asian Seas. The approach provides a framework for management of the coast of the Batangas Bay region of the Province of Batangas in the Philippines. It includes guidelines for the implementation of a core program of: (1) integrated waste management, (2) water pollution abatement, (3) conservation of stressed mangrove and coral reef areas, (4) coastal tourism development, and (5) improvements of the municipal fisheries. Special support programs addressing interests of the stakeholders of the region have been developed and are being implemented for: (1) development of legal and institutional mechanisms for ICM, (2) strengthening of provincial integrated planning and resource management, (3) improvement of policy support systems, (4) upgrading of monitoring and enforcement capabilities, (5) capacity building in technology transfer and coastal management, (6) community outreach, (7) establishment of a multi-sectoral information, education, and communication system, (8) expansion of research and extension activities, (9) establishment of a management information system, and (10) development of sustainable financing mechanisms.

## 7. MECHANISMS FOR CO-OPERATION: IOC MEMORANDUM OF UNDERSTANDING

The IOC has played an important *ad hoc* role in the development and application of the LME concept, and LME monitoring and assessment projects could benefit from a more formal involvement of the IOC. For example, the IOC could play an important coordination role through its regional bodies such as IOCINDIO, IOCINCWIO and WESTPAC, as well as by identifying key individuals within the marine science communities of participating countries. Also, if strong linkages can be established between the IOC and the developing LME monitoring and assessment programs, some indirect support may be provided for IOC programs.

In light of this potential strong relationship, the participants recommended that the IOC establish a Memorandum of Understanding (MOU) with NOAA for LME activities. It was also noted that other organizations, e.g., ICES, PICES, IUCN, ORSTOM, FAO could contribute significantly to LME efforts, and that a multilateral MOU should be a longer-term goal.

**RECOMMENDATIONS**

The Group recommended the following priority actions:

The Expert Consultative Meeting acknowledges or otherwise notes the progress made in the application of the LME approach to monitoring, assessment and management of marine ecosystems in support of the UNCED Chapter 17 of Agenda 21, urging countries to: (1) prevent, reduce, and control degradation of the marine environment so as to maintain and improve its life-supporting and productive capacity; (2) develop and increase the potential of marine living resources to meet human nutritional needs, as well as social, economic, and development goals; and (3) promote the integrated management and sustainable development of coastal areas and the marine environment. - IOC will undertake to communicate these achievements to the UN and other international organizations, on the basis of a summary brief prepared jointly with a small group with representatives from NOAA, IUCN, ICES and IOC.

IUCN in collaboration with NOAA, IOC, and UNIDO should disseminate LME information more widely using the "World Wide Web" as one of the delivery mechanisms. LME activities should be planned for the "1998 International Year of the Oceans (IYO) and EXPO 98". IOC will convene, but not pay for, a consultative meeting in late 1997, constituted by but not limited to IUCN, NOAA, ICES; to plan and suggest means of implementation of the LME activities for IYO.

FAO should consider options for reporting fish statistics by LME areas in addition to present statistical areas.

NOAA, IUCN and IOC should update productivity information for each of the LMEs based on available data, both in situ and satellite remote-sensing where pertinent. Utilize ECOPATH carrying capacity models in collaboration with appropriate experts.

Existing and future LME projects should consider the application of new technologies and techniques to assess the status and changes in LME coastal habitats. Such technologies include airborne instruments e.g. compact airborne spectrophotometric instruments, acoustic assessment of sedimentary habitats, GIS, and rapid assessment techniques for biodiversity.

The IUCN Marine and Coastal Programme Office in collaboration with WWF, the IUCN Commission of Ecosystem Management and other partners, should provide a report addressing ICAM issues in relation to the LME modular monitoring and assessment approach, taking into account the recent GESAMP report on "The Contribution of Science to Integrated Coastal Management" and the ocean health and assessment network.

A matrix should be developed describing the relationships among international programmes, with particular regard to developing GEF supported LME projects and efforts to encourage close links between the application of science based ecosystem assessment and management particularly with regard to socio-economic benefits and governance. ICES volunteered to develop this matrix together with other relevant organizations.

As a means to foster science-based management of marine resources for sustainable use, encourage further development of country-driven GEF projects as outlined in the GEF Operational Guidelines and the Monitoring and Evaluation Guidelines of the World Bank. This should be done particularly with respect to the Yellow Sea, Somali Current, Baltic Sea, Caribbean Sea, Agulhas Current, Western Indian Ocean Gyre and South China Sea LMEs. IUCN, NOAA, IOC, and other partners should assist developing countries in preparing GEF projects proposals on these LMEs.

Recognize the potential for synergy between UNEP's Regional Seas Programme, IOC's regional programmes and LME projects. In areas within an LME, that fall either wholly or partially under a UNEP Regional Sea, collaborative assessment and monitoring should be undertaken by the responsible agencies.

The IUCN - Marine and Coastal Program in collaboration with the World Conservation Monitoring Center, FAO, UNEP and the Commission of Ecosystem Management, should update the description of LMEs within the context of UNEP Regional Sea Programme as well as the LME World Map.

The Expert Consultative Meeting, taking into account the excellent progress made in implementation of the Gulf Guinea LME project, encourages IOC and IUCN in collaboration with UNIDO to disseminate initial results to the marine science, policy, and management communities, as well as educational institutes and the general public.

NOAA, IOC and IUCN should continue to prepare summary reviews from ongoing LME monitoring and assessment studies not funded by the GEF.

IOC, IUCN and NOAA will develop the Terms of References (TOR) for an LME Committee to replace the ad hoc Committee as soon as possible. The TOR will be reviewed subsequently by FAO, ICES, UNIDO and UNEP and circulated for reviews and comments by the attendees of the 23-24 January 1997 LME Meeting.

The establishment of an LME Committee should not preclude regular contact among the network of parties involved in LMEs, and such regular contact should be encouraged. In this regard the participants agreed to form the nucleus of this network through e-mail.

Reconvene consultations in January 1998 to review LME Programme developments, in relation to the practical activities of GLOBEC, LOICZ, GOOS and other science-orientated initiatives on ocean dynamics, like JGOFS, as well as progress made towards closer integration of marine science with socio-economic and governance activities.

# ANNEX I

## GEF OPERATIONAL PROGRAMMES
**June 1997**

These three sections are taken from the above-mentioned document published by Global Environmenal Facility (GEF)

## OPERATIONAL PROGRAMME NUMBER 8
## WATERBODY-BASED OPERATIONAL PROGRAMME

## OPERATIONAL PROGRAMME NUMBER 9
## INTEGRATED LAND AND WATER MULTIPLE FOCAL AREA OPERATIONAL PROGRAMME

## OPERATIONAL PROGRAMME NUMBER 10
## CONTAMINANT-BASED OPERATIONAL PROGRAMME

# OPERATIONAL PROGRAM NUMBER 8
# WATERBODY-BASED OPERATIONAL PROGRAM

## GUIDANCE

8.1 Guidance for this operational program (OP) comes from the GEF Council in the Operational Strategy. Operational Programs in the international waters focal area provide a planning framework for the design, implementation, and coordination of different sets of GEF international water projects that can achieve particular global environmental benefits. Through different operational programs, emphasis is placed on a variety of interventions and certain types of projects that can lead to implementation of more comprehensive approaches for restoring and protecting the international waters environment. Operational programs are established to ensure systematic coordination among implementing agencies, countries, and other actors as well as to generate programmatic benefits for the global environment that would not otherwise be achievable.

8.2 In the Waterbody-Based operational program, the GEF will play a catalytic role in assisting a group of countries seeking to leverage cofinancing in association with national funding, development financing, agency regular programs, and private sector action for necessary elements of a comprehensive approach for sustainably managing the international waters environment. The goal is to assist countries in making changes in the ways that human activities are conducted in a number of sectors so that the particular waterbody and its multi-country drainage basin can sustainably support human activities. GEF helps countries to utilize the full range of technical, economic, financial, regulatory, and institutional measures that are necessary.

8.3 Projects in this operational program focus mainly on seriously threatened water-bodies and the most imminent transboundary threats to their ecosystems as described in the Operational Strategy[1]. Consequently, priority is placed on changing sectoral policies and activities responsible for the most serious root causes or needed to solve the top priority transboundary environmental concerns. GEF may fund the transaction costs of neighboring countries collaborating on defining the priority transboundary environmental concern of the waterbody and determining expected baseline and additional actions needed to resolve each priority concern. Based on the countries' commitments to change sectoral policies or activities and to fund expected baseline investments, GEF may fund the agreed incremental cost of additional measures.

[1] Imminent transboundary concerns that seriously threaten waterbodies include, pollution, over-exploitation of living and non-living resources, habitat degradation, and nonindigenous species.

## PROGRAM OBJECTIVES

8.4 The long-term objective of the program is to undertake a series of projects that involve helping groups of countries to work collaboratively with the support of implementing agencies in achieving changes in sectoral policies and activities so that transboundary environmental concerns degrading specific waterbodies can be resolved.

8.5 Short-term objectives of the program are to:

(a) undertake a series of projects that utilize a spectrum of interventions for addressing different transboundary environmental concerns in different types of waterbodies that are representative of diverse geographic settings across the world;

(b) derive lessons learned from experiences in using various types of institutional arrangements at the national and regional levels for collaboration in addressing transboundary priority environmental concerns; provisions will be included for periodic stock-taking and review of lessons learned as projects are implemented;

(c) assess the usefulness of Strategic Action Program formulation in leveraging national/donor actions at the policy/investment levels, in coordinating support of regular implementing agency programs, and in serving as a logical framework for M&E;

(d) initiate actions toward resolving transboundary environmental concerns for a variety of waterbody settings with at least one freshwater basin project and one large marine ecosystem project in each of the worldís five development regions;[2] and

(e) fully develop a GEF strategic approach to a specific, damaged Large Marine Ecosystem (LME) so that significant investments are leveraged and regular programs of implementing agencies are harnessed to address priority transboundary environmental concerns in the highly damaged large marine ecosystem.

## PROGRAM SCOPE

8.6 The operational program consists of projects that utilize different types of interventions to make changes in sectoral policies and activities which degrade the international waters environment. A range of transboundary environmental concerns,

[2] The five development regions are Sub-Saharan Africa, Asia, Latin America/Caribbean, Middle East/North Africa, and Eastern Europe/Former Soviet Union.

different types of waterbodies, and a number of geographic settings are utilized across the world to test various interventions and learn from implementation. Implementing agencies assist the countries with tasks according to their comparative advantages. Groups of countries work collaboratively in learning about and resolving priority transboundary environmental concerns.

8.7 Waterbodies with varied ecological systems and economic value will be the subject of GEF projects. Freshwater systems range from transboundary river and lake basins to transboundary groundwater systems. Marine waters are primarily addressed through LMEs. These are the equivalent of sea-based ecosystems for areas of common circulation or enclosed/semi-enclosed seas. There are 49 that make up the continental shelfs and associated currents and these provide about 95 percent of ocean fish catches. Certain priority portions of LMEs, limited ocean spaces, or certain living resources of the ocean can also be targeted for interventions in this operational program.

**Characteristics of the Waterbodies**

8.8 The waterbodies chosen for projects will encompass a range of different transboundary environmental concerns, geographic settings, and regions as follows:

(a) transboundary concerns are defined by neighboring countries in a transboundary diagnostic analysis;

(b) transboundary concerns create significant threats to the functioning of the ecosystems and a focus is placed on the highest threats;

(c) most countries contributing to the problems wish to collaborate;

(d) resources are programmed to support projects in many different development regions rather than being clustered on one continent; and

(e) LMEs address marine issues, coastal zone issues, and relevant freshwater basin concerns.

**Characteristics of the Interventions**

8.9 Assistance may be provided by the GEF to:

(a) conduct a transboundary diagnostic analysis to identify priority transboundary environmental concerns;

(b) formulate a Strategic Action Program of actions each country needs to take to address the priority transboundary concerns (including differentiation of

agreed expected baseline actions and those that would be additional in nature) and to leverage non-GEF resources for implementing both baseline and additional actions;

(c) support the incremental cost of technical assistance, capacity building, limited demonstrations, and certain investments needed to address the priority transboundary concerns as outlined below under "Types of Activities".

(d) encourage the use of sound science and technological innovations for management.

**EXPECTED OUTCOMES**

8.10 International water projects normally require a long-term commitment on the part of governments, implementing agencies, donors, and the GEF to leverage the intended sectoral changes - to address the root causes - of complex environmental problems in this focal area. Many GEF international water projects require political commitments on the part of neighboring countries to work together. It takes time to nurture the capacity to work together, establish factual priorities, and decide on joint commitments for action. Collaborative processes are fostered through a logical progression of GEF-funded activities - from project development to analyses of transboundary priority environmental concerns to formulation of an international water Strategic Action Program to eventual regional capacity building or country-specific investment projects. The strategic action program is a key element for the GEF because it will contain the agreed transboundary analyses for determining priorities and the array of expected baseline and additional actions needed for resolving each priority problem. Some groups of countries may already have in place the analyses and identified the environmental protection commitments needed to support formulation of a strategic action program, and in those cases Project Development Facility (PDF) funds might be utilized to pull together the array of reasonable baseline and additional actions needed to solve the priority transboundary problems and then quickly proceed to project preparation in conjunction with leveraged funding.

8.11 The GEF will normally play an important catalytic role in restoring/protecting waterbodies but it will be only a small part of the larger multicountry effort with assistance from donors and implementing agency (IA) regular programs. Development or strengthening of multicountry institutional arrangements are often appropriate measures for support and countries should ensure financial sustainability of these arrangements to ensure that the expected outcomes can be achieved, which in some cases may be years after the GEF project has been completed.

8.12 Expected outcomes of this program include reduction of stress to the international waters environment in parts of all five development regions across the globe as a

result of countries changing their individual sectoral policies, making critical investments, developing necessary programs, and collaborating jointly in managing transboundary water resources. In addition, achievement of the program objectives listed herein may be considered as an expected outcome of the programming of projects in this operational program.

8.13 Key assumptions are that:

(a) over time, the full range of technical, economic, financial, regulatory, and institutional measures necessary to restore and protect the waterbody would have been taken by collaborating countries to accompany the leveraged development assistance of regular programs of the implementing agencies, international co-funding of investments, and private sector action; and

(b) participating and donor countries would have committed funding for needed baseline actions.

**PROGRAM OUTPUT**

8.14 The outputs of this program are a representative number of transboundary freshwater basin international water projects (both surface and subsurface basins) as part of a freshwater basin component as well as a representative number of international water projects focusing on marine/coastal ecosystems (or perhaps limited oceanic areas and their living resources) as part of a large marine ecosystem component of the program. Different considerations, elements, and interventions may be characteristic of projects addressing these varying types of waterbodies consequently two distinct components are required for programming. Of course, since each project addresses transboundary concerns, global environmental benefits constitute the fundamental program output.

8.15 Another significant output involves the programming (or targeting) of individual GEF projects in one area to make a catalytic, on the ground impact in a case that is so complex that no single country, no single donor, or no single implementing agency can make a real difference. These programmatic global environmental benefits represent a synergistic effect from GEF activities.

8.16 Outputs from individual international water projects include:

(a) a comprehensive transboundary environmental analysis identifying top priority multi-country environmental concerns;

(b) a strategic action program consisting of expected baseline and additional actions needed to resolve each transboundary concern;

(c) country commitments to implement expected baseline and additional actions;

(d) documentation of stakeholder participation in determining expected baseline and additional actions to be implemented;

(e) implementation of measures with incremental costs that help resolve the priority transboundary environmental concerns; and

(f) monitoring and evaluation indicators related to the international waters project and subsequent actions following project completion (process indicators, stress reduction indicators, and environmental status indicators).

**TYPES OF ACTIVITIES**

8.17 This operational program heavily relies on cooperation among Implementing Agencies as part of specific projects as well as a significant commitment from each Implementing Agency to target its regular development assistance programs to the international waters project area along with the GEF. These Implementing Agency commitments to action (including regular agency programs such as capacity building) and individual country commitments to baseline and additional specific actions are often contained in Strategic Action Programs developed with GEF assistance. Typical GEF projects first contain activities to complete this strategic work and gain agreement among countries and then with implementing agencies. Then, subsequent regional capacity building or country-specific investment projects fund the incremental costs of priority additional measures along with baseline actions funded by countries, implementing agency regular programs, donors, private sector, or other sources.

8.18 Indicative activities for projects in each of the two components of this operational program include:

**Transboundary Freshwater Basin Component**

8.19 A number of transboundary lake basins, river basins, and groundwater basins provide settings for application of the operational program to projects in this component. Rather than addressing all the environmental problems in the basins of these waterbodies, GEF seeks to focus on the top priority problems that are transboundary in nature so that sectoral policies and activities that create the problems are changed in the basin. Joint actions among nations and regional cooperative institutional arrangements are often key features of these projects. The projects run the range from capacity building and technical assistance to specific investments with incremental costs. Demonstration projects are often included to test new or innovative interventions. Institutional elements such as water quality standards/regulations, permit processes, or water

minimization/pollution requirements are harmonized among countries. Institutional arrangements such as commissions are often developed or strengthened to provide mechanisms for countries to sustain actions after the GEF projects ends. The scientific community is often also involved in providing advice as part of the institutional arrangements.

**Large Marine Ecosystem Component**

8.20 With ninety-five percent of all marine fisheries in the world coming from 49 large marine ecosystems that make up continental shelf areas, projects in this component are essential for food security and for sustainable use of coastal resources. Linkages among coastal areas, marine waters, and their contributing freshwater basins are highlighted to provide the necessary comprehensive approach to addressing transboundary environmental concerns.

8.21 Integrated freshwater basin-coastal area management measures are important for protecting large marine ecosystems. In hotspots of transboundary environmental damage, targeted technical assistance or investment projects are encouraged to address serious problems. If only several of a large number of riparian countries wish to proceed, formulation of a strategic action program would be a useful, incremental first step. In addition, cooperating countries may wish to jointly address environmental problems of an oceanic area not included in a large marine ecosystem. Use of new technological and institutional tools is encouraged. Technological advances are being introduced that use information technology and computer simulation to help make critical management decisions for marine resources and tools such as the Code of Conduct for Responsible Fishing consistent with the Law of the Sea Convention also exist. Some projects may address issues (e.g. destructive fishing techniques) that are common to many countries in which changes in sectoral policies or activities are needed to maintain the environmental sustainability of marine and coastal waters.

**Indicative Activities for Capacity Building or Investment Projects**

(a) technical assistance for countries deciding how they jointly desire to work together with committee structures to collaborate more effectively;

(b) funding the communication infrastructure for committees and for stakeholder participation;

(c) advice and assistance in stakeholder/NGO participation design, conducting social assessments, etc.;

(d) limited demonstration projects to determine feasibility;

(e) feasibility studies;

(f) technical assistance and capacity building in how country interministerial teams work, how they involve stakeholders, and how they determine expected baseline and additional priority actions; and

(g) advice and facilitation in formulation of the strategic action program.

8.22 The GEF may fund the incremental cost of priority elements of the strategic action program that address the transboundary priorities. This funding could provide cost-shared incentives for leveraging government, private sector, or donor action in implementing priority solutions on the ground. Examples of indicative activities might include:

(a) a modest cost share in supporting establishment of an industrial toxics pretreatment program or physical interventions to separate easily treated municipal wastewater from more dangerous industrial wastewater;

(b) incremental cost funding for wetland restoration to provide habitats and to mitigate the effects of pollutants before they reach international waters;

(c) innovative approaches such as tradable pollution discharge permit systems or offset programs to cost-effectively improve water quality in shared basins;

(d) cost-share best management practice installation for nonpoint source control of land-based pollution in degraded, priority watersheds; and

(e) building a human resources capability to strengthen institutions. Hotspots of transboundary degradation may be targeted for funding if information is sufficient to characterize the transboundary nature of the problem and the country (or countries) commit to undertaking the needed measures. Single-country versions of strategic action programs may be appropriate to leverage other funding for baseline and additional actions.

## INTERAGENCY COORDINATION AND PUBLIC INVOLVEMENT

8.23 All three implementing agencies are normally involved on a task force for project preparation with environmental ministries of each participating nation. This is because each implementing agency has a comparative advantage, something additional, to bring to the table with its regular programs. Formulation of Strategic Action Programs (SAP) is the responsibility of the collaborating governments and national/regional stakeholders. Strategic action programs formulation provides an opportunity for implementing agencies to support country initiatives according to the implementing agency's comparative advantage and to bring their regular programs to bear where needed. While multiple implementing agency involvement is not

mandatory, it will be encouraged. It is through strategic action program formulation that baseline and additional priority actions are identified.

8.24 Stakeholder involvement and participation of different sectoral ministries in each recipient country constitute important elements of GEF activities concerning international waters. Stakeholder involvement will differ at each level of planning and administration. Participation of these various stakeholders (including the private sector) within and across countries can improve the quality, effectiveness, and sustainability of projects. However, there is a need to identify the key stakeholders through a stakeholder analysis or social assessment, as well as the levels at which their involvement will be critical and the means to ensure their effective participation. Linkage through computer-based networks is promising. Networking among stake-holders and government organizations can foster broad involvement in planning and implementing GEF international waters projects and should help to improve the quality, public awareness, and scientific basis of international waters projects. These technological innovations promote transparency among cooperating nations regarding key information, encourage broader participation by stakeholder groups within country and across countries, and provide a basis for evaluation. Interministerial coordination is essential so that actual changes can be made in sectoral activities.

## RESOURCES

8.25 With a large number of highly damaged and threatened waterbodies worldwide, the coming 3-year period will be utilized to select good examples of projects in each of the two components of the operational program. During the planning period, half the projects will be in an initial strategic stage while half will have been reviewed by Council and will have begun implementation. The modest estimate of financial resources needed for this operational program is $75-90 million for FY1998-2000 to accomplish objectives stated herein.

# OPERATIONAL PROGRAM NUMBER 9
# INTEGRATED LAND AND WATER
# MULTIPLE FOCAL AREA OPERATIONAL PROGRAM

## GUIDANCE

9.1 Guidance for this Operational Program (OP) comes from the GEF Council in the Operational Strategy. While there is no single convention that provides guidance, such as with the other GEF focal areas, an intricate web of conventions and action programs may provide an initial basis for countries to collaborate. Operational Programs in the International Waters (IW) focal area provide a planning framework for the design, implementation, and coordination of different sets of GEF IW projects that can achieve particular global environmental benefits. Through different OPs, emphasis is placed on various kinds of interventions and certain types of projects that can lead to implementation of more comprehensive approaches for restoring and protecting the international waters environment.

9.2 The Integrated Land and Water Multiple Focal Area OP is broader in scope than the Waterbody-Based OP. While projects still are aimed at achieving changes in sectoral policies and activities as well as in leveraging donor and regular Implementing Agency (IA) program participation, these projects focus on integrated approaches to the use of better land and water resource management practices on an area-wide basis. The goal is to help groups of countries utilize the full range of technical, economic, financial, regulatory, and institutional measures needed to operationalize sustainable development strategies for international waters and their drainage basins. Global benefits often are produced in other GEF focal areas by these projects, and the crosscutting issue of land degradation is an important element. With this more area-wide focus, and with biodiversity considerations often included in project objectives, more proactive interventions aimed at the protection of international waters with important biodiversity are common. In addition, projects addressing linkages among the coastal zone, oceans, climate change, and international waters may also provide multiple focal area benefits. Prevention of damage to threatened waters is stressed in this OP while remediation of damaged systems is more often stressed in the Waterbody- Based OP.

## PROGRAM OBJECTIVES

9.3 The long-term objective of the program is to achieve global environmental benefits through implementation of IW projects which integrate the use of sound land and water resource management strategies as a result of changes in sectoral polices and activities that promote sustainable development.

9.4 Short-term objectives of the program include:

(a) undertake a series of international water projects, in several development regions, that address the cross cutting issues of land degradation and include a focus on Africa;

(b) assess the usefulness of the Strategic Action Program (SAP) concept for IW projects with multiple focal area benefits in: facilitating collaboration among IA's and countries; leveraging the involvement of regular IA programs and donors; and serving as a logical framework for M&E;

(c) derive lessons learned in testing workable mechanisms to improve community, NGO, stakeholder, and interministerial participation in planning, implementing, and evaluating projects in this OP, especially as they relate to the special needs of Small Island Developing States; and

(d) develop projects in two or three areas of threatened marine waters in close cooperation with Operational Programs in the climate change and biodiversity focal areas and with the coastal/marine priority of the Conference of the Parties of the Convention on Biological Diversity.

**PROGRAM SCOPE**

9.5 While the Waterbody-based OP focuses on the ecological status of trans-boundary waterbodies and on the narrow, prescriptive measures necessary to address the top priority transboundary concerns, Operational Program Number 9 focuses on area-wide interventions that typically involve integrated management of land and water resources. Like Operational Program Number 8, projects in this OP are often multi-country in nature, but unlike Operational Program Number 8 they often focus on preventive measures to address threats rather than remedial, highly capital- intensive measures. In addition, global benefits in multiple focal areas are often associated with projects in this OP. Consequently, dose cooperation with Operational Program Number 1 (arid and semi-arid zone ecosystems) and Operational Program Number 2 (coastal, marine, wetlands) is important. Interactions between the oceans and climate are frequently reflected in the physical, chemical, and biological characteristics of marine systems. Collaborating nations that desire to address sustainable protection of their coastal zone resources may often wish to examine linkages with climate as part of their marine ecosystem project.

9.6 With components devoted to the cross cutting issue of land degradation, and the special conditions and needs of Small Island Developing States, projects in this OP often involve determining what sectoral changes are needed to achieve the goals of sustainable development as well as what type nature of measures are needed to ensure that the ecological carrying capacity of the waterbody is not exceeded. Consequently,

with these considerations and the area-wide nature of interventions, community involvement and stakeholder participation become especially important in this OP. In addition, projects often involve processes that link biodiversity protection or climate change considerations into the thinking of sectoral managers (water engineers, agricultural officials, tourism development organizations, etc.) to ensure that sectoral policies and activities are modified to address sustainability and to protect aquatic/marine ecosystems.

9.7 As with the Waterbody-Based OP, the process of formulating a SAP may be useful to help provide a focus for setting priorities among countries, determining baseline and additional actions for addressing the priorities, and leveraging other forms of assistance. Single country projects may be appropriate if world-class biodiversity of habitat conditions warrant priority and, as part of project preparation, undertaking the equivalent of a SAP may be useful.

**EXPECTED OUTCOMES**

9.8 Similar to GEF expectations with regard to the Waterbody-Based OP, IW projects in Operational Program Number 9 will normally require a long-term commitment on the part of governments, IAs, donors, and the GEF to leverage the intended sectoral changes - to address the root causes - of complex environmental problems in this focal area. Because land degradation resulting in damage to the water resources in one nation often occurs upstream in another nation, political commitments on the part of neighboring countries to work together, establish factual priorities, and decide on joint commitments for action need to be nurtured. Collaborative processes are fostered through SAP formulation. Project Development Facility funds may be utilized by participating countries as part of project preparation to pull together the array of reasonable baseline and additional actions needed to solve the priority problems.

9.9 The GEF can be a catalyst for action to bring about the successful integration of improved land and water resource management practices on an area-wide basis. But the complexity and far-reaching nature of the issues will result in the GEF being only a small part of the necessary multi-country, multi-stakeholder effort. Active involvement of donors and built-in consideration by IA regular programs are also expected. Similar to the Waterbody-Based OP, development of or strengthened multi-country institutional arrangements are often appropriate measures for support, and countries should ensure financial sustainability of these arrangements to ensure that the expected outcomes can be achieved. This may be years after the GEF project has been completed.

9.10 Expected outcomes of this program include reduction of stress to the international waters environment in selected parts of all five development regions across the globe through participating countries making changes in their sectoral policies, making critical investments, developing necessary programs, and collaborating jointly in

implementing land and water resources protection measures. Achievement of the program objectives listed herein may be considered as an expected outcome of the programming in this OP as would be increased global environment benefits in several focal areas. Since the GEF is in an active learning mode in this focal area, periodic stocktaking and review of lessons learned will be programmed.

9.11 Key assumptions are that:

(a) over time, the full range of technical, economic, financial, regulatory, and institutional measures necessary to protect the international waters environment would have been taken by collaborating countries to accompany the leveraged development assistance of regular programs of the implementing agencies, international co-funding of investments, and private sector action;

(b) participating recipient and donor countries would have committed funding for needed baseline and some additional actions; and

(c) countries will have put into practice lessons that have been learned.

**PROGRAM OUTPUTS**

9.12 The outputs of this program include a representative number of IW projects as part of a land degradation component, a Small Islands Developing States component, and a multiple focal area component. Different considerations, elements, and interventions may be characteristic of projects addressing these situations, consequently, three distinct components are required for programming to ensure balance and to generate the global environmental benefits in different focal areas.

9.13 Outputs from individual IW projects in this OP include:

(a) a comprehensive transboundary environmental analysis identifying top priority multi-country environmental concerns;

(b) a strategic action program consisting of expected baseline and additional actions needed to implement an integrated approach to land and water resources management;

(c) country commitments to implement expected baseline and additional actions;

(d) documentation of stakeholder participation to determine expected base-line and additional actions to be implemented as well as community involvement in the project;

(e) implementation of measures related to integrated management of land and water resources that have incremental costs and that can generate global environmental benefits in several focal areas; and

(f) indicators related to the international waters project and subsequent actions following project completion (process indicators, stress reduction indicators, and environmental status indicators).

9.14 Key assumptions include:

(a) implementing agencies will cooperate with each other and participating countries, according to their comparative advantages; and

(b) barriers to adoption of integrated approaches to land and water management can be overcome through the projects or with the assistance of regular programs of agencies.

## TYPES OF ACTIVITIES

9.15 The OP relies on cooperation among Implementing Agencies as part of specific projects as well as a significant commitment from Implementing Agencies to target regular development assistance programs to the international waters project area along with the GEF. The Implementing Agency commitments to action (including regular agency programs such as capacity building and lending) and individual country commitments to baseline and additional specific actions are often contained in Strategic Action Programs developed with GEF assistance. Different types of activities characterize each component of Operational Program Number 9 as illustrated below.

### Land Degradation Component

9.16 A special linkage exists between land degradation in dryland areas and management of both surface and groundwater resources in transboundary drainage basins. Rehabilitation of damaged catchments, adoption of sustainable land use systems, and integration of water resources management and land management practices are priorities for both transboundary basins and ecologically important multiple country dryland settings. Opportunities will be sought for deriving global environmental benefits in other focal areas, such as climate change and biodiversity, with sound water resources management measures and revegetation initiatives being important elements of international waters projects that address this cross-cutting issue.

9.17 Improved watershed and catchment management, sustainable land-use and conservation systems, as well as sound sectoral development and economic policies are essential to addressing transboundary water-related environmental concerns related to land degradation. Especially in dryland regions, land degradation can be linked with changes in climate and river flow regimes and with the overuse of water resources by sectoral activities such as agriculture. This can also result in degraded subsurface water supplies, some of which have transboundary implications. Support for preparation of water resources management strategies by riparian countries for a transboundary dryland basin is a common characteristic of these projects, providing a basis for harmonization of sectoral water uses among basin countries in an environmentally sustainable manner. This often requires commitments to reduce water withdrawals in dryland basins so that sufficient quality and quantity of water are provided to sustain the international waters environment and its ecological diversity.

9.18 SAP formulation projects are encouraged as first steps of projects in this component. Water resources management strategies are integral elements of these SAPs, because of the processes involving multicountry commitments to environmentally sustainable water use in these dryland basins. While projects are sought worldwide, an initial emphasis will be placed on Africa and on close cooperation with the GEF arid and semi-arid ecosystems OP.

**Small Islands Developing States (SIDS) Component**

9.19 With their special conditions and needs, SIDS require more integrated approaches to improved land and water management in order to address threats to their water resources. In particular, projects in this component stress integrated freshwater basin - coastal area management as key elements to ensure a sustainable future for these island states. As noted in the GEF Operational Strategy, activities are typically targeted to six major issues SIDS have in common (coastal area management and bio-diversity, sustainable management of regional fish stocks, tourism development, protection of water supplies, land and marine-based sources of pollution, and vulnerability to climate change). Regional groups of SIDS often share access to marine resources and experience common water-related environmental problems (for example, saltwater intrusion into groundwater supplies as a result of rising oceans) or stocks of fish being depleted by foreign fishing fleets that can be addressed through the GEF in the context of altering sectoral activities on each island state to meet sustainable development goals. SIDS share common environmental problems and solutions that reflect the partnership between their representative regional organizations and the capacity and institutional building needed on each island state to more comprehensively address these problems. The transboundary issues then involve international cooperation among sovereign island states as well as transborder issues among the many islands of individual states as they utilize measures to protect their water resources.

9.20 The GEF helps facilitate the analysis of environmental problems and the setting of specific priorities for modifications of sectoral policies and activities that might be needed on particular islands. The GEF also helps strengthen regional approaches to joint management and helps leverage needed investments. Processes similar to SAP formulation may be appropriate for regional groupings of SIDS. Close linkages to the biodiversity focal area and the climate change area are evident.

**Multiple Focal Area Component**

9.21 GEF projects integrating several focal areas have the potential to multiply global benefits from GEF interventions. For example, wetland restoration and protection initiatives can provide benefits for both biodiversity protection and water quality improvement. Biodiversity protection and carbon sequestration have linkages and important roles in restoring damaged transboundary basins. In areas with globally significant biodiversity concerns, especially unique wetlands, coastal areas, and coral reefs, multiple focal areas projects might be appropriate for addressing current and anticipated threats in order to correct or prevent environmental damage. If the unique ecosystem lies mostly in one country, a single country project would be appropriate aimed at sectoral policies and activities needed to ensure that sustainable development can occur. Likewise, joint IW/biodiversity projects aimed at certain endangered aquatic/marine species that cross borders are appropriate for this component.

9.22 Various linkages with the climate change focal area exist as well. As part of an international waters project, innovative technologies, information systems, and simulation modeling may be utilized to build predictive capabilities to improve environmental management. Some additional activities might provide significant value-added for countries in managing coastal zones by incorporating possible changes in climate scenarios in these predictive tools. Benefits in several focal areas may then result from sectoral interventions based on the IW project.

## INTERAGENCY COORDINATION AND PUBLIC INVOLVEMENT

9.23 All three IAs are normally involved on a task force for project preparation with environmental ministries of each participating nation. This is because each IA has a comparative advantage, something additional, and unique to bring to the table with its regular programs. Formulation of a SAP is the responsibility of the collaborating governments and national/regional stakeholders. SAP formulation provides an opportunity for IAs to support country initiatives according to the IA's comparative advantage and to bring their regular programs to bear where needed. While multiple IA involvement is not mandatory, it will be encouraged. It is though SAP formulation that baseline and additional priority actions are identified.

9.24 Stakeholder involvement and participation of different sectoral ministries in each recipient country constitute important elements of GEF activities concerning international waters. Stakeholder involvement will differ at each level of planning and administration. Participation of these various stakeholders (including the private sector) within and across countries can improve the quality, effectiveness, and sustainability of projects. However, there is a need to identify the key stakeholders through a stakeholder analysis, or social assessment, as well as the levels at which their involvement will be critical and creating the means to ensure their effective participation. Linkage through computer-based networks is promising. Networking among stakeholders and government organizations can foster broad involvement in planning and implementing GEF international waters projects and should help to improve the quality, public awareness, and scientific basis of international waters projects. These technological innovations promote transparency among cooperating nations regarding key information, encourage broader participation by stakeholder groups within country and across countries, and provide a basis for evaluation. Interministerial coordination is essential so that actual changes can be made in sectoral activities.

## RESOURCES

9.25 With potential linkages among focal areas, judicious GEF programming may have a synergistic effect on global benefits. Consequently, the 3-year resource requirements for the OP will exceed the requirements in other operational programs ($90-105 million) in international waters.

## OPERATIONAL PROGRAM NUMBER 10
## CONTAMINANT BASED OPERATIONAL PROGRAM

### GUIDANCE

10.1 Guidance for this Operational Program (OP) comes from the GEF Council in the Operational Strategy. Operational Programs in the International Waters focal area provide a planning framework for the design, implementation, and coordination of different sets of GEF International Water projects that can achieve particular global environmental benefits. Through different operational programs, emphasis is placed on various kinds of interventions and certain types of projects that can lead to implementation of more comprehensive approaches for restoring and protecting the International Waters environment. Operational Programs are established to ensure systematic coordination among implementing agencies, countries, and other actors as well as to generate programmatic benefits for the global environment that would not otherwise be achievable

10.2 In the Contaminant-Based Operational Program, the GEF includes projects that help demonstrate ways of overcoming barriers to the adoption of best practices that limit contamination of the International Waters environment. Four components characterize the range of projects in this operational program. One includes a set of limited demonstration projects for addressing land-based activities while others include projects related to contaminants released from ships, persistent toxic substances such as persistent organic pollutants (POPs), and targeted regional or global projects useful in setting priorities for possible GEF interventions, meeting the technical needs of projects in this focal area, or distilling lessons learned from experience.

### PROGRAM OBJECTIVES

10.3 The long-term objective of the Contaminant-Based Operational Program is to develop and implement International Waters projects that demonstrate ways of overcoming barriers to the use of best practices for limiting releases of contaminants causing priority concerns in the International Waters focal area, and to involve the private sector in utilizing technological advances for resolving these transboundary priority concerns.

10.4 Short-term objectives of the program include:

(a) demonstrate strategies for addressing land-based activities that degrade marine waters through development of a component consisting of one pilot project in each of the world's development regions;

(b) harness involvement of U.N. agencies and institutions specializing in the development of modern technology as executing agencies for

International Waters projects addressing non-indigenous species in ship ballast water, use of new technology to assess and reduce contaminant loading of International Waters, and prevention of releases of globally significant toxic substances such as persistent organic pollutants (POPs);

(c) leverage significant private sector support to conduct at least one major demonstration using modern technology to prevent shipping accidents, oil spills, and releases of contaminants as well as to demonstrate innovative measures for addressing MARPOL issues; and

(d) develop several regional or global International Waters projects aimed at deriving and disseminating lessons learned from projects undertaken in the pilot phase and the permanent GEF, sharing the learning experience with groups of countries cooperating on International Waters projects, and addressing the technical and institutional needs of those countries cooperating on International Waters projects.

**PROGRAM SCOPE**

10.5 In the Contaminant-Based Operational Program, GEF plays a catalytic role in demonstrating ways to overcome barriers to the adoption of best practices limiting contamination of International Waters. Since the focus is contaminants rather than a specific waterbody, there is no requirement that these projects be tied to a particular multi-country collaborative effort as there is in the two other International Waters operational programs. However, projects are encouraged where an imminent threat exists and where neighboring countries wish to collaborate. Several components are included to illustrate application of this operational program to different types of contaminants from different sources. While pollution abatement and prevention should also be a key element of other operational programs, this one focuses on poorly addressed contaminants and aims to utilize demonstrations to overcome barriers to adoption of best practices, waste minimization strategies, and pollution prevention measures. Demonstration projects or project elements that test the use of innovative policies or economic instruments, such as tradable pollution reduction allocation systems, would be a priority in this operational program.

10.6 The operational program includes narrowly focused regional or global projects that can help meet particular technical needs or build capacity for the use of certain measures by various on-going International Waters projects. Targeted technical demonstration and capacity building projects can help build awareness in countries that are participating in International Waters projects and serve as a means to encourage best practices, develop tools for finding solutions, and formulate policies for innovative institutional approaches. Also included in this operational program are global International Waters projects that help contribute to the development of strategic

approaches across operational programs in the focal area and facilitate exchange of experience among different International Waters initiatives. From these exchanges, capacity can be built and lessons learned derived for wider application.

10.7 Pollution prevention is stressed in this operational program. Prevention, not remediation, is a more cost effective strategy. In fact, industrial waste minimization programs and technological advances that can prevent ship collisions and discourage spills may increase profits of the private sector once barriers are removed - and may assist as part of "user pays" and "polluter pays" strategies to provide funding for sustaining regional cooperation aimed at protecting transboundary waters. (Waste minimization assessment, technology transfer, and information exchange will be fostered in projects dealing with global toxic contaminants.) Private sector involvement is sought to leverage needed investments and innovative modalities such as contingent finance may be tested.

## EXPECTED OUTCOMES

10.8 International water projects normally require a long-term commitment on the part of governments, implementing agencies, donors, and GEF to leverage the intended sectoral changes - to address the root causes - of complex environmental problems in this focal area. While the two other operational programs are characterized by the need for a more deliberate process, the contaminant-based operational program is intended to include an array of projects that address certain high priority contaminants in the areas of land-based activities which degrade marine waters, global toxic pollutants, and ship related contaminants. A fourth component represents the collection of global and regional projects that provide programmatic and strategic benefits for the global environment through technical support, assessment, and derivation of lessons learned across operational programs in this focal area. As with other International Waters operational programs, the GEF will normally play an important catalytic role in funding solutions that address the most threatening global contaminants. Expected outcomes of this operational program include a series of projects in these four different components.

10.9 A key assumption is that substantial private sector resources will have been leveraged over time as part of the demonstration projects aimed at removing the barriers to adoption of the measures. Another assumption is that there will be dose cooperation among GEF Implementing Agencies and possible executing agencies on demonstration projects. A mixture of project elements addressing technical issues, scientific assessment, analysis, capacity building, and investments may be needed to adequately meet objectives.

## PROGRAM OUTPUTS

10.10 The outputs of the operational program encompass a number of projects that focus on certain types of contaminants that degrade the International Waters environment. Consequently, GEF interventions in this operational program tend to demonstrate that technological barriers can be overcome or that measures aimed at removing barriers can be implemented. Some barriers involve lack of information or the lack of training. Others involve the legal, regulatory, or sectoral policy adjustments needed to reduce environmental stress. Innovative programs, financing measures, and demonstrations of technologies characterize certain projects.

10.11 Outputs from individual International Waters projects in this operational program can be inferred by the types of activities included for each of the components listed under "Types of Activities". A key assumption is that over time, successful demonstrations will be replicated, approaches to certain problems will be repeatedly utilized by implementing agencies, and barriers to adoption of pollution prevention measures will have been removed.

## TYPES OF ACTIVITIES

10.12 GEF activities under this operational program are quite varied and programming will be accomplished to limit the number of projects to a representative amount in each of the difference components. Typical activities for projects in different components include:

### Land-Based Activities Demonstration Component

10.13 Land-based activities can be addressed in all three operational programs of this focal area depending on the setting and the waterbody. Because the other two operational programs represent more deliberate processes, this component includes a series of demonstration projects (at least one in each development region of the world) consisting of basins or areas draining to coastal\marine waters. Fast-track demonstrations of approaches, techniques, pilot projects, innovative technologies, institutional arrangements, and contaminant release show how these should be addressed in relation to other stresses. In particular, several demonstrations involving the use of economic instruments are of high priority. Project preparation should include an analysis of priority contaminants, the barrier being removed, and a strategy for implementing needed baseline and additional actions. These demonstration projects may be useful for testing strategies countries might wish to pursue under the Global Programme of Action for land- based activities that degrade marine waters.

**Global Contaminants Component**

10.14 Some toxic pollutants that are persistent in nature can be considered as "global contaminants" because they are transported long distances in ocean currents or through deposition from the atmosphere. They can accumulate in living organisms and can pose human or ecosystem health risks. Some of these pollutant releases are associated with certain industrial processes across the world. Contaminated International Waters sometimes cannot be rehabilitated through regional action alone because this may place particular regions or enterprise at an economic disadvantage in world markets. Substances such as mercury, dioxin, PCBs, persistent organic pollutants, and some pesticides that can disrupt human endocrine systems or pose human health threats are candidates for global action. This component is designed to be consisted with initiatives on persistent organic pollutants (POPs) underway as part of the Global Program of Action.

10.15 The GEF may support activities that help characterize the nature, extent, and significance of these contaminants and support the agreed incremental cost of processes and measures that demonstrate prevention or reduction of releases in recipient countries.

**Ship-Related Contaminants Component**

10.16 Various interventions have been planned as part of pilot phase International Waters projects to address releases of oil and garbage from ships. As the projects mature, lessons will be derived from the experiences. In the near term of the GEF, special emphasis is being placed on interventions to prevent the transfer of non-indigenous species in ship ballast water, in demonstration of new technology to help ships avoid collisions in busy corridors, and to prevent unauthorized releases of contaminants while leveraging private sector involvement. The new information technology may discourage releases of oil and non-degradable waste, and provide a means of determining whether ballast water was exchanged in accordance with best practices to prevent transfer of species and to address MARPOL issues. Once barriers to use of the new technology are overcome, efficiency gains and reduced insurance costs may raise the profits of the private sector and some of these profits might contribute to financial sustainability following the end of GEF involvement.

**Regional/Global Technical Support Component**

10.17 The complexity of International Waters projects raises technical questions about how and what contaminants to monitor, how to analyze complex sets of data, where to get help, how countries can institutionally work together, and how to involve the public in decision-making. Targeted regional or global capacity-building projects may be necessary to help increase awareness on how to jointly address these contaminant problems. Global projects in this component can help individual groups of countries to share experience with other areas around the globe and lessons can be derived from the

experience. New computer simulation models, remote sensing tools, and information systems have been developed - especially for marine and coastal areas - that can help countries sort through complex decisions for dealing with root causes of transboundary environmental degradation. Targeted technical information sharing, capacity building, and training opportunities may also be appropriate. In addition, certain global projects of a strategic nature that assess contribution of contaminants to the environmental status of International Waters or that develop longer-range approaches may be programmed in this operational program.

10.18 Outputs from individual International Waters projects in this operational program include:

(a) work to implement number of fast-track demonstration projects of approaches, techniques, pilot projects, innovative technologies, institutional arrangements. and the use of economic instruments;

(b) an analysis of the priority contaminants requiring action and the identification of the barriers to the required actions;

(c) the establishment of multi-country, donor, institutional, and stakeholder commitments to implement expected baseline and additional actions;

(d) the initiation and documentation of stakeholder participation in determining the identification of the priority contaminants, the barriers to action, and the expected baseline and additional actions to be implemented;

(e) the development of computer simulation models and use of remote sensing technology and information systems, especially for marine areas, can help countries sort through complex decisions for dealing with root causes of transboundary environmental degradation;

(f) the development of interim best practices for minimizing risk, phaseout of the use of a particular contaminant or of a process that generates a problem contaminant, pollution prevention strategies, substitution of chemicals in feedstock, and possible other interim measures;

(g) the incremental cost of funding of priority actions needed to remediate the negative transboundary affects of contaminants. This funding could include cost-shared incentives for leveraging government, private sector, or donor action in implementing priority solutions on the ground that involve:

(i) costs associated with the development of new technologies to neutralize priority contaminants and the development of economic instruments to illustrate the feasibility of measures to abate/-prevent priority contaminant releases;

(ii) costs associated with the establishment of information sharing mechanisms, capacity building, and training opportunities with regard to the safe handling and disposal of priority contaminants;

(iii) costs associated with the development of computer simulation models and information systems for dealing with root causes of environmental degradation; and

(iv) costs associated with targeted research to assess the impact of specifically identified priority contaminants on human and ecosystem health.

## INTERAGENCY COORDINATION AND PUBLIC INVOLVEMENT

10.19 The Contaminant-Based Operational Program involves more single IA projects than the other two operational programs. It also involves more specialized agencies, such as the IMO, and technology institutions in the execution of projects. Projects in this operational program may not be mutually exclusive from some regional International Waters projects in other operational programs. By including the flexibility that comes of demonstration projects for priority contaminants, IAs may be able to respond more comprehensively to country driven interests.

10.20 Stakeholder involvement and participation is an essential part of this operational program. A necessity for participation of the various stakeholders (including the private sector) within and across countries can improve the quality, effectiveness, implementation, and sustainability of projects. However, there is a need to identify the key stakeholders through a stakeholder analysis (or social assessment), determine the levels at which their involvement will be required, and define the process that will ensure their effective participation. Linkage through computer-based networks is promising. Networking among stakeholders and government organizations can foster broad involvement in planning and implementing GEF International Waters projects and should help to improve the quality, public awareness, and scientific basis of International Waters projects. These technological innovations promote transparency among cooperating nations regarding key information, encourage broader participation by stakeholder groups within country and across countries, and provide a basis for evaluation.

## RESOURCES

10.21 Programming is done in this operational program for the four components of the program (Land Based Activities Demonstration Component, Global Contaminants Component, Ship-Related Contaminants Component, Regional/Global Technical Support Component). Three-year resource requirements for the operational program are estimated to be between $30-50 million.

**ANNEX II**

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# ANNEX III

## LIST OF ACRONYMS

| | |
|---|---|
| **EXPO 98** | World Exhibition in Lisbon in 1998 |
| **FAO** | The Food and Agriculture Organization of the United Nations |
| **GEF** | Global Environmental Facility of The World Bank |
| **GESAMP** | Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection |
| **GIS** | Geographic Information System |
| **GIWA** | UNEP's Global International Waters Assessment |
| **GIW** | UNEP's Global International Waters |
| **GLOBEC** | Global Ocean Ecosystem Dynamic (IGBP/IOC/SCOR) |
| **GOG** | Gulf of Guinea Project |
| **GOOS** | Global Ocean Observing System (IOC/ICSU/WMO) |
| **GOOS-LME** | Living Marine Resources Module of GOOS |
| **ICAM** | Integrated Coastal Area Management |
| **ICES** | International Council for the Exploitations |
| **ICM** | Integrated Coastal Management |
| **ICSU** | International Council of scientific Unions |
| **IGBP** | International Geosphere-Biosphere Programme (ICSU) |
| **IMO** | International Maritime Organization |
| **IOC** | Intergovernmental Oceanographic Commission |
| **IOCEA** | IOC Regional Committee for the Central Eastern Atlantic |
| **IOCINCWIO** | Regional Committee for the Co-operation Investigation in the North and Central Western Indian Ocean. |
| **IOCINDIO** | IOC Regional Committee for the Central Indian Ocean |
| **IPCC** | Intergovernmental Panel On climate Change |
| **IUCN** | The World Conservation Union |
| **IUCN-MCP** | The World Conservation Union's Marine and Coastal Programme |
| **IYO** | International Year of the Oceans (1998) |
| **IWP** | International waters programme of GEF |
| **JGOFS** | Joint Global Ocean Flux Study (IGBP) |
| **KMFRI** | Kenya Marine & Fisheries Research Institute |
| **LOICZ** | Land-Ocean Interactions in the Coastal Zone (IGBP) |
| **MCB** | Marine Catchment Basin |
| **MOU** | Memorandum of Understanding |
| **NMFS-NOAA** | National Marine Fisheries Service, National Oceanographic Atmospheric Administration (USA) |
| **NOAA** | US National Oceanographic Atmospheric Administration |
| **OSTOM** | Institute français de recherche scientific pour le développement en coopération |
| **PICES** | North Pacific Marine Science Organization |
| **SAP** | Strategic Action Programme of GEF |
| **SCOPE** | Scientific Committee on Problems of the Environment |
| **SCOR** | Scientific Committee on Ocean Research |
| **SCS** | South China Sea |
| **TOR** | Terms of References |
| **UNCED** | United Nations Conference on Environmental and Development |
| **UNESCO** | United Nations Educational, Scientific and Cultural Organization |
| **UNEP** | United Nations Environmental Programme |
| **UNIDO** | United Nations Industrial Development Organization |
| **WCMC** | World Conservation Monitoring Center |