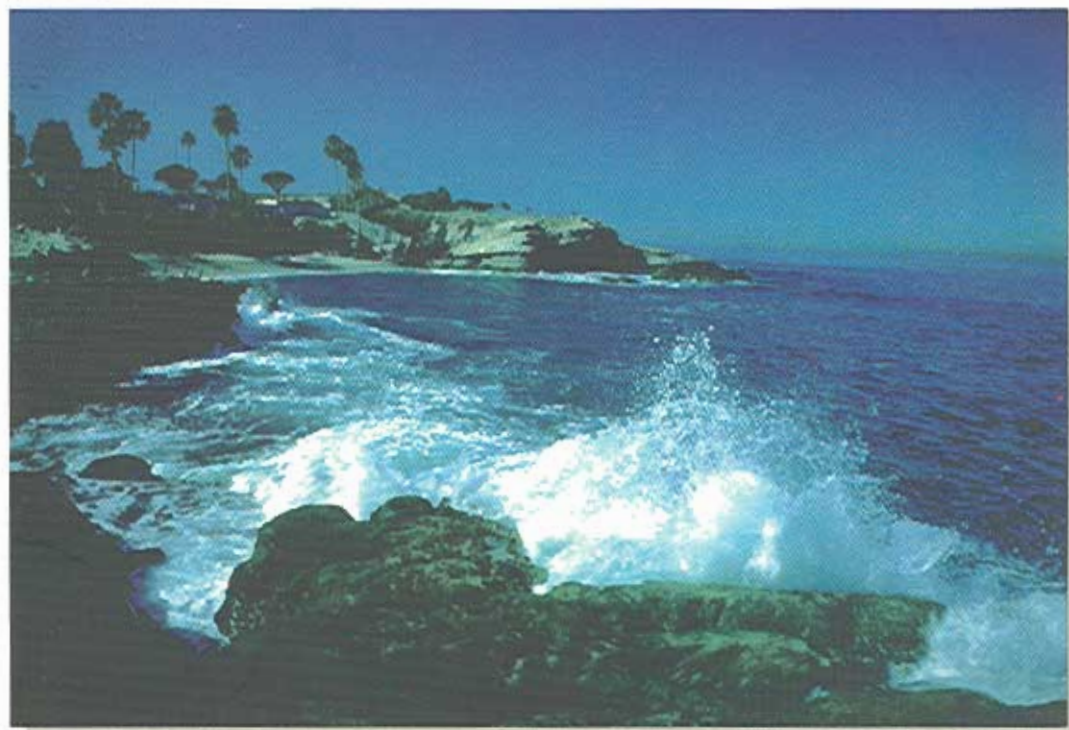


MARINE POLLUTION PREVENTION AND MANAGEMENT IN THE EAST ASIAN SEAS: FROM PLANNING TO ACTION



REGIONAL PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF MARINE POLLUTION
IN THE EAST ASIAN SEAS

1996 Annual Report

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MANAGEMENT IN THE EAST ASIAN SEAS:
FROM PLANNING TO ACTION

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MESSAGE FROM THE REGIONAL PROGRAMME MANAGER

The 1996 Annual Report of the Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas has been prepared under the theme, "From Planning to Action". Recalling that the overall objective of the Programme is to support the efforts of participating governments in the prevention and management of marine pollution at both the national and subregional levels on a long-term and self-reliant basis, the theme voices the essence of work which has been undertaken over the past twelve months toward that end. For 1996 was a year in which the mechanisms and potential benefits of achieving marine pollution management objectives, through integrated coastal management (ICM) practices, were implemented and began to bear results. In Xiamen, China, and Batangas, Philippines, institutional frameworks were put in place, Strategic Environmental Management Plans were developed and adopted, and action programs on functional zonation schemes and integrated waste management were approved and implemented by local governments in Xiamen and Batangas, respectively. Each of these actions, and others, further authenticated ICM as a working model for marine pollution management and established local government as the vehicle for putting the right things into proper perspective and order. The achievements at the demonstration sites have created considerable interest within the region, and elsewhere. The Programme's goal is to build upon this momentum, supporting the development of national demonstration sites in other countries in the East Asia region and the extension of the number of sites in the Philippines and China.

Equally important in 1996 were the partnerships that the Programme began to forge. To attain its objective of sustainability, the building of partnerships with national and local governments, communities, academe, businesses and NGOs was a clear priority. The Programme assessed opportunities and means of sharing the burden of marine pollution initiatives among the beneficiaries and users of the marine and coastal environment. A strategy was implemented which sought to build and promote the concept of public sector-private sector partnerships. The spin-offs from this initiative have been very promising, with marine pollution management activities at the local level being particularly prominent. Among the potential ventures identified were shore reception facilities, waste management, marine pollution monitoring and information management. An important task for 1997 is to promote these ventures toward the realization of on-the-ground facilities and services. The task will involve the cooperation of government, donors, international agencies, financial institutions, NGOs and the private sector to mobilize the necessary technical and financial resources. Clearly, the experience of 1996 has demonstrated that there is a will among stakeholders to advance the public sector-private sector partnerships issue from a policy debate into practice.

I am confident that the outputs and the lessons learned from the efforts of 1996 will serve as benchmarks for future initiatives under the Programme and, most importantly, for long-term and self-reliant programs in marine pollution prevention and management throughout the region.

The 1996 Annual Report is a joint effort of the technical staff of the Regional Programme including Dr. Huming Yu, Dr. Gil Jacinto, Atty. Stella Bernad, James Paw and Nancy Bermas. Appreciation for editorial and layouting assistance of Deborah M. Villa, Lilian A. Jimenez-Marfil and Jonel P. Dulay is acknowledged.

Chua Thia-Eng
Regional Programme Manager

1 PROGRAMME OVERVIEW

INTRODUCTION

In 1992, the United Nations Conference on Environment and Development produced Agenda 21, a blueprint for action for global sustainable development into the 21st century. Global ocean issues were addressed in the Agenda 21 plan, including components such as integrated management of coastal areas, marine environment protection and sustainable use of living marine resources. The concept of global objectives being achieved through regional, national and local actions was outlined in Chapter 17, and perhaps, more than any other document, underscores the basic theme of the GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas (MPP-EAS).

In November 1995, the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities was adopted by an Intergovernmental Conference in Washington, D.C. The Global Programme of Action recognizes that roughly 80% of the contaminant load of the oceans emanates from land-based activities and affects the most productive areas of the marine environment, including estuaries, bays and the nearshore coastal areas. These areas are likewise threatened by physical alteration of the coastal environment, including

destruction of habitats of vital importance for ecosystem health and biodiversity. In addition to localized effects, persistent contaminants originating on land are transported great distances by watercourses, ocean currents and atmospheric processes, posing risks to human health and living resources on a regional and global scale.

For the East Asia region, as in other regions of the world, most contaminants to the marine environment originate from land-based activities. With nearly 60% of the region's population living within 60 km of a coastline, there is little doubt that human activities will continue to have a major impact on coastal waters of the East Asian Seas and the resources therein. However, it is also recognized that, with the ever-increasing volume of shipping traffic into and within the region, sea-based pollution is also a source of concern, especially along heavily congested shipping routes. Oil and chemical spills from ships are easily visible and attract wide media coverage and public attention. Furthermore, shipping accidents are perceived by the general public to pose an immediate and serious threat to the livelihoods and welfare of coastal populations, in as much as the effects of resulting spills cannot be precisely predicted or controlled.

Programme strategy for prevention and management of marine pollution from land-based sources

Integrated coastal management (ICM) provides a decision-making framework and management process involving the major stakeholders in coastal and marine resources management, including governments, the private sector, local communities, and scientific and educational institutions. The framework incorporates considerations for prevention and mitigation of adverse impacts of human activities on coastal and marine ecosystems into the planning, development and operational activities of the stakeholders, thus minimizing pollution risks.

A fundamental strategy of the Programme is to demonstrate the effectiveness and modalities of ICM application in tackling marine pollution from land-based sources. It is the Programme's objective to develop working models at the demonstration sites in Xiamen, China and Batangas Bay, Philippines, to extend the experience gained at the two sites to other countries of the region, and to forge a network of national sites throughout the region. International cooperation and assistance at ground level, specifically to support the adoption of ICM practices by local governments throughout the region, is required and will effectively contribute to implementation of marine pollution prevention and management in a practical and cost-effective manner.

In 1996, the Regional Programme achieved full implementation of a work program that operationalized the strategies and actions espoused in Agenda 21 and the Global Plan of Action. The Programme's primary objective was implemented through a series of subprojects and events involving both the public and private sectors. Unique features of the Regional Programme which were demonstrated over the 12-month period included:

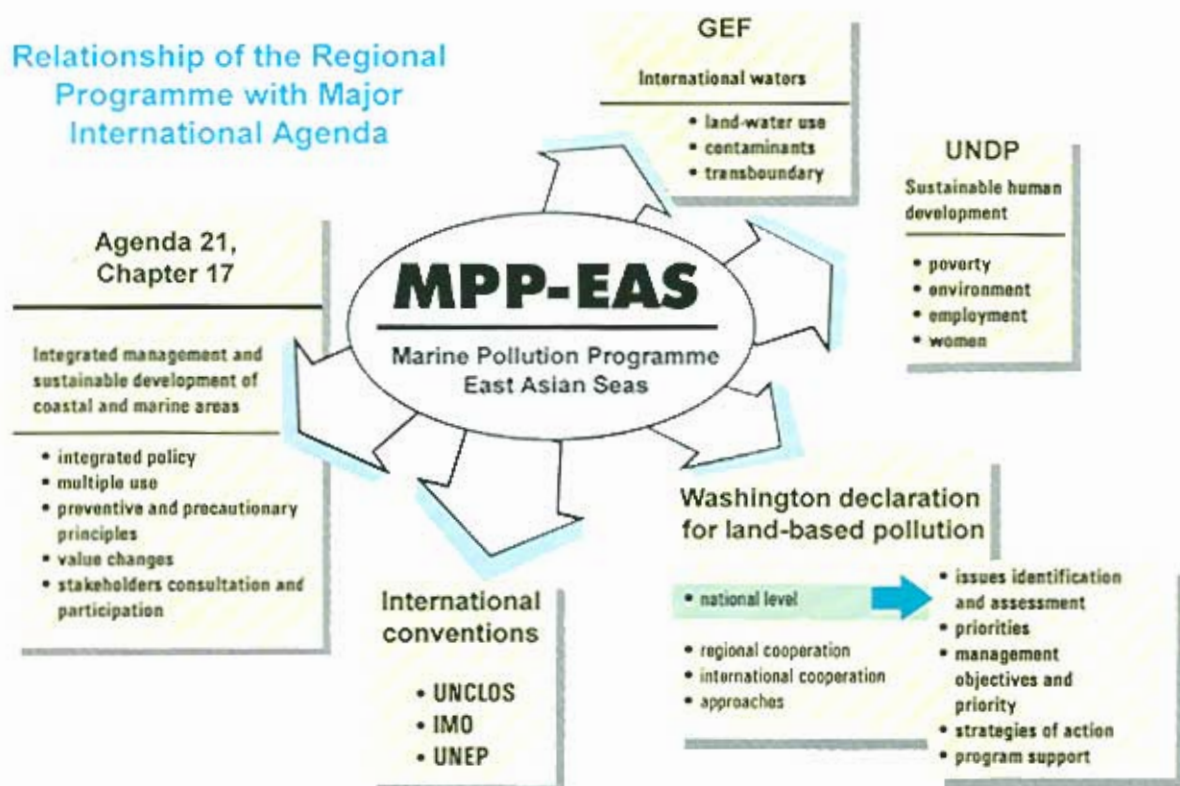
- (1) an integrated management framework for land-based and sea-based sources of marine pollution;
- (2) working models on marine pollution prevention and mitigation from land-based activities;
- (3) capacity building at local and national levels, through hands-on experience, practical training programs, technology transfer and information dissemination;
- (4) harmonization of pollution monitoring and analytical measurement techniques;
- (5) networking among national scientific institutions, ocean research centers and

organizations involved in marine and coastal monitoring activities and a sharing of information and data on the state of the coastal and marine environment of the East Asian Seas;

- (6) networking of public and private institutions in the region on the legal aspects of marine pollution, the status of national regulations and the implementation of international conventions; and
- (7) public sector-private sector partnerships as a financial mechanism to sustain marine pollution programs locally, nationally and regionally.

The 1996 Annual Report reviews some of the issues and challenges that were involved in implementing the Regional Programme. The experience and lessons learned have provided a better appreciation among stakeholders of why and how integrated coastal management is applied in the coastal area, the social and economic opportunities that are afforded as a result of marine pollution initiatives and the costs and benefits of partnerships between government and the private sector.

Relationship of the Regional Programme with Major International Agenda



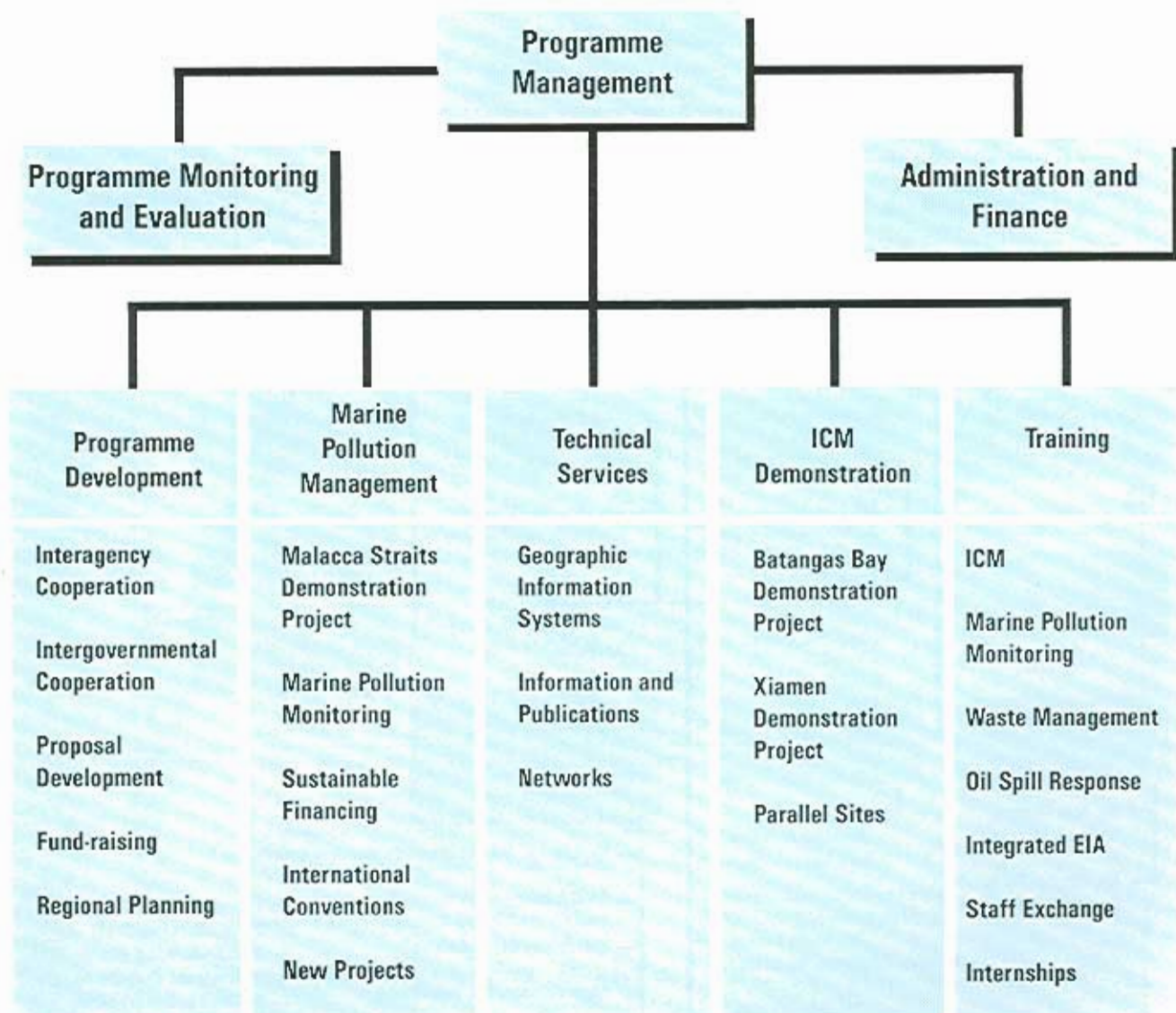
PROGRAMME MANAGEMENT AND ADMINISTRATION

The Programme Development and Management Office in Manila underwent a transformation in 1996, with the decentralization of technical backstopping and various administrative responsibilities from IMO headquarters and the addition of staff to meet the transferred obligations. Presently, the Programme Office activities are classified under the functional responsibilities of programme management,

monitoring and evaluation, administration and finance, programme development, marine pollution management, technical services, integrated coastal management (ICM) demonstration, and training.

The Programme Office includes three internationally recruited officers, namely the Regional Programme Manager and a Technical Advisor, and a Senior Programme Officer assigned

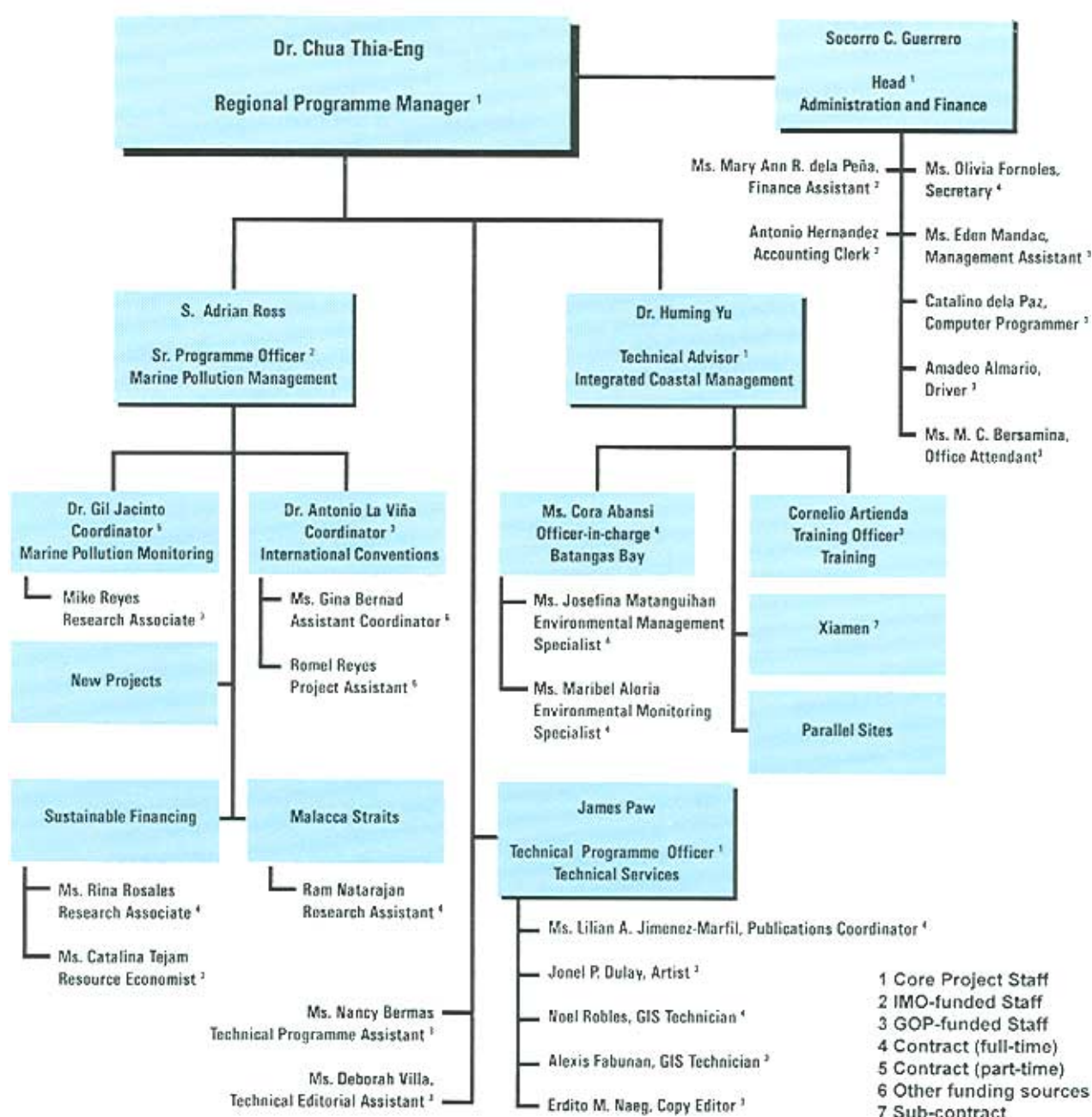
**IMO Programme Development and Management Office
Functional Chart**



full-time to the Manila office by IMO headquarters. The balance of the core staff includes a Technical Programme Officer and an Administrative Officer, as well as a Finance Assistant and Accounting Clerk, both of whom have been recruited locally by IMO headquarters. Other technical support is acquired on short-term contractual basis to assist in research and in the

implementation of project activities. In addition, ten staff have been seconded to the project by the Government of the Philippines through the Department of Environment and Natural Resources (DENR). DENR has also made significant contributions to the Regional Programme as host of the Programme Office and as a major investor in ICM at the Batangas Bay Demonstration Site.

IMO Programme Development and Management Office Organizational Chart*



- 1 Core Project Staff
- 2 IMO-funded Staff
- 3 GOP-funded Staff
- 4 Contract (full-time)
- 5 Contract (part-time)
- 6 Other funding sources
- 7 Sub-contract

*as of December, 1996

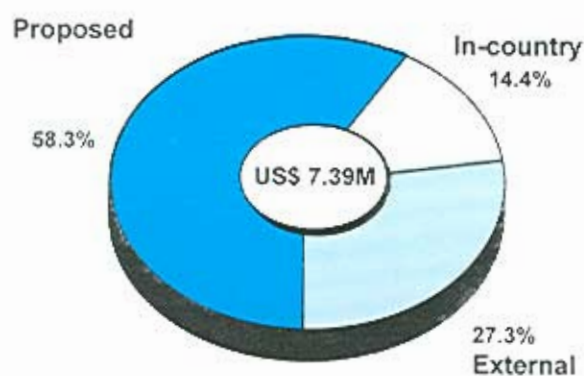
PROGRAMME MILESTONES IN 1996

MONTH	MAJOR ACTIVITIES/ OUTPUTS/ EVENTS
<i>January</i>	Environment and Natural Resources Office, Batangas Provincial Government - established as lead local agency for environmental management Tropical Coasts Newsletter, Volume 2, No.2 Updates, Volume 2, No.1
<i>February</i>	First Hydrographic Field Survey of Batangas Bay
<i>March</i>	IMO Mid-Term Review of Regional Programme Inception Workshop of the Regional Network on the Legal Aspects of Marine Pollution
<i>April</i>	Training Course on Marine Water Quality Sampling and Field Measurements, Vietnam Inception Workshop on Regional Marine Pollution Monitoring Network, Manila, Philippines
<i>May</i>	International Workshop on Integrated Coastal Management in Tropical Developing Countries: Lessons Learned from Successes and Failures, Xiamen, China Batangas Bay Council for Integrated Coastal Management (BBCICM) established by Provincial Ordinance GIS Training, Xiamen Demonstration Site Staff
<i>June</i>	Regional Workshop on Oil Spill Modelling, Pusan, Republic of Korea
<i>July</i>	Memorandum of Agreement with KORDI, Republic of Korea on cooperative activities. Memorandum of Agreement with S14MA, Democratic People's Republic of Korea on the Development of Marine Pollution Monitoring Programme for Nampo Region
<i>August</i>	Adoption of the Strategic Environmental Management Plan and Action Plan for Integrated Waste Management in Batangas Bay by the Batangas Bay Council
<i>September</i>	IMO's Secretary-General's visit to the Philippines IPS/IMO International Conference on Navigational Safety and Control of Pollution in the Straits of Malacca and Singapore, Singapore Coastal Environmental Profile of the Batangas Bay Region, published Voluntary Agreements on Integrated Waste Management between public and private sectors signed in Batangas
<i>October</i>	Regional Training Course on the Application of Integrated Coastal Management System in Marine Pollution Prevention and Management, Philippines, People's Republic of China and Singapore Workshop on the Ratification and Implementation of MARPOL, Singapore Final Draft of Malacca Straits Environmental Profile Adoption of Marine Functional Zonation Scheme for Xiamen, Xiamen Municipal Government Strategic Environmental Management Plan for the Batangas Bay Region, published GIS Training for Bauan Municipal Staff, Batangas
<i>November</i>	Regional Conference on Sustainable Financing Mechanisms for the Prevention and Management of Marine Pollution: Public Sector-Private Sector Partnerships, Manila, Philippines ENRO-Bulletin, Volume 1, No. 1, published Consultative Meeting on Malacca Straits Demonstration Project, Manila, Philippines
<i>December</i>	Third Meeting of the Programme Steering Committee, Kuala Lumpur, Malaysia Coastal Environmental Profile for Xiamen, published Strategic Environmental Management Plan for Xiamen, published Integrated Waste Management Action Plan for Batangas Bay Region, published Summary Proceedings of the International Workshop on Integrated Coastal Management in Tropical Developing Countries: Lessons Learned from Successes and Failures, published Marine Pollution Updates, Volume 2, No. 3, published GIS Training (follow-on) for Xiamen Demonstration Site Staff Staff exchange between Batangas and Xiamen, hands-on training in Xiamen chemical laboratory

MOBILIZATION OF RESOURCES

Cooperative and collaborative working arrangements have been established with other United Nations (UN) agencies, donors and participating governments. For example, a Memorandum of Agreement has been developed with the Food and Agriculture Organization (FAO) to complete a hazardous waste (pesticide) assessment project in Xiamen and Batangas. Similar agreements have also resulted in the channelling of external resources in support of conferences, workshops, ICM training and publication of the *Tropical Coasts* newsletter. A total of US\$ 7.4 million has been mobilized by the governments of PR China, the Philippines, the Republic of Korea and Norway; donor agencies such as the Swedish International Development Agency (Sida), the International Development Research Centre (IDRC) and the Danish Cooperation for Environment and Development (DANCED); UNDP and IMO. Memoranda of Agreement and Understanding have been signed with six government agencies, one donor agency and two NGOs as part of the mobilization initiative.

Mobilization of financial resources



AGREEMENTS WITH STAKEHOLDERS	DURATION
Memorandum of Agreement (MOA) between IMO and State Hydrometeorological Administration (SHMA), Democratic People's Republic of Korea (Developed)	1996 to 1998
MOA between the IMO and the Food and Agriculture Organization of the United Nations (Developed)	1997
MOA between IMO and Korea Ocean Research and Development Institute (KORDI) (SIGNED: September 1996)	1996 to 1998
MOA between IMO and the Provincial Government of Batangas (SIGNED: August 1996)	1996 to 1998
MOA between the IMO and the Coastal Management Center (CMC) (SIGNED: November 1994)	1994 to 1998
Memorandum of Understanding (MOU) between Swedish Agency for Research Cooperation with Developing Countries (SAREC) Marine Science Programme and IMO, and the Ministry of Science, Technology and Environment of Vietnam (SIGNED: March 1994)	1994 to 1998
MOU between UNDP, IMO and DENR with the Local Government Units of Batangas and the Batangas Coastal Resources Management Foundation (BCRMF) in the Philippines (SIGNED: April 1994)	1994 to 1998
MOU between IMO and the Municipal Government of Xiamen, China (SIGNED: October 1994)	1994 to 1998

2 KEY LESSONS LEARNED IN 1996

The work program for 1996 has resulted in numerous outputs which are described in the succeeding sections. In addition to the outputs, a number of important lessons have begun to emerge and these too are worth sharing.

Information management

The preparation of coastal environmental profiles for the demonstration sites in Batangas Bay, Philippines; Xiamen, China; and the Straits of Malacca have resulted in three substantive documents. But these documents were not produced without a major effort and time input on the part of contributors from local and national governments, scientific and technical institutions, academe and the private sector. In all cases, the information that was being put together had to be extracted from a variety of sources, in an assortment of formats, and compiled at a central location. The data were reviewed, analyzed, and either incorporated into the compendium of material that eventually resulted in the environmental profiles, or discarded. In total, it is estimated that more than 9 person-years were involved in gathering, compiling and preparing the three profiles, (roughly estimated to be 3.5 person-years, 2 person-years and 3.5 person-years for Xiamen, Batangas and the Malacca Straits, respectively).

The lesson that has been reinforced through this exercise is that if marine pollution management programs are to be sustainable, the legacy of information must be preserved. In other words, data which have been and continue to be collected as part of diverse projects and programs at local, national and regional levels, need to be accessible. Accessibility of data refers to two elements, namely: a clear definition of data location; and unobstructed availability and use of data. Centralization of data from different sources into a common "database warehouse" is one way of addressing the location issue. However, warehousing is only part of the requirement. The data still need to be put into a format that is useable.

In other words, standards may need to be identified which specify the type and quality of data to be gathered, and the manner in which such data are stored, transferred, analyzed and reported.

There are obvious concerns and constraints with respect to centralized databases, especially when such databases span a geographic area the breadth of the East Asian Seas. With the use of electronic communication networks, the requirement does not necessarily involve the establishment of one large warehouse containing all data. Rather, the Programme's concept of an information network, namely a series of manageable mini-warehouses with the capacity to receive and transfer information among suppliers and users of data, appears far more practical and cost-effective.

Marine pollution monitoring

The mention of marine and coastal environmental monitoring programs often congers up visions of expensive sampling vessels, large laboratories and sophisticated analytical instruments. However, the experience of the Programme has changed this perception. Two elements contributed to the change, namely: the integration and sharing of monitoring and analytical activities among the public and private sectors; and the training and utilization of existing human resources at the local government level.

In Xiamen, several agencies have mandates for obtaining environmental data and monitoring the marine environment. In the past, difficulties were encountered because each agency pursued its own mandate with very little flexibility or integration with other groups. Through the Programme, implementation of a co-ordinated and complementary monitoring program, which optimized existing resources and avoided duplication was initiated, spearheaded by the local government. A similar situation occurred in Batangas, where local government, industry, academe and NGOs combined resources, facilities and expertise in formulating an environmental

If marine pollution management programs are to be sustainable, the legacy of information must be preserved.

monitoring program. The need for significant investment by a single agency or sector has been avoided.

A second factor has been the development of local monitoring programs which are based upon parameters that are highly significant but relatively easy to determine. Upon confirmation of management-oriented monitoring programs, training of local staff was undertaken. Experience in the Philippines (i.e., Batangas), Cambodia, Vietnam and DPR Korea has proven that the financial investment required to initiate functional monitoring programs is manageable, and that the human resource potential at the community level, with the capacity to competently conduct such programs, is virtually unmined.

The Programme's approach is to tap this resource through national and local government programs, and thereby establish a network of monitoring sites across the region. In addition to gathering information on the state of marine environment in the East Asian Seas, such initiatives also contribute to social and economic goals such as job creation, poverty alleviation, environmental awareness and technological advancement.

Integrated coastal management development and application

In May 1996, the Programme co-sponsored an international workshop on ICM application in tropical developing countries. One of the outputs of the workshop was a summary document on good practices in ICM initiatives. The document lists seven steps to good ICM practice, as well as four stages in an evolutionary process, progressing from initial demonstration sites to full-fledged national programs. The meeting of international experts confirmed the value of the work which has been implemented at the demonstration sites in the Philippines and in China. At the same time, the group supported the strategy that ICM should be promoted at the local level.

The obvious challenge to such an approach is the time, resources and technical support required to extend the ICM working models to other countries in the region and to replicate sites within countries. The Programme viewed the challenge from two fronts, namely: i) preparation and implementation of national plans of action for prevention and management of

Experience in the Philippines (i.e., Batangas), Cambodia, Vietnam and DPR Korea has proven that the financial investment required to initiate functional monitoring programs is manageable, and that the human resource potential at the community level, with the capacity to competently conduct such programs, is virtually unmined.

Seven steps to good ICM practices

1. Adopt a systematic, incremental approach in developing and implementing ICM projects and programs.
2. Involve the public in the ICM process.
3. Integrate environmental, economic, and social information from the very beginning of the ICM process.
4. Establish mechanisms for integration and coordination.
5. Establish sustainable financing mechanisms.
6. Develop ICM capacity at all levels.
7. Monitor the effectiveness of ICM projects and programs.

marine pollution through ICM application in coastal areas; and ii) mobilization and channelling of resources from public and private sectors, nationally and internationally, to marine pollution programs within the ICM framework. The endeavours that have been implemented in the Philippines and China are prototypes in ICM practice. These prototypes now need to be marketed and extended to other participating countries through training, information networking and the formation of innovative partnerships.

Economic instruments and their application in marine pollution initiatives

Case studies were completed on the application of economic instruments to sustain the operation of shore reception facilities, sewage collection and treatment services, solid waste management, navigational safety and pollution management in port areas. One common message emerged from the case studies. The message was that economic instruments, to be accepted and successfully implemented, have to be tailored to the local situation. Economic instruments need to be supported by awareness programs to educate sectors that will be affected, and bolstered by a legal framework that will protect public interest, users and potential investors. For example, the implementation of a user fee system for sewage collection and treatment in Malaysia has been hampered by the public's perception that the newly imposed fees were excessive and that inadequate services were being provided. The conclusion was that the transition from a so-called "free service" to a user pay service was too rapid, and was undertaken with inadequate public consultation, consensus building and legal authority. Similar situations were presented in other case studies.

The development and application of economic instruments for marine pollution activities, such as BOT schemes, user fees and

property and tenorial rights, must build on local political, social, cultural, legal and technical strengths. Early instruments need to be seen as fair, easily administered and well targeted. More sophisticated mechanisms can be phased in gradually, in conjunction with supporting regulations, and monitoring and enforcement capabilities.

Investment opportunities

Realization of benefit is a primary consideration in the successful promotion of opportunities for investment, whether the investment comes from the public purse, the private sector or some combination of the two.

The public sector looks at investment from the perspective of public good and the socio-economic benefits to the community at large. The private sector considers investment with a view to return-on-investment, security and profitability.

The Programme has identified a number of opportunities for investment in marine pollution programs, from environmental data gathering at the local

community level, to training of seafarers, to construction and operation of shore reception facilities, to building an electronic highway across the East Asian Seas. However, for each opportunity, there are costs, benefits and risk factors that need to be explored, quantified to the extent possible, and translated into terms that are appreciated by politicians, decision-makers, potential investors and the general public. Opportunities that provide win-win outcomes with respect to public good and economic benefit are a first priority in the evolution of sustainable marine pollution initiatives.

Partnerships

Public sector-private sector partnerships have been promoted as a financial mechanism for ensuring sustainability of marine pollution

To be successful, economic instruments must be tailored to local situations, supported by awareness programs and bolstered by legal frameworks.

Partnerships between the two sectors require a sharing of responsibility. The manner in which such responsibility is divested from government to the private sector, the duration of agreements and the rights of parties throughout the contract period are principal among the points of early negotiation in the partnership development process.

programs. Since the history of such programs in the East Asia region is relatively short, there is a lack of confidence and know-how with respect to handling such partnerships. The Regional Conference on Sustainable Financing Mechanisms, held in November 1996, addressed this issue and came forward with a series of recommendations for promoting and strengthening partnerships in the region. Overall, the feasibility of public sector-private sector partnerships is based upon three simple elements:

- shared investments
- shared risks
- shared revenues

Partnerships between the two sectors require a sharing of responsibility. The manner in which such responsibility is divested from government to the private sector, the duration of agreements and the rights of parties throughout the contract period are principal among the points of early negotiation in the partnership development process.



Governor Hermilando Mandanas and a local government official with IMO Secretary-General W. A. O'Neil during the inauguration of the Batangas Bay Council for Integrated Coastal Management.

3 FROM PLANNING TO ACTION

Project implementation in 1996 included activities in all components of the Regional Programme. Highlights of the activities and the related outputs are summarized under the headings of capacity building, enabling activities and financing the investment.

CAPACITY BUILDING

Strategies in capacity building were operationalized through project activities at the three demonstration sites, workshops and internship programs, formal training programs, and the transfer of information and data to stakeholders in the region.

Institutionalization of ICM programs

Institutionalization of ICM programs at Batangas and Xiamen was substantially achieved in 1996.

In Batangas, the Programme completed an environmental profile, a Strategic Management Plan and a study of institutional arrangements for managing Batangas Bay. In line with the concepts and recommendations arising from these activities, the Batangas Provincial Government established an Environment and Natural Resources Office (PG-ENRO) in January 1996. In May, as a consequence of a Provincial Ordinance, the Batangas Bay Council for Integrated Coastal Management, composed of representatives of concerned provincial and local government units, industry and NGOs, was organized with the PG-ENRO as the operational arm. The Council adopted a Strategic Management Plan and an Action Plan for Integrated Waste Management. The Council also reviewed proposed development projects in the Bay area.

In Xiamen, building on the experience of the Executive Committee for the Xiamen Demonstration Project, the Xiamen Municipal Government established a permanent Integrated Marine Management and Coordination Committee in early 1996. The Marine Management Division, originally affiliated with the Municipal Science and Technology Commission, was placed under the Secretary-General of the Municipal Government, and became the Coordinating Office for the Committee. The reorganization in Xiamen

signifies the determination of the local government to embark on an integrated coastal management path and to accord priority to coastal and marine issues. A group of experts was instituted to advise the Committee on technical and scientific matters, utilizing the technical expertise that had been mobilized as part of project implementation. The newly established mechanism has already proved effective in resolving a number of resource use conflicts in the coastal area of Xiamen.

Responsibilities of the Marine Management and Coordination Committee of Xiamen

The Marine Management and Coordination Committee was specifically tasked to undertake the following:

- (1) prepare a functional zonation scheme;
- (2) protect and manage the marine environment;
- (3) enact local coastal and marine regulations;
- (4) enforce the law jointly with relevant agencies to address coastal use conflicts; and
- (5) manage the activities covering the use of coastal resources.

Its implementing arm, the Coordination Committee Office, was charged with planning, development, construction, management and coordination of the areas beyond the high tide line. Through these mechanisms, regulations were prepared for submission to the Municipal Government covering such subjects as a functional zonation scheme, utilization of maritime space, environmental protection and aquaculture in marine waters.

Legislation on marine area management has recently been submitted to the Xiamen Municipal Congress for adoption. The legislation will institutionalize multi-sectoral participation in coastal management, integrated impact assessment and permit system, and the use of market-based instruments to regulate users of coastal resources.

The Batangas and Xiamen sites provide examples of institutional frameworks which have been successfully established to manage coastal and marine activities at the local level, and which will continue to function beyond the life of the Regional Programme.

Some ground level applications of the ICM system: the Xiamen experience

Multi-sectoral consultation

A proposed project to construct a new shipyard near Paitou Village, Haicang Township, Xiamen, was heavily opposed by the traditional fish farming communities. In line with the marine functional zonation scheme, mariculture activities were required to move out of the area which had been designated for shipping. A potential conflict was apparent. To resolve the conflict, the Office for the Integrated Marine Management and Coordination Committee initiated consultations with the concerned parties, including the port authority, fisheries sector and management agency and the marine public security. After several rounds of consultation, an agreement was reached. The shipyard operators agreed to compensate the fish farmers at a mutually agreed amount. The aquaculture operations were shifted to an area designated for mariculture. The Office issued a notice through mass media to the concerned local communities and general public. The action paved the way for the construction of the shipyard.

Joint law enforcement

Eel farming is a lucrative business in Xiamen. For a long time, eel-fry gathering in the major shipping lanes and harbours has posed a serious threat to navigational safety. This became an intractable problem due to the lack of consultation and coordination among concerned sectors and government agencies. The Coordinating Office took the following actions: initiation of consultation among concerned government agencies; implementation of public awareness drives; and organization of joint marine policing activities by the concerned implementing agencies. The actions effectively eliminated illegal fishing in the shipping routes and anchorage areas of the Xiamen marine waters.

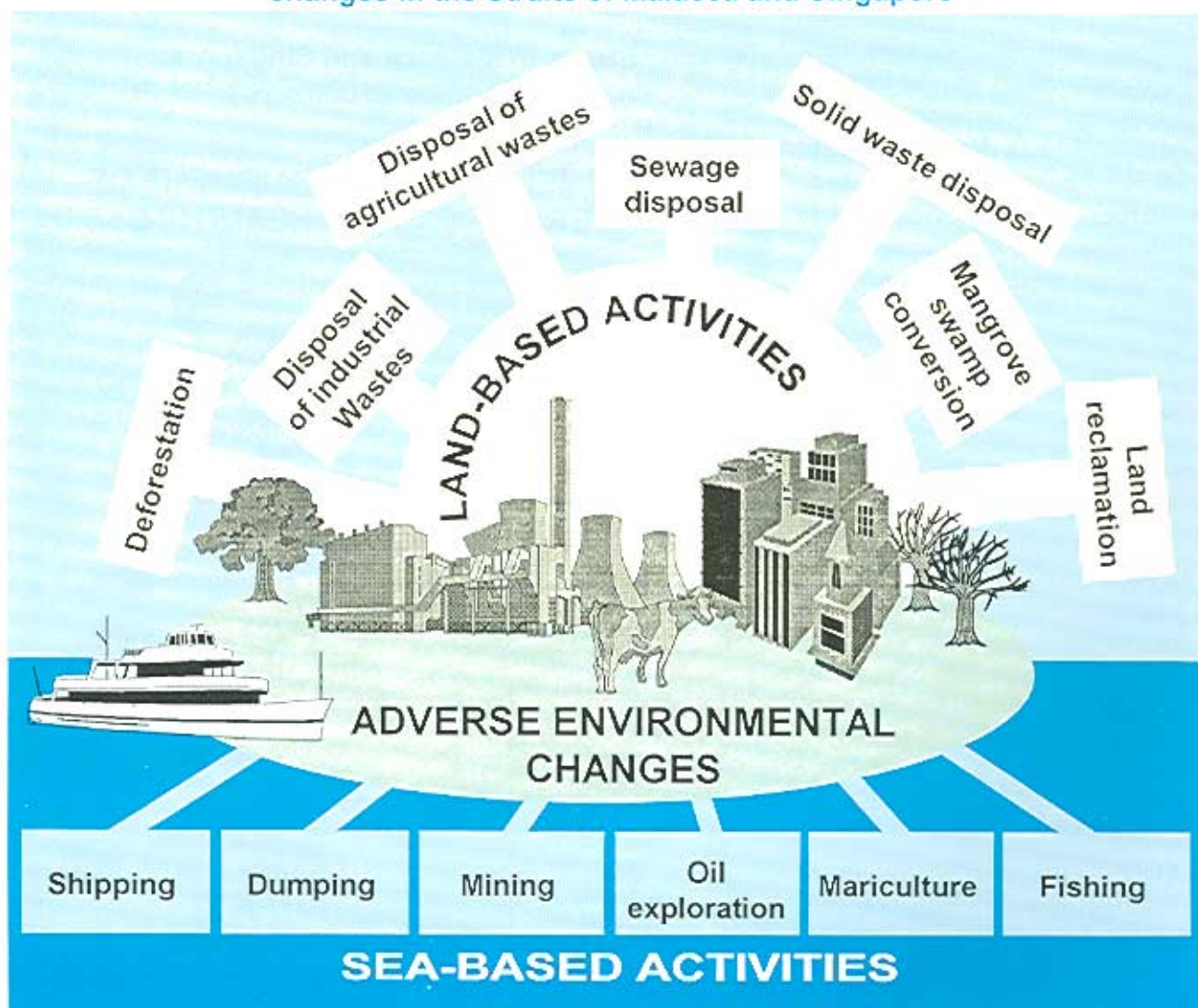
Malacca Straits Environmental Profile

One of the objectives of the Regional Programme is to assist the littoral States of the Malacca Straits to identify existing and potential pollution risks to the coastal and marine environment of the Malacca Straits, to strengthen surveillance and regulatory mechanisms and instruments for managing pollution in the Straits, and to package the approaches, methods and the experience for use in other subregions where similar issues are apparent. The Programme has completed an environmental profile of the Straits, which identifies:

- (1) the various sources of pollution, both land-based and sea-based;
- (2) the living and non-living resources of the Straits;
- (3) the state of the marine environment, including some of the measurable indicators of marine pollution and the effects on living and non-living resources; and
- (4) controls and interventions that have been put in place to manage marine pollution in the Straits.

The environmental profile identifies the Straits as a unique tropical environment, as well as one of the busiest sea routes for international navigation in the world. The profile contains an inventory of living and non-living resources,

Human activities contributing to adverse environmental changes in the Straits of Malacca and Singapore



Malacca Straits profile

About 480,000 hectares of mangroves border the Straits, serving as a coastal habitat and nursery ground for fisheries, a supply of fuel and other products and a buffer for shoreline protection. The area of mangroves in the Straits constitutes between 6% to 8% of the total world mangroves.

Seagrass beds thrive in the shallow waters of the Straits, forming an important coastal submerged ecosystem and playing a significant role in breeding, feeding and nursery grounds for fish, shrimp and dugongs. About 20% of the 50 species of seagrasses in the world are found in the Straits.

Fish production in the Straits was about 865,000 tons in 1990 and 884,000 tons in 1993. Available data indicate that the catch per unit effort (CPUE) for the pelagic and demersal fisheries in

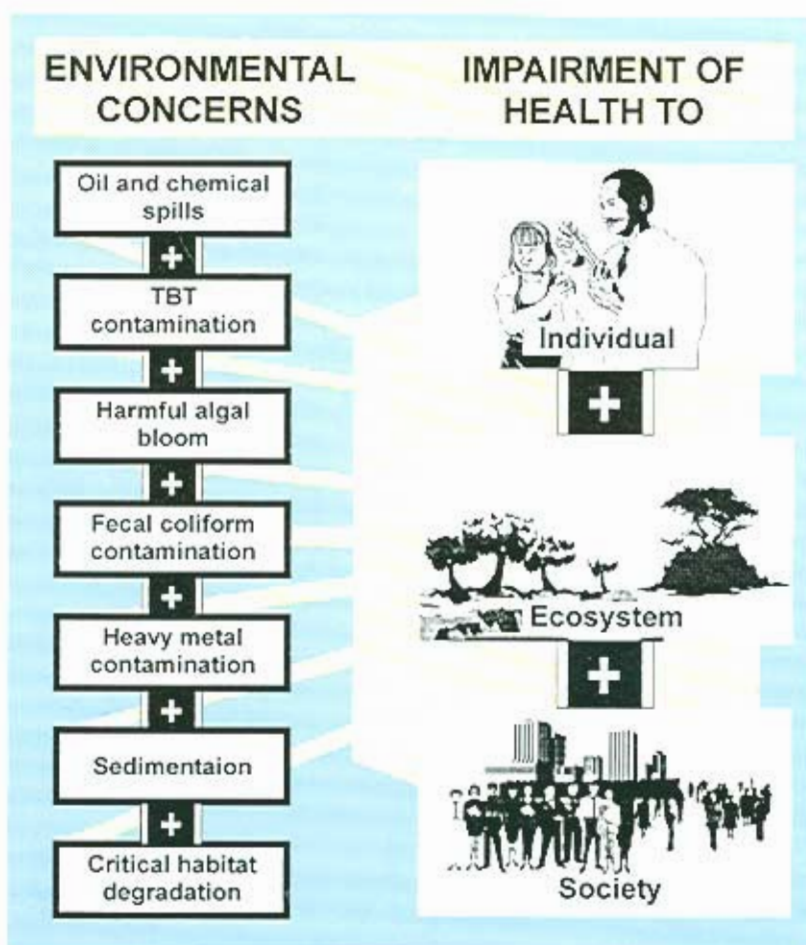
the Straits are on a sharp decline. The conclusion is that fisheries in the Straits are being overexploited. In the early 1950's, fish known locally as ikan terobok (*Alosa toli*) and another species of Clupeids (*Lactarius lactarius*) were abundant in the Straits. Today, the former is rarely caught and the latter have completely disappeared. Similarly, the population of stingrays has also decreased and dugongs (*Dugong dugong*), which feed on seagrasses and were once a common sight in the Strait of Malacca, are now scarce.

The RED LIST of Singapore identifies species declared extinct or at the verge of extinction. The numbers are staggering, including 52 species of fish, 13 species of coral and sea anemones and 12 species of crustaceans declared extinct. More than 50 other species are considered threatened.

current policies, strategies and initiatives taken by the littoral States, regional and international organizations in the management of land-based and sea-based sources of pollution, and information on key management issues that require attention in the Straits.

The profile determined that human activities in and along the Straits have caused considerable impact on the environment. Major concerns include: oil and chemical spills; harmful algal blooms and fish kills; tributyltin contamination; fecal coliform contamination; heavy metal pollution; sedimentation; and the degradation of natural habitats. The economic benefit and potential development of the coastal areas and living resources were also examined in the document. Overall, the profile provides a baseline of information on the state of environment in the Straits.

Straits of Malacca and Singapore: environmental concerns



But the profile also points out gaps and uncertainties with respect to the Straits. For example, although environmental monitoring is being conducted by environmental agencies and institutions in each of the littoral States, there is very little co-ordination of programs within or among the States, or sharing of results. A regional mechanism has yet to be in place to provide managers in each of the littoral States, individually and collectively, with information to determine the state of marine environment in the Straits, the effectiveness of existing interventions and the potential impact of future developments and activities, nationally and subregionally.

The profile has been developed as a resource document for stakeholders from the littoral States, Straits' users and beneficiaries of the Straits. In addition, within the Programme, the document is being employed as resource material for completing the initial risk assessment of the Malacca Straits.

Scientific, technical and legal capacities

During 1996, the development and testing of critical scientific, technical and legal tools and techniques for application of marine pollution prevention and management programs occurred. Highlights of these activities are summarized below:

Geographic Information Systems (GIS) and Information Management

In Xiamen, the development of a marine pollution management database has been initiated. The database will incorporate the results of marine pollution monitoring, as well as support the implementation of the marine zonation scheme. A management atlas is being compiled from the database, which will be used by various agencies with mandates in the coastal and marine area for planning and management in Xiamen. Remotely sensed data for 1989, 1992 and 1996 have been integrated into the database providing additional important spatial information, especially on urban development and expansion.

The GIS activities in the Batangas Bay Demonstration Project are quite similar to that of Xiamen. A spatial database for environmental

management is being established. Currently, the database has 15 basic digital maps that have been encoded from 140 thematic maps, 5 nautical charts and over 200 cadastral maps. A substudy using GIS is underway to assist the Municipality of Bauan in the development of a general land use plan. About 10 thematic maps from the database have been provided to the planning team of Bauan and follow-up work is in progress. The GIS is also being used to support the activities of the Integrated Waste Management Action Plan of the Bay region through site suitability assessment for a sanitary landfill. Other activities in progress are the evaluation of existing zone plans of the Bay region and the development of a water-use zone plan.

The Malacca Straits which are heavily travelled by various types and sizes of vessels, have the potential for acute accidental oil and chemical spills. Ascertaining such risks need accurate spatial information not only on the potential trajectories of such spills but more importantly, on what might be affected along its path (i.e., coastal habitats and resources; economic activities). Sensitivity mapping addresses this void. In general, such

Geographic information systems

One of the capacity building activities of the Programme is the development, application and transfer of spatial databases and environmental management atlases at the three demonstration sites. This is being accomplished through the use of geographic information systems (GIS). GIS is an analytical tool that can be used to generate spatial information on coastal and marine resources and environmental conditions. The electronic databases complement the information found in the environmental profiles, allowing information to be periodically updated, particularly with respect to changes in the management areas. Such databases, in combination with GIS, serve to provide decision-makers with the ability to generate various scenarios to aid them in policy formulation or reform.

mapping procedure largely considers the geomorphic characteristics of coastal areas and classifies them based on their degree of vulnerability or exposure. Ecological (e.g., coastal ecosystems and natural resources) and socio-economic (e.g., fishing or coastal communities; livelihood dependency on coastal fisheries and aquaculture; and resort areas) characteristics need to be considered in establishing vulnerability or sensitivity indices for the coastal areas. In addition to sensitivity mapping, a spatial database will be developed leading to a management atlas for risk management of marine pollution in the Straits using GIS.

Legal Information Database

The establishment and development of a Legal Information Database has been undertaken for the purpose of providing an information center for official documents and commentaries on the legal aspects of marine pollution at the international, regional and national levels. The database brings together materials which are currently in separate collections, or are difficult to access. The separate collections referred to are international, such as the IMO, UN Division of Ocean Affairs and Law of the Sea (DOALOS), and UNEP; regional, such as the APCEL database



Hands-on training in marine pollution monitoring – Vietnam.

(currently under development at the Asia-Pacific Centre for Environmental Law, Faculty of Law, National University of Singapore); and national agencies of the participating countries. The annotative materials, such as journal articles, conference proceedings, etc. are being sourced from libraries and resources persons. Contacts have been made with operators of related databases, with the intention of linking databases where possible.

Assessment of National Legislation and Constraints to Ratification and Implementation of International Conventions on Marine Pollution

Work was undertaken in 1996 to assess the appropriateness and adequacy of existing national legislation and regulations and to identify the constraints to the ratification and implementation of international conventions in six countries: Cambodia, Indonesia, Malaysia, Philippines, Thailand, and Vietnam. The outputs will be employed to provide assistance in strengthening legislation and improving enforcement capacities. From early assessments, it has been observed that provisions relating to marine pollution are scattered in many separate pieces of legislation. Also, in many countries, laws on marine pollution are statements couched in general terms, with little definition of authority or mechanisms of enforcement.

Laboratory and monitoring programs

A major effort was made by the Programme to assist the local government units in Xiamen and Batangas to conceptualize and develop pollution monitoring programs. Suitable environmental parameters were identified for monitoring, and pinpointing equipment and supplies needed in the respective laboratories. Direction was also provided on sampling and analytical methodologies.

Special efforts in monitoring were also focused on lesser developed countries in the region. A training course entitled, "Marine Water Sampling and Field Measurements," was held at the Do Son Marine Monitoring Station, Haiphong, Vietnam, in March 1996. A total of 22 participants from institutions in Vietnam attended. The

training course consisted of lectures and field and laboratory exercises. Its purpose was to provide participants with practical knowledge of seawater sampling and field measurements. Similar initiatives are being developed in Cambodia and DPR Korea.

The theme adopted by the Programme was to build up existing capabilities, both in terms of manpower and instrumentation. Equipment was purchased for Batangas, Xiamen and Vietnam, based upon existing resources in participating institutions and financial support being provided by funding institutions (e.g., Sida). Commitments have been made for the purchase of pollution monitoring and analytical equipment for Cambodia and DPR Korea in 1997.

Oil spill workshop

In collaboration with KORDI and with co-sponsorship from IOC/WESTPAC, the Programme organized a Regional Workshop on Oil Spill Modelling in June 1996. Some 50 experts from 10 countries of the region participated in the

workshop. State of the art modelling, particularly the experience with hydrodynamic and trajectory models, with special reference to modelling activities in the Malacca Straits, was assessed. A set of guidelines for improving modelling efforts through international cooperation on the subregional level was produced, and a draft action plan for application of common models by the littoral States of the Malacca Straits was developed. It is expected that necessary support will be mobilized to implement the plan. Experiences gained from these activities will be extended to other subregions.

Integrated coastal management

The Second Regional Training Course on the Application of Integrated Coastal Management System in Marine Pollution Prevention and Management was held in October with 23 participants from 11 countries. The course venues included sites in Batangas Bay, Xiamen and Singapore to provide participants with an appreciation of the practical issues and solutions for the prevention and management of marine pollution.

Features of the regional training course on the application of ICM system in marine pollution prevention and management

1. Practical experience in ICM system development with two thirds of the course time being devoted to field studies at 17 selected sites in China, Philippines and Singapore;
2. Improving institutional frameworks in order to implement effective technical and engineering interventions in ICM application;
3. Examination of ICM application under different socio-economic systems: market-based developing economy; market-based developed economy; and developing economy of central planning and market mechanisms;
4. Exploration of rural and urban applications of the ICM system;
5. Identification of integrated waste management practices, covering hazardous and non-hazardous waste, waste minimization, and integrated facilities and services;
6. Examination of sustainable financing mechanisms and options at the local and national level, including property rights, public and private partnership and use of market-based instruments (MBIs);
7. Analysis of international cooperation in ICM application, particularly at the regional and subregional levels, the networking of ICM sites and projects, compliance with international conventions and guidelines on marine pollution; and
8. Development of ICM strategic planning and application, particularly at the local level.

On-the-job training and internship

On-the-job training was given to some 15 staff in Batangas and Xiamen to build up local expertise in GIS application. Staff exchanges between Xiamen and the Programme Office provided training in project development and management, while staff from the Batangas site spent three weeks in Xiamen, developing their skills in analytical techniques for marine pollution monitoring.

Three young scientists from DPR Korea and Vietnam received internships at the Programme Office to learn about environmental profiling, ICM strategic planning and project development. The experience allowed the interns to be actively involved in the Programme implementation and to develop as effective forces in the regional networking of ICM programs.

Information dissemination

Information dissemination under the Regional Programme includes the preparation, publication and distribution of technical and scientific reports, as well as the preparation of numerous technical papers. Most of the technical papers are presented at workshops and conferences, including those organized by the Programme. In addition, the Programme prepares in-house research reports, quarterly reports, case studies and mission reports which receive limited distribution to participating countries, UNDP and IMO. Other outputs from the Programme include the *Tropical Coasts* newsletter and the *Marine Pollution Updates*.

Since 1994, a number of activities implemented by the Programme have resulted in documents which have been published under the Technical Report Series. The Series also include documents arising from workshops and conferences organized by the Programme, or jointly sponsored with donor agencies and institutions. One such event in 1996 was the International Workshop on Integrated Coastal Management in Tropical Developing Countries: Lessons Learned from Successes and Failures, held in Xiamen. Two documents have been published as a result of the Xiamen workshop: a summary of proceedings and a manual of good ICM practices. The latter distilled lessons learned from ICM initiatives world-wide into a set of practical guidelines and principles for ICM. The document is being translated into Chinese, Indonesian, Thai, Korean, Vietnamese, French, Portuguese and Swahili.

The environmental profiles and strategic management plans for the demonstration sites and the Programme's annual report are published under the Technical Series. To date, there are eight published documents in the Programme's Technical Report Series, as identified in Annex 1.

Tropical Coasts

Tropical Coasts is a bi-annual publication of the Regional Programme, the Sida/SAREC Marine Science Programme and the Coastal Management Center. Four issues have been published and distributed.

Efforts are underway to make the newsletter sustainable. At present, *Tropical Coasts* is distributed free of charge to 790 institutions and individuals in 53 countries.

For 1996, the major themes of *Tropical Coasts* were obligations and opportunities associated with international conventions on marine pollution prevention and management, and integrated coastal management initiatives in Eastern Africa. The latter was a special issue for the October 1996 Integrated Coastal Management Ministerial Conference in Seychelles, organized by Sida.

Forthcoming issues will focus on sustainable financing, marine pollution monitoring and marine biodiversity.

Marine Pollution Updates

The *Marine Pollution Updates* is issued quarterly and, thus far, eight issues have been published. For 1996, *Updates* covered significant developments in the Regional Programme, including events at the Xiamen and Batangas Demonstration Sites, the visit of the IMO Secretary-General, Mr. W. A. O'Neil, to the Philippines and the institutionalization of a regional marine pollution monitoring network. **The *Marine Pollution Updates* is distributed free of charge to 545 institutions and individuals in 53 countries.**

ENABLING ACTIVITIES

Regional Network on the Legal Aspects of Marine Pollution

A network on the legal aspects of marine pollution was established at an inception workshop held in Manila in the first quarter of 1996. The objectives of the network are to develop the necessary legislative and technical capacity to ratify and implement international conventions relating to marine pollution by enhancing the knowledge and capabilities of its members, thereby enabling them to contribute to:

- the development, design and implementation of activities which strengthen marine pollution legislation and implementation of international conventions and agreements;
- the formulation of proposals concerning regional policies and agreements; and
- the cooperation and collaboration among national, regional and international organizations, programs and projects.

The network established working relationships with the National University of Singapore (NUS), Faculty of Law and with the Maritime Institute of Malaysia (MIMA). With the former, cooperation on the Legal Information Database with the Asia-Pacific Centre for Environmental Law (APCEL) was instituted. APCEL is developing a regional database on environmental law. MIMA, a policy research institute of the Malaysian Government, has agreed to collaborate on the development of Guidelines for National Legislation on Marine Pollution Prevention and Management in the East Asian Seas, during the first half of 1997.

Regional Marine Pollution Monitoring and Information Management Network

The inception workshop of the Regional Marine Pollution Monitoring and Information Management Network was held in April 1996. The Network is seen as an effective mechanism to periodically assess the state and trend of marine pollution at various sites in the East Asian Seas. It

is also targeted at transferring information among Network members, information that enhances the effectiveness of marine pollution monitoring with respect to decision-making and the evaluation of pollution management strategies and interventions.

One unique aspect of the Network is the private sector participation in marine pollution monitoring. Here, the multi-sectoral program at the demonstration sites involves monitoring of the receiving coastal waters to determine the condition of the water bodies in relation to their designated uses. In Batangas, for example, the private sector is well-placed and capable of providing logistic support, including sampling vessels and analysis of parameters that are routinely determined in their laboratories (e.g., oil and grease).

Ratification and implementation of MARPOL 73/78

A project funded by the Government of Norway and implemented as part of the international convention component of the Regional Programme is focused on the ratification and implementation of MARPOL in four countries: Cambodia, Indonesia, the Philippines and Vietnam. Representatives of the four countries attended an initial workshop in Singapore, in October 1996, to develop individual work plans for strengthening MARPOL implementation. The workshop was co-sponsored by the APCEL, Faculty of Law, NUS, and the Maritime and Port Authority of Singapore. Outputs from the workshop included practical work plans for progressing toward ratification and improved implementation of MARPOL and other IMO conventions over the next year.

Harmonizing approaches and mechanisms

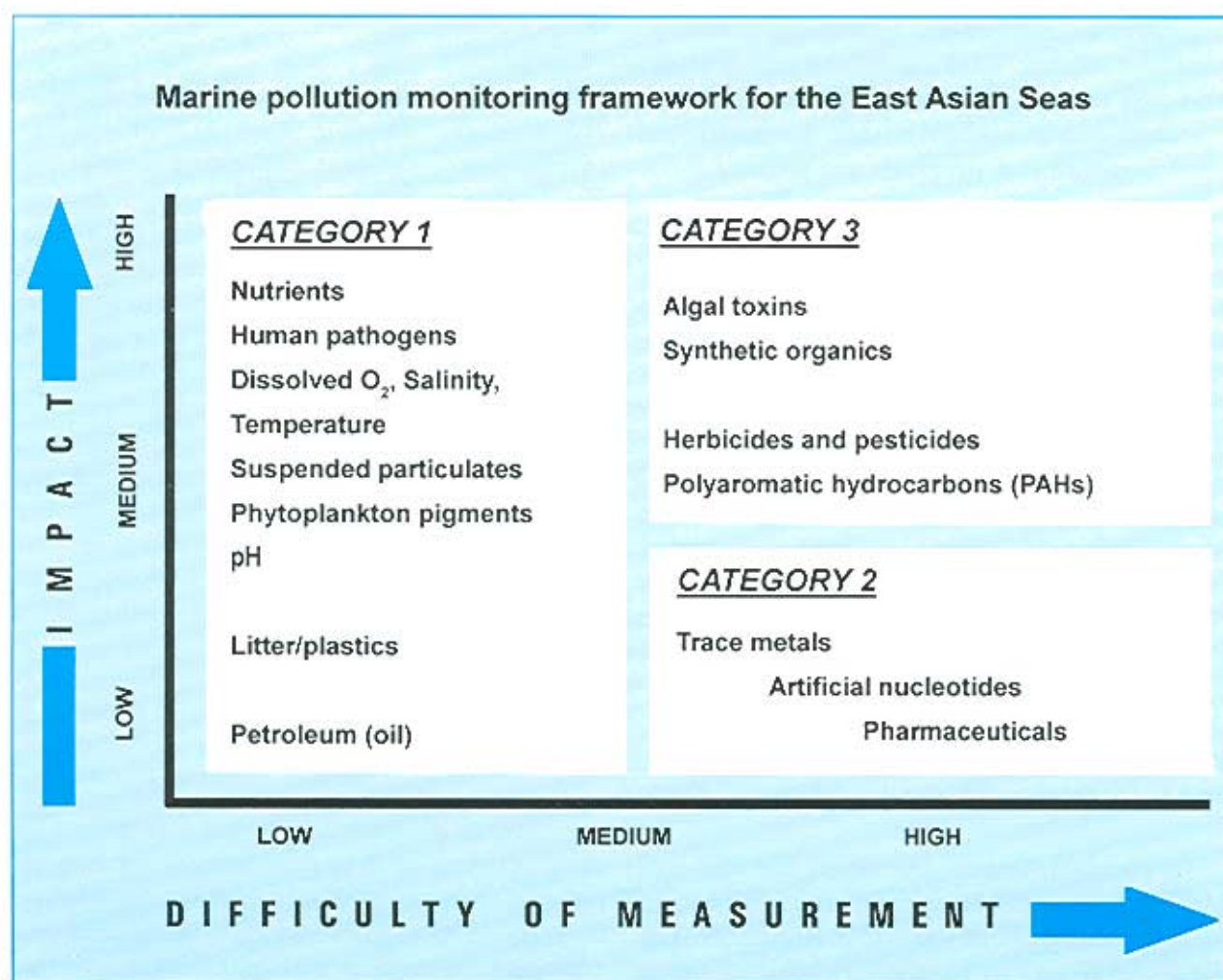
A key element of the marine pollution monitoring effort is to harmonize approaches in pollution monitoring. Discussions at a workshop in early 1996 focused on the state of marine pollution monitoring efforts in the various countries in the East Asian region, the determination of appropriate monitoring strategies, as well as

identification of parameters and matrices that should be included in a pollution monitoring program. The participants also reviewed a draft manual for marine pollution monitoring and analysis. The consensus of the workshop was to publish and promote the manual as a major reference for pollution monitoring programs in the region.

The workshop also generated a basic marine pollution monitoring framework. The framework provides countries with monitoring options based on their current capabilities. The workshop also discussed ongoing and proposed monitoring programs at the Programme's demonstration sites. There was a general agreement to increase the use of Internet, more specifically e-mail and Web pages, as a mechanism to exchange information more efficiently among participants.

Voluntary agreements on integrated waste management

Within the framework of the Integrated Waste Management Action Plan for Batangas Bay, twelve industries and nine shipping companies signed voluntary agreements with concerned government agencies at the national and local level in September 1996. The agreements are a declaration on the part of waste generators to reduce waste generation and to improve the management of hazardous and non-hazardous waste over a five-year period. On the part of the public sector, the agreement provides allowances to companies which establish and implement schedules for achieving waste management goals, a format and schedule for monitoring progress, and collaboration in the development and implementation of both transitional and long-term waste management solutions.



Voluntary agreements between public and private sectors in waste management: the Batangas experience

Voluntary agreements have been developed and adapted in Batangas, containing the following principles:

Goals:

- measurable short-term and long-term targets to be achieved within identified timeframes
- designation of respective roles and responsibilities of signatories
- mechanism for tracking progress toward targets
- integration of activities within and across public and private sectors

Coverage:

- municipal solid waste
- municipal sewage
- industrial waste
- port and ship waste

Parties involved:

- Batangas City and the four coastal municipalities of Bauan, Mabini, San Pascual and Tingloy
- Provincial Government of Batangas
- national government agencies (Philippine Coast Guard, Philippines Ports Authority, Maritime Industry Authority, Department of Environment and Natural Resources)
- industries in the coastal area
- shipping companies
- port and terminal operators
- ship repair yards

Private sector responsibilities:

- determination of sources, quantities and characteristics of waste and handling methods
- development of work program and schedule for waste reduction and improved management
- utilization of accredited contractors and off-site facilities
- implementation of competent monitoring, reporting and tracking program
- commissioning and operating environmentally sound waste management facilities and services

Public sector responsibilities:

- clarification of regulatory requirements and authorities
- technical assistance and guidance on implementation of regulatory requirements
- accreditation of contractors and facilities
- promotion of integrated, centralized facilities and services for small-sized and medium-sized waste generators
- preparation of fair and equitable cost-recovery schemes for waste management services
- development of waste tracking system and supporting database
- monitoring the progress of public and private sector signatories in fulfilling the goals of the agreement

Duration: 5 years

Integrated Environmental Impact Assessment (IEIA)

Two successive workshops, organized by the Coastal Management Center (CMC) and the Regional Programme, in collaboration with Sida, were held in March and June 1996 to discuss and prepare a curriculum for a two-week training course on IEIA. The training materials are to be used by coastal managers, universities and institutions as part of their curriculum on environmental management. The target audiences will also include officers, administrators and consultants who are handling EIAs. The modules will emphasize the full advantages and benefits of IEIA which is wider in scope compared to the traditional EIA.

Two sets of training modules are being prepared, one for trainees and the other for trainers. The modules are to be finalized for a training course to be held in mid-1997. A multi-disciplinary team of experts from the region has been assigned the task of developing the modules.

Marine functional zonation scheme

A marine functional zonation scheme for Xiamen was formulated by the project team and adopted by the Xiamen Government in 1996. Four major development zones were classified in the scheme, namely:

- shipping and port
- tourism
- aquaculture
- resource conservation

Five subzones were also categorized under the scheme:

- development
- special uses
- limited development
- preservation
- nature reserves

A critical component of marine functional zonation concerns the definition of "dominant function," which requires an impact assessment and economic valuation. The Xiamen zonation scheme has been employed in the resolution of use conflicts and in the development of long term plans in the coastal and marine area.

Risk assessment/risk management in the Malacca Straits

The initial risk assessment of the Straits of Malacca was initiated in 1996 involving the appraisal of:

- (1) risks and uncertainties of major polluting sources and activities (land-based and sea-based) and the effects of pollution on living and non-living resources;
- (2) identification of endpoints that are the most significant indicators of ecological, human health and societal risk;
- (3) spatial and temporal scales;
- (4) interactions between sea-based and land-based activities and living and non-living resources in and along the Straits;
- (5) combined effects of multiple and diverse stresses on the ecology of the Straits; and
- (6) the systematic effect of a catastrophic event on the ecology of the Straits.

A regional workshop on risk assessment in the Malacca Straits will be implemented in 1997. The workshop will provide a forum for managers, scientists and technicians in the littoral States to learn more about regional risk assessment, and its potential application as a management tool in the Straits area. The workshop, and the products of the Malacca Straits' risk assessment, will also have application in other subregional sea areas within the East Asia region.

FINANCING THE INVESTMENT

Examination of various options and opportunities for ensuring the sustainability of national and subregional marine pollution prevention and management activities and programs confirmed that it is unlikely that any single mechanism or arrangement will meet the needs of all countries in the region. A two-pronged approach to financing the investment in marine pollution programs was implemented in 1996:

- (1) public sector-private sector partnerships at the local level, including joint ventures and privatization programs, where the benefits of marine pollution preventive and mitigative activities are most obvious and have direct value to the local users of the coastal environment; and
- (2) policies and programs of central governments which can be employed to enhance national capabilities for attracting investments by the private sector (national, regional and international) in the environmental industry of East Asia.

A series of case studies and research projects were completed in an attempt to identify investment opportunities, appropriate policies and programs for attracting investment, and financial mechanisms and procedures for sustaining investments and programs at the local and national levels. The first major milestone in the sustainable financing component of the project was a regional conference held in November 1996. The conference was attended by 203 participants from 24 countries, and was highlighted by a keynote address by H.E. Fidel V. Ramos, President of the Philippines.

Results of the Programme's research work and case studies were presented at the conference. Over the three days, participants examined roles and responsibilities of government, industry, NGOs and international agencies in the forging of partnerships, business opportunities, socio-economic benefits and economic instruments that can be utilized to promote and support such ventures. Recommendations for enhancing partnerships between public and private sectors in the region were developed.



H.E. President Fidel V. Ramos, DENR Secretary Victor O. Ramos and IMO's Dr. Chua Thia-Eng during the Special Dinner Reception of the Sustainable Financing Conference, November 1996.

Key Recommendations of the Sustainable Financing Conference

(1) National Governments and Non-State Entities:

- Prepare Plans of Action which target marine pollution prevention and management on a national and regional basis
- Develop national coastal policies and innovative programs aimed at providing Local Governments with the authority and capabilities to manage local coastal areas by establishing new financing initiatives to support marine pollution policies and programs on a long-term and self-reliant basis
- Accelerate the formation of public sector-private sector partnerships, through build-operate-transfer (BOT) and similar economic instruments
- Develop national and regional information infrastructures
- Develop technical assistance and financial incentive programs for the establishment of a sustainable national and regional environment industry, focusing on the advancement of small-sized and medium-sized enterprises

(2) Local Governments:

- Incorporate integrated coastal management strategies and practices into local planning, economic development, land management, social and environmental services and fiscal policies
- Develop partnerships with the private sector, both formal and informal, through contractual arrangements, BOT, joint ventures, or similar schemes, by generating proposals that are technically and financially sound, implementing competitive bidding procedures, clearly identifying procedures and requirements of government in project development and implementation, and serving as the focal point between project proponents and the public sector
- Enhance monitoring capacities in marine and coastal areas and strengthen regulatory and economic instruments at the local level by forming partnerships and voluntary agreements with the private sector, NGOs and the general public

(3) The United Nations Development Programme (UNDP):

- Expand sustainable development efforts through country Indicative Planning Figures (IPF), encouraging national and local governments to develop the necessary integrative planning and management frameworks in marine pollution management, thereby creating employment and alleviating poverty in coastal areas

(4) The International Maritime Organization (IMO) and its Member States:

- Organize a conference of the littoral States and user States of the Straits of Malacca and Singapore, reviewing alternative financial mechanisms for cost-sharing maritime safety and aids to navigation and prevention and management of marine pollution within the Straits

(5) The Global Environment Facility (GEF), Donor Agencies and Multilateral Banking Institutions:

- Provide financial support to national and local governments and the private sector, within the framework of national economic programs and policies, to establish, develop and extend marine pollution programs to individual countries and regionally, through capacity building initiatives, pre-investment studies, research, case studies on sustainable financing mechanisms and the formulation of other related "software"

(6) The Private Sector:

- Work at the local, national and international level, and develop and implement processes, practices and management frameworks which combine good business with sound environmental management
- Develop capabilities and capacities to provide hardware and related technical, scientific and management services essential to the development and sustainability of marine pollution programs

(7) NGOs:

- Implement community-based action programs, protecting and conserving coastal and marine resources, establish community rights over fishing and critical habitats, such as coral reef areas, reduce waste generation and waste management abuses, and promote economic rents and users fees that are fair and equitable among all sectors of the community

(8) GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas and the Eleven Participating Countries of the East Asia region:

- Demonstrate the application of appropriate financial mechanisms, promoting and establishing public sector-private sector partnerships in the East Asia region, and work cooperatively with the private sector, international agencies, multilateral financial institutions and NGOs to achieve this common objective
- Develop a timetable and action program, ensure the viability and sustainability of the recommendations of the Conference, strengthen public sector-private sector partnerships and advance marine pollution prevention and management programs throughout the East Asian Seas.

In addition to economic instruments for promoting partnerships, it was recognized that a co-operative framework was needed in which government, the private sector and others are able to identify their niche and contribution. The framework was broadly described as consisting of two components:

- prevention and management of land-based pollution of marine and coastal areas through the application of ICM practices; and
- environmental management of subregional sea areas and straits used for navigation.

The potential contributions of the various sectors can then be identified in accordance with the mandate and capacity within each of the components.

National governments have the capacity to leverage private sector investment, through incentive programs such as build-operate-transfer, economic and developmental policies and regulation. Information infrastructure and development of incentive programs directed toward small-sized and medium-sized enterprises were earmarked as potential opportunities for government to act as a facilitator of a sustainable national and regional environmental industry.

Application of ICM at the local government level received considerable attention at the conference. The concept of establishing a local presence and capacity, and then proceeding to a more ambitious provincial and national program after sufficient experience and expertise have been developed, was viewed as practical and cost-effective. To achieve this goal, local governments need support to incorporate ICM strategies and practices into their

Public sector-private sector partnership and international support for marine pollution prevention and management in the East Asian Seas

Marine Pollution Programme East Asian Seas



planning, economic development, land management, social and environmental services and fiscal policies. Local governments are further challenged to develop infrastructure proposals that are technically and environmentally sound, as well as attractive to potential investors. To achieve this capacity, most local governments will need to strengthen their administrations and their human resource capabilities. It is here that national governments, NGOs, donor agencies and international organizations can play a significant role. By developing capacities at the local level, the sense of ownership and community responsibility, the viability of ICM, the potential for replication to other coastal areas, and the reduction of land-based pollution of the marine environment, are reinforced.

Opportunities for investment

In addition to the roles and responsibilities of stakeholders, a number of opportunities for investment in the environmental industry of the region were identified. Potential ventures in shore reception facilities, waste prevention and management, marine pollution monitoring, oil

Criteria for selecting ICM demonstration sites

- (1) Existence of environmental and resource use issues across jurisdictional and administrative boundaries, requiring consensus building among stakeholders;
- (2) Identified issues and the size of the coastal area are manageable within mobilized resources (i.e., human, financial and materials) and expertise (i.e., scientific and technological);
- (3) Political will to apply innovative approaches to coastal area management; and
- (4) The types and levels of environmental problems and socio-economic and ecological conditions are reflective of most coastal areas in the country or region, the resolution of which can be used as working models for replication and extension.

Electronic Chart Display and Information System

The Electronic Chart Display and Information System is a system of electronic chart technology that has the ability to:

- (1) integrate vast quantities of data for high speed computer processing and analysis prior to real-time display;
- (2) perform the navigational information gathering and computational tasks automatically and with high accuracy;
- (3) display the location and movement of own vessel as well as other vessels;
- (4) increase safety and efficiency of the voyage by providing real-time information on water levels in a timely and efficient manner;
- (5) increase profitability by enabling oil tankers and cargo owners to maximize loads safely, navigate precisely and decrease insurance costs; and
- (6) provide the framework for the incorporation of marine spatial data into resource management information systems.

spill preparedness and response, hydrographic surveys and electronic charting were examined. A proposal that received particular attention involved the establishment of an electronic highway, extending from the Persian Gulf to Japan, and throughout the East Asian Seas region. The electronic highway, which involves transforming paper hydrographic charts into electronic charts with real-time information, incorporates interests that cut across maritime transportation, resource and environmental management and financial sustainability issues. As a starting point, the feasibility and investment required to develop an electronic highway in the region will be evaluated for the Malacca Straits, through linkages established under the Programme.

Financing the investment: the Malacca Straits

A major issue currently being addressed in the Malacca Straits is multiple use by the international community and the littoral States. Discussions on how the different stakeholders can work together to ensure the protection of the marine environment have been ongoing through 1994, 1995 and 1996. The matter of financing environmental management and navigational safety in the Straits has produced definite views in both communities.

Apart from managing pollution from land-based sources, marine pollution management in the Strait of Malacca consists of the following elements:

- (1) maintaining a high degree of preparedness to counter and combat actual or potential oil spills;
- (2) sustained programming of activities to minimize and prevent pollution from human activities on land;
- (3) continuous surveillance, monitoring and enforcement of regulations for the control of vessel-source pollution; and
- (4) damage repair and compensation.

To accomplish these objectives requires adequate financing. International funding, almost exclusively from Japanese sources, has been received for oil spill preparedness and response activities. The subject of additional international funding for environmental protection is contentious and remains unresolved.

The Programme's contribution to future collaborations between the littoral States and users is to identify the costs incurred and benefits derived by different stakeholders. Schemes and mechanisms for establishing fair and equitable cost-sharing systems are also being identified and disseminated. Finally, an international conference of littoral States and user States will be organized to review alternative financial mechanisms for cost-sharing maritime safety and aids to navigation and prevention and management of marine pollution in the Straits of Malacca.

Socio-economic benefits

Another aspect of sustainable financing component that received attention in 1996 was the socio-economic benefit derived from investments in ICM. Case studies on various programs which incorporated aspects of the ICM framework were completed, and the results analyzed to determine indications of socio-economic benefit. The case studies involved marine pollution management, river clean-up projects, marine parks, coral reef protection, tourism development and fisheries management. Socio-economic outputs from the studies were mostly qualitative in nature, simply because there were little baseline data on situations before interventions occurred. There was significant overlap between benefits which could be directly attributed to ICM initiatives and benefits accruing as a result of a number of influences, one of which was the ICM intervention. The case studies also showed that while benefits such as improved public health, tourism, employment, fishery yields and land values can be readily measured, other socio-political benefits are not so easily quantified, such as civic pride, community discipline and societal change.

Developing public sector-private sector partnerships

An important aspect of the institutionalization of ICM at the local level is the development of partnerships between the public and private sectors. The public-private sector

Economic value of the Malacca Straits to its users

The importance of the Straits of Malacca to international users is reflected in the high tonnage of goods carried through the Straits. Some 283 million tonnes of oil were transported from the Middle East and Africa through the Straits during the first nine months of 1995. The total movement of tankers through the Strait during that period involved 2,441 voyages. It is estimated that, by using the Straits of Malacca versus other sea routes, the Japanese petroleum industry alone saves up to US\$ 340 million annually. However, the needs and interests of the littoral States extend beyond economics. The Strait is a lifeline in the socio-economic fabric of local communities. Besides a large marine fishery sector, the Strait also hosts numerous aquaculture and mariculture ventures. In 1994, the value of Malaysian aquaculture and mariculture products from the Strait of Malacca amounted to RM 214.4 million.

partnership is an alternative to the traditional approach that places the government solely responsible for environmental management. Its purpose is to break away from the situation where the private sector waits for the public sector to develop a service or to enforce a regulation. The partnership is built on the foundation of mutual benefit. The public sector gains access to required technical and business skills, while the private sector benefits from involvement in defining a long-term management programme.

Costs of marine pollution in Xiamen

The following costs were determined for the socio-economic impact assessment of damages and mitigation activities for marine pollution in Xiamen.

No.	Impact Category	Annual Cost (million US \$)
1	Pollution damage to mariculture	0.081
2	Damage to living resources by illegal fishing methods	0.031
3	Cost of garbage removal at sea	0.123
4	Cost of dredging due to human induced siltation	0.212
5	Pollution mitigation in Yan Dang Lake	4.321
6	Cost for maintaining egret reserve	0.025
7	Cost for maintaining lancelet reserve	0.013
8	Loss due to coastal erosion	4.481
9	Impact of oil leakage	to be determined
TOTAL COST		>9.287

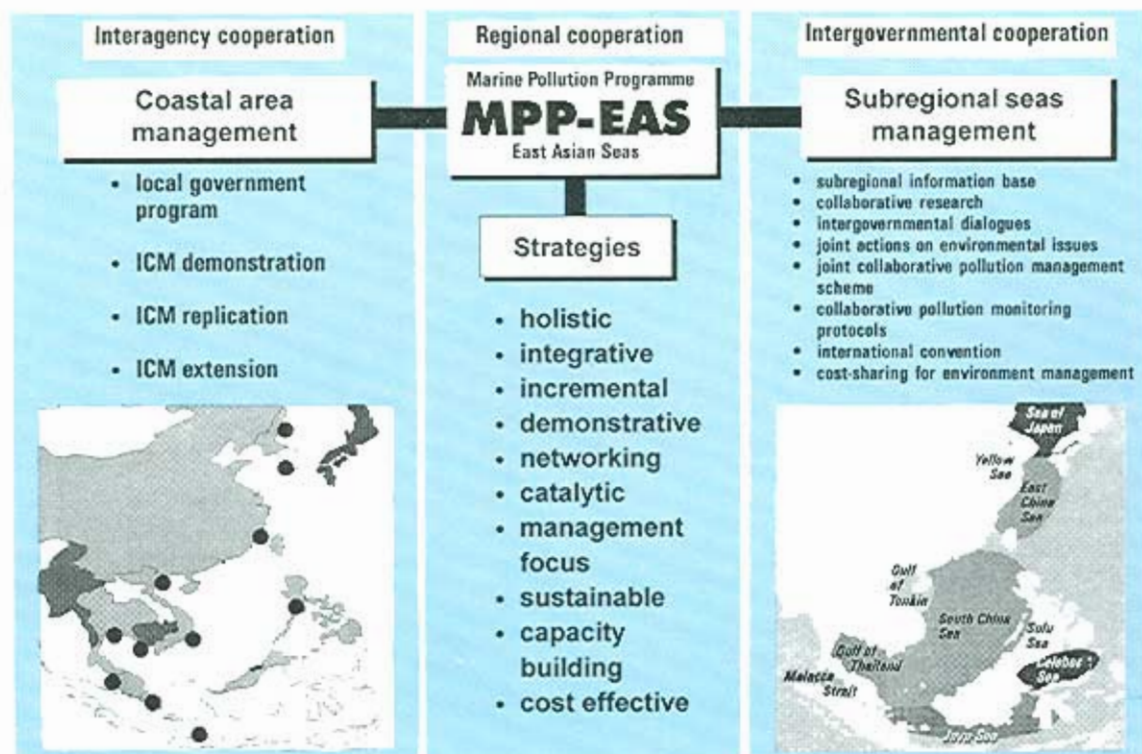
In Batangas, for example, eleven major industries, including Shell, Caltex, Union Carbide, and Keppel Shipyards, have organized themselves into the Batangas Coastal Resources Management Foundation with a view to supporting environmental management of the Bay region. From its onset, the Foundation, with the Provincial Governor and other local officials among its membership, was designed as a forum for discussion and coordination of industry's role in protecting and managing the Bay. The Foundation is the voice of industry in the Batangas Bay Council, and remains an effective partner to the PG-ENRO in the implementation of the Strategic Environmental Management Plan and the Action Plan for Integrated Waste Management.

Opportunities are also available for international agencies, donors and NGOs to contribute their efforts, in partnership with national and local governments and the private sector to a sustainable marine environment. ICM provides many avenues for cooperation and collaboration, and the efficient use of pooled resources for a common goal.

Objectives of the Batangas Coastal Resources Management Foundation:

- Promote sustainable development of Batangas' coastal resources;
- Encourage the development and implementation of integrated, interdisciplinary and comprehensive coastal resources management plans;
- Strengthen the management capabilities of governmental and non-governmental organizations responsible for the management of coastal resources;
- Explore ways and means by which the public and private sectors can cooperate and thereby benefit from the efforts to develop Batangas' coastal resources;
- Implement and rigorously enforce effective regulations and support incentive schemes to promote sustainable uses of Batangas' coastal resources;
- Increase awareness of the coastal population regarding their critical dependence on the continued productivity of the coastal resources; and
- Promote community-based participation in coastal area management.

National and regional cooperation for reducing marine pollution in the East Asian Seas



4 BEYOND 1996

Over the past three years, the Programme has developed and implemented pragmatic and cost-effective approaches to address marine

pollution problems in the region. Enabling activities form the major focus of the work, supported by networks of specialized programs and institutions. What are the Programme plans for 1997?

Numerous activities and events are scheduled for 1997 which will shape the nature of the Programme and the expected deliverables.

Xiamen

- local legislation for ICM institutional development
- coastal management atlas
- integrated waste management action plan and database
- comparative study of pollution mitigation in Yuan Dang Lake, Pasig and Singapore Rivers
- integrated marine pollution monitoring system
- wrap-up workshop to review project achievements

Batangas Bay

- integrated waste management pilot project in Bauan
- marine pollution monitoring programme and network
- database and coastal management atlas
- water-use zonation scheme
- ships' routing measures for Batangas Bay
- wrap-up workshop to review project achievements

Malacca Straits

- an initial risk assessment of the Straits
- subregional environmental information management network
- an environmental management atlas
- economic valuation of environmental resources in the Straits
- cost-benefit analysis of uses and benefits derived from the Strait's operations
- cost recovery options for maritime safety and marine pollution prevention and management in the Straits

Marine pollution monitoring

- Network Web page
- Internet Mailing List
- networking of Marine Pollution Monitoring Programme at demonstration sites

International conventions

- guidelines for the development of national marine pollution legislation
- a regional database on marine pollution legislation, international conventions and regional agreements
- local government code on integrated management of coastal areas
- framework for national coastal policy and plan of action for national marine pollution prevention and management program

Sustainable financing

- a BOT proposal concerning waste management facilities
- a user pay scheme for port reception facilities and services
- business plan development for a regional information management network
- socio-economic benefit analysis of ICM demonstration sites
- trust fund

Capacity building

Training courses/workshops

- third regional training course on integrated coastal management
- subregional training course for the Gulf of Thailand and for the southern South China Sea on oil pollution preparedness, response and cooperation
- regional training workshop on integrated environmental impact assessment
- national training in the application of integrated coastal management system for Vietnam, DPR Korea and the Philippines

Internship programme

Staff exchange programme

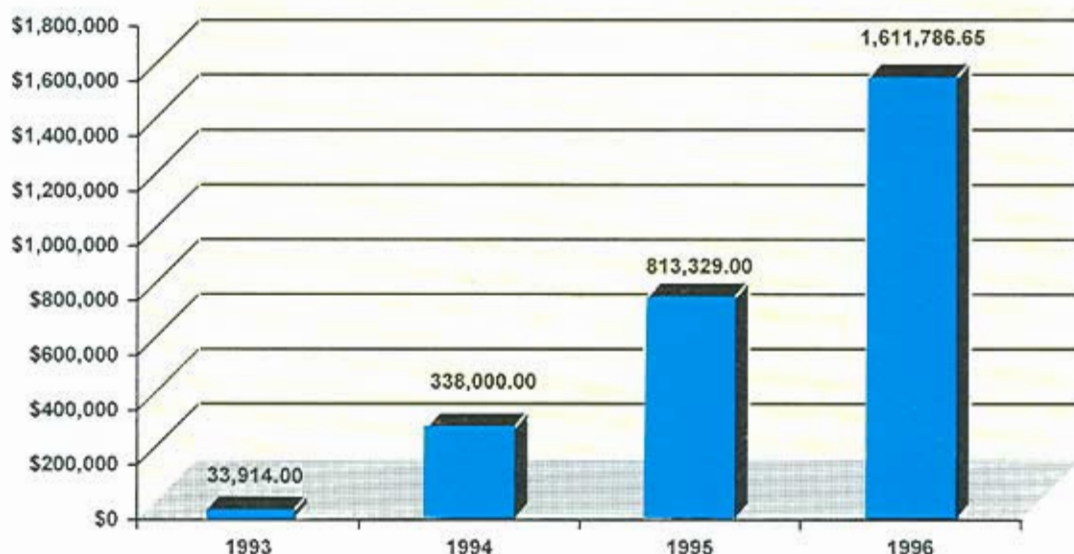
Enabling activities

- marine pollution monitoring program design, training and equipment purchase for the Port of Sihanoukville, Cambodia and the Nampo Region, DPR Korea
- Regional Marine Pollution Monitoring and Information Management Web Page on Internet for linkage with other relevant sites and for transfer of data and other information
- Regional Technical Conference on the Application of Integrated Coastal Management for the Prevention and Management of Marine Pollution in the East Asian Seas
- Workshop on the Development of a Regional Information Management System for Pollution Monitoring Data

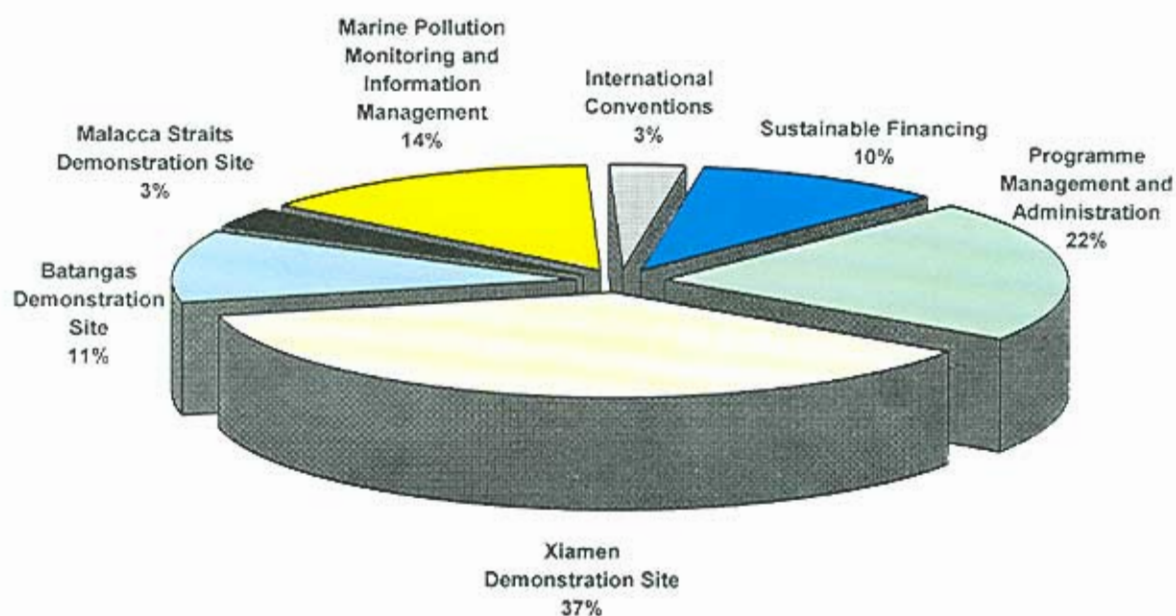
5 FINANCIAL COMMITMENTS UNDER THE REGIONAL PROGRAMME

Financial Commitments of the Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas

- a) Programme Expenditures, 1993 to 1996 in US Dollars (excluding overhead allocation)



- b) Operational Expenditures, 1996



ANNEXES

ANNEX 1

MPP-EAS TECHNICAL REPORT SERIES

MPP-EAS Technical Report No. 1	The Regional Programme for Marine Pollution Prevention and Management in the East Asian Seas (GEF Project RAS/92/G34): Annual Report 1994-1995.
MPP-EAS Technical Report No. 2	Enhancing the Success of Integrated Coastal Management: Good Practices in the Formulation, Design and Implementation of Integrated Coastal Management Initiatives (1996).
MPP-EAS Technical Report No. 3	Strategic Environmental Management Plan for the Batangas Bay Region (1996).
MPP-EAS Technical Report No. 4	Integrated Coastal Management in Tropical Developing Countries: Lessons Learned from Successes and Failures (1996).
MPP-EAS Technical Report No. 5	The Coastal Environmental Profile of the Batangas Bay Region (1996).
MPP-EAS Technical Report No. 6	The Coastal Environmental Profile of Xiamen (publication pending).
MPP-EAS Technical Report No. 7	The Strategic Management Plan for Marine Pollution Prevention and Management in Xiamen (publication pending).
MPP-EAS Technical Report No. 8	Marine Pollution Prevention and Management in the East Asian Seas: From Planning to Action 1996 Annual Report.

NEWSLETTER

- Tropical Coasts December 1994, Volume 1, Number 1.
- Tropical Coasts July 1995, Volume 2, Number 1.
- Tropical Coasts December 1995, Volume 2, Number 2.
- Tropical Coasts July 1996, Volume 3, Number 1.

MARINE POLLUTION UPDATES

- Updates January 1995, Volume I, Number 1
- Updates April 1995, Volume I, Number 2
- Updates June 1995, Volume I, Number 3
- Updates September 1995, Volume I, Number 4
- Updates January 1996, Volume II, Number 1
- Updates March 1996, Volume II, Number 1
- Updates June 1996, Volume II, Number 2
- Updates September 1996, Volume II, Number 3

PROGRAMME BROCHURE

Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas

ANNEX 2

INTERNSHIP

Contract No. and Duration	Name/Country	Purpose
1996		
IC/12-96/ Internship 3/11/96-9/11/96	Nguyen Minh Son Vietnam	<ul style="list-style-type: none">- to assist in the preparation of proceedings for the Oil Spill Modelling Workshop, Pusan, Republic of Korea; and- to initiate project formulation on the application of common oil spill models.
IC/14-96/ Internship 3/11/96-6/22/96	O Ryang Pyong Democratic People's Republic of Korea	<ul style="list-style-type: none">- to prepare a project proposal for developing marine pollution monitoring program for the Nampo Region.
IC/15-96/ Internship 3/11/96-6/22/96	Ryang Chol Democratic People's Republic of Korea	<ul style="list-style-type: none">- to prepare a project proposal for developing marine pollution monitoring program for the Nampo Region.
IC/54-96/ Internship 9/24/96-3/21/97	Nguyen Minh Son Vietnam	<ul style="list-style-type: none">- to assist in developing a joint action plan on oil spill modelling with the littoral States of the Malacca Straits.
1995		
IC/16-95/ Internship 7/15/95-12/15/95	Long Rithirak Cambodia	<ul style="list-style-type: none">- to prepare a coastal environmental profile of Sihanoukville Province and an ICM project proposal



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