

# The Regional Programme for Marine Pollution Prevention and Management in the East Asian Seas (GEF Project RAS/92/G34)



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**PROGRAMME  
DEVELOPMENT  
AND  
MANAGEMENT  
OFFICE**

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1994-1995**

**The Regional Programme for  
Marine Pollution Prevention and Management  
in the East Asian Seas (GEF Project RAS/92/G34)  
Bi-annual Report 1994-1995**

**The Regional Programme for Marine Pollution  
Prevention and Management in the East Asian  
Seas: Bi-annual Report 1994-1995  
(GEF Project RAS/92/G34)**

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## PREFACE

The Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas adopts a demonstrative, catalytic, participatory, and networking approach in supporting the efforts of the participating governments to undertake pragmatic policy, management, and technological interventions for addressing marine pollution problems arising from land- and sea-based sources. The Programme mobilizes human and financial resources at the national, regional, and international levels in undertaking a series of organized project activities with a common objective of preventing and reducing marine pollution in the East Asian Seas. This long-term programme approach needs to be sustained by the participating governments of the region.

This bi-annual report (1994-1995) aims to document the progress made in the last two years in the implementation of the Programme. Many of the approaches, methodologies and experiences as well as the lessons learned from successes and failures could be useful for the improvement of the current Programme and new initiatives.

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# The Regional Programme for Marine Pollution Prevention and Management in the East Asian Seas: An Overview

## Introduction

The primary objective of the Global Environment Facility Regional Programme on Marine Pollution Prevention and Management in the East Asian Seas is to support the efforts of the participating governments to prevent and manage marine pollution at the national and subregional levels on a long-term and self-reliant basis. It is the Programme's vision that, through the concerted efforts of stakeholders to collectively address pollution arising from both land- and sea-based sources, adverse impacts of marine pollution can be prevented or minimized without compromising desired economic development.

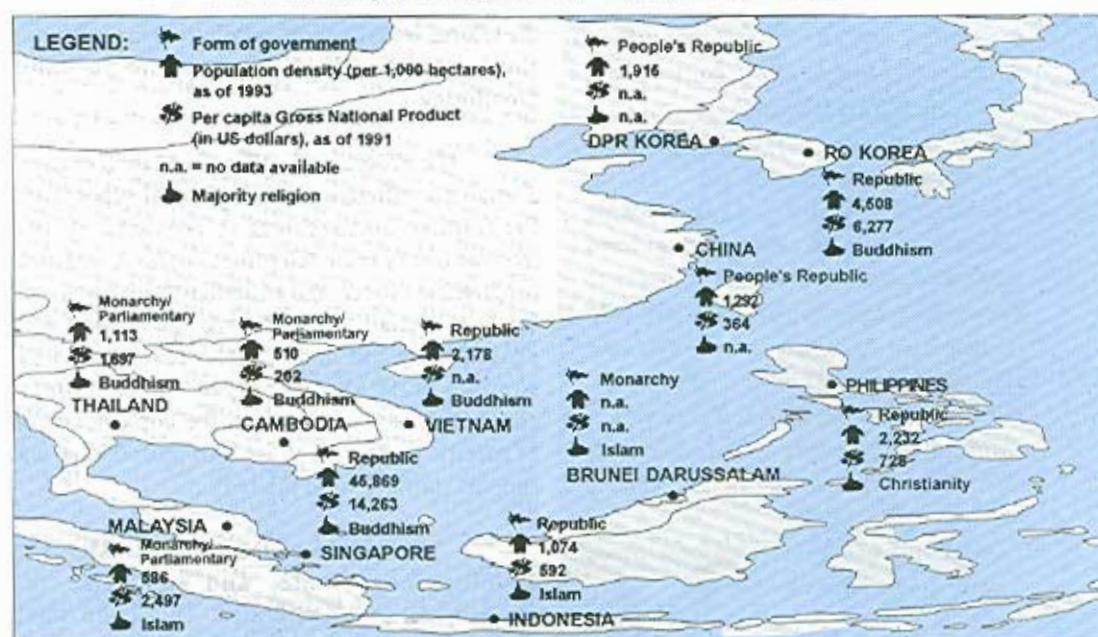
The Programme recognizes that participating countries bordering the East Asian Seas are characterized by diverse socioeconomic, political, and cultural practices; disparities in scientific and technical skills and capabilities; and immense variation in coastal demographic and development features. For the Programme to be effective, these characteristics need to be defined and employed within an integrated coastal management (ICM) framework, building upon each country's strengths and existing capacities to bridge constraints towards progressive marine pollution prevention and mitigation programs.

Nevertheless, it is important to acknowledge that meaningful reductions in marine pollution will not be achieved throughout the region in the short term. Governments, industries, donor agencies, financial institutions and the general public must be aware of the long-term commitments that are essential in order to protect the living and non-living resources in their coastal and marine environment. It is the objective of the Programme to establish operational strategies and mechanisms to support these long-term commitments.

The implementation of these strategies and activities will result in appropriate and effective policy, management and technological interventions at the local, national, and regional levels, contributing to the ultimate goal of reducing marine pollution in both coastal and international waters, over the longer term.

A deteriorating marine environment calls for stronger commitments and urgent actions from all sectors of society. Solutions to these complex pollution problems require sound environmental policy and enforceable legislation, effective and sustainable pollution prevention and management programs, adequate technical and management capability and cooperation, and the participation of all key stakeholders, including industries and the affected communities.

*Selected socioeconomic, political and cultural characteristics of East Asian countries*



During the first six months of 1994, the International Maritime Organization (IMO) recruited staff, established the Programme Development and Management Office (PDMO) in Manila and consulted with East Asian countries regarding the concept, design, and possible refinement of activities. The Programme became operational in June 1994, following presentation and acceptance of the work plan at the first meeting of the Programme Steering Committee.

The Programme benefited from the cooperation and support of the national focal points in the 11 participating countries. These focal points participated in a number of consultative meetings, shared their views and experience and provided technical support to improve the concept and design of the Programme. Likewise, a number of regional experts, technical and educational institutions, nongovernment organizations (NGOs) and United Nations (UN) technical agencies worked closely with the Programme. This report, therefore, is the summary and product of the various intensive operational and technical interactions of the concerned parties during the first two years of the Programme.

### *Programme Strategies*

- *Develop and demonstrate workable models on marine pollution reduction, prevention and risk management.*
- *Assist countries in developing the necessary legislation and technical capability to implement international conventions relating to marine pollution.*
- *Strengthen institutional capacity to manage marine pollution problems.*
- *Develop a regional network of stations for marine pollution monitoring and information management.*
- *Promote public awareness on and participation in the abatement of marine pollution.*
- *Facilitate standardization and inter-calibration of sampling and analytical techniques and environmental impact assessment procedures.*
- *Promote sustainable financing for activities requiring long-term commitments.*

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### **Role of the Executing Agency and IMO's Programme Development and Management Office (PDMO)**

As the Executing Agency, IMO provides technical and administrative support to the Programme, including technical guidance on such matters as the implementation of international conventions, shipping-related activities, pollution management and control for land-based and sea-based sources of pollution, and training in oil spill preparedness and response. IMO uses its global network of contacts to support the Programme. For example, in 1994, a workshop was organized involving international experts on marine pollution to engage in support and technical advice from the Global Investigation of Pollution in the Marine Environment (GIPME) on marine pollution monitoring.

The Programme Office in Manila engages a small but efficient staff. Technical support and Programme management is provided by two internationally recruited professionals, a technical programme officer, and an administrative assistant. There is a small administrative and support staff provided by the host government. Technical support staff are employed on short-term contractual bases to assist in the implementation of specific project activities. All professional and support staff are from the region.

The main function of the PDMO is to develop, coordinate, and supervise the implementation of activities. This is no small task given the number and nature of



objectives and activities of the Programme. A total of 121 project activities were originally conceived and grouped into the following components: a) demonstration projects; b) ratification and implementation of international conventions; c) marine pollution monitoring and information management; and d) sustainable financing. Over the past two years, some activities have been refined and consolidated in order to respond more effectively to the priorities and needs of the participating countries. There is an obvious need for close operational and technical linkages among the activities and the components in order to ensure that the Programme objectives are achieved.

A main responsibility of PDMO is to mobilize local expertise, institutions, and agencies to implement the activities in two of the three demonstration sites in the region. As for

For the most part, integrated coastal management is a relatively new concept to countries of the region and many national experts and institutions are not familiar with the required regimen. The transition from a single sector approach to an integrated management, issue-oriented program requires guidance and skills development. The responsibility for providing technical guidance and coordinating and integrating the various sectors and disciplines lies with PDMO. A case in point is the application of the Geographic Information Systems (GIS) at each demonstration site, which involves training of national staff not only in the use of the equipment and software but, more importantly, in the use of available information to support management programs.

A considerable amount of PDMO's professional staff time is devoted to assisting the

### FOCAL POINTS OF PARTICIPATING COUNTRIES

*Brunei Darussalam*

*Cambodia*

*People's Republic of China*

*Indonesia*

*Democratic People's Republic of Korea*

*Republic of Korea*

*Malaysia*

*Philippines*

*Singapore*

*Thailand*

*Vietnam*

*Ministry of Communications*

*State Ministry of Environment*

*State Oceanic Administration*

*Agency for Environmental Impact Assessment*

*General Bureau for Cooperation with International Organizations*

*Korea Ocean Research and Development Institute*

*Ministry of Science, Technology and the Environment*

*Department of Environment and Natural Resources*

*Ministry of Environment*

*Ministry of Transport and Communications*

*Ministry of Science, Technology and the Environment*

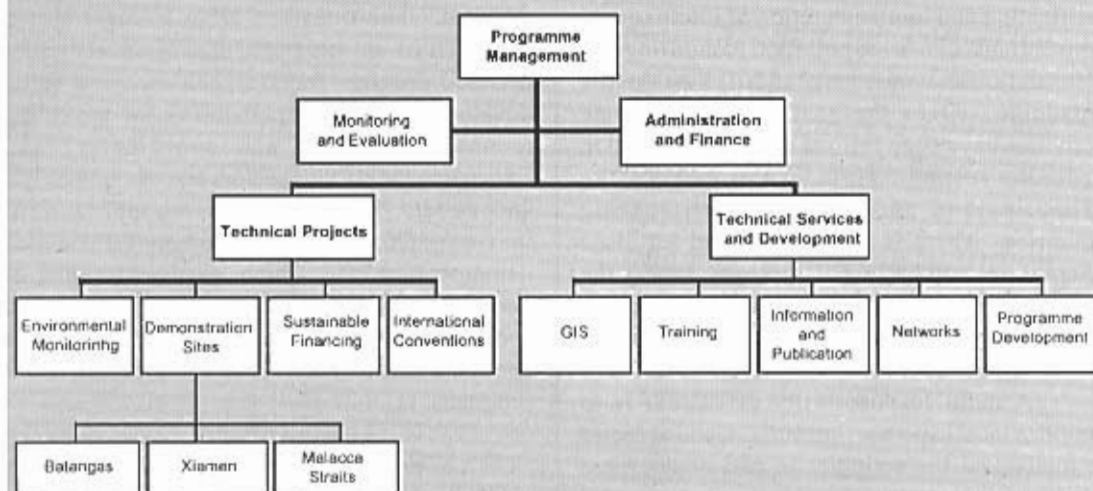
instance, in Xiamen, China, more than 26 agencies participate in a project management committee and over 41 technical experts and officials have been involved in project execution since June 1994. The expertise developed through the demonstration project will remain in Xiamen thereby continually contribute to the improvement of management programs. In the other demonstration site, Batangas Bay, Philippines, 29 agencies from the local government, industry, and NGOs participate in the project management committee and a team of at least seven technical experts and officials are involved in the development of an environmental profile, strategic management plan, surveys and related research. These interdisciplinary teams are essential in the development of similar project activities in other coastal areas of the country, and throughout the region in general.

project personnel at the demonstration sites to develop appropriate proposals and work plans to implement the activities. The Programme has taken the perspective that proposal development, planning and budgeting are all part of capacity building and forms the essential initial steps in developing national and regional expertise in effective management of marine pollution.

Similarly, PDMO is involved with the development of training activities based, not on experience elsewhere, but on the lessons learned at the demonstration projects. The Programme's first integrated coastal management (ICM) training course entitled, *Application of Integrated Coastal Management System for Marine Pollution Prevention and Management*, was held at four venues, namely Manila and Batangas Province, Philippines; Xiamen



## Programme Management Structure (as of October 1995)



China, and Singapore from October 2 to 25, 1995. The course focused on economic development and marine environment management and experiences at each site, and allowed participants the opportunity to experience ICM programs at various stages of development and implementation.

### Programme Steering Committee (PSC)

The Programme Steering Committee is composed of representatives of the 11 participating countries, the IMO, and the United Nations Development Programme (UNDP). In addition, representatives from UN agencies, bilateral and multilateral programmes, industry and NGOs are invited to PSC meetings as observers. The PSC provides policy guidance and direction, reviews project progress, and approves work plans.

At the first PSC meeting (June 1994) in Manila, implementing strategies were discussed and approved, along with the 1994 budget and work plan. A second meeting is scheduled in December 1995.

### Building Partnership

The Programme is concentrating on building partnerships among governments, the scientific community, industries, NGOs, and local communities as a basic step in addressing marine pollution problems. A number of initiatives in 1994 and 1995 emphasize the role of partnerships in the Programme.

At the local level, specifically at the demonstration sites in Batangas Bay and Xiamen,

working partnerships are being promoted between the various local government agencies in the preparation of strategic management programs for the coastal areas. At Batangas Bay, the Programme jointly organized a public awareness campaign in late 1994 and early 1995 with the Batangas Coastal Resources Management Foundation (BCRMF). BCRMF is an NGO composed of industries, such as Pilipinas Shell, Caltex, Petron, Purefoods and Union Carbide. Plans were developed in 1995 with the support of the Foundation to undertake joint pollution monitoring activities, using industry's analytical capability and laboratory facilities to complement national environmental laboratories.

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A working relationship was also established with the Coastal Management Center (CMC), a non-profit scientific NGO located in Manila, and the Swedish Agency for Research Cooperation with Developing Countries/Swedish International Development Agency (SAREC/SIDA) Marine Science Programme. A joint program was developed with the agency and the Ministry

of Science, Technology and the Environment to strengthen the technical capability of the Haiphong Institute of Oceanology and the Nha Trang Institute of Oceanography in Vietnam.

At the regional level, the Programme forged ties with the International Petroleum Industries Environment Conservation Association (IPIECA) to strengthen national capacities in emergency response to oil spills. Arrangements are also being made with the East Asian Response Limited (EARL) and OilChem Recovery Denmark to develop joint training exercises on oil spill response.

The importance of partnerships between the public and private sectors is being highlighted in other areas as well. A regional conference entitled, *Sustainable Financing Mechanisms for Marine Pollution Prevention and Management: Public-Private Partnerships* will be held in November 1996. The conference will be jointly organized in cooperation with the Asian Development Bank (ADB), the International Development Research Centre (IDRC), CMC, and the Government of the Philippines as host.

### **From Information Gathering to Management Interventions**

A large part of the early activities at each demonstration site is devoted to gathering relevant information on the various economic sectors, legislation, policies, technologies, and the coastal and marine ecosystems. Assessing and analyzing this information requires a multi-disciplinary team, not only to gather and collate data in relation to specific environmental or natural resource management issue, but also to develop and propose appropriate policies, management options, and economic and technological interventions. To assist in these undertakings, the Programme has developed a document entitled, *Essential Elements for the Preparation of Environmental Profiles and Environmental Management Plans with Indicative Time Frame*. The document has been used at each demonstration site to complete the respective coastal profiles.

The use of scientific data to plan and implement management interventions is the theme of the Pollution Monitoring and Information Management component of the Programme. Efforts are being made to standardize monitoring methodologies and to develop monitoring programs at priority sites where management interventions are required

or are being implemented. In accordance with this goal, legal studies are also being undertaken at the Batangas and Xiamen demonstration sites to identify the implications associated with establishing functional zonation schemes along the coast. The adoption of such schemes will have a significant impact on the management and sustainable use of the coastal resources at the demonstration sites.

Data management is essential to all aspects of the Programme. For the demonstration projects, primary and secondary data are collected and staff are applying GIS in environmental planning, development, and delineation of functional zones.

Since the third quarter of 1995, collection of secondary data related to pollution risk assessment and management has started and will be developed into a database system for the Malacca Straits. (The Malacca Straits is the third demonstration site of the Programme.) The data will be used to identify existing and potential risks to marine resources in and along the Straits, and to assess current capacity of littoral States to collectively manage the identified risks. With the use of GIS and the computerized database system, the Malacca Straits project is expected to develop a *Malacca Straits Environment Management Atlas* for use by the littoral states.

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### **Building and Sustaining Capacity**

Five strategies have been adopted on capacity building, again with a vision of joint endeavors among the major players in the sub-region, and at the national and community levels. The strategies are directed towards narrowing the disparity of technical capacity among participating countries in the region, especially in the less developed ones. As previously mentioned, in cooperation with SAREC and CMC, a series of activities were initiated in Vietnam aiming at

*An environmental profile essentially contains the following components:*

1. *Rationale, Purpose and Historical Information*
2. *Natural Endowment*
3. *Land Use Patterns*
4. *Water Use Patterns*
5. *Users and Beneficiaries of Natural Resources*
6. *Population and Demographic Characteristics*
7. *Institutional and Organizational Arrangements*
8. *Development Plans and Strategies*
9. *Environmental Management Issues*

Networking is another necessary and viable long-term mechanism to promote and strengthen self-reliance in the prevention and management of marine pollution throughout the region. One of the long-term strategies of the Programme is to develop a network of national demonstration sites in the region which will undertake replication of appropriate typologies established at the three demonstration projects. A related network involves research and training institutions

upgrading the institutional capacity of the two key oceanographic research institutions to undertake research and pollution monitoring and information management. Haiphong Institute of Oceanology and Nha Trang Institute of Oceanography, respectively, have just completed the *State of the Marine Environment in Tongkin Gulf* and *State of the Marine Environment in South Vietnam*. The two reports are being merged and the first detailed version of the *State of the Marine Environment in Vietnam* will be finalized by December 1995.

A national workshop was held in Vietnam in July 1995 to identify current environment management issues and information gaps. During the workshop, which was attended by about 40 scientists from Vietnam, the participants developed research priorities and projects. Four projects were identified for joint funding between the Programme and the SAREC.

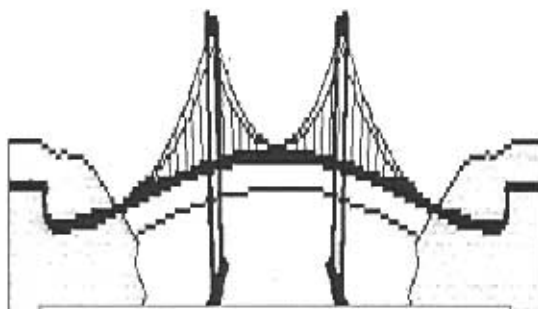
The approach adopted in Vietnam will be applied in Cambodia and the Democratic People's Republic (DPR) of Korea.

Another example of a joint endeavor in capacity building is the collaboration with IPIECA and IMO in organizing of a training seminar on *Oil Spill Contingency and Response* for policymakers and marine environment managers. The seminar was held in Hong Kong in December 1994.

### *Strategies for Capacity Building*

*The Programme adopts the following strategies in strengthening the capability of participating countries in marine pollution prevention and management:*

- *Increase the knowledge and specialized skills of personnel to plan and implement marine pollution programs at the national and local levels, particularly in the development and execution of integrated coastal management (ICM) and pollution risk management programs, including oil spill contingency plans, impact assessment, pollution monitoring and information exchange.*
- *Strengthen technical capability of participating countries to implement international conventions and codes.*
- *Help develop the necessary facilities to undertake marine pollution prevention and management activities, especially at the local level.*
- *Help marine research institutions in need of special assistance in developing appropriate programs and methodologies to undertake research in marine pollution.*
- *Assist national research institutions interested in coastal environmental management to orient their focus to multi-disciplinary approach regarding research in coastal and marine environmental problems including marine pollution.*



**The Network of Local Governments for ICM Demonstration Sites.** *This network is composed of participating local governments and is intended to ensure political commitments and to promote institutional and organizational arrangements for the planning and implementation of ICM programs.*

**The Network of Research/Academic Institutions.** *This network will provide technical inputs for policy, management, and technological interventions.*

**The Pollution Monitoring and Information Management Network.** *This network will ensure regular monitoring of environmental changes as well as the efficient use of information for management interventions.*

**The Network of Legal Experts on Marine Pollution.** *This network is intended to serve as a catalyst to country and regional efforts to develop, enact and effectively implement international and national laws on marine pollution.*

*The network approach is expected to bring about cross-fertilization of disciplines, concepts and experiences as well as the formulation and adoption of regional legal and policy initiatives, where appropriate, such as harmonization of standards.*

working at each demonstration site, such as Xiamen University, the Third Oceanographic Institution in Xiamen and the Marine Science Institute of the University of the Philippines. Such institutions will collaborate and effectively undertake national/regional training and develop similar programs in the future. As new sites are established, there will be more research and training institutions involved in the network.

A marine pollution monitoring and information management network and a network of marine environment legal experts are two other regional networks being developed under the Programme. Their purpose is to ensure collaboration among countries and institutions on marine pollution monitoring and legislation over the long-term.

All four networks are challenged with the task of developing financial mechanisms to ensure their sustainability beyond the life of the Programme.

A final initiative that has been implemented under the capacity building phase of the Programme is the development of an internship program at PDMO. Under the program, young professionals from participating countries work at PDMO for a certain period of time to hone their skills in ICM program development and implementation. A Cambodian intern has been working at PDMO since August 1995 to improve his skills in project development and management and a general upgrading of other technical skills such as word processing, GIS applications, and preparation of technical reports. Two interns from DPR Korea will be joining PDMO in the first quarter of 1996.

### **Support for Policy and Legislation**

To effectively address marine pollution in the East Asian Seas, appropriate policy interventions at the local, subregional, and regional levels are essential. A major effort is directed at establishing a sound foundation for policy decisions and management actions. At the local level, policy and management interventions are needed to establish or strengthen institutional arrangements, legislation, and regulatory controls. An appropriate regional policy is also an essential element in any attempt to address pollution of international waterways, gulfs, and subregional seas bordered by more than one country.

At the Xiamen and Batangas demonstration sites, work was initiated in mid-1994 to develop legislation and policy which will support institutional mechanisms for effective management of marine pollution, as well as economic instruments to sustain much needed management actions.

A major initiative in the Malacca Straits Demonstration Project involves a review of existing



subregional legislation, institutional, and financial arrangements which have been put in place to address marine pollution, especially marine pollution arising from shipping activities. In addition, the feasibility and implications of adopting the Malacca Straits as a *Special Area* under the International Convention on Pollution from Ships (MARPOL 73-78) is being undertaken.

Many international conventions related to the protection of the marine environment, including the UN Convention on the Law of the Sea (UNCLOS), have yet to be ratified and implemented in the region. A major challenge is to assist countries to better understand these international conventions. Part of this endeavor was initiated in 1995, with the development of a project to assess the status of marine pollution legislation in each of the participating countries, and to identify obstacles and constraints to ratification and implementation of international conventions.

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#### Set the Price Right

Major obstacles to the strengthening and enforcement of proactive policies to prevent and reduce marine pollution are the determination of the socioeconomic impacts of: (a) direct and indirect damage to the functional integrity of the resource systems; and (b) actual and potential harm to human health, threats to food supply, loss of employment opportunities, among others. This information is crucial to policymakers when considering appropriate control tactics and management interventions. These issues are now being addressed at the three demonstration sites.

An economic assessment of the natural resources, their uses, and the direct and indirect beneficiaries have been initiated in Batangas Bay and Xiamen, while in the Malacca Straits, work has begun on the assessment of the economic value of the Straits to the various users and beneficiaries. Such data will contribute to the development of

policy instruments and an equitable share of responsibility in the regional effort to protect coastal and marine resources.

#### Investment Opportunities

The perception of most policymakers and environmental managers is that prevention and mitigation of marine pollution problems is a costly exercise requiring considerable investment from the public purse. In most situations in the developing world, because of competing demands for limited funds, pollution is not a priority issue except in the event of a catastrophe, such as an oil spill or an outbreak of red tide. The general perception of the public and industry is that marine pollution management is the sole responsibility of government.

It is the Programme's strategy to change this perception. First, there is a need to have strong political commitment and public understanding of the gravity of the problems which threaten sustainable development. Second, the role of addressing marine pollution problems need not necessarily be the full responsibility of the government, rather, this role should be shared with industry and other stakeholders. Finally, pollution prevention and management constitutes a substantial percentage of the growing environment industry; therefore, it should be promoted as an investment opportunity for the private sector.

The Programme has taken the initiative to develop a sustainable financing element which will document successful case studies and experiences in various parts of the world. The objective is to promote the private sector's role in the prevention and management of marine pollution. The forthcoming conference on *Sustainable Financing Mechanisms* scheduled in November 1996 will provide a forum for close interaction between the public and private sectors to examine investment opportunities in the region.

#### Pooling of Resources and Cooperation with Bilateral and Multilateral Projects and Programs

The Programme plays a catalytic role by mobilizing regional and national resources to collectively address marine pollution problems in the region. Since the beginning of the Xiamen Demonstration Project, the Programme was able to obtain government financial inputs to strengthen the activities in Xiamen. The total national commitment amounting to US\$1.38 million was

*Memorandum of Agreement between the Marine Science Institute (MSI) of the University of the Philippines and the IMO. The document affirms MSI's membership in the Programme's regional network and defines the agreement of both parties to coordinate closely on activities related to marine pollution monitoring and information management, integrated coastal management, capacity building, networking, technical assistance, training, and information exchange.*

*Memorandum of Agreement between the IMO and the Coastal Management Center (CMC). This document affirms the working partnership of IMO and CMC in regional programs and activities.*

*Memorandum of Understanding between the SAREC Marine Programme and the IMO, and the Ministry of Science, Technology and Environment (MOSTE) of Vietnam. The document establishes the working relationship between the three parties in line with strengthening the institutional capacity of Vietnam and East Africa in the field of marine science research and development.*

*Memorandum of Understanding between the UNDP, the IMO, and the DENR with the Local Government Units of Batangas and the BCRMF in the Philippines. This document manifests the agreement among the parties to collaborate and coordinate activities in line with the Programme's pollution prevention and management goals in Batangas Bay. It also defines the roles and responsibilities of the parties as members of the Programme.*

*Memorandum of Understanding between the IMO and the Municipal Government of Xiamen, China. This document outlines the agreement among the parties to collaborate and coordinate activities in line with the Programme's pollution prevention and management goals in Xiamen, China. It also defines the roles and responsibilities of the parties as members of the Programme.*

reflected in the Memorandum of Agreement between the Xiamen Municipal Government and the Executing Agency. In the Batangas Bay Demonstration Project, the provincial government committed local support in terms of personnel, office space, and facilities. This commitment was further strengthened in 1995 with the allocation of more project support staff directly provided by the Governor's office. The announcement of the Governor of Batangas to establish the provincial department of Environment and Natural Resources will result in the integration of existing project office staff into the new department.

The Government of the Philippines, which hosts the PDMO, has also committed a total of US\$380,000 since the beginning of the Programme, of which approximately US\$200,000 is earmarked for 1995. It is expected that the host government shall continue to provide the necessary support throughout the project

Cooperation and collaboration with bilateral and multilateral programs also strengthen the ongoing and planned activities. SAREC has provided financial support for collaborative work in Vietnam aimed at strengthening the technical capability in the area of marine pollution, integrated coastal management and marine science research. Joint activities included the survey and

analysis of training and research needs in the region, publication of the newsletter *Tropical Coasts*, sponsorship of regional training courses and in-service training, sponsorship of an international workshop on integrated coastal management in Xiamen scheduled for May 1996, publication of the directory of institutions involved in marine environmental research and management, as well as preparation of training and public education.

Similarly, the Programme has recently joined hands with the Clean Technologies Development Programme of the IDRC to sponsor the regional conference on sustainable financing mechanisms. IDRC has agreed to contribute C\$20,000 for the conference. In addition, IDRC is collaborating by contributing to the publication of the *Tropical Coasts* newsletter, with the provision of information on clean technologies.

Support has also come from the Korea Ocean Research and Development Institute (KORDI) of the Republic of Korea (ROK) in the form of a real-time wave and tide monitoring device for Batangas Bay. KORDI provided the services of technicians to install the equipment at the demonstration site. Plans to organize a marine monitoring workshop in Korea are underway, with the host country sharing the associated costs.

In-country resources

Xiamen Municipality (2 years)	1,380,000
Government of the Philippines (1994-95)	380,000
Batangas Provincial Government	8,000

External resources

SAREC-C/MC joint project	620,000
SAREC-supported training course	7,000
ADB (grantable financing)	12,000
SAREC/SIDA (CM workshop)	20,000
KORDI (cost of equipment and experts)	52,000

TOTAL 2,462,000

Concerted efforts were made with other projects or programmes being undertaken by UN technical agencies and international organisations. Funding was provided to support the efforts of the Coordinating Body on the Sea of East Asia (CORSEA) in extending the studies on handling of dangerous chemicals in ports and harbours in the East Asian region, to include Xiamen and Haiphong. In addition, assistance was provided in a CORSEA effort on public awareness. The programme supported the inclusion of Cambodia into the project and sent two representatives from Xiamen and Batangas Demonstration Projects to an organisational workshop in Singapore.

Arrangements are underway with the Food and Agriculture Organization (FAO), the Sub-Commission for the Western Pacific (Intergovernmental Oceanographic Commission (WESTPACIOC) and the Bay of Bengal Programme (BOBP) towards joint activities in the region along areas of mutual interest. In addition, the Programme has approached the United Nations Environment Programme (UNEP) in Bangkok and the International Center for Living Aquatic Resources Management (ICLARM) in the joint publication of the directory of marine institutions, in addition to the inputs from SAREC and CMC. Another joint endeavor in the planning involves the production of a video on integrated coastal management with the Aquaculture Department of the Southeast Asian Fisheries Development Center (SEAFDEC).

The regional GEF initiative is aimed at supporting participating government efforts in marine pollution management. To effectively address pollution in the marine environment, management efforts must address pollution sources from the land and sea. The proposed network of national and demonstration sites, building on the experience and typology developed through the Programme, serves to be a pragmatic approach to prevent and mitigate pollution at the local level. An effort of KORDI to adopt Masasa-Chimbar Bay as a possible demonstration site in the Republic of Korea is a step in this direction. The interest of DPR Korea and Cambodia to develop demonstration sites at Namphu and Sihanoukville, respectively, and to link with the network is a further indication of the acceptability of the networking concept.

Similarly, the experience and lessons learned from the Malacca Straits project will contribute to the application of appropriate methodologies to address marine pollution risks in subregional seas and shipping lanes throughout the region.

**Pollution has no political or national boundary and, thus, its cumulative impacts can be disastrous to all, irrespective of source. Pollution is not only a national concern, it is a concern of the region and the world at large.**

A longer term strategy and organisational arrangement will be necessary to take advantage of the management framework and the pool of expertise being developed in the region. It is in the interest of the region to build future initiatives based on the foundation being laid through the present programme.

Pollution has no political or national boundary and, thus, its cumulative impacts can be disastrous to all, irrespective of source. Pollution is not only a national concern, it is a concern of the region and the world at large.

# Application of the Integrated Coastal Management System: The Batangas Bay and Xiamen Demonstration Projects

Xiamen, China and the Batangas Bay, Philippines have been chosen as demonstration sites for the following reasons:

1. Existing or potential multi-sectoral coastal use conflict;
2. Presence of major habitats and/or strategic economies which are at risk of marine pollution; and
3. Political will, commitment, and interest from the local government.

The Programme recognizes that the magnitude of the marine pollution problems vary among areas in the region depending on a mix of factors, such as economic development and population pressures. The demonstration sites were thus selected to reflect different stages of economic development, especially industrialization in the region. Furthermore, the activities of the demonstration sites have been designed to serve as a prototype for use in other coastal areas throughout the region. The demonstration sites will be used as training grounds for resource managers, serving as examples where policies and actions on economic growth and environmental protection can be implemented in a complementary and supportive fashion.

## The Setting

Xiamen is a harbor city and one of the five special economic zones of China. It is located in the southern coast of Fujian Province along the western part of Taiwan Strait. Economic activities are very similar to Batangas Bay area albeit more intensive (i.e., annual economic growth is greater than 25%). Natural ecosystems/habitats are widespread compared to Batangas Bay.

Batangas Bay is located in the southern part of Batangas Province, Luzon Island, Philippines. It is part of the five-province industrial zone for Southern Luzon. At present, the Batangas Bay area has about 79 industrial establishments situated along the coast. Also, an international deep water port will be built in Batangas Bay to cater to the transshipment of raw and finished products to and from the industrial zone. Other activities include urban development, fishing, aquaculture, and agriculture.

In recent years, rapid economic growth, dense population, and high concentration of industrial establishments in the two areas have been causing multiple coastal use conflicts and deteriorating resource base and ecosystem health.



*Water use conflict with aquaculture in Xiamen*



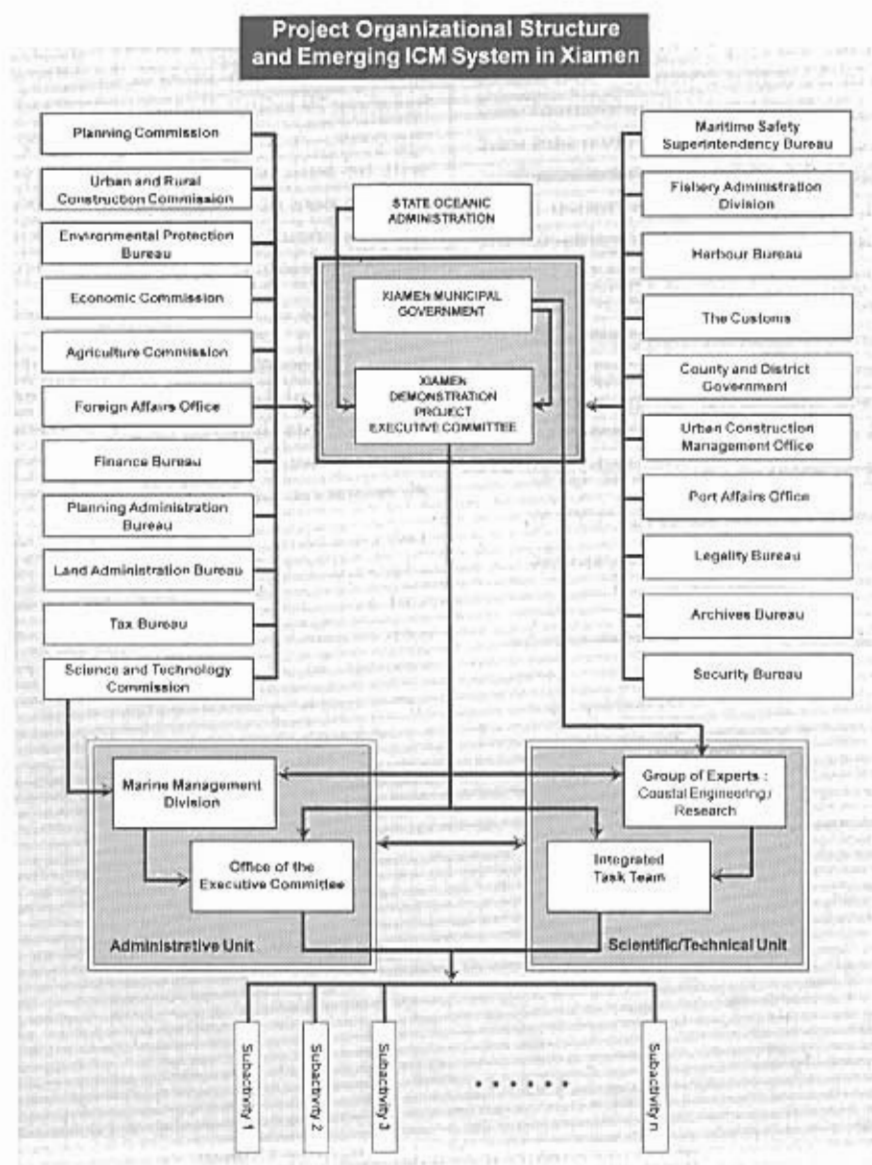
Thus, a viable management mechanism is needed to achieve sustainable development.

### The Xiamen Demonstration Project

The Xiamen Demonstration Project (XDP) was operationalized in 1994 with the Xiamen Municipal Government as the lead implementing body and the Marine Management Division as its operational arm. An executive committee has been established by the Xiamen Government to take charge of project management, with the Vice Mayor as chairperson. The Executive Committee involves over 20 government agencies working on planning, finance, marine affairs, land use, environmental protection, fisheries, port operations and tourism. The Executive Committee is viewed by the Xiamen Municipal Government as a prototype mechanism on ICM, specifically for interagency consultation, coordination and review of major coastal projects.

Twenty-three subprojects were identified to address marine pollution and coastal zone issues that are confronting Xiamen. To date, 10 subprojects have been implemented. One is nearing completion (environmental profile and strategic management plan), three are on institutional strengthening, and six new subprojects are covering impact assessment, socioeconomic, waste management, public awareness, and strengthening regulations on coastal management. A contract formally approving the implementation of the six new subprojects was signed on September 23, 1995 in Xiamen between IMO and the municipal government. The remaining 13 subprojects, of which eight are technical/management studies and five are capacity building (training), will be implemented beginning 1996.

Public awareness activities have been launched in Xiamen in 1994. These included an essay writing contest on ocean knowledge and the



publication of a book entitled, *We Own the Sea*, written in the Chinese language. Together with the local government, a number of public awareness materials, such as posters, a brochure, a middle school textbook and audiovisual aids covering ecosystem health, resource conservation,



*We Own the Sea*

rational uses and sustainable development, will be prepared as part of the project.

IMO, DENR, local governments of Batangas Province and the Batangas Coastal Resources Management Foundation (BCRMF), a non-government organization composed of representatives from the industrial sector and local governments.

There are 33 subprojects in the BBDP and nine have been implemented since mid-1994. Of the nine subprojects, three involve institutional strengthening including the establishment of a project office. The remaining six technical subprojects involve the development of a coastal profile, the formulation of a strategic management plan, the strengthening of institutional mechanisms, the establishment of an environmental management fund, the assessment of monitoring capability among



*The site of the Batangas Demonstration Project*

One institutional mechanism articulated in the nearly completed strategic management plan for the Xiamen demonstration site is the formation of the Marine Management Coordinating Committee. It will be a permanent structure within the Xiamen Government and tasked to coordinate various agencies and institutions involved in the implementation of the project activities and Xiamen's coastal development and marine pollution management program over the long term. This Committee is headed by the Mayor of Xiamen and four Vice Mayors as deputies.

### **The Batangas Bay Demonstration Project**

The Batangas Bay Demonstration Project (BBDP) initiated project activities with the signing of a Memorandum of Understanding among UNDP,

the public and private sectors, and the development of a GIS for the study site.

Apart from implementation of subprojects, the BBDP has also initiated new activities related to marine pollution management. The BBDP has been instrumental in convincing the provincial government of Batangas to formalize the establishment of the Environment and Natural Resources Office (ENRO) as its environmental management arm. It also helped in the framing of the organizational structure and technical requirements of the ENRO, which will be set up either in late 1995 or early 1996.

In the third quarter of 1995, the KORDI donated a wave and tide monitoring device, which has been installed at the Shell Refinery in Tabangao, Batangas City. Data gathering commenced in the fourth quarter of 1995.

Public awareness activities have been initiated since 1994. The project office provided assistance in the implementation of a cleanest coastal barangay (village) contest organized by the provincial government and BCRME. The initiative aimed at improving the surroundings of coastal areas. Project activities have been published in local newspapers and disseminated through workshops and meetings organized by the project and participated in by representatives from the local government, BCRME, academe and the media.

### **Working Models on Waste Management: Xinglin Bay and Bauan**

Bauan is one of the coastal municipalities of the Batangas Bay Region and it has a number of industries, such as construction and chemical manufacturing, which include storage terminals for industrial goods. Wastes, particularly oily wastes, discharged from these establishments typically end up in the Batangas Bay. In addition, domestic wastes, especially solid wastes, are dumped into the Bay. In order to address the issue of pollution

of the Bay, the BBDP in collaboration with the Municipal Government of Bauan, initiated the Bauan waste management demonstration subproject. This activity is intended to serve as a working model for the management of wastes generated from domestic and industrial sources. The initiative was started in 1995, with technical support from the Programme and financial input from the local government.

Xinglin Bay is located in the northwestern section of Xiamen, and is intensely utilized for aquaculture, industry and settlements. In addition to the obvious resource use conflicts, Xinglin Bay is polluted by waste discharges originating from both land- and sea-based sources. The problems affecting Xinglin Bay can be seen as a small-scale version of the whole of Xiamen. Recognizing the need to mitigate the existing situation, the Xiamen Municipal Government has allocated US\$18,000 for the formulation a special project that focuses on comprehensive pollution prevention and management of Xinglin Bay. It will apply the framework and approaches developed under the project, with technical support from the Programme.



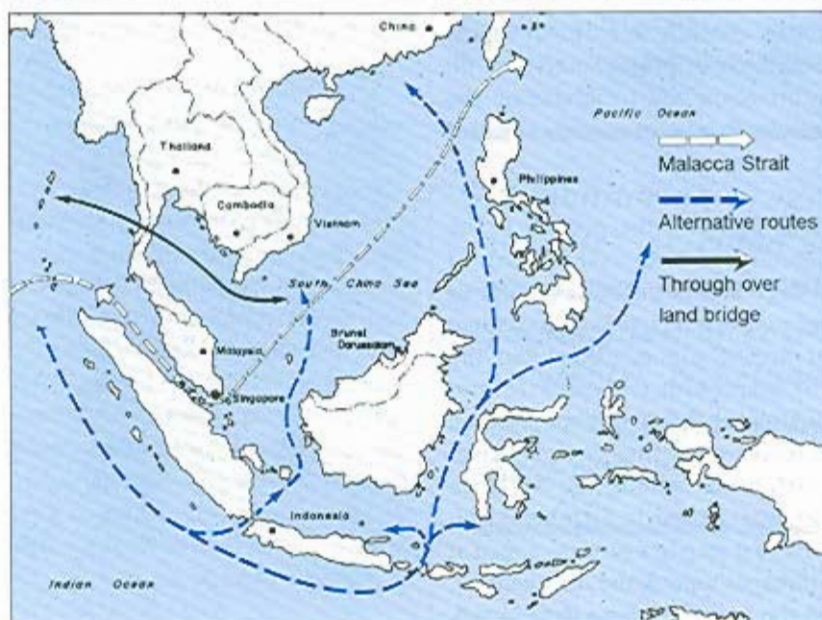
*Cleaning at Yuantan Lagoon, Xiamen, China*



## Pollution Risk Assessment and Management in the Malacca Straits

For the purpose of the Programme, the Straits of Malacca include the Malacca Strait and the Singapore Strait. The Straits are among the busiest international sea lanes with over 84,000 vessels (1991) traversing the path. The Straits are vital sources of food and raw materials and provide environmental benefits to the coastal populations of the three littoral States.

The first phase of the project, which was initiated in 1994, involved consultations with the three littoral States. A number of missions were made in Malaysia, Singapore, and Indonesia to explain the project design and implementation details to concerned agencies, and to seek government involvement in the implementation of the project. Wider consultation was sought at



*Alternative routes aside from the Malacca Straits*

Approximately three million barrels of crude oil are shipped through the Straits daily, subjecting the sensitive marine environment to the threat of accidental oil spillage. An average of two to three oil spill incidents per year have been recorded in the Straits over a 10 year period (1981 to 1991). With increasing tanker traffic, offshore oil and gas exploration and production activities and coastal development, the risks of oil pollution in the Straits are increasing.

The purpose of the Malacca Straits Demonstration Project (MSDP) is to assist the littoral States in their efforts to identify existing and potential pollution risks, strengthen surveillance and regulatory mechanisms and instruments for managing pollution in the Straits and package the approaches, methods and the experience for use in other subregions where similar issues are apparent.

regional meetings related to marine pollution, including a Southeast Asian Programme in Ocean Law, Policy and Management (SEAPOL) meeting in May 1994, the International Conference on Malacca Straits in June 1994, a consultative meeting involving government officials from the three littoral States, the tanker and oil industries and invited resource persons from the Malacca Strait Council, and a Malaysian Institute of Maritime Affairs (MIMA) workshop on the Malacca Straits in January 1995.

A team of experts from the three littoral States was brought together in September 1994 to review the work plan as approved by the First PSC Meeting and to formulate specific implementation strategies based on the recommendations of the series of consultative meetings.



In September 1994, Malaysia formally advised that it would participate in the MSDP. A multi-agency National Steering Committee was also established, chaired by the Secretary-General of the Ministry of Science, Technology and the Environment.

A Subregional Meeting of Senior Environment Officials was held in April 1995 in Kuala Lumpur. Representatives from the three littoral states attended, along with officials from UNDP and IMO. The Malacca Straits Demonstration Project work plan, operational mechanisms and strategies were discussed. Seven priority activities were examined and agreed upon by the participating countries. National focal points were nominated by each country to serve as key contacts to coordinate national inputs during implementation of project activities, to disseminate information and to advise on the use of project results for policy and management interventions.

The initial focus of the project is the compilation, analysis and assessment of information on the resource/ecosystem features and their values and existing risk management measures that are in place. Work on the preparation of an ecological profile and economic evaluation of the Straits commenced in July 1995. A review of existing environmental and resource databases among the Malacca Straits countries was started in October 1995. This review is the first step in a process aimed at strengthening linkages among the data centers, and to enhance the usage of these data in risk management. Ultimately, the Programme will consolidate available information into an environmental management atlas for the Straits. The atlas will include succinct descriptions of thematic maps for convenient use by managers and policymakers. It will also include information

### *Seven Priority Areas*

*Building upon and complementing existing efforts, the Programme formulated activities for MDSP which were approved by the concerned governments. These activities are characteristically multi-disciplinary and multi-sectoral, covering seven priority areas as described below:*

- 1 Economic evaluation and ecological profile of the Malacca Straits.*
- 2 Marine pollution risk assessment arising from land- and sea-based sources.*
- 3 Marine pollution prevention measures in the Malacca Straits.*
- 4 Implementation of marine pollution-related international conventions.*
- 5 The need and feasibility of designating the Malacca Straits as a special area under MARPOL 73/78.*
- 6 Preparedness and response strategies to combat oil pollution in the Malacca Straits.*
- 7 Capacity Building.*

on resource features, particularly those vulnerable to marine pollution from land-based and sea-based sources, resource use and management patterns, pollution sources and nature of pollution, priority areas and the state of environmental quality.

## Marine Pollution Monitoring

Marine pollution monitoring programs exist in the region yet the information gathered are not necessarily: (a) in a form readily usable by managers and policymakers; (b) utilized for and translated into management strategies and interventions; or (c) reliable or relevant because of deficiencies in planning and design of the program. Oftentimes, there is also a lack of assessment of the value of the monitoring activity itself. In part, this may be due to the ambiguity in defining the objectives of the program.

The *shotgun* approach is frequently used in pollution monitoring programs. This entails the measurement of a whole range of parameters simply because they are in a standard list and have always been determined, without serious consideration of the major contaminants in the area and their sources, or the appropriateness of the contaminants and matrices being monitored to indicate long-term changes. This has yielded information which may not be directly useful in addressing the fundamental pollution problems and concerns. Monitoring done for its own sake has led to a profusion of data being acquired and left to gather dust. Thus, resources are used inefficiently and the marine environment continues to deteriorate as policy or technical interventions are not put in place.

A related issue in monitoring programs is the absence of workable solutions to address the state of contamination which may be detected. For developing countries, environmental management approaches which rely on the best available control technology may be too expensive. On the other hand, compliance monitoring may work in localities where compliance can be enforced but this assumes adequate government resources and the political will to pursue the strategy.

### Monitoring and Management Interventions

A monitoring program that targets selected critical problems and inputs to the formulation of cost-effective strategies is believed to be better suited for the East Asian Seas region. Coupled with a participatory approach which would involve the various users and custodians of the marine environment in the monitoring, safeguarding, and

management intervention processes, more effective results are expected.

A unique feature of the envisioned monitoring program is that the activities will not be relegated only to a government department but will be the responsibility of a consortium consisting of major stakeholders at a site. Often, major stakeholders are the industries operating in the coastal area. The Programme intends to involve the private sector in the monitoring effort.

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*A monitoring program that targets selected critical problems and inputs to the formulation of cost-effective strategies is believed to be better suited for the East Asian Seas region.*

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### Role of Industry in Pollution Monitoring

In many developing and less developed countries, it is recognized that the environmental monitoring effort (especially marine pollution monitoring), cannot be effectively handled by government alone primarily because of funding and human resource constraints. Thus, there is generally no monitoring program but rather random checks on the quality of water as the need arises. Often, the need arises only when a crisis situation already exists (e.g., the occurrence of fish kills; an oil spill) or when there are complaints from the people.

The Programme supports the strategy of having both the government and the private sector involved in the marine pollution monitoring effort. Such a strategy could work best in coastal areas where the major stakeholders are the industries themselves (e.g., industrial sites; export processing zones). Environmental units in government could, and perhaps should, still take the lead as they are

generally mandated by law to provide the check and balance to the effort.

Operationally, however, industry can play a major role in supplementing limitations of government by providing analytical facilities, watercraft, sampling equipment, and even field personnel. During the early phase of this proposed effort, emphasis could be given on the water quality of the marine waters and the status of these waters relative to their intended use. Thus, comparisons and assessments can be made against marine water quality criteria rather than on water quality standards. The latter tends to focus on end-of-pipe monitoring and is, therefore, effectively compliance monitoring. Involvement of the private sector in compliance monitoring at the outset may be less appealing and even intimidating compared to their possible involvement in trend and environmental monitoring.

As industrial firms become more aware, responsible and capable of addressing pollution issues emanating from their own activities, the monitoring effort could move upstream to consider point sources and compliance to water quality standards. Self-regulation among industries operating in coastal areas is possible in the long term with government acting to periodically provide the check and balance to the strategy.

It should be possible to sell the concept to the private sector because involvement in the monitoring program at the very least contributes to a positive public image to the companies involved. Depending on the seriousness of firms in adopting pollution prevention programs, other benefits can accrue to them including economic benefits, reducing potential future liability and a competitive advantage.

The monitoring effort should eventually enable an assessment, not only of pollution trends, but also of the effectiveness, cost and efficiency of control strategies that are put in place.

Progress is being made in applying this concept in the Batangas Bay demonstration site. Efforts started with an assessment of environmental monitoring capabilities of various firms operating around the Bay and obtaining not only interest but also a commitment from some firms to provide resources in the proposed monitoring strategy.

#### **Standardization and Intercalibration**

Many initiatives in marine pollution monitoring exist in the East Asian region. However,

it remains difficult to validate the quality of data that are produced. While efforts may have been exerted to put in place quality assurance (QA) and quality control (QC) in the various phases of obtaining environmental data, only a limited number of laboratories in the region involved in marine pollution have, in fact, shown their capability to provide credible information.

Even more problematic in the acquisition of reliable environmental monitoring data are the activities prior to analysis in the laboratory, particularly during sampling. More specifically, the reliability of environmental chemistry data is often determined by the amount of care and attention given to obtaining representative samples from the environment being studied and keeping these samples unchanged until these are ready to be analyzed in the laboratory.

Experience has shown that the most well-equipped and advanced laboratories in the world cannot produce reliable data if, in the first place, the samples obtained are not representative of the area and the constituents being studied have changed by the time they are analyzed.

Initiatives towards addressing this problem have been started over the past few years through several programs (e.g., UNEP/IAO/International Atomic Energy Agency (IAEA) Reference Manuals for Marine Pollution Studies; Association of Southeast Asian Nations (ASEAN)-Canada Cooperative Programme on Marine Science-Phase II; IOC Workshop on the analysis of trace elements and organics in marine sediments). While a number of laboratories in the region have certainly benefited from these outputs and activities, many more have to develop their capabilities.

The focus of this program is to maintain the level of interest among laboratories already familiar with the concerns of QA/QC (generally among the members of ASEAN) as well as facilitate the adoption of QA/QC among the less developed countries in the region. Moreover, the program will endeavor to encourage the adoption of appropriate sampling and analytical methods from among those recommended by international bodies and marine scientists involved in marine pollution.

Among the measures to address this concern for obtaining good environmental data is an on-going compilation of recommended methods for the acquisition and analysis of the more common marine environmental parameters. Some of these methods are being simplified for their easier use and implementation. The resulting manual will then

be made available to participating demonstration and parallel sites in the Programme and other institutions affiliated with the marine pollution network.

Another activity intended to emphasize QA/QC concerns is the proposed conduct of a training course in field measurements and sampling techniques. This will be held in Vietnam and will likely bring in participants from other demonstration sites (existing or proposed) in the region.

The program will also seek out opportunities to encourage laboratories in demonstration sites to participate in on-going or planned inter-comparison exercises initiated by various international organizations (e.g., IAEA, IOC). Inter-comparison exercises are also planned among demonstration sites.

### State of Marine Pollution

Cognizant with earlier initiatives to assess the state of the marine environment (e.g., the Group of Experts on Scientific Aspects of Marine Pollution or GESAMP), the Programme through its network hopes to bring together information and data on the state of the marine pollution from newly industrialized and developing countries in the East Asian Seas region.

Information in earlier assessments of the state of the marine environment in the region was necessarily limited and for this region, culled primarily from the ASEAN perspective. Through the Programme and because of an emerging atmosphere of greater openness and cooperation, it is anticipated that more information can be acquired especially from countries outside ASEAN. Thus, the proposed status report should provide a more realistic picture on marine pollution in the region as well as a reference against which progress in the initiatives to control pollution may be gauged in the future.

### Role of the Network

The Regional Programme's Marine Pollution Monitoring and Information Network is envisioned to be a means for effective periodic assessment of the state and trend of marine pollution in various sites in the East Asian Region as well as ascertainment of improvements, if any, as a result of pollution management strategies and interventions. The advantages of networking include: (a) the sharing of experiences and expertise to address similar/common pollution

### Criteria for Membership in the Network

- *An interest to start or continue a marine pollution monitoring program preferably within the context of the integrated coastal management concept;*
- *The openness to reconsider pollution monitoring strategies which may already be in place, determine common and appropriate parameters for the monitoring program, and adopt a quality assurance program; and*
- *The willingness to contribute information and participate in the exchange of data.*

*Other sites could also be brought into the network where there exists functioning monitoring programs that use advanced technologies which may be adopted to other sites in the region.*

problems; (b) increased availability of data to enable an assessment of the status and trends of marine pollution on a regional basis; (c) facilitation of the formulation of regional initiatives and programs to address marine pollution prevention.

A critical step in the development of the regional network is the selection of sites at the onset that can be part of the network.

### Mechanisms of Interaction within the Network

The newsletter *Tropical Coasts* will be one means of exchanging information and perspectives on the monitoring program.

Planning workshops will enable the consideration of experiences of various countries in monitoring programs, the definition of measurable objectives, and the development and refinement of the strategies and methodologies to be adopted for the demonstration and other network sites. An important consideration for such workshops will be the quality assurance program that will be put in place.

Training workshops will bring together participants in the network who may have particular technical requirements and deficiencies.

Site visits will be a feature of the networking program where participants from the major



demonstration sites will obtain a first hand perspective of developments at other sites.

The development of a database system should allow sharing of data. The system will consider the quality of data and allow for the screening and evaluation of information that is made part of the database.

Where available, rapid information exchange will be facilitated with the use of electronic mail. The possibility of setting up an electronic bulletin board will also be explored.

### Strengthening Regional Monitoring Capacity

The network aims to strengthen linkages among scientists in the East Asian Region and will also build on initiatives by various groups in the region (e.g., UNEP Regional Seas Programme, GESAMP, GIPME, ASEAN-Canada). When needed, expertise outside the region will be tapped to contribute to the program. Last November, for instance, the Group of Experts on Effects of Pollutants (GEEP) was requested to comment on the proposed framework for pollution monitoring. Interaction and collaboration will also be built around the expertise generated in the region from the ASEAN-Canada program. Suitable individuals and laboratories in the region will be tapped to provide training opportunities and contribute towards the development and execution of specific activities within the program.

Among the options in sustaining the operation of the network is to link or associate with an existing organization of marine scientists under the ASEAN umbrella called the Association of Southeast Asian Marine Scientists (ASEAMS). This

### Planned Activities of the Network

1. *The review and adoption of a common pollution monitoring strategy based on selected critical coastal activities;*
2. *The selection of appropriate parameters and sample matrices to monitor trends;*
3. *The adoption of sampling and analytical procedures;*
4. *The adoption of an agreed upon quality assurance program; and*
5. *The provision of suitable data intended for policy and management actions.*

group could evolve into the Association of East Asian Marine Scientists while retaining the acronym ASEAMS. At present, ASEAMS links marine scientists in the ASEAN through a quarterly newsletter and conferences held every two or three years. Activities of this group can conceivably expand to accommodate the needs of members outside the ASEAN particularly in the sphere of information exchange and training.

However, it must be recognized that efforts at marine pollution monitoring and networking addresses only one, and probably the tail-end, aspect of the effort to prevent and mitigate pollution in East Asian waters. Greater gains can be achieved through initiatives that limit and reduce the types and quantities of contaminants discharged into the marine environment.



*Korean experts installing tidal monitoring equipment at the Batangas Bay*

## Information Management

Information management has greatly benefited from the progress in computer technology in terms of processing, analysis, access, and storage, not to mention versatility and cost effectiveness.

### Application of Geographic Information Systems for Environmental Management

Among the innovative technologies for planning and management are geographic information systems (GIS). GIS are computer-based analytical tools for geographically referenced data. Too often, GIS are mistaken as automated mapping systems. Actually, GIS have features similar to other information systems such as remote sensing, computerized cartography, computer-aided design and database management systems (DBMS). GIS are being used in land resources planning and management, transportation, urban and municipal planning, natural resource management and environmental management.

The Programme is establishing GIS capability in two demonstration sites—Xiamen, China and Batangas Bay, Philippines—while enhancing existing capability in participating countries of the Malacca Straits Demonstration Project. The GIS will be used in land and water use planning, sensitivity analysis (e.g., impact of pollution on habitats or ecosystems) and marine pollution monitoring. One of the aims of GIS activity is the electronic encoding of relevant maps and geographically referenced attribute data of each demonstration site. Examples of these data are maps on geology, physiography, land use (historical and present), elevation, bathymetry (from nautical charts), soil, existing zone plans, administrative boundaries, and roads. On the other hand, attribute data include soil chemistry and texture; socio-economic variables such as population, income and production; observations on environmental parameters measured at specific locations; i.e., water quality, rainfall; and type and amount of wastes discharged. Attribute data tagged to specific maps will be processed through the use of popular softwares like spreadsheets, word processors, and database management systems.

A spatial database system will also be developed. Similar thematic data types will be used for Xiamen and the Malacca Straits. In the Malacca Straits, shipping and marine environment data will be available, as these will be important to sensitivity mapping (e.g., vulnerability of resources to oil pollution) and pollution risk assessment. Some of the digital data on the Malacca Straits is being sourced from the World Conservation Monitoring Centre in the United Kingdom.

In Batangas, GIS activity commenced in the second quarter of 1995, while Xiamen and the Malacca Straits preparatory activities are underway. The software used is Spatial Analysis System or SPANS OS/2 for the microcomputer. Maps on geology, physiography, soil, historical land use, elevation and bathymetry have been digitized. Data acquisition and encoding are in progress.

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*The major outputs of the GIS activities of the Programme in its three demonstration sites are the enhancement of GIS capability at the local level with trained government staff, establishment of spatial database systems, presenting draft functional zonation schemes, and management atlases.*

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The use of GIS for environmental management is not straight forward because many environmental data are inherently three dimensional, while GIS are more effective in handling two dimensional spatial data. Nevertheless, the application of GIS for environmental management has been increasing since the early 1990s. Modeling within and external to the GIS can also be done. For the marine pollution monitoring component of the

Programme, external oil spill trajectory and hydrodynamic/nutrient models will result in "scenarios" or output visualized in GIS.

The major outputs at the three demonstration sites are the enhancement of GIS capability at the local level and the establishment of spatial database systems, draft functional zonation schemes, and management atlases.

### Management Atlas

The compilation of spatial data in hard copy or maps shall be one of the major outputs at the three demonstration sites. The production of a management atlas is a logical development in the establishment of a spatial database system. The management atlas covers not only thematic maps on coastal and marine resources, socioeconomic activities, and the geophysical and biological features of the demonstration site; but also maps derived from modeling. Output, such as functional zonation schemes, demarcated sensitive or vulnerable habitats and areas subject to pollution from land and sea, will be part of the atlas. Indices used in the classification of critical areas and habitats will be included along with explanatory text to describe each map.

### Directory of Institutions and Individuals on Marine Environment and Marine Affairs

There are several institutions in the East Asian Seas region involved in marine environmental research and management. These agencies have contributed in various ways to the development of sectoral management strategies on the utilization of marine resources and the prevention of marine pollution. However, there is minimal integration and coordination among regional institutions to resolve use conflicts and environmental issues.

To promote closer cooperation and collaboration among institutions in the region, increased awareness is essential. One way to enhance awareness is through the compilation of institutions actively engaged in marine environmental research and management. In this regard, a directory of institutions and individuals on marine environment and marine affairs is being prepared by the Programme. It is expected that the compilation will serve as a tool to facilitate communication among institutions and individuals who share similar concerns and commitments for the protection of the marine environment and the utilization of marine resources. It is also

### Objectives of the Directory

- *To identify and determine which and how many institutions in the region are involved in marine environmental research and management;*
- *To assist programme personnel and other individuals in establishing contacts and cooperation with relevant agencies;*
- *To provide information on the level of technical expertise and institutional capability in the region; and*
- *To update information in existing directories, particularly the Directory of institutions and scientists in the ASEAN region involved in research and/or management related to coastal areas published by the International Center for Living Aquatic Resources Management in 1989.*

*Survey questionnaires were sent to about 360 institutions in the 11 participating countries of the Programme. Thus far, about 170 institutions responded and encoding of the returned survey results is underway. A database system and printed directory will be produced by early 1996.*

envisioned to stimulate the sharing of information on areas of mutual interest, hopefully, leading to cooperation.

### Tropical Coasts Newsletter

The *Tropical Coasts* is a biannual joint publication of the Programme, the Swedish Agency for Research Cooperation with Developing Countries (SAREC) Marine Science Programme and the Coastal Management Center (CMC). Its purpose is to stimulate exchange of information and sharing of experiences and ideas with respect to environmental protection and the management of coastal and marine areas. The target audience are policymakers, environmental managers, scientists and resource users. The first issue came out in December 1994 while the second issue was distributed in July 1995. The third issue due in December 1995 is in preparation. Regular

contributions come from the Programme, IMO London, CMC and SAREC Marine Science Programme. Articles and news cover not only the East Asian Seas region, but also the Eastern Indian Ocean region where the SAREC Marine Science Programme is very much involved. Contributions from other institutions and the private sector are being solicited to provide a cross sectoral perspective to the newsletter. The *Tropical Coasts* is distributed free of charge to 184 institutions and 259 individuals in 34 countries.

### **Programme Updates**

Since the inception of the Programme in January 1994, significant progress in its various activities has been made. Also, implementation of activities are accelerating, especially in the

Xiamen and Batangas demonstration sites. In order to widely disseminate information on the Programme and its activities, a four-page periodical is produced in-house on a quarterly basis called *Updates*. *Updates* aims at keeping concerned institutions and individuals informed of the Programme's progress. Articles cover the "who's who" in the Programme; the activities completed to date, in progress, or in the pipeline; collaborative endeavors with other institutions and individuals; achievements and significant impacts (especially on the target beneficiaries) arising from the implementation of Programme activities.

*Updates* was first published in January 1995 and two issues have since been printed. The fourth issue due in October 1995 is in preparation. The *Updates* is distributed to 154 institutions and 227 individuals in 31 countries.

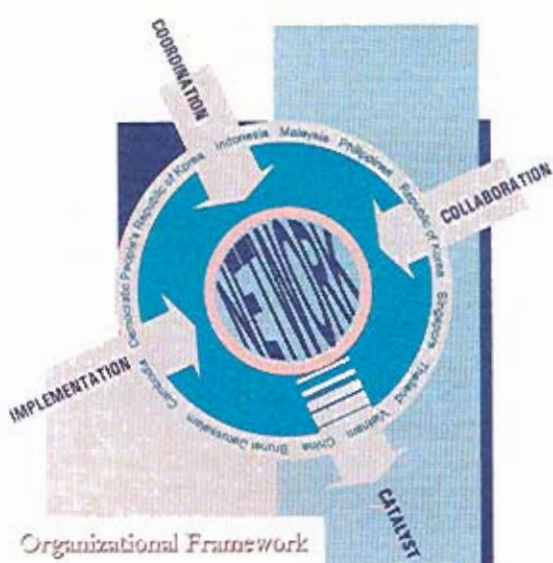


## International Conventions

The main objective of the International Conventions component of the Programme is to assist participating countries in developing the necessary legislative and technical capability to ratify and implement international conventions relating to marine pollution. At present, only a few countries in the region have ratified the key international agreements on marine pollution. Moreover, while many countries already have legislation in place, many of these laws are not being enforced or complied with and need to be updated or amended for greater effectivity.

A corollary objective is to assist the countries in the region develop regional policies and agreements with respect to the prevention and mitigation of marine pollution where such regional initiatives are appropriate and necessary. Hence, through this component of the Programme, it is expected that national laws and policies and/or regional agreements which effectively address the problem of marine pollution will be adopted and implemented.

One strategy in accomplishing this objective is to establish a Regional Network of Legal Experts on Marine Pollution. At present, there is no existing body working on the development, formulation and implementation of marine pollution legislation in East Asia. While most governments in the region



are trying to establish a coherent legislative framework to deal with marine pollution, a catalyst is needed at the regional level to accelerate these efforts. The Legal Network is expected to fulfill this role

This is the first network of legal experts on marine pollution in the region. The Regional Network of Legal Experts on Marine Pollution will interact and collaborate with other networks organized and established under the Programme.

INTERNATIONAL CONVENTIONS related to marine pollution	C O N V E N T I O N S																
	U N C L O S 82	MARPOL				London Convention		Intervention		CLC			Fund			S A L 89	O P R C 90
		73/78	III	IV	V	CONV 72	Amend 78	CONV 69	PROT 73	CONV 69	PROT 76	PROT 92	CONV 71	PROT 76	PROT 92		
COUNTRY																	
Brunei Darussalam	■									■	■		■				
Cambodia	■	■	■	■						■							
China	■	■	■	■	■		■	■	■	■						■	
Dem. People's Rep. Of Korea	■	■	■	■													
Indonesia	■	■								■		■	■				
Malaysia										■			■				
Philippines	■				■												
Republic of Korea	■	■			■					■	■		■				
Singapore	■	■	■							■	■						
Thailand																	
Vietnam	■	■															

## Organizing the Regional Network

In 1995, the priority activity under the International Conventions component of the Programme was the organization of a Regional Network of Legal Experts. A working paper for the network has been drafted identifying potential members of the network, and laying the groundwork for implementation of projects under the international conventions component.

In June 1995, the Programme participated in the conference on *International Boundaries and Environment Security* sponsored by the Centre for

constraints to ratification of international conventions in the region will be discussed in this meeting. Implementation strategies, operational modalities and guidelines, and specific projects and programs will, after examination and deliberation, be reviewed and adopted during the first meeting.

## Membership

The Legal Network shall be composed of individual national associates primarily from the participating countries of the Programme, who are marine law experts or environmental legal experts

### *Operational Guidelines for Legal Network Activities*

*Implementation of network activities shall be guided by the following principles:*

- *Respect for the economic, political, and cultural diversity of the countries in the East Asia Region shall, at all times, be paramount in designing and implementing activities.*
- *To ensure an interdisciplinary approach, the network shall interact and collaborate with the other regional networks established under the Programme.*
- *To ensure that the outputs of the network are doable and implementable, lessons from the demonstration site projects of the Programme, insofar as these are relevant to these outputs, shall always be integrated, i.e., the lessons from these sites must be incorporated into the policies and legislation - national or regional - which the network may draft and propose.*
- *The implementation of network activities, to ensure efficiency, must build on each other.*

*Preceding activities must serve as the foundation of latter activities (and latter activities must reinforce preceding ones).*

Advanced Studies, Faculty of Arts and Social Studies of the National University of Singapore. During the Conference, a paper entitled *South-South Cooperation in the East Asian Seas: Developing Regional Networks for Environmental Management* was presented and a number of participants indicated their interest in forming such a network.

In October 1995, the working paper of the regional legal network and a network brochure were sent to potential members of the network. The potential members were invited to join the network and to participate in its activities.

An organizing conference is scheduled for February 1996. The state of marine pollution legislation in the participating countries and the

attached or affiliated with public or private institutions specializing in law and policy and who are engaged in marine, coastal, and environmental issues. In participating countries where the above-mentioned experts are not available, legal experts who are attached or affiliated with such institutions will qualify.

The Legal Network is an informal association of individual national associates, voluntarily collaborating with each other and working together to attain the objectives of the network. Meetings of members of the network will be held at least once a year to plan annual activities. They will be convened and coordinated by the Network Coordinator, who will be based in the Programme Development and Management Office in Manila. The responsibility for implementation

of network activities will be distributed among its members.

Seed funding for establishing the Legal Network and for its initial activities shall come from the Programme. Other sources of funding shall be explored.

#### **Legal Information Database on Marine Pollution**

As part of its thrust to build the capacity of participating countries to deal with marine pollution, a Legal Information Database on Marine Pollution is being established. This database, which will be located at the PDMO, will serve the legal information needs of participating countries and provide legal

material (e.g., copies of conventions, legislation, legal texts) to law libraries and government departments to build the respective capacities of participating countries that require assistance, especially those with inadequate databases.

Preparatory activities began in September 1995, including designing the database, identifying the materials to include, determining possible sources, and conceptualizing an efficient delivery system. As part of the database project, discussions were conducted on possible collaboration with the Faculty of Law of the National University of Singapore. This collaboration will hopefully be formalized by the end of October 1995. By June 1996, the database is expected to be fully operational.

## Sustainable Financing

### Start-up of Sustainable Financing

The first meeting of the Programme Steering Committee (PSC) resolved that the Executing Agency should work with others to develop a practical project plan for the Sustainable Financing component of the Programme. The PSC further emphasized that financial mechanisms for use by local governments should be identified, and integrated into the demonstration site activities.

During the final quarter of 1994 and first two quarters of 1995, a number of consultations were held with UN agencies and various experts concerning the obligations and sources of funding that countries currently employ for maritime safety and marine pollution prevention and management activities. In addition, the existence of examples or case studies on sustainable financing as applied in other parts of the world was explored with the idea of promoting similar activities in the East Asian region.

A background paper was prepared, along with a series of proposals for evaluating and demonstrating sustainable financing mechanisms at the local level. The background paper and proposals were discussed at brainstorming sessions at UNDP New York and the World Bank in Washington in May 1995, where representatives from the two organizations, as well as World Wide Fund and academia, commented on the strategy and methodologies employed to demonstrate sustainable financing mechanisms in a "real world" situation. The brainstorming sessions concluded that a priority component of sustainable financing at the local level is public sector-private sector partnership, whereby government, industry, the private sector, and NGOs combine their strengths and capacities to address marine pollution prevention and management issues, including waste management, coastal development and oil spill prevention, preparedness and response over the longer term.

### Concept of Sustainable Financing

A concept paper and revised project plan for the Sustainable Financing component of the Programme was prepared in September 1995, based

upon the research material and outputs from the aforementioned meetings. The revised plan addresses sustainable financing on two fronts, namely: the use of demonstration sites as testing grounds for financial mechanisms appropriate at the local level; and mobilization and channelling of in-country and external resources to ensure sustainable programs. The revised project plan was costed and incorporated into the 1996 Programme work plan.

### *Sustainable Financing Strategy*

*The Programme strategy for advancing capacities to sustain marine pollution prevention and management programs across the region over the long term is to focus on the mobilization and channelling of in-country resources, and to examine how support from outside the country, over the short- to medium-term, can be used more effectively to stimulate and complement the input and application of domestic resources.*

### Sustainability of Local Programs

The Programme places special attention on the development of feasible financing mechanisms at the local level to sustain pollution management efforts developed through the two demonstration sites. Special efforts are already underway in this regard. For example, an integrated waste management action plan is being formulated for the municipality of Bauan, in Batangas Province, to involve the private sector and NGOs, in collaboration with the municipal government, to establish a waste recycling program, to institute systematic reduction of organic waste through composting and to commission and operate an environmentally sound waste disposal facility.

Two issues of particular interest are public sector-private sector partnerships and privatization of facilities and services in support of marine pollution prevention and management programs. Public sector-private sector partnerships and



privatization are of special significance to local governments. First, local governments normally have little say regarding the allocation of funds by central governments. Second, the legal machinery is usually not adequate to provide local government with the means or the authority to generate income which adequately covers the costs of environmental programs. Even the operation of basic municipal services, such as garbage collection and disposal, are recognized as being underfunded and inefficient in many areas of the East Asian region. Public sector-private sector partnerships and privatization programs are two instruments in the local government tool box of policies that offer potential relief. The application of such instruments, in combination with regulatory measures and institutional arrangements, will be identified and promoted at the Xiamen and Batangas Bay demonstration sites.

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*A cursory review of ongoing and proposed marine pollution/coastal management projects in countries throughout the region reveals the large interest and financial commitment that is being applied to address this important issue. However, one still needs to examine whether these activities are sustainable and exactly what benefits can be assured over the longer term as a result of a series of well-intended, but short-term, projects.*

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#### Sustainability of Subregional Programs

The Malacca Straits Demonstration Project brings another dimension to the issue of sustainable financing, and that is the sustainability of sub-regional marine pollution prevention and management initiatives. Unlike the situation at Xiamen and Batangas, the littoral States of the Malacca Straits have long-established administrative and operational arrangements and mechanisms for managing the Straits. The focus of attention during this demonstration project is the

identification and assessment of the effectiveness of existing management frameworks and financial mechanisms, covering both land- and sea-based sources of pollution. The Straits are rich and varied in living and non-renewable resources including some of the most productive coastal ecosystems in the East Asian region. Economic development in and along the Straits, including an increasing volume of ship traffic, is posing high risks of damage and destruction to these sensitive living marine resources. In parallel with this economic evolution, users and beneficiaries of the Malacca Straits, both direct and indirect, have also changed in number, as well as sectorally and geographically, over time. It has been conceded that administrative and financial mechanisms for managing the Straits may not be keeping pace with economic development.

#### Mobilization of Resources

The basic premise of the second component of the Programme's sustainable financing initiative is recognition that the main obstacle to financing of marine pollution prevention and management projects is not so much the availability of financial resources from external and in-country sources, but the problem of linking priority needs in this environmental sector with the supply of available financing. A cursory review of ongoing and proposed marine pollution/coastal management projects in countries throughout the region reveals the large interest and financial commitment that is being applied to address this important issue. However, one still needs to examine whether these activities are sustainable and exactly what benefits can be assured over the longer term as a result of a series of well-intended, but short-term, projects.

A regional conference, entitled *Sustainable Financing of Marine Pollution and Prevention and Management Programmes: Public Sector-Private Sector Partnerships* was organized, scheduled for September 1995 in Manila. Co-sponsors were identified (ADB and IDRC), a program was prepared and invitations were sent out to potential participants and speakers. Unfortunately, due to conflicting dates with other conferences and meetings scheduled for the end of September, a number of key participants and speakers indicated that they could not attend. It was decided that the Conference be postponed for one year, in order to ensure that the proposed gathering have the benefit of input from all of the key players in the region. The decision to postpone the Conference until November 1996 was agreed to by ADB and IDRC.

## Developing Capacity

A major effort of the Programme is to develop human resources in the region to effectively implement appropriate preventive, control, and mitigating measures to address marine pollution. Appropriate research capabilities are also being developed to provide information needed for policy development and management actions. During the first two years of the Programme, the focus has been, first, the formulation of a strategy or approach to building capacity in the region and, second, the development and implementation of a long-term, sustainable, capacity building program.

A training needs survey was conducted early in the Programme to gain insight into needs and priorities as perceived by the participating countries. Ten countries responded to the survey, which was completed in August 1995. The survey results showed that, out of 13 subject areas identified, the top rankings were: pollution monitoring; impact assessment; oil spill response; GIS application; waste management; and ICM training. The results of the survey are being used as a guide for the Programme, with formulation of training modules and activities in each of these six areas currently underway.

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The premise upon which the capacity building program is being developed and implemented is that it is more productive and interesting for professionals, scientists, administrators, and managers to learn by doing, than going through an academic exercise describing what needs to be done. A good example of the hands-on approach to capacity building is the work being completed at the Programme's demonstration sites. In Xiamen and Batangas, officers from local government agencies have either been assigned directly to the project office or are jointly participating in the development, implementation, and management of project activities. In addition, scientists and engineers from local and national institutions and universities provide the technical support and input to the demonstration site activities by developing and implementing project activities and reporting outputs in a format and style that supports and strengthens management initiatives and interventions.

In the Xiamen Demonstration Project, over the past 18 months, 11 project proposals have been prepared and implemented, involving collaboration and cooperation among: over 26 government agencies and bureaus; the Third Institute of Oceanography; the Fujian Institute of Oceanography; the Environmental Science and Research Centre, Department of Oceanography, Institute of Sub-Tropical Oceanography, Law Department and the Institute of Political Science and Law of Xiamen University; Office of Solid Waste Disposal Facility; Xiamen Harbour Construction Command, and the Department of International Trade. Similarly, the Batangas Bay Demonstration Project included collaboration among over 29 local government agencies and offices of five municipal governments, the province and central government, the Marine Science Institute and the Law Department of the University of the Philippines, the Batangas Bay Coastal Resources Management Foundation and more than 13 industries, in formulating the coastal profile and strategic environmental management plan for Batangas Bay. Workshops, consultative meetings and the drafting of the products themselves are all part of a process to strengthen

the capacity of local people to develop, manage and sustain ICM programs.

In addition to the hands-on training experience offered at the demonstration sites, formal training programs have also been organized and implemented under the Programme. An ICM training course entitled, *Regional Training on the Application of Integrated Coastal Management System in Marine Pollution Prevention and Management*, co-sponsored by the Programme and SAREC, was implemented from October 2-25, 1995. The course venues included site visits to Manila Bay, Batangas Bay, Xiamen, and Singapore to provide the 21 participants from 11 countries with an appreciation of the practical issues, problems and potential solutions for the prevention and management of marine pollution. Again, the strategy employed in the training exercise was to allow each participant to experience the effect that economic development is creating on the coastal and marine environment at each location and to learn the ICM approaches that are being developed and implemented to manage and mitigate negative impacts. The training course was organized by the Programme and with the cooperation of the Coastal Management Center, Xiamen University, National University of Singapore, and the University of the Philippines. A similar course will be held each year until the end of the Programme.

Two other formal training initiatives were also implemented in 1994 and 1995, both involving the cooperation of industry. In November 1994, an IMO/IPIECA Seminar on *Oil Spill Contingency Planning and Response* was held in Hong Kong. The seminar was designed to introduce senior managers in the public and private sectors to the Oil Spill Preparedness, Response and Cooperation Convention (OPRC 1990) and to explain the objectives, benefits, and obligations of the international agreement. The Programme cooperated with the organizing agencies in this endeavour, facilitating financial support for 16 delegates from participating countries to attend the seminar.

In November 1994, four participants from the public sector of Indonesia, Malaysia, Thailand, and Singapore attended a one-week training course entitled, *Oil Spill Clearance Course* at the East Asian Response Ltd. (EARL) facility in Singapore. The course was also attended by 16 representatives from the petroleum industry throughout the region, as an introduction to persons who are relatively inexperienced in oil pollution, but who currently play a role or have responsibility within an oil spill

response organization. The course format involved both theory and practical workings of oil spill management and the importance of contingency planning.

The Programme's approach is that joint industry and public sector training initiatives involving both the public and private sectors are not only learning opportunities, but a chance to bring the two sectors closer together, to appreciate respective problems and perspectives in marine pollution programs. Hopefully, this will result in closer working relationships to solve existing and future coastal management issues.

Another priority activity in capacity building is the Programme's work in less developed countries of the region. The aim of this work is to strengthen existing capacities in marine pollution research and monitoring so that there is a basic level of capability throughout the region. In Vietnam, the strengthening of national research and management capabilities at two oceanographic institutions, Nha Trang and Haiphong, was initiated with the support and cooperation of SAREC and CMC. A joint workshop, organized by SAREC, CMC, the Ministry of Science Technology and Environment (MOSTE) and the Programme was held in August 1995, at which existing and potential environmental management issues, research areas and projects, human resource needs and facility requirements were identified by over 40 participating scientists. Four research projects were formulated and scientific equipment for such work are being purchased. In addition, a draft version of the *State of Marine Environment in Vietnam* was

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prepared by merging available reports from each institution. The report will be published in early 1996.

In addition, missions to Cambodia and DPR Korea were completed to start-up capacity building activities in those countries. Proposals are forthcoming on equipment needs and human resource development requirements.

Another indication of the Programme's approach to capacity building is the internship

program which was established in 1995. Under the program, young professionals from participating countries are invited to work as interns at the Programme Office in Manila to improve their skills in project development and management and to train in and apply some of the instruments that are an essential part of ICM (e.g., GIS, coastal profiles technical proposals/reports). In August 1995, a Cambodian intern started his assignment at the Programme Office. In 1996, two other interns from DPR Korea will be joining the Programme.



## Toward Attaining Programme Goals

In 1994 and 1995, the Programme has successfully established a regional institutional framework with specialized networks centering at PDMO. Some outputs from the demonstration sites began to surface and various component activities began to piece together like a giant jigsaw puzzle. A larger picture, depicting what the Programme is all about, began to take shape. The larger picture contributes to a better understanding and appreciation of the Programme's strategies and approaches to achieving the overall goal of reducing marine pollution in the coastal and marine waters of the East Asian seas. It also reveals opportunities for a greater involvement and benefits to all concerned sectors.

Much work is still needed. Analysis of the experience and lessons learned in the past two years is essential in order to bring the Programme into the next phase of activities.

### *Operational Strategies for 1996*

*Based on the experience of the last two years, the Programme adopts the following operation strategies for 1996:*

- 1. Initiate and implement all activities pertaining to capacity building especially in the less developed countries;*
- 2. Promote a stronger partnership between the public and private sectors in marine pollution prevention and management;*
- 3. Initiate packaging of lessons learned from the demonstration sites for early transfer of applicable methodologies and approaches;*
- 4. Promote a greater involvement of participating governments in the implementation of Programme activities; and*
- 5. Mobilize in-country and external resources through cooperation and collaboration with other bilateral and multilateral projects and programs of other organizations or donors in meeting Programme objectives.*

### Demonstration Sites

1. Consolidating project activities under the two demonstration sites in Xiamen and Batangas Bay.

#### *Demonstration project in Xiamen*

- Establishment of functional zonation schemes
- Ecological and socioeconomic impacts of economic developments
- Abatement and management of pollution from coastal aquaculture
- Evaluation of solid and hazardous waste management, including sea disposal
- Evaluation of the Yuantan Lagoon - a case study
- GIS development for planning and management
- An environmental foundation and an environment fund
- Public-awareness of marine pollution issues
- Strengthening regulations on coastal management
- Sea water quality standards and criteria
- Action plan on integrated waste management in Xinglin Bay
- Marine environment quality changes and monitoring of coastal waters

#### *Demonstration project in the Batangas Bay*

- Legal evaluation of institutional arrangements for coastal management among ENRO, BCRMF and concerned government agencies
- Finalization and adoption of strategic management plan
- Establishment of a Provincial Department of Environment and Natural Resources
- Development of strategic and management action plans for wastes, and implementation of waste management action plans for Bauan Municipality
- Establishment of functional zonation schemes
- Studies on waste generation and disposal
- Baseline information on the water quality of the Bay
- Feasibility studies on Batangas Bay Environment Management Funds
- Socioeconomic impacts of marine pollution
- Batangas Bay hydrodynamics
- Analysis of navigational traffic and the traffic separation scheme
- Application of GIS for planning and management
- Assessment of the technical and economic feasibility of setting up an analytical laboratory for water quality monitoring
- Assessment of fisheries resources and aquaculture
- Development of a pollution monitoring program

2. Initiating project activities on *Pollution Risk Assessment and Management in the Straits of Malacca*.

- Preparation of a profile document on *Pollution Risk Assessment and Management in the Straits of Malacca: Present Status, Policies and Practices*
- Develop database for the preparation of the management atlas
- Oil spill modeling
- Pollution risk data assessment
- Review traffic separation scheme
- Review airborne surveillance
- Study on *Special Area* under international convention
- Strengthen oil spill response capability

3. Packaging of experience/lessons learned from the application of integrated coastal management system for marine pollution prevention and management for possible application in other coastal areas of the region.

- International ICM workshop: lessons learned from successes and failures
- Preparation of a guidebook on ICM
- Preparation of specific documents on lessons learned

## Pollution Monitoring

1. Establish Pollution Monitoring and Information Network.
2. Design regional pollution monitoring program.
  - Review efforts on monitoring pollution
  - Standardization of sampling and analytical methods
  - Establishment of a regional pollution monitoring program
  - Implementation of the monitoring program

## International Conventions

1. Organize inception workshop of members of the network of legal experts on marine environmental laws.
2. Identify constraints to the ratification and implementation of international conventions.
3. Assess the effectiveness of current national marine pollution legislation and regulations.
4. Review effluent standards and water-use classification in the region.
5. Draft guidelines and/or principles to facilitate development or implementation of marine pollution legislation and regulation.

## Sustainable Financing

1. Organize regional conference on sustainable financing mechanisms for marine pollution prevention and management: public sector-private sector partnership.
2. Undertake case study on privatization of waste management in Malaysia.
3. Privatization of reception facilities and oil spill response in ports and harbors.
4. Public sector-private sector partnership in establishment and implementation of a marine pollution monitoring program in Batangas Bay.
5. Investment opportunity in the prevention and management of marine pollution in Xiamen Municipality.
6. Develop mechanisms to mobilize in-country and external resources to enable local efforts to sustain and extend ICM programs for marine pollution management.

## Capacity Building

1. Training courses/workshops.
  - Application of integrated coastal management system for marine pollution prevention and management
  - Oil pollution preparedness, response, and cooperation training course
  - Oil spill modeling
  - Marine pollution monitoring methodology
  - International workshop on integrated coastal management: lessons learned from successes and failures
  - Workshop of legal experts on marine pollution legislation
2. Continue to operate internship program.
3. Develop and implement staff exchange among participating countries.
4. Upgrade technical capacity of Cambodia, Vietnam and DPR Korea.
  - Strengthen basic research and monitoring facilities
  - Organize in-service training courses
  - Provide internship and staff exchange opportunities
5. Integrated environmental impact assessment.

## Publication and Information Dissemination

1. Continue the joint publication of the semi-annual newsletter *Tropical Coasts*.
2. Continue publication of the quarterly *Updates*.
3. Directory of institutions involved in marine environmental research and management in the East Asian Seas region.
4. Environmental profile of Xiamen and strategic management plan.
5. Environmental profile of Batangas Bay and strategic management plan.
6. Publication of the guidelines on *Standard sampling and analytical methods for marine pollution monitoring*.
7. Publication of the *Practical guidelines on integrated coastal management* in cooperation with SAREC and CMC.
8. Proceedings on the international conference on *Integrated coastal management: lessons learned from successes and failures*.



## New Initiatives

The main objective of the three demonstration projects is to provide a set of tested methodologies, approaches, typologies, and lessons learned related to the prevention and management of marine pollution arising from both land- and sea-based sources. The philosophy behind setting up the demonstration sites is to encourage: (a) participating countries to establish similar ICM programs at the local level to address land-based pollution and (b) littoral states bordering subregional seas or shipping lanes to collectively address pollution arising from vessel sources. Hence, there is an obvious need to mobilize in-country and external resources to support this long-term endeavor. Existing component activities need strengthening especially the newly established networks.

A number of new ideas and new initiatives have taken root since the start-up of the Programme. These initiatives will be further developed in 1996.

### Other ICM Demonstration Sites

The Center for Policy Research of the Korea Ocean Research Institute has recently established an ICM project at Masan-Chinhae Bay. The project works closely with the local government to address basic environmental problems and resource use conflicts. The project has developed a close working relationship with the Programme in its initial phase of operation. The Programme provided technical advice and had two Korean staff trained at the ICM training course in October 1995. The Programme and KORDI initiated specific cooperative arrangements on the possibility of making Masan-Chinhae Bay a national ICM demonstration site.

The Democratic People's Republic of Korea has proposed the establishment of an ICM demonstration site at Nampu; and Cambodia is interested in establishing a similar site at Sihanoukville. The Programme is exploring such possibilities with concerned authorities and is seeking funding sources. In the meantime, efforts are made to upgrade the technical capabilities in ICM through training, internship, and upgrading of basic facilities within the budget available for them. The Programme will assist these countries in developing appropriate ICM proposals for external funding support.

Through further cooperation with SAREC and CMC, the Programme will explore the

possibility of establishing at least one ICM demonstration site in Vietnam where two oceanographic institutes in Haiphong and Nha Trang have been receiving technical support from the collaborative efforts of the SAREC Marine Science Programme and CMC.

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### ICM Parallel Sites

One measure of success of the Programme is the adoption and replication, in full or in part, of the methodologies, approaches and typologies developed through this Programme using in-country resources. The Programme encourages local government of coastal provinces and municipalities to adopt the ICM system in addressing their marine pollution problems. In order to assist interested local governments in this endeavor, the Programme will provide technical advice and assist them where possible in securing in-country or external financial support.

The provincial government of Guangxi Province, People's Republic of China, has already established an interagency committee at the provincial and municipal level to coordinate and implement management activities related to the protection of the coastal and marine environment. The Provincial Government has formally requested the designation of an ICM parallel site under the Programme, so that it can receive constant technical advice and possible support in developing a comprehensive ICM program, utilizing the experience and skills developed at the Xiamen demonstration project.

Similar initiatives are being planned with the Coastal Environment Program of the Department of Environment and Natural Resources (DENR) of the Philippines.

#### **Sub-National Network of ICM Centers**

The successful establishment of an ICM demonstration site in Xiamen has drawn the attention and support not only of the administrators of the State Oceanic Administration and local government of Xiamen, but also the interest of other coastal provinces and municipalities. The 1995 national meeting of directors of marine departments was held in Xiamen, during which the progress of the Xiamen project was highlighted.

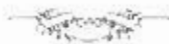
A national initiative is being developed to establish a sub-national network of ICM centers composed of the Province of Guangdong, Guangxi, Hainan and the Municipality of Xiamen. These coastal provinces bordering the upper South China Sea are China's gateway to Southeast Asia. Their rapid economic development will bear serious implications to the health of the marine environment of the South China Sea. A proposal is being developed by the three provinces and one municipality to develop ICM centers, each focusing on specific aspects of the environmental and

resource use problems. Xiamen, being a Programme demonstration site, shall use its experience to undertake the task of national ICM training. Guangxi Province will focus on integrated port and harbor management, Hainan on ICM policy and legislation and island management, and Guangdong on the application of ICM for sustainable fisheries development. The proposal is being prepared for submission to UNDP.

#### **Other Initiatives**

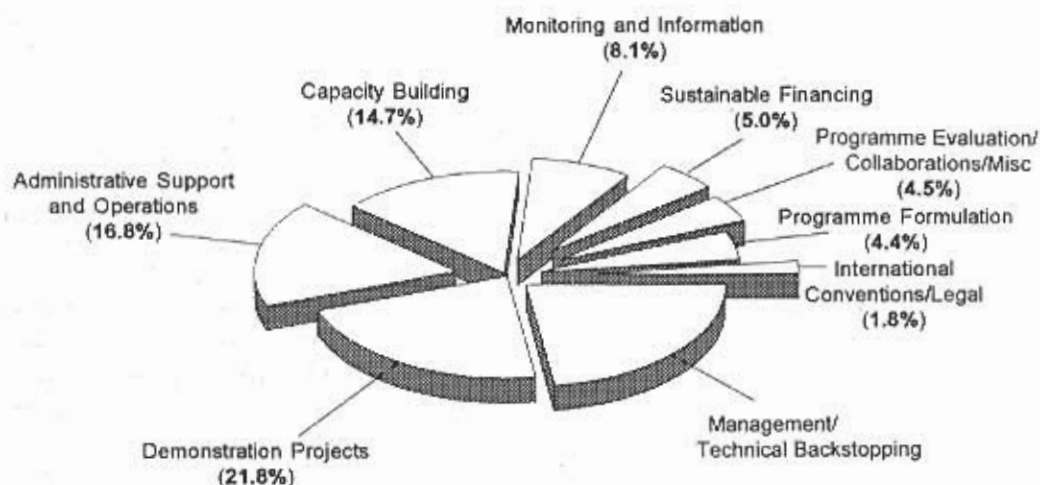
IMO has developed a project proposal, together with IPIECA, which will focus on upgrading the technical capability of coastal governments and the oil industries in addressing oil spills problems. The project is being subjected to worldwide consultations with various concerned governments and industries. A large part of the project will be initiated in the East Asian Seas region and the Programme is expected to cooperate or assist in its implementation.

In addition to the above initiatives, the Programme has been working closely with IDRC clean technologies program in developing cooperative activities, as well as with the Bay of Bengal Programme pertaining to its possible involvement in fisheries assessment and management in the Malacca Straits.



**Funding Allocation for the Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas based on the First Programme Steering Committee Approved Budget**

<b>COMPONENTS</b>	<b>Funding Allocation (US\$)</b>	<b>% of Total</b>
Demonstration Projects	1,745,050	21.8
Pollution Monitoring and Information Management	650,600	8.1
International Conventions/Legal	143,100	1.8
Sustainable Financing	400,000	5.0
Capacity Building	1,179,130	14.7
Administrative Support and Operations	1,341,946	16.8
Management/Technical Backstopping	1,821,698	22.8
Programme Formulation	355,322	4.4
Programme Evaluation/Collaborations/Miscellaneous	363,154	4.5
<b>TOTAL</b>	<b>8,000,000</b>	<b>100.0</b>



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While the PDMO does its best to see that no inaccurate or misleading information occurs in this publication, opinions and information appearing herein are the sole responsibility of the authors.

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