

Sharing Lessons and Experiences in Marine Pollution Management

Chua Thia-Eng, S. Adrian Ross, Huming Yu,
Gil Jacinto and Stella Regina Bernad



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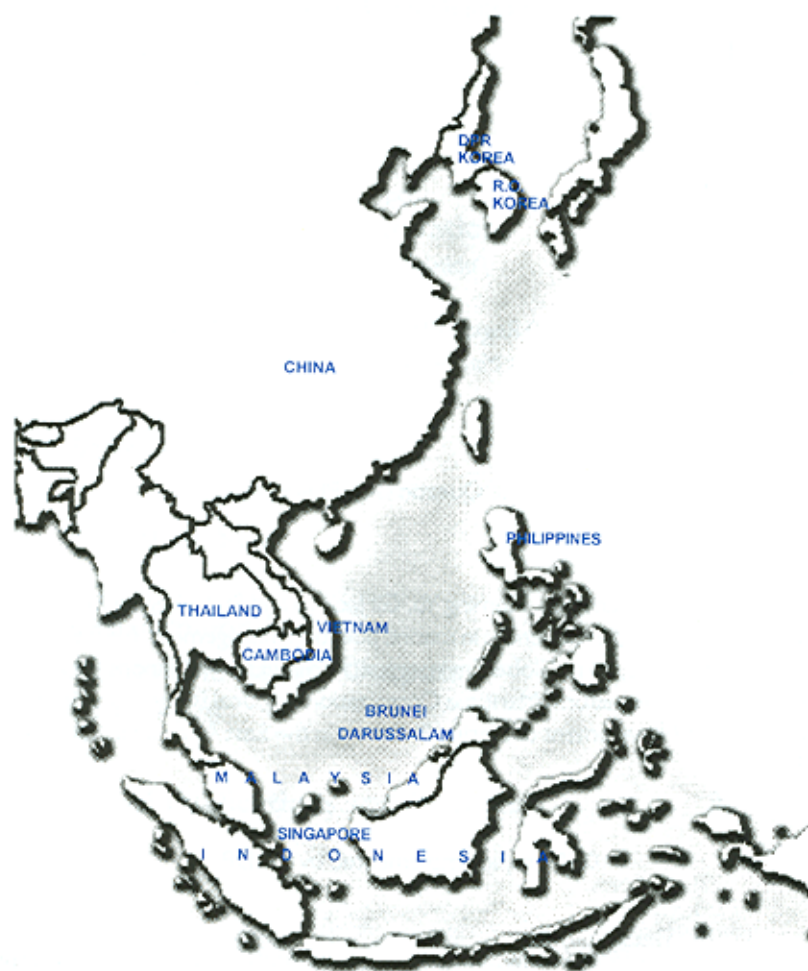


GEF/UNDP/IMO Regional Programme for the
Prevention and Management of Marine Pollution
in the East Asian Seas

1994-1998

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It is with pride and gratitude that the authors identify the following individuals for their contribution to this summary report:

Finance/Administration:	Cory Guerrero, Mary Ann dela Peña, Antonio Hernandez, Caroline Velasquez, Eden Mandac and Marlene Mariano
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Introduction



The seas of East Asia provide food, livelihood and various forms of goods and services to the coastal population of the region, as well as contributing a significant share of the Gross Domestic Product (GDP) of bordering nations. During the last few decades, rapid industrial development, coupled with the expansion of maritime trade, have placed the East Asian Seas under severe environmental stress. Overexploitation of resources, habitat destruction and reduction in marine environmental quality are among the evidence of impacts that economic growth is having on the region's coastal and marine ecosystems.

In 1993, the East Asian Seas nations collectively launched a regional initiative aimed at addressing the social, environmental and economic consequences of a continuing trend of degradation of their regional sea. The Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas was designed to demonstrate how marine pollution can be prevented and managed in developing countries through the application of appropriate policy, institutional and technological interventions. The vision of the project was that adverse impacts

of localised and transboundary marine pollution can be prevented or minimised through the collective efforts of the stakeholders, without compromising desired economic development.

Eleven nations participated in the regional initiative, including: Brunei Darussalam; Cambodia; PR China; DPR Korea; Indonesia; Malaysia; Philippines; R.O. Korea; Singapore; Thailand; and Vietnam. The Global Environment Facility (GEF) provided US\$8 million in support of the Programme. The Programme was implemented by the United Nations Development Programme (UNDP) and executed by the International Maritime Organization (IMO). IMO established a Programme Development and Management Office (PDMO) in Manila, Philippines, which was

responsible for the operation of the Regional Programme.

The Regional Programme began operation in January 1994, and completed all major activities by December 1998. Significant progress was made in achieving the Programme objective, and several important benchmarks were established. The progress of the past five years provide the countries of the region, as well as intergovernmental organisations, international bodies and donor agencies, with sound practical experience and knowledge. From this foundation, sustainable marine pollution management programmes may be developed, expanded and replicated throughout the East Asian Seas region, and beyond.

Chinese Government White Paper on Xiamen Demonstration Project

"Since 1994, the Chinese Government, in collaboration with the United Nations Development Programme and other institutions, has established an integrated coastal management demonstration site in the Xiamen Municipality, achieving significant results, receiving good feedback from concerned international organisations, and providing an opportunity to transfer our experience in integrated coastal management for replication elsewhere in China and in other countries. As a result, in 1997, China, again in collaboration with the United Nations Development Programme, initiated integrated coastal management projects in Fangcheng City of Guangxi Province, Yangjiang City of Guangdong Province and Wenchang City of Hainan Province."

*From "The Development of China's Marine Affairs", Information Office,
State Council, the People's Republic of China, Beijing, May 1998*

The following summary report includes five elements of review.

Meeting Objectives considers the overall impact of the project and the benefits derived by the region. Features of the project design, implementation strategies and management approaches that contributed to the achievement of objectives are examined, as are some of the constraints experienced during the Regional Programme.

Strengthening the Foundation is a look at the basic tools and materials that were developed and applied during the course of the project to enhance national capacities, sustain programme initiatives and build public awareness. The mechanisms that are highlighted in this section cut across a number of projects and activities of the Regional Programme, and are the building blocks for the transfer of working models to other sites and other environmental issues in the region.

Consolidating Outputs and Lessons Learned is a review of the principal activities of the project, the progress that has been made, and some practical examples of the aftereffect of the work. The section attempts to provide a sampling of how the project contributed to some significant changes in awareness and actions on the part of public and private sector stakeholders, and the advantages of such changes.

Sharing Experiences is a summary of concepts and approaches, which have evolved over the course of this project. In some instances, the ideas have been developed and applied during the project, in others they have emerged but will only be tested in follow-on activities.

The Next Step describes follow-on activities in the region. The section briefly describes a follow-on initiative that has been endorsed by the participating countries and approved by GEF, which is a second phase to the Regional Programme. The second phase is scheduled to commence in July 1999.

The summary report concludes with a detailed listing of achievements between 1994 and 1998.

Many lessons and experiences can be culled from a close examination of the successes and failures of different projects. A review of the Regional Programme's strategies, design, management and implementation processes, in relation to outputs, not only takes stock of achievements, but also identifies the problems and constraints. Overall, the experiences should prove to be a source of knowledge and lessons to other regional programmes of similar complexity and magnitude.

Meeting Objectives

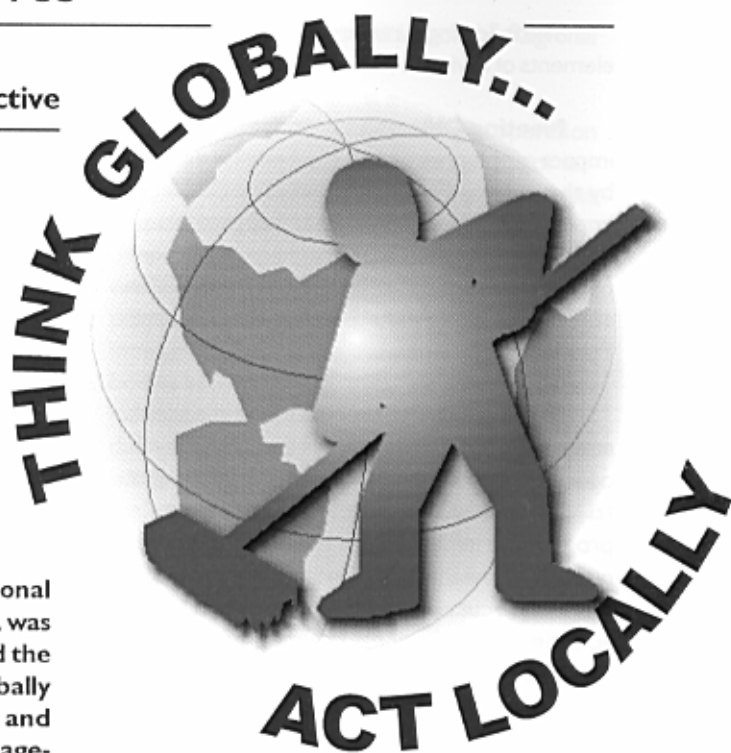
Regional Programme Objective

To support the efforts of the participating governments to prevent and manage marine pollution at the national and subregional levels on a long-term and self-reliant basis

Programme Achievements

The uniqueness of the Regional Programme, and its achievements, was that it successfully operationalised the environmental adage, "think globally and act locally". It developed and groundtruthed an integrated management framework for addressing localised and transboundary marine pollution arising from land- and sea-based activities and interactions. In practical terms, working models of integrated coastal management (ICM) were put into operation and tested to confirm their effectiveness, and their sustainability. The outcome of the demonstration projects showed that:

1. by applying an integrated management mechanism at the local level, transboundary pollution issues and other global environmental concerns can be effectively addressed;
2. local programmes contribute to the fulfilment of international conventions and agreements related to marine pollution, such as the Law of the Sea, Basel and IMO Conventions and the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities;



3. it is the development of institutional arrangements that ensure sustained efforts to protect the coastal and marine environment.

A significant milestone of the Regional Programme was the paradigm shift in pollution management, particularly at the local government level. The new concept highlighted the shared responsibility of the public and private sectors in environmental management, including identification of priority concerns and opportunities for co-investment in problem-solving. The public-private partnership approach called for a change in perception by both sectors. For example, waste was viewed as a resource, rather than an unwanted byproduct of human activity. Waste management was developed as an opportunity not only to protect the coastal area, but to improve the social well-being of the general populace, create jobs, enhance quality of life, develop new commercial activities and markets, reduce operating costs, and so on.

Overall Achievement

In parallel with the identification of partnership opportunities, a systematic process for identifying priority environmental concerns and associated management interventions was developed and demonstrated. The environmental risk assessment and management process, as applied in the Malacca Straits Demonstration Project, presented some obvious advantages over *ad hoc* and "crisis-oriented" management approaches to preventing and managing transboundary marine pollution. The importance of the process, when applied within the integrated management framework, was the capability to describe and quantify potential harm to human health and the ecosystem as a consequence of both land- and sea-based human activities, and to evaluate options for reducing risk with due consideration of other societal issues within a subregional setting.

The Regional Programme, within a relatively short timeframe, has made good progress in carrying through a comprehensive and complex environmental initiative in the East Asian Seas. The working models that were developed and demonstrated have proven to be cost-effective and worthy of replication throughout the region. They provide the countries with innovative approaches, effective management strategies, the appropriate tools and sustainable financing mechanisms for managing marine pollution risks under varying and diverse socio-economic, political, cultural and demographic conditions. The next step is to build stronger partnerships between governments, donors, international agencies, NGOs, the scientific community and all interested groups, by pooling resources and efforts to collectively apply the models to environmental problems at the local level, and the region at large. Participating countries support this next step, and have already endorsed a follow-on project aimed at building partnerships in the application of the working models to address various environmental concerns across the region.

*The Regional Programme
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Participation and Benefits

All the eleven member countries participated in some or all activities organised by the Regional Programme. China and the Philippines hosted the two ICM demonstration sites, while Indonesia, Malaysia and Singapore jointly implemented the Malacca Straits Demonstration Project. Brunei Darussalam, China, Indonesia, Malaysia, Philippines, R.O. Korea, Singapore, Thailand and Vietnam also contributed by hosting or organising some of the Regional Programme's activities, such as training, workshops and other meetings. All countries participated in the training courses, workshops or study tours. *Active participation of member countries is key to the success of programme implementation.*

Country Participation in Programme Activities

	Brunei Darussalam	Cambodia	DPR Korea	PR China	Indonesia	Malaysia	Philippines	R.O. Korea	Singapore	Thailand	Vietnam
1. Training											
Oil spill response	✓	✓	✓	✓		✓	✓	✓		✓	✓
ICM		✓	✓	✓	✓	✓	✓	✓		✓	✓
IEIA	✓	✓	✓		✓	✓	✓		✓	✓	✓
Marine pollution monitoring techniques			✓		✓			✓			✓
International Conventions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Risk assessment/management	✓	✓	✓		✓	✓	✓		✓	✓	✓
Natural res. damage assessment	✓	✓	✓		✓	✓	✓		✓	✓	✓
Internship/staff exchange		✓	✓	✓	✓		✓				✓
Study tour		✓	✓	✓	✓	✓	✓			✓	✓
2. Workshop and conferences											
Marine electronic highway					✓	✓			✓		
Marine pollution monitoring		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Marine legislation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ICM technical conference		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Risk assessment/management					✓	✓	✓		✓		
International conventions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sustainable financing		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Resource valuation			✓		✓	✓	✓		✓		
Oil spill modelling			✓		✓	✓	✓	✓			
Public awareness and education	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Equipment		✓	✓	✓			✓				✓
4. Publications											
Newsletters/Updates	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Technical reports/conferences	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5. Host of Programme events	✓		✓		✓	✓	✓	✓	✓	✓	✓
6. Demonstration sites			✓		✓	✓	✓		✓		
7. Public-private sector partnerships			✓				✓				

Much of the Regional Programme's outputs directly or indirectly benefited participating countries. While China and the Philippines realised direct benefit from the ICM demonstration projects, national staff from other countries were trained in the application of ICM through study tours and training courses at the two sites. The compilation of the environmental profile, the development of integrated databases, and the evaluation of management options provided the three littoral States of the Malacca Straits (Indonesia, Malaysia and Singapore) with a better understanding of the values of the natural resources and the types and level of risks associated with transboundary marine pollution. The risk assessment and the natural resource and damage assessment methodologies, which were developed and refined for the Straits of Malacca project, were packaged into training manuals and used for training national staff from other countries.

A number of other outputs also had region-wide impact. The regional network on the legal aspects of marine pollution developed a database on national legislation, which was widely used by marine legal experts. The network was active in organising workshops and training courses, and providing legal advice to participating governments on implementing legislation for international conventions. Another example was the successful implementation of the integrated pollution monitoring programme in Xiamen, which was a showcase of cost-effective pollution monitoring for local governments of the region. Finally, the innovative public-private sector partnership process demonstrated in Batangas provided countries with an alternative mechanism for developing, financing and sustaining environmental programmes, facilities and services.

"... since 1994, the GEF/UNDP/IMO regional initiative has helped develop essential working models and innovative approaches to address the coastal and marine environmental issues in the East Asian Seas. The eleven participating nations... have all benefited from the Programme."

Statement by the delegation of Singapore, and on behalf of Indonesia, Malaysia, Philippines and Thailand, at the 42nd Session of the Marine Environmental Protection Committee, International Maritime Organization, London, 2-6 November 1998.

Programme Design

The framers of the Regional Programme understood the complexities and complications inherent in transboundary pollution management, especially in a region with a wide diversity of political, cultural, ecological and socio-economic conditions. A variety of strategies and techniques were needed to assess and manage the different sources and types of pollutants, with due consideration of the level and magnitude of environmental and social impacts. The framers adopted strategies that were demonstrative, catalytic and sustainable. The strategies were the nuclei of project formulation and implementation activities, which in turn emphasised: demonstrating the effectiveness and modalities of ICM application; developing national capacity to plan and manage at the local level; and playing a catalytic role in mobilising external resources.

Regional Programme Strategies:

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

A positive feature of programme design was the recognition of the need for flexibility. The Programme Document highlighted the need and allowed modifications or adjustments to the Programme, based on feedback from the participating countries. The flexibility enabled relatively rapid response to the concerns of the participating countries. As project outputs were achieved, specific project activities were modified, and in some instances replaced with more appropriate new activities, to meet the objective and strategies of the Regional Programme. This positive feature of the programme design was highlighted by external reviewers during the 1997 mid-term evaluation.

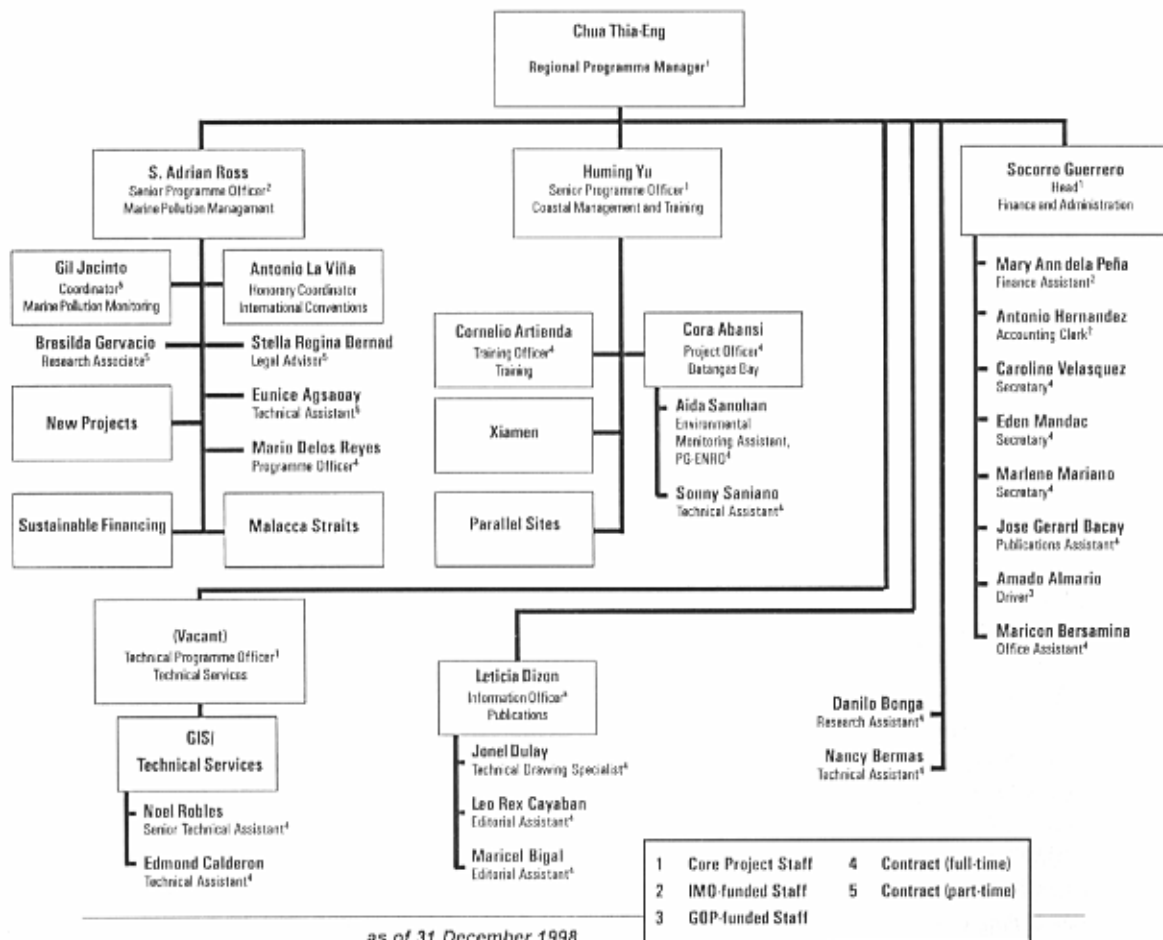
“Programme flexibility has allowed the refinement and fine-tuning of the Programme, reflecting the evolutionary situation in many aspects, such as the number of participating countries and the differing circumstances they are in. Flexibility has also allowed the Programme Manager to seek additional funding for extra activities, almost doubling the original budget.”

Mid-term External Evaluation Report, 1997

However, there were also some flaws in the Programme design, and these created some difficulties in meeting targets. A case in point was the success criteria in the international convention component. The Programme Document described the end of Programme situation as, "Each country will have ratified and implemented the most critical international marine pollution conventions" and that "All countries will have improved administrative and legal structures pertaining to marine pollution." This situation, realistically, could not be achieved over a five-

year period. Although the number of conventions and protocols ratified by participating countries increased by 91% (from 34 to 65), and progress towards improved administrative and legal structures was made in some countries, the dual goals were not accomplished. When formulating capacity building programmes of this nature, it should be recognised that the pace of delivery extensively depends on: a) political will; and b) the availability and accessibility of appropriate human resources, within the participating countries.

IMO Programme Development and Management Office Organisational Chart



Implementation Strategies and Processes

The scope of the Regional Programme, and the complex nature of activities, required that the Programme Development and Management Office (PDMO) locate in the region. PDMO was staffed with three internationally recruited professionals and a team of national technical and administrative support staff. The Government of the Philippines hosted PDMO at the Department of Environment and Natural Resources (DENR) in Manila.

Programme Development and Management Office

PDMO played a central role in the day to day management of the Regional Programme. It had a wide range of responsibilities including planning and co-ordinating Programme activities; recruiting project personnel and short-term consultants; organising workshops and conferences; conducting training courses; and disbursing funds. PDMO regularly monitored progress and assessed outputs of each of the more than one hundred projects, subprojects, tasks and activities. It maintained close working relationships with relevant central and local governments, donors, UN agencies, international organisations, non-government bodies and other interested groups. Most importantly, PDMO provided leadership and technical advice in the execution of Programme activities.

By all accounts, PDMO functioned efficiently and effectively in the execution of the activities. This was possible because of the confidence it enjoyed with GEF, UNDP and IMO headquarters, as well as with the participating governments. The support expressed at the annual Programme Steering Committee meetings reflected such confidence. The Mid-Term External Evaluation Team (1997) concluded that *"PDMO is seen as a strong, effective office, successfully leading and managing the implementation of Programme activities."*

The decentralisation of responsibility for project implementation, from IMO headquarters to the field office, was a key to the effectiveness of PDMO. One year into the Programme, IMO's Secretary-General delegated increased administrative authority and responsibility to the regional office. Although this move did not entirely eliminate stress at headquarters and the field office, which was primarily related to the issue of project management versus project delivery, it was a major accomplishment. The eventual solution lay in improved communication, and a mutual appreciation of the roles and responsibilities of IMO, both as an executing agency and project implementer.

Programme Steering Committee (PSC)

The Programme Steering Committee (PSC) was composed of representatives from the eleven participating governments, concerned donors, international and regional organisations, UNDP and IMO. The PSC met annually to assess the progress of the work programme, provide policy guidance on programme matters and ensure that the Programme was responding to the needs of the region. The annual PSC meeting was particularly important as it provided a useful forum for participating nations and other partners to understand and to appreciate the operation of activities region-wide. The PSC also approved annual workplans and budgets.

Not all countries joined the Regional Programme in the beginning. There were concerns over duplication of effort with existing regional programmes and confusion concerning the mandate of the executing agency. Criticisms were also levelled at the choice of demonstration sites. At the launching meeting in Xiamen in November 1993, only five countries participated. After further clarification and preparation of a comprehensive work programme, ten countries participated in the 1st PSC meeting, held in Manila in June 1994. One

year later all eleven countries became active participants in the Regional Programme, with Japan joining the PSC in an observer status.

Change of perception began to occur with increased understanding and appreciation of the Regional Programme's objectives and mode of operation. Confidence was enhanced with the accomplishment of early outputs. Towards the project's mid-term, the Regional Programme received strong support from participating countries and increased recognition from its early critics. Perception changes were prominent among government officials and scientists involved in work at the two ICM demonstration sites, as a better appreciation of the concept of integration, the value of stakeholder consultation and the need to focus research on solving management problems, began to take hold.

National Expertise and Networks

The use of national experts for the implementation of activities was a critical component of the capacity building strategy. However, it also had its down side. Lack of proficiency in English affected the quality of reports and often delayed outputs. Competing demands for qualified national experts proficient in the English language often limited their availability. Thus, it was essential to allow adequate time and support mechanisms to national experts in order to complete project activities and produce outputs that could be shared among the participating countries.

The use of specialised networks proved to be a cost-effective option. The networks contributed to the upgrading of national capacity and strengthening of working relationships among network members from different nations. Through the legal database and related training courses, members of the legal network were able to strengthen national legislation for ratifying and implementing international conventions.

Implementation Processes

Implementation of the two ICM demonstration sites validated the strategies, processes and sustainable mechanisms for addressing marine pollution at the local level. The local interagency project committees were gradually transformed into permanent interagency, multi-sectoral consultative bodies. The project site offices became part of the government establishment, with an operational budget and permanent staff. Local institutionalisation actions ensured the continuation of the ICM programme beyond the life of the Regional Programme.

In the case of the Malacca Straits demonstration project, the project was planned and implemented in consultation with the governments of the three littoral States. The actual implementation of project activities was undertaken by a multi-disciplinary team of more than 30 scientists, technicians and professionals from institutions in Indonesia, Malaysia and Singapore. The working relationships, confidence and experience gained by the individual team members and institutions in forging an environmental information system for the sub-regional sea area was an important milestone of the project. The "shared" environmental information system was not only the first of its kind in the subregion, but was also the knowledge base upon which an environmental risk and management analysis of the Malacca Straits was completed. The information system thus demonstrated its potential as a valuable instrument for managers and decision-makers in the three countries, for developing and analysing environmental management options for transboundary marine pollution in the Straits of Malacca.

Another lesson from the implementation experience was that pre-training of project staff is essential in order to ensure quality outputs and timely delivery of project activities. Difficulties encountered during the initial phases of operation at the two demonstration sites could have been reduced or avoided if adequate train-

ing had been given to the project staff prior to project start-up. Without adequate preparation, site staff relied heavily on guidance provided by PDMO. This delayed many project deliveries and overtaxed the limited human resources within PDMO.

The same lesson applies to administrative matters, especially with respect to financial management and related approval processes. Although workplans and budgets were approved on an annual basis, delays in the approval of contracts and agreements with other project partners created unnecessary stress and friction between headquarters and the field office. Administrative procedures, including appropriate financial authorities and control mechanisms, need to be laid out with a clear appreciation of project demands, size and pace of operation. Once a project has been initiated, lack of forethought on these matters leads to inefficiency and delay.

Government bureaucracy also needs to be considered in the planning and implementation of regional projects of this nature. A full understanding of government operating procedures helps to reduce duplication of effort and delays in official response. The Regional Programme frequently experienced situations where responses to invitations to meetings, training programmes or workshops were overdue. This caused several problems for PDMO, not the least of which was the last minute panic to secure travel visas for country nominees. Sufficient lead times and reliable lines of communication with government officials are essential components for strengthening interactions with government agencies.

Two Steps Forward and One Step Back

One of the greatest challenges to the Regional Programme was maintaining momentum, in respect of support, interest and enthusiasm

by the participating governments. Changes in government administrations, national focal points and key officials at the local and national levels are a natural occurrence. In one national agency, working relationships were re-established with three Secretaries (Ministers) and numerous Undersecretaries (Deputy Ministers) in the course of 5 years, in order to maintain support for the Programme. In the case of the two demonstration projects in Batangas and Xiamen, changes in local officials affected the work programme. It was always difficult to convince a new administration to take pride in the on-going programme of the previous administration. The value of institutionalising ICM as part of the local government's regular programme became apparent. Personality conflicts and "turf protection" were also real issues, threatening the stability and continuity of the ICM programme. Such matters, although the responsibility of local government administrators, could not be ignored by the Regional Programme.

Summing up the experience, progress was best described as "two steps forward and one step back". It was the accumulated knowledge, incremental progress and purposeful outputs that make the experience a practical lesson for others.

Mobilisation of External Resources

The Regional Programme did not operate in isolation. Collaborative and co-operative working arrangements were developed with donors, UN and international agencies, the private sector, NGOs and other interested groups. In 1995, 5 co-operative activities were implemented. In 1996, there were 9, and by 1998 the total number had increased to 19. Most of these collaborative activities were facilitated through formal agreements. Since 1994, 24 such agreements have been concluded with national and international partners.

Collaborating with International Partners 1998-99

P A R T N E R	C O L L A B O R A T I V E A C T I V I T Y
United Nations Development Programme (UNDP)	<ul style="list-style-type: none"> • ICM parallel sites in the Masinloc-Dyon Bay, Ormoc Bay and Macajalar Bay, Philippines, and Guang Xi, Hainan and Guangdong, China • National ICM demonstration projects in Cambodia, DPR Korea, Malaysia, Indonesia, Thailand and Vietnam
Swedish International Development Co-operation Agency (Sida)/SAREC/Coastal Management Center (CMC)	<ul style="list-style-type: none"> • Regional Training Course on the Application of Integrated Coastal Management System for Marine Pollution Prevention and Management • Training Workshop on Integrated Environmental Impact Assessment for Coastal and Marine Areas • Developing Institutional Capacity in Managing Marine Pollution in Vietnam: Marine Scientific Survey and Pollution Monitoring • Publication of <i>Tropical Coasts</i>
Collaborative Environmental Project in Indonesia (CEPI), CIDA	<ul style="list-style-type: none"> • Workshop for Sub-Regional Cooperation in Oil Spill Modeling in the Malacca Straits
City University of Hong Kong	<ul style="list-style-type: none"> • Training Workshop on Integrated Environmental Impact Assessment for Coastal and Marine Areas • Special Session for Malacca Straits Demonstration Project, the 2nd International Conference on Marine Pollution and Ecotoxicology
Australian Maritime Safety Authority (AMSA), East Asia Response Limited and Shell Pacific Enterprises Ltd.	<ul style="list-style-type: none"> • OPRC Training Course for the First Responders/On-scene Commanders, Thailand and Brunei Darussalam • OPRC Training Seminar for Senior Managers and Administrators, China
Japan Association of Marine Safety, Japan Hydrographic Department and Maritime Safety Agency	<ul style="list-style-type: none"> • Regional Workshop on the Marine Electronic Highway, Singapore
UNDP/Strategic Project Management	<ul style="list-style-type: none"> • Investors' Round Table on Public-Private Partnerships: Investment Opportunities in Coastal and Marine Sectors, Manila, Philippines • Development of Investment Opportunities for Integrated Waste Management in Batangas
Advisers of the Urban Environment and Development of the Urban Waste Expertise Programme (WASTE/UWEP)	<ul style="list-style-type: none"> • Establishment of a local management co-ordinating body in the Municipality of Bauan • Development of a community-based waste management system under a community-private partnership in Bauan • Enhancement of resource recovery and recycling sector in the Batangas Bay project area • Integrated waste management in Tingloy
Norwegian Government	<ul style="list-style-type: none"> • Co-operation on ratification and implementation of MARPOL in Cambodia, Indonesia, Vietnam and the Philippines
Canada-ASEAN Centre, WASTE, Sida/CMC, Coordinating Bodies on the Seas of South-east Asia (COBSEA) and Department of Environment and Natural Resources (DENR)	<ul style="list-style-type: none"> • International Conference on 'Challenges and Opportunities in Marine Pollution Prevention and Management in the East Asian Seas', March 1999, Philippines
Universiti Putra Malaysia, Japan International Co-operation Agency (JICA), Islamic Education, Scientific and General Organization (ISESCO) and The British Council	<ul style="list-style-type: none"> • International Conference of "Towards Sustainable Management of the Straits of Malacca: Scientific Basis, Technical and Financial Options," Malaysia, April 1999

Mobilisation of In-Country and External Financial Resources

	1994-1996 (US\$)	1996 (US\$)	1997 (US\$)	1998 (US\$)	TOTAL (US\$)
In-Country Resources					
Xiamen Municipality	552,000	276,000	552,000		1,380,000
Government of the Philippines:					
Contribution to the Regional Programme	380,000	166,740	102,000	105,898	754,638
Contribution to Capacity Building for ICM				230,858	230,858
Batangas Provincial Government	8,000	180,077	231,327	175,367	594,771
SOA, China (International ICM Workshop)		3,840			3,840
OPRC Training:					
Host Country (Brunei & Thailand)			22,700		22,700
BAPEDAL, Indonesia (Oil Spill Modelling Workshop)				6,000	6,000
Philippine Ports Authority			150,000		150,000
KORDI, Republic of Korea	25,000	39,000			64,000
SUB-TOTAL	965,000	665,657	1,058,027	518,123	3,206,807
External Resources					
Government of Norway (MARPOL Project)		160,000			160,000
UNDP/CHINA (Capacity Building for ICM in Northern/South China Sea (1997-2000))			3,427,729		3,427,729
SIDA/SAREC/CMC/IMO Joint Project (1994-1996)	650,000				650,000
SIDA-Supported Training Course/CMC	7,800	39,420	30,381	24,000	101,401
SIDA/CMC (Sustainable Financing Conference)		50,000			50,000
IDRC (Sustainable Financing Conference)		15,000			15,000
SIDA/CMC (International ICM Workshop)		50,000			50,000
DANCED (International ICM Workshop)		15,000			15,000
Philippine Coast Guard-PCG (ICM Workshop)			800		800
OPRC Training:					
Australia Maritime Safety Authority-AMSA			12,500		12,500
East Asia Response, Ltd.-EARL			12,500		12,500
WASTE (1997-1999)			600,000		600,000
PPP/UNDP			150,000		150,000
SIDA/CMC (1997-1999)			1,250,000		1,250,000
IMO (Training Courses, Workshop)			75,000	130,000	205,000
JAMS, Japan (MEH Workshop)				2,600	2,600
NUS, Singapore (Training Course)				1,235	1,235
UNDP/Philippines-Capacity Building for ICM				2,028,680	2,028,680
Training/Workshop/Consultancy Fee (1995-1996)		76,356			76,356
SUB-TOTAL	657,600	405,776	5,558,910	2,186,515	8,808,800
GRAND TOTAL	1,622,600	1,071,432	6,616,937	2,704,638	12,016,608

From 1994 to 1998, a total of US\$12.02 million in extra-budgetary funds was mobilised. The support was unprecedented in previous international water projects in the region and was an indication of the interest that donors, international bodies and governments had in the objectives and work programme of the Regional Programme. The commitments were also a signal that the strategy of sharing resources, as partners in a project of common interest, is attractive and workable among the various sectors. In a time of competing demands and scarce financial resources, the partnership arrangement proved to be a most advantageous path for intergovernmental, interagency and intersectoral collaboration and co-operation.

Collaborative and Co-operative Arrangements

“The Programme has catalysed an increasing number of collaborative and co-operative working arrangements with donor and international agencies. The commendable efforts have mobilised in-country and external financial resources for specific project activities, many of which are co-sharing arrangements.”

Final Project Evaluation Report, 1998

Strengthening the Foundation

Capacity Building

Capacity building has been implemented with a particular vision in mind; that being to narrow disparities in marine pollution prevention and management capabilities among the eleven participating countries. Although the prominent progeny of the Regional Programme were the working models for ICM and risk assessment/risk management, a number of training programmes, tools and guidelines were also developed that cut across marine pollution issues and concerns of the region. These supporting initiatives are categorised under training, public awareness and sustainability. It is not possible to provide a comprehensive description of each of the tools in a summary report. However, the following examples are provided to illustrate the work that was completed, as well as the building

blocks that are available to assist with the transfer of the working models to other sites and to other environmental issues throughout the region.

Training Programmes

Over the past five years, 25 training courses and workshops have been organised. The training courses covered various topics, including: integrated coastal management (ICM); oil pollution preparedness, response and co-operation (OPRC); integrated environmental impact assessment (IEIA); marine pollution monitoring; pollution risk assessment/risk management (RA/RM); natural resource damage assessment (NRDA); development and application of geographic information systems (GIS); and strategies, tools and techniques for implementing international conventions.

Major Achievements:

- Adapting ICM demonstration sites in Batangas and Xiamen as "laboratories" for regional training
- Facilitating institutional arrangements, including government agencies, the private sector, academic institutions and NGOs for sustaining local, national and subregional efforts to protect the coastal and marine environment
- Developing specialised management-oriented training courses/workshops, based on the outputs and experience of the Regional Programme
- Establishing a pool of expertise within the region to implement marine pollution programmes

Strategies in Capacity Building:

- *Increase the specialised skills to plan, implement and evaluate marine pollution management programmes*
- *Strengthen capabilities to implement international conventions*
- *Develop capacities and mechanisms for establishing and sustaining facilities and services in marine pollution prevention and management*
- *Enhance management-oriented research capabilities*

The Programme has supported over 1,120 participants, mostly from the 11 participating countries.

Specialised management-oriented training programmes have been developed to address the needs of the region in general and individual countries in particular. The training programmes have not only drawn on the practical experiences of the Regional Programme, but from model training packages of other institutions and international programmes as well.

Demonstration Sites as Training Labs

The two ICM demonstration sites have been sharing their experience by way of workshops, study tours and annual regional training courses. Participants from across the region have learned about: institutional arrangements; legislation and enforcement; marine pollution monitoring and assessment; scientific and technical services; sustainable financing options; and public awareness from the practical applications in Batangas and Xiamen.

ICM experts from around the world attended the International Workshop on Integrated Coastal Management in Tropical Developing Countries: Lessons Learned from Successes and Failures, held in Xiamen, in May 1996. Initial results from the two demonstration projects were presented, and used in the development of the workshop's main findings, which are contained in the document, "*Good Practices in the Formulation, Design and Implementation of Integrated Coastal Management Initiatives*". The "*Good Practices*" guide was eventually translated into nine languages, and distributed throughout the region, as well as to Africa and South America.

The Malacca Straits Demonstration Project tested two processes for enhancing environmental management of coastal and marine ecosystems, namely: environmental risk assessment/management (RA/RM); and natural resource damage assessment (NRDA). The experience and outputs of the demonstration project were packaged into two training manuals. The manuals were field-tested at a regional training workshop, held in Singapore in October 1998. As a result of the workshop, modular training programmes were published for application throughout the region.

Environmental Management Atlas of the Batangas Bay Region

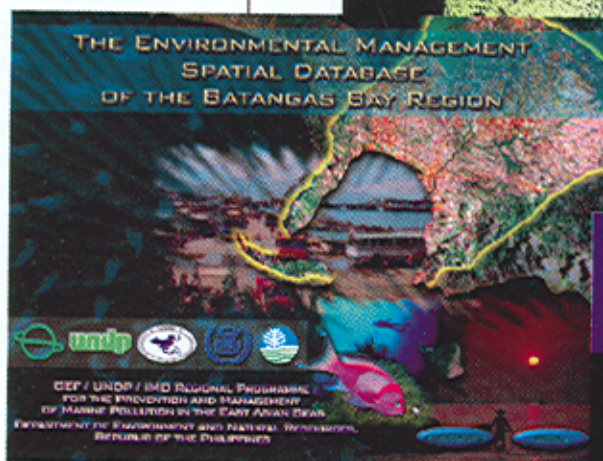
by

JAMER BAW
NOEL A. BOBLES
EDMUND TITUS A. CALDERON

1997



GEF/UNDP/IMO
Regional Programme for the Prevention
and Management of Marine Pollution
in the East Asian Seas



How to Use the Environmental Management Spatial Database of the Batangas Bay Region



Spatial and Temporal Databases for ICM Developed

Environment planning capacity in Batangas and Xiamen was upgraded through the installation of GIS facilities and the training of local staff. The GIS facilities, including both necessary hardware and software, are now fully functional and being used by the local planning units, environmental agencies, etc. The database framework and service functions are now being updated and customised into a generic integrated information management system (IIMS), which will be applied at ICM sites and subregional seas across the region.

Oil Pollution Preparedness, Response and Co-operation (OPRC)

The Regional Programme has accorded high priority to the enhancement of capability in oil spill preparedness and response, in recognition of the more than one-quarter billion

tonnes of oil and petroleum products that are transported by ships within the East Asian Seas each year. The OPRC model courses developed by the International Maritime Organization (IMO) have been modified and applied to meet the training needs of the region, including training for supervisors and on-scene commanders (IMO Model Course Level 2) conducted in Brunei Darussalam and Thailand in 1997, and training of administrators/senior managers (IMO Model Course Level 3) completed in Dalian, PR China, in June 1998.

The OPRC training has been supported by the IMO, the Australian Maritime Safety Authority (AMSA), East Asia Response Limited (EARL, Singapore) and Korea Shell Pacific Enterprises Ltd.

Constraints to Regional Training Courses:

- Identification of appropriate candidates from a cross-section of departments, agencies, institutions and levels of government
- Language used in training courses, and in training materials, is normally English, which limits participation to English speaking candidates

Integrated Environmental Impact Assessment (IEIA)

Activities were undertaken to strengthen environmental impact assessment (EIA) as a more effective tool for decision-makers. The Regional Programme, in collaboration with the Coastal Management Center (CMC) and the Swedish International Development Co-operation Agency (Sida), organised a group of experts in the region to develop a training package that incorporated advancements in determining accumulative ecosystem impacts and economic valuation of environmental consequences. The training package was first tested and applied at a training workshop on Integrated Environment Impact Assessment (IEIA) for Coastal and Marine Areas at the City University of Hong Kong in December 1997. The training workshop was repeated at the National University of Singapore in November 1998.

Opportunities Created for Young Scientists and Professionals

Eight young scientists and professionals from the region were trained at the Regional Programme's Office in Manila through an internship programme. Interns are given an opportunity to develop skills in ICM programme

implementation, marine pollution monitoring, environmental and socio-economic impact assessment, implementation of international conventions and so on. First-hand experience in assisting with project development and management activities also fortified an intern's capacity in future marine pollution project initiatives in his/her country. An additional advantage of the programme has been the strengthening of linkages between the Regional Programme and the home institutions of the eight interns.

South-South and North-South Co-operation

The Regional Programme has emphasised collaboration among developing countries within the region, and among regions. This has been evidenced through training activities, study tours and workshops on the experience and lessons from the project demonstration sites. For example, experts from the Philippines and Thailand have provided technical assistance to Vietnam to strengthen institutional capacities in pollution monitoring and management programmes. Similarly, scientists from Cambodia and DPR Korea were trained in marine pollution monitoring techniques in China (Xiamen and Dalian). All instructors for the ICM Regional Training Course and the Train-

ing Workshop on Integrated Environmental Impact Assessment were drawn from the countries of the region.

South-South co-operation has been extended outside the region also. National professionals from East Africa and South America have attended the ICM Regional Training Course to learn from the experiences in the region. Also, experiences on project design and management have been shared with the GEF International Waters project in East Africa, and on waste management with countries of Southern and Eastern Africa in a joint IMO/UNEP/IOC initiative.

There has also been a transfer of knowledge and technology from the North to the South, particularly in areas where expertise is lacking. For example, the methodology for implementation of a region-wide environmental risk assessment was developed and applied in the Malacca Straits through the joint efforts of experts from the North and a team of scientists from the region. The training programme, which was developed as a means of transferring the experience to other scientists in the region, included local instructors with the practical knowledge gained from the demonstration project.

Creating Public Awareness

Creating public awareness is one of the essential elements in ensuring sustainability of the project results. An educated public plays a dual role, that of supporting and assisting programme implementation, and contributing to the monitoring of progress and impact of management interventions.

Major Activities Contributing to Capacity Building, 1994-1998

Training

- training needs assessment
- training courses and workshops
- staff exchange programme
- in-service training

Technical Assistance in Marine Pollution Monitoring and Assessment

- Cambodia
- DPR Korea
- Vietnam

Networking

- Regional Network for Marine Pollution Monitoring
- Regional Network for the Legal Aspects of Marine Pollution

Technical Co-operation among Developing Countries

- national professionals to undertake capacity building activities
- experts from region to provide technical assistance
- technical staff from the region in programme management (e.g., internship programme)

South-South Co-operation

- participating countries share expertise in training programmes
- national professionals from East Africa and South America undertake training organised by the Regional Programme
- translation of *ICM Good Practices* into Swahili, French and Portuguese

Endangered Species: A Priority Concern in Xiamen

An ICM Contingent Valuation Survey was conducted in Xiamen in July 1998. The survey was designed to assess public awareness with respect to local environmental issues, and to determine the people's "willingness to pay" to improve existing environmental programmes in four main areas:

- Fisheries management
- Protection of endangered species
- Environmental management of beaches and water quality
- Sewage and solid waste management.

A total of 1,860 residents of Xiamen completed survey questionnaires over a five-day period.

Results of the survey showed that the residents of Xiamen have a high awareness of their environment, and various opinions on how to improve existing environmental programmes. In an area of the survey form where respondents were asked to give their views on environmental protection and coastal and marine resource management in Xiamen, more than 80% of the residents took the time to make personal remarks on existing programmes. Comments showed that there is substantial support for environmental programmes.

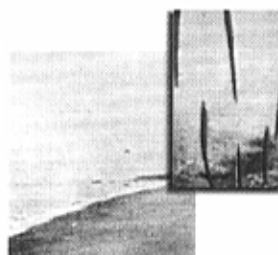
In the willingness to pay portion of the survey, 85% to 95% of the respondents indicated their support for preservation of endangered species in the Xiamen Sea, with preservation of the egret receiving highest ranking, followed by the Chinese white dolphin and the lancelet. Marine conservation areas and supporting legislation have been adopted by the Xiamen Government for the preservation of these endangered species. When asked how much they would be willing to pay to support preservation programmes, the average amount tendered by respondents was RMB 85 (approximately US\$10).



The egret is the mascot of Xiamen



The Chinese white dolphin (Sousa chinensis) is a favorite of tourists and residents alike in Xiamen



The lancelet (Branchiostoma belcheri) is a rare warm water benthic species, considered a living fossil

BATANGAS BAY WATCH

To boost the implementation of the integrated waste management programme and marine environment monitoring activities, the Batangas "Bay Watch" movement was organised. Bay Watch is a public awareness programme targeted at the youth, as active partners in the management and protection of the bay. As a Bay Watcher, he or she will work closely with the Environment and Natural Resources Office of the Provincial Government to monitor and report any incidence of pollution in the Bay area, and participate actively in information dissemination. Major outputs of the movement include: awareness enhancement activities by the youth; reduction of waste dumping and littering in the Bay area; and improved handling and management of waste on school premises and other public areas. The Bay Watch was officially launched in March 1998 by the Provincial Governor Hermilando I. Mandanas. Membership identification cards and orientation have been provided to nearly 1,000 students.



In Batangas, "Cleanest Village" contests are held regularly, as a reminder of the importance of one's immediate environment. "Bay Watch" activities and a special weekly radio programme devoted to the Bay environment also help maintain a high degree of environmental concern and conscientiousness among the populace.

In Xiamen, the number of environment-related recommendations tabled in the local consultative and legislative assemblies significantly increased in 1996 and 1997. The recommendations concerned such issues as functional zoning of coastal and marine areas, waste

management and environment improvement projects. The increase in concern and actions by the governing bodies is attributed to a growing public environmental awareness in Xiamen.

Promoting Connectivity

The Regional Programme promotes connectivity through multi-media information networking, including the Internet, a directory of institutions, a regional legal network, a regional marine pollution monitoring network, the International Waters LEARN programme, and two newsletters—the biannual *Tropical Coasts* and the quarterly *Marine Pollution Updates*.

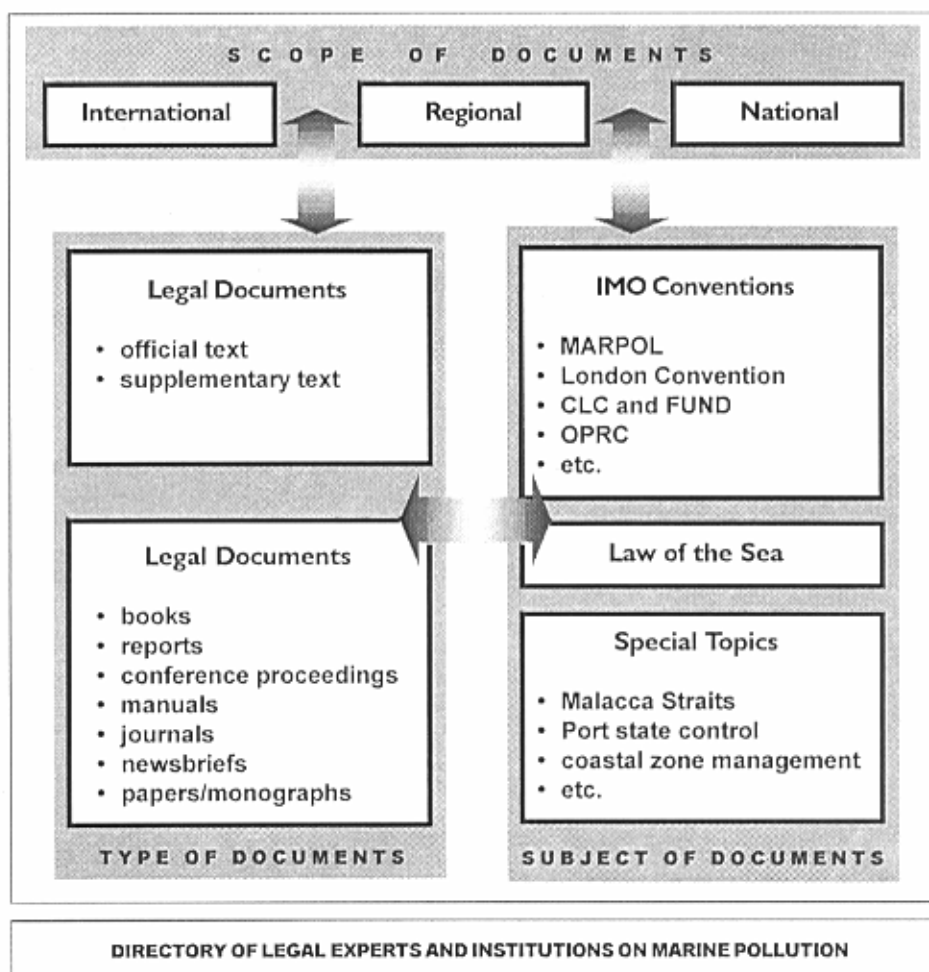
- **Websites**

The Regional Programme operates an Internet Home Page (<http://www.imo.org.ph>) for the dissemination of Programme activities and outputs. As of March 1999, more than 700 visitors have accessed the site. The menu provides a wide range of activities being undertaken as part of the Regional Programme, as well as linkages to other regional and global bodies and programmes.

- **Regional Directory**

A listing of institutions in the region that deal with research and management of marine resources and the marine environment has been compiled by the Regional Programme. The aim is to promote closer co-operation and collaboration among research and management institutions in the region in the resolution of environmental issues. In 1998, the number of directory entries increased from 218 to 231. A final version is available on the Programme's web page.

Schematic Representation of the Contents of the Legal Information Database



- **Legal Information**

The Network on Legal Aspects of Marine Pollution is proving effective in the exchange of legal concepts, knowledge and experience among regional network members. The Legal Information Database is one of the tools that has been developed to enhance the capacities of network members to work with their governments to ratify and implement conventions. The database contains 600 reference materials pertaining to marine pollution, including the texts of international and regional conventions, national legislation, articles, books and other materials relating to marine pollution. The Legal Information Database Reference Catalogue (LIDRC), which lists all reference materials available along with a brief abstract, is on the Regional Programme's Web Page.

National legislation contained in the database has been reviewed by the Regional Programme, and the results provide a good background on existing legislative structures among participating countries relative to obligations under international conventions related to marine pollution.

- **Monitoring Network**

The Marine Pollution Monitoring and Information Management (MPMIM) Network was launched to strengthen linkages among scientists in the region, specifically in sites where ICM is practiced. The Network serves as a channel for the exchange of information on the state and trend of marine pollution in East Asia. One of the activities being implemented is the development of site-specific monitoring programmes by member institutions, and linking the member institutions through Internet, for the purpose of sharing monitoring results and related information on ICM implementation.

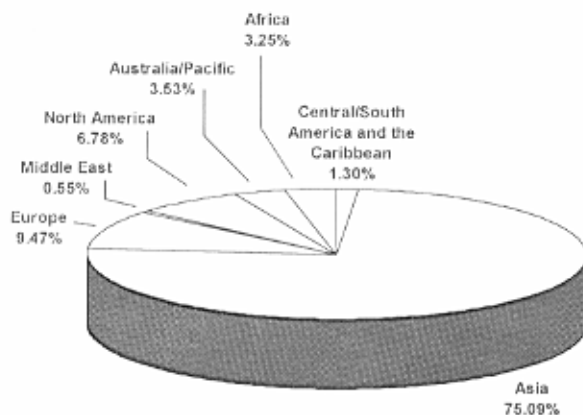
- **IW:LEARN**

The Regional Programme is one of Global Environment Facility (GEF) projects in the International Waters Learning Exchange and Resource Network (IW:LEARN). IW:LEARN is a UNDP-implemented distance learning project. Its purpose is to create synergy among the growing community of international waters projects financed by the GEF and other donors. Eventually, it will link projects among the three GEF Implementing Agencies (UNDP, World Bank and UNEP), providing up-to-date information on each project. If successful, IW:LEARN will contribute significantly to South-to-South exchange, more equitable sharing of science and technology, and enhanced follow-through of regional agreements and international conventions to protect global waters.

- **Tropical Coasts**

Tropical Coasts is a newsletter published to stimulate exchange of information and sharing of experience and ideas with respect to

**Dissemination of
Tropical Coasts Newsletter**





environmental protection and the management of coastal and marine areas. It is published biannually (July and December). The newsletter targets policymakers, environmental managers, scientists and resource users. It is sponsored by the Sida/SAREC Marine Science Programme, GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas and the Coastal Management Center.

The newsletter is distributed to over a thousand individuals and institutions worldwide, including 126 libraries.

- **Marine Pollution Updates**

Marine Pollution Updates is a newsletter published quarterly. It provides relevant information on the latest activities of the Regional Programme as well as contributes to efforts on public awareness.

Creating Sustainability

Sustainability was embodied in the overall strategy and activities of the Regional Programme. It was not a separate activity, but rather a vital component of all activities. From the planning and development of the national ICM demonstration sites...to the ratification of international conventions...to the formulation of marine pollution monitoring and evaluation programmes, the manner and means of ensuring the extension and replication of each major initiative beyond the term of the Regional Programme were considered. Such considerations involved institutional arrangements, training, awareness building, public sector-private sector partnership development, identification and testing of innovative management tools, preparation of investment opportunities, formulation of bankable project proposals, etc. In the end, several components of the Regional Programme, those primarily work related to the two ICM demonstration sites, proved the strategy to be valid, while others are now only beginning to emerge as potential mechanisms leading to sustainability (e.g., Natural Resource Damage Assessment).

Institutional Arrangements Proven Effective

The Batangas Bay Environmental Protection Council, composed of concerned government units, private industry and NGOs, and the Environment and Natural Resources Office of the Provincial Government, the implementing arm of the Council, were established in 1996. These mechanisms have proven effective in building up stakeholder consensus and shaping up major coastal projects having potential impact on the Bay region.

There are several practical examples of the value of the institutional relationships. A case in point, in 1998, the Environment and Natural Resources Office of the Provincial Government, in response to the complaints of local communities over alleged waste discharges from two distilleries into the Palico and Bagbag Rivers, organised site inspections to the two firms. Included on the inspection team were representatives from a local radio station, local branch offices of the Department of Environment and Natural Resources (DENR), Pollution Adjudication Board, mayors of the concerned municipalities and an NGO representative. Based on the inspection, the two distilleries were ordered to evaluate their waste treatment facilities and to verify the effectiveness of the systems in reducing harmful impacts of the receiving waters, or face the suspension or closure of operation.

Batangas ICM Mechanisms in Action

The Batangas Bay Environmental Protection Council, together with the Provincial Development Council, screened two proposed reclamation projects in the Bay area in November 1996. In view of the potential for discharge of wastes and other negative impacts on the Bay, the Council requested EIAs of the projects prior to consideration of approval. Eventually, the Council approved a natural gas pipeline to traverse the Bay, subject to the implementation of impact mitigation measures stipulated in the EIA.

Putting the Legal Teeth into ICM

Legislation to strengthen the role of the local government in managing major coastal development projects has taken place in Batangas and Xiamen. In Batangas, implementation of EIA related functions is a key area of interest, as a consequence of a national policy which devolves responsibility from central government to local governments. ICM legislative efforts in Xiamen focused on the issues of cross-sector co-ordination in the coastal project review and permit

process, scientific decision-making and the use of market-based instruments. The adoption of administrative rules for relocation of mariculture from the shipping area, and for eel larvae harvesting, helped the marine management office to resolve conflicts between navigation and fisheries. Marine functional zonation, integrated environment impact assessments and studies on sustainable financing mechanisms and options, provided scientific basis for the Regulations of Xiamen Municipality for Uses of the Sea Area.

Legislation to Strengthen the Role of Local Governments in Coastal Management

Sectoral laws on such specific coastal management issues as navigational safety, fisheries, coastal engineering and mineral resources are fairly common in the region. For the first time in PR China, a law (Regulations of Xiamen Municipality on the Use of Sea Areas) has been enacted by a local legislative assembly to focus on multiple coastal use issues using ICM approaches. The regulations mandate "the competent marine management sector", namely the Interagency Steering Group for Marine Management and Co-ordination and its implementing arm, the Marine Management Office of the Municipal Government, to co-ordinate permit reviews for all projects affecting the coastal waters. The regulations require consideration of the marine functional zonation in the review and approval of development projects, and the institution of fees for exclusive rights to use coastal water areas for commercial purposes.

The Philippine "Local Government Code 1992" facilitates a decentralisation policy and broadened base of mandates for the local governments in environment and natural resource management. However, implementation mechanisms and procedures, in many cases, have not yet been developed. A Memorandum of Understanding between the Provincial Government of Batangas and the Philippine Department of Environment and Natural Resources (DENR) has been formulated, enabling devolution of functions related to the EIA review and approval processes. The MOU was signed in February 1999.

Development of Legal Instruments for Marine Environment in Xiamen

Year	Major Project Activities	Legal Instruments
1994	<ul style="list-style-type: none"> • Strengthening local government commitments • Public awareness campaigns 	<ul style="list-style-type: none"> • Regulation for Environmental Protection
1995	<ul style="list-style-type: none"> • Integrated management committee/office established • Profile/environment management plan prepared • Marine laws reviewed and new legal instruments proposed 	<ul style="list-style-type: none"> • Regulations for Managing the Resources of Sands, Rocks and Soils • Regulations for the Management of Navigation • Municipal Ordinance for Egret Nature Reserve in Dayu Island • Administrative Rules on the Relocation of Aquaculture in the Marine Area for the Siting of Xiamen Shipyard • Administrative Rules for Strengthening the Management of Catching Marine Eel Larvae • Regulations for the Management of Water Resources
1996	<ul style="list-style-type: none"> • Yuan Dang Lagoon case study • Wastes problems and management assessed • Aquaculture impact study • Integrated monitoring system established 	<ul style="list-style-type: none"> • Municipal Ordinance for Managing Yuan Dang Lagoon Area • Municipal Ordinance for Urban Landscaping and Environmental Health • Administrative Rules for Aquaculture in Shallow Seas and Tidal Flats • Regulations for Marine Environment Protection
1997	<ul style="list-style-type: none"> • Integrated environment impact assessment • Functional zoning scheme developed • Studies on sustainable financing mechanisms 	<ul style="list-style-type: none"> • Regulations for the Uses of Sea Areas • Regulations for the Protection of Chinese White Dolphin • Regulations for the Management of Tourism • Government Notice on Implementation of Xiamen Marine Functional Zoning Scheme

The experiences at the two sites provided modalities to address legal issues relating to both inter- and intra-governmental dimensions (i.e., agency vs. agency, and national vs. local government).

Another interesting aspect of the local government initiatives was the direct impact on national obligations under international conventions. As an example, the Xiamen Government relocated a designated dumpsite for ocean disposal of monosodium glutamate (MSG), in consideration of the London Convention 1972. Alternate solutions were eventually developed by industry, and ocean

disposal of MSG was terminated in 1995. Termination of the dumping practice occurred prior to the global ban on ocean dumping of industrial waste, which came into effect on 1 January 1996. A similar situation is occurring in Batangas. There, waste derived from ships and port areas (i.e., MARPOL 73/78), as well as hazardous waste generated by industrial, commercial and institutional operations (Basel Convention), are being addressed within an integrated waste management action plan that has been adopted and implemented by local government. This confirms that programmes at the local level contribute directly to the implementation of global legal instruments.



London Convention 1972

- Criteria for selection of suitable sea disposal sites (e.g., depth; dilution; distance from coast)
- Dumping of industrial wastes prohibited, as of January 1996

Local Government Actions

- **October 1990**
Dumping of waste water inshore (West Harbour) prohibited
- **1990 - 1994**
New dumpsite (Zhenghaijiao) designated in a high energy environment with a water depth of 13-30 m and 16 km offshore of Xiamen

Results

- **1995**
Dumping MSG waste water terminated

Manual on Economic Instruments for ICM

Most environmental policy instruments used by governments are of the "command-and-control" variety, and seek to achieve mandated environmental standards through fines and legal sanctions. However, integrated coastal management, risk assessment/risk management and environmental impact assessment show that understanding the full costs and benefits of a project or programme, including environmental concerns, is essential in making investments and effective decisions. A proper understanding of the balance between the costs of pollution and resource depletion and the costs of mitigating these problems can and should lead to improved environmental policies.

Experiences in industrialised regions of the world provide helpful insight into the use of economic instruments to achieve environmental objectives. In preparing the Manual on Economic Instruments for ICM, the Regional Programme considered the experiences from the developed world, in tandem with the capabilities and needs of local governments in the East Asian Seas region. In reviewing and selecting appropriate economic instruments for inclusion in the Manual, criteria for assessing and designing the instruments were considered, including:

- effectiveness in achieving the environmental goal;
- the ability to achieve the environmental objective at a lower cost than other policies;
- the short-term costs that can be expected, and the time required before environmental and economic benefits are realised;
- administrative, monitoring and enforcement costs;
- consistency with other government policies, in particular programmes and activities which are designed as an incentive to economic development;
- the distribution of impact within and among economic sectors and society as a whole;
- legal authority to introduce and implement the economic instrument;

- acceptance and understanding of the instrument by the general public;
- factors concerning international competitiveness.

Among the economic instruments reviewed in the Manual, along with examples of application, are user charges, deposit-refund schemes, transferable development rights, risk-liability schemes and environmental bonds.

Straits of Malacca Environmental Information System

The vast coastal resources of the Straits of Malacca are under increasing stress as a consequence of land- and sea-based human activities in the subregion. The three littoral States have been working co-operatively for a number of years to protect the resources in the Straits, primarily focused on navigational safety and marine pollution prevention and response associated with shipping in the international strait.

One of the principal outputs of the Malacca Straits Demonstration Project was a comprehensive database and geographic information system (GIS) entitled, Straits of Malacca Environmental Information System. The system is a Windows-based software that provides a basic framework for the operation of an environmental and marine and coastal resource database and computer mapping, as well as different physical models. In designing the system, the objective was to provide an environmental management and decision support system for the Malacca Straits.

In completing the system, 15 subprojects were initiated by scientific institutions in the three littoral States. The institutions were:

- Center for Coastal and Marine Resources Studies, Bogor Agricultural University, Indonesia

Environmental Guarantee Funds/Environmental Monitoring Funds

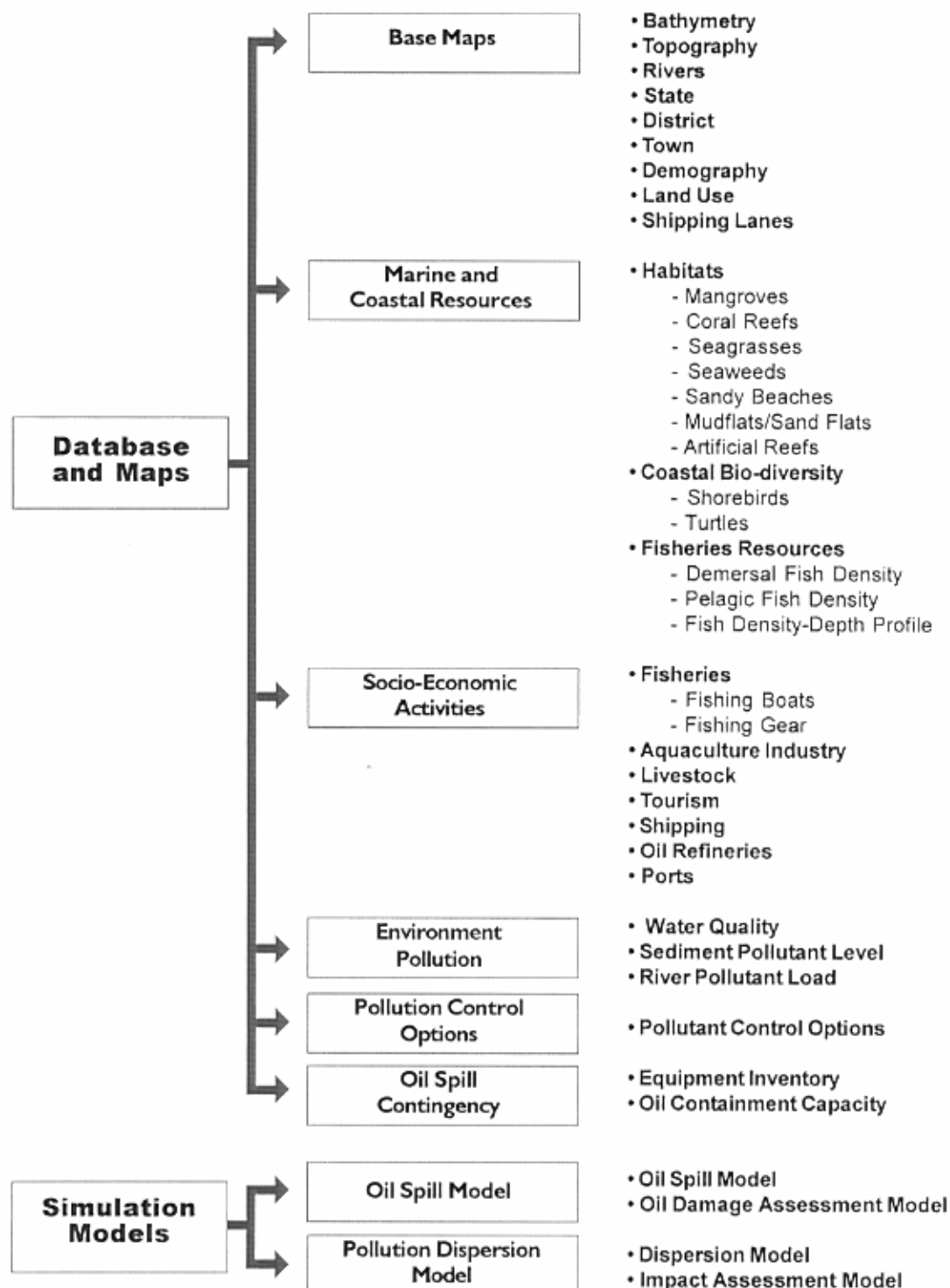
An **environmental guarantee fund (EGF)** is a type of economic instrument that falls under risk-liability schemes, which require firms to post monetary bonds before operations begin. These bonds will be forfeited if the firm's activities result in excessive pollution levels or cause detrimental effect on the environment. Thus, the burden is shifted from society to the firm for the potential damages.

An **environmental monitoring fund (EMF)** is a fund that project implementers are required to establish when an operating permit/environmental compliance certificate is issued by a government authority, to be used to support activities related to monitoring the firm's compliance with the designated permit/certificate. A multi-sectoral team is convened for the purpose of conducting the compliance monitoring, with the composition and responsibilities of the team to be agreed upon by the project implementer, the government authority and major stakeholders.

The EGF and EMF mechanisms are examples of economic instruments that make project proponents, or the market, take greater responsibility in ensuring that their activities do not have deleterious impact on the environment. In consonance with the polluter pays principle, these economic instruments call for the increasing role of the private sector in environmental management.

A crucial question is whether local governments can or should establish EGFs and EMFs on their own, or rely on central government to develop such mechanisms. There are legal issues to be assessed when contemplating these instruments. If local governments are given fund-raising powers by central government, then these two mechanisms represent an opportunity to exact contributions not only from project proponents but also from business establishments in their jurisdiction who benefit from or utilise the coastal resources. However, matters such as local government territorial jurisdiction, uniformity among local governments, procedures for assessing funding levels, fund security and administration, etc. all require careful evaluation. There is regional experience in the Philippines and Malaysia with these instruments.

Component Modules of the Database and Maps of the Straits of Malacca Environmental Information System (SMEIS)



- Institute of Postgraduate Studies and Research, University of Malaya, Malaysia
- Tropical Marine Science Initiative, National University of Singapore, Singapore

The system is menu driven, with seven sub-modules; five for databases and two for modeling. Base maps include bathymetry, topography, rivers, state, district, town, demography, land use and shipping lanes. Database and/or map overlays are available on marine and coastal resources, socio-economic activities, environmental pollution, pollution control options and oil spill contingency. The modeling sub-modules include oil spill trajectory and pollutant dispersion. The two models are linked to the database, to provide a rapid assessment of resources that are at risk in the coastal area, as well as an estimate of the potential economic impact on the area threatened by pollution.

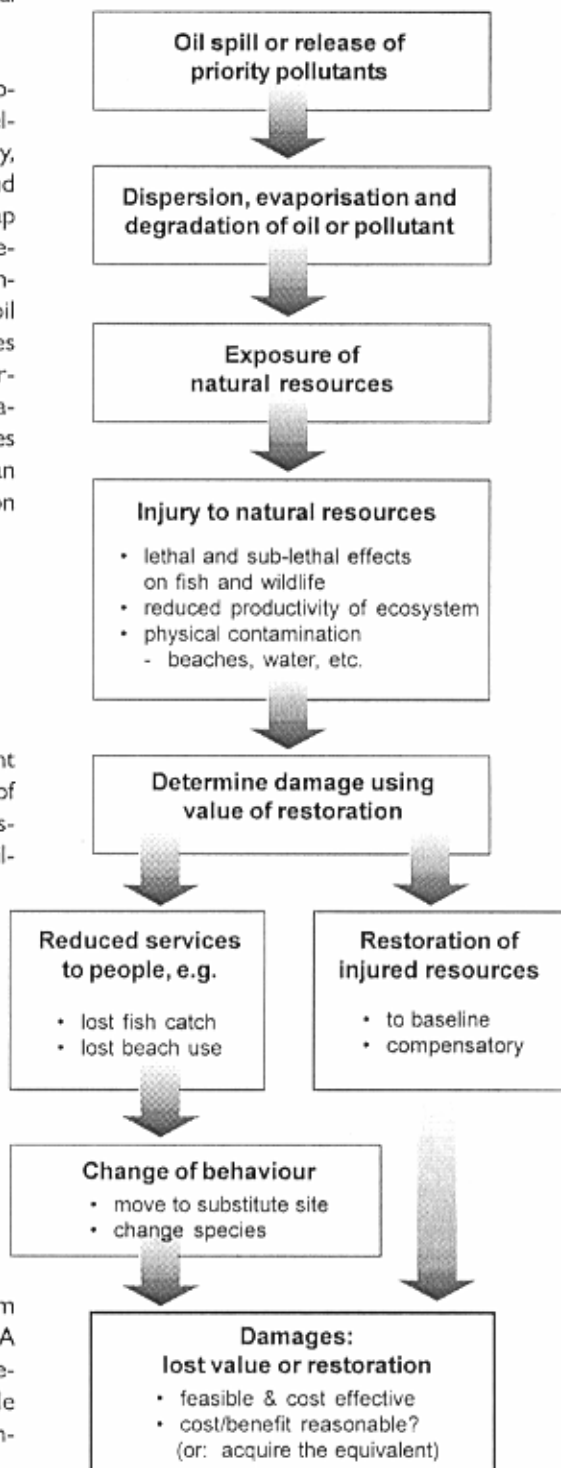
Natural Resource Damage Assessment: A Sustainability Tool

Natural Resource Damage Assessment (NRDA) is a process that involves the use of legal, scientific and economic principles to assess monetary damages due to pollution. Liability for damages from pollution, as quantified in a NRDA, provides an additional measure for sustainable financing by compensating for injuries and lost services of natural resources due to transboundary pollution.

NRDA consists of a formalised process, within an institutional regime, that supports the quantification of allowable losses from pollution incidents and the collection of resulting damage claims.

The intended outcome of a NRDA is a claim against a responsible party. As a result, NRDA necessarily involves tensions and adversarial debate between government, which is responsible for implementing and enforcing NRDA, and in-

Simplified Representation of NRDA Process



POLLUTANT DISPERSION MODEL (Oil & Grease)

Dispersion Model

Default User Input

Pollutant Loading - 1996

Compute for Rivers:

Muda River Klang River
 Juru River Langat River
 Kurau River Linggi River
 Perak River Melaka River
 Bernam River Kesang River
 Selangor River Muar River
 All Rivers

Oil & Grease

Klang

Display View Table

View Table

Risk Quotient

RQ Values	1 to 2	2 to 10	> 10
Zone of Impact (km)	9.09	1.83	24.89
Economic Value of Coastline in Impact Zone (US \$Million)	48.89	9.82	133.92

*RQ = Risk Quotient $\left(\frac{\text{Measured Environmental Concentration}}{\text{Assumed Ecotoxicological Threshold for Oil & Grease (100 } \mu\text{g/L)}} \right)$

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dustry, which must respond to and pay legitimate claims, and coastal businesses and users harmed by marine pollution. Critics of NRDA question the reliability and, in some cases, the appropriateness of NRDA assessments. Supporters of NRDA acknowledge the many difficulties that arise in quantifying loss, but make comparisons with the many empirical challenges and uncertainties addressed as a matter of course when assessing damages in other contexts, such as the value of intellectual property rights, of business anti-trust issues, and losses from personal injury, including the wrongful death of victims, in work-related accidents.

The Regional Programme has developed a NRDA model for the Malacca Straits, as an integral component of the Malacca Straits Environmental Atlas. The NRDA model is linked to the GIS database for the Straits, and runs in combination with the related oil spill trajectory or pollutant fate models. The result is a graphic presentation of the potential effects of an oil spill or pollutant discharge, as well as an estimate of the economic value of coastal and marine resources that are at risk as a consequence of such occurrences.

Consolidating Outputs and Lessons Learned

Integrated Coastal Management (ICM)

The Regional Programme has accomplished more than 100 projects and subprojects. Most activities were interrelated, with the output of one project providing a result to another, or an experience to feed into the capacity building constituent. This section contains a review of principal categories of activity, namely those associated with ICM and risk assessment/risk management demonstration projects, international conventions, marine pollution monitoring and sustainable financing. In addition to reviewing the progress made, a sampling of changes that occurred in public awareness, and the reactions of government and private sector stakeholders, is given. Finally, an assessment of the benefits of such changes is provided.

“Improved environmental quality in the River Thames in England, Boston Harbor in the United States, and Xiamen Harbor in China show that determined, co-ordinated action can produce benefits even in large urban areas, where development and population pressures are concentrated.”

IMO/FAO/UNESCO-IOC/WMO/WHO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP), 28th Session, Geneva, 20-24 April 1998

Major Achievements:

- Operationalisation of a generic integrated management framework for marine pollution prevention and management in Batangas Bay and Xiamen
- Packaging the experience and lessons learned from the ICM demonstration sites for extension region-wide

The demonstration sites in Batangas (Philippines) and Xiamen (China) were both successful in implementing comprehensive ICM programmes. Over the life of the project, they were able to establish and operationalise interagency and multi-sectoral co-ordinating mechanisms, which included all relevant government agencies. In addition, each site developed a prioritised agenda, undertook capacity building to strengthen their planning and management capability, developed environmental quality monitoring programmes, established mechanisms to ensure the sustainability of the programmes and promulgated needed local laws to legitimise institutional arrangements and permit systems.

ICM programme sustainability at the two sites has been bolstered by the changes in perception and attitude that has occurred among government officials and other local stakeholders. In Xiamen, senior government officials have seen the socio-economic and ecological benefits of Yuan Dang lagoon cleanup. Improvement of water quality through management interventions is apparent and they have seen how the functional zonation scheme has helped to reduce user conflicts, resulting in more willingness among the officials of various government agencies to work together. Perception changes are also apparent among the scientists in Xiamen, moving from single, disciplinary research to interdisciplinary, management-oriented research. The local government set up an integrated law enforcement arrangement that has increased the overall efficiency of government enforcement programmes.

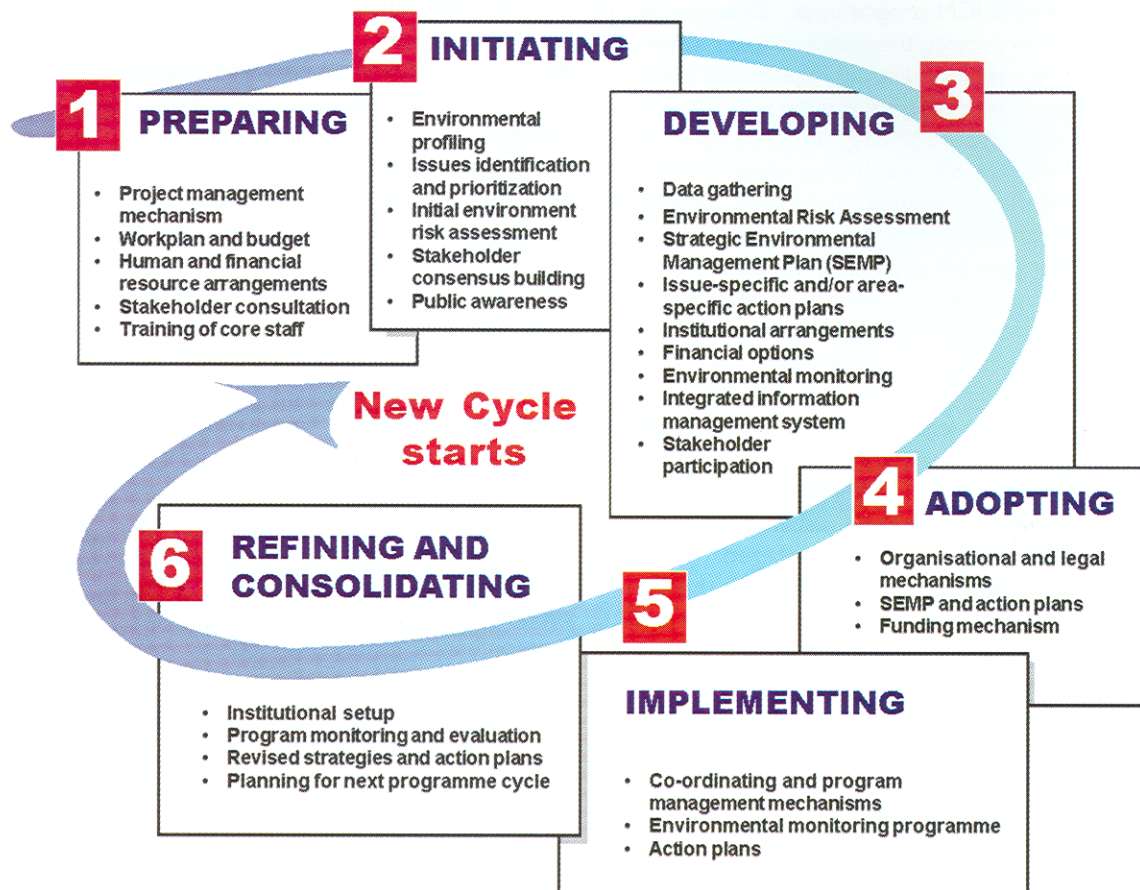
In Batangas, changes in perception and programmes of action have also occurred among politicians and private sector stake-

holders. The Provincial Government Environment and Natural Resources Office was established, including human and budgetary resources, with the ICM programme as a principal activity. The private sector in Batangas established the Batangas Coastal Resources Management Foundation (BCRMF), comprised of 23 large- and medium-sized industries located in the bay area, with a focus on protection and conservation of the bay. Although ecological and socio-economic impacts of ICM initiatives have not yet become evident in Batangas, the water quality monitoring programme shows that environmental quality is being maintained. An oil spill that occurred in the Bay in 1996 was efficiently contained by the oil spill combating facilities of the oil companies, with the support of local communities. There are better dialogues between various users concerning management of the Bay, through the interagency, multi-sectoral Batangas Bay Environmental Protection Council, thus avoiding unnecessary conflict and duplication of effort between public and private sector user groups in the Bay.

Project Development and Implementation Cycle

The implementation of ICM demonstration programmes in Batangas and Xiamen has taken from four to five years, covering project preparation, initiation, development, adoption, implementation, consolidation and refinement processes, which follow a cyclical pattern. The two demonstration projects were implemented in a relatively short period of time, considering the conventional view that a time frame of 8-15 years is required, depending on project size and complexity.

ICM Project Development and Implementation Cycle



The time reduction was basically due to the political will and commitment of the local governments, optimal use of existing information and intensive efforts to promote stakeholder consultation and participation. As the projects are approaching the end of their cycle, emphasis is being given to the consolidation of the project results and the formulation of ICM programmes for the

next cycle, taking into account changed circumstances and the need for management refinements. For example, in Xiamen, emphasis will be given to the development of a joint management regime over the Jiulong Estuary, which is shared between Xiamen Municipality and its neighbouring Zhangzhou Prefecture.

ICM Practices in Batangas and Xiamen, 1994-1998

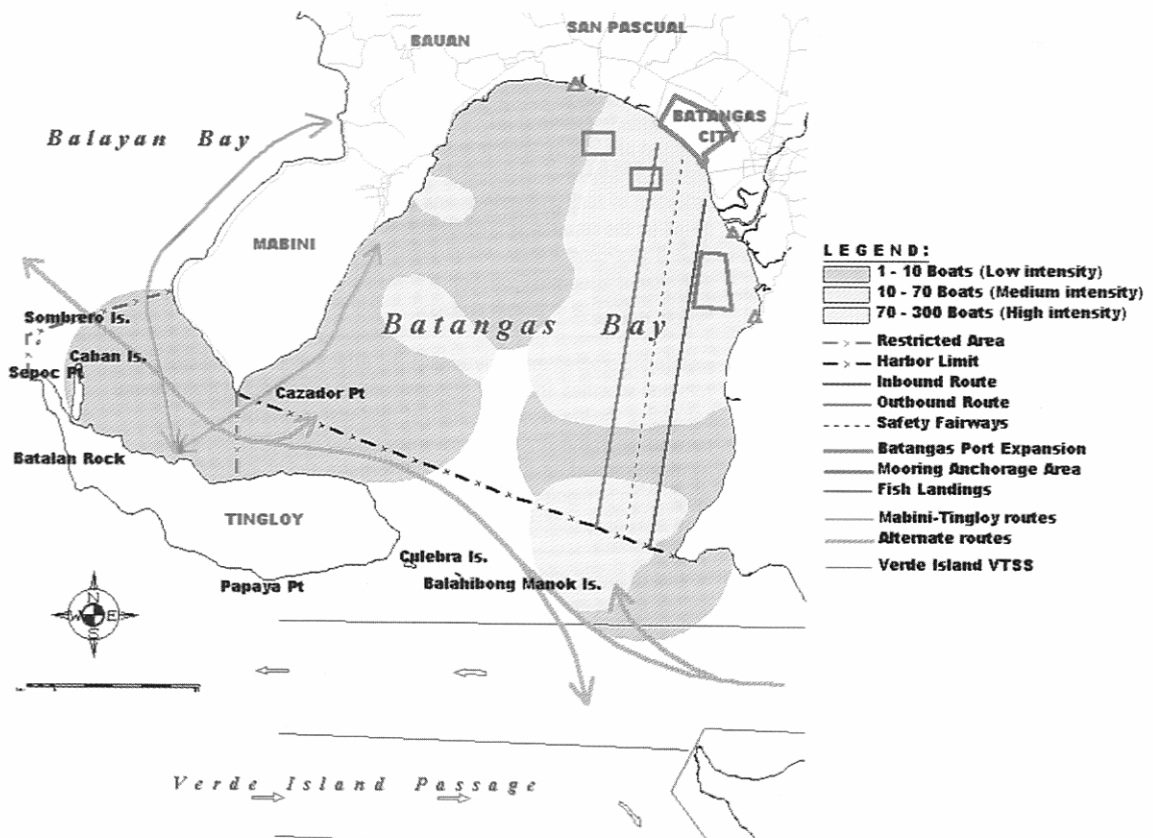
	PROJECT OUT-PUTS	PROJECT ACTIVITIES
1	Institutional arrangements, including organisational and legal	<ul style="list-style-type: none"> • coastal policy co-ordination mechanisms involving all the stakeholders • organisational structure for project co-ordination and implementation • operational arm for project co-ordination and implementation • scientific input to coastal management decision-making • legislation implementing ICM policies and practices and the use of market-based instruments
2	Information/database development	<ul style="list-style-type: none"> • multidisciplinary information management and dissemination • profiling environmental, socio-economic and management conditions • identification of major environment problems and management issues • packaging information to increase public awareness
3	Environmental impact/risk assessment	<ul style="list-style-type: none"> • qualitative and quantitative assessments of trade-off between economic development and loss of resources and environmental services • prioritisation of concerns and identification of management options
4	Strategic Environmental Management Plan (SEMP)	<ul style="list-style-type: none"> • packaging of institutional, technical and economic interventions to tackle identified concerns • stakeholder consensus building • identification of financing needs and investment opportunities • adoption of SEMP by government authority as part of its overall socio-economic development programme
5	Management Action Plan (MAP)	<ul style="list-style-type: none"> • development of integrated MAP to address priority environment/resource conservation concerns, e.g., pollution, fisheries, biodiversity, habitats, etc. • assessment of appropriate sustainable financing mechanisms, including public-private partnerships • adoption of MAP by appropriate government authorities
6	Integrated land and water use zoning	<ul style="list-style-type: none"> • definition of zoning objectives and classification criteria and schemes based on the requirements of SEMP and MAP • stakeholder consultation • adoption of integrated zonation scheme by the appropriate government authority for use in permit process
7	Environmental monitoring programme	<ul style="list-style-type: none"> • monitoring programme to determine the effectiveness of policies, zonation schemes and other management interventions in maintaining/enhancing the life support system of the local ecosystem • networking of monitoring programmes among ICM sites • harmonisation of environment quality criteria and standards • application of monitoring data in environment quality assessment, EIAs and policy-making
8	Sustainable financing mechanisms	<ul style="list-style-type: none"> • forging of public and private sector partnerships in project planning/review, public awareness drives, waste management • defining investment opportunities through prefeasibility studies
9	Core staff training	<ul style="list-style-type: none"> • training in ICM concepts and practices using demonstration sites as a "laboratory" • cultivation of interdisciplinary, interagency and intersectoral team work • hands-on experience in project development, implementation and management
10	Stakeholder consultation and public participation	<ul style="list-style-type: none"> • consultation with industries, private sector, NGOs and local communities • agreements/arrangements for participation in ICM process and project development and implementation activities • formalisation of partnerships to insure project sustainability and effectiveness

Water Use Zonation Schemes in Xiamen and Batangas

Zoning schemes have been developed in Xiamen and Batangas to guide use and development of sites and activities in the coastal area. In preparing the zonations, review and analysis of ecosystem functions, socio-economic features and resource valuation were completed. The principal aim was to ensure that the community is provided with optimum advantage as a con-

sequence of development, with due consideration to the environment as a contributing, sustainable resource. In Xiamen, consideration of the functional zoning scheme in siting coastal projects has become a legal requirement (Regulations of Xiamen Municipality on the Uses of Sea Areas). The Batangas Bay Water Use Zonation Scheme has already been applied in the review of a proposed gas pipeline landing project and in the development of a vessel traffic separation scheme (VTSS) for the Bay.

Vessel Traffic Separation Scheme in the Batangas Bay



Marine Functional Zoning in Xiamen: Balancing Navigational Safety and Marine Mammal Protection

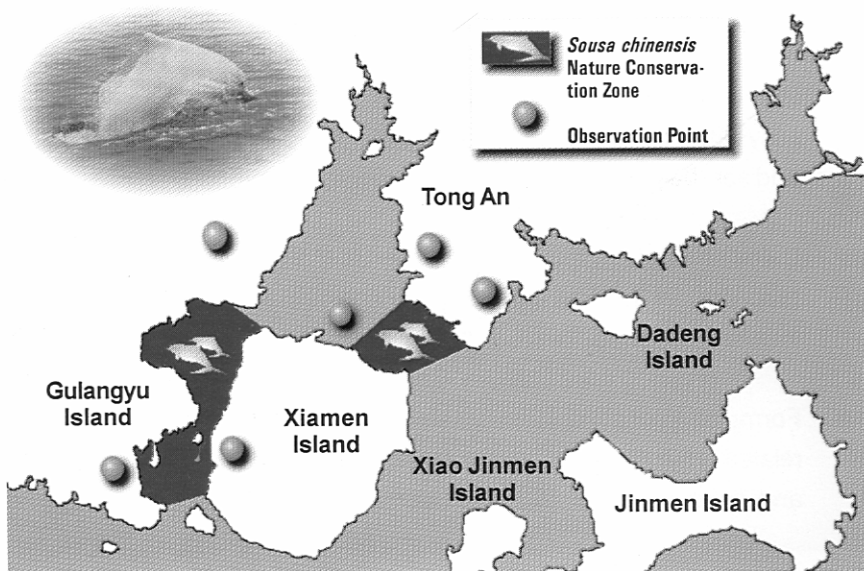
According to the zonation scheme, shipping and port development are the dominant functions in the West Sea of Xiamen. Tourism (Gulangyu Tourist Islet) is identified as a compatible function and mariculture is a restricted activity, to control the shellfish culturing rafts and fish cages from encroaching on the designated navigational channels.

The West Sea is also an important habitat for the Chinese white dolphin (*Sousa chinensis*), a species listed in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and is classified as a nature reserve for the dolphin. This presents a potential conflict, as a nature reserve law would preclude navigation. The Xiamen Municipal Government issued a special ordinance on the nature reserve, to protect the dolphin and also to allow navigation in the area. The ordinance contains the following legal requirements:

- ship cruising speed to be kept under 8 knots except in emergencies
- no bottom trawling or gill nets
- no high speed recreational boating and surfing
- no effluent discharges, unless under permit and in keeping with relevant standards
- special permits required for reclamation
- no underwater explosions and other activities that would disturb the habitat or increase suspended sediment loads in the water column

A White Dolphin Nature Reserve Management Division was established under the fisheries agency to enforce the ordinance. A Special Fund for White Dolphin Protection of about 1.1 million yuan has been set up to provide food for the dolphin, to promote related research and education and to implement protection measures. Some 19 public institutions and 900 individuals contributed to the fund in 1997. No dolphin catching or killing has been reported since the implementation of the ordinance.

Nature Conservation Zones for Chinese White Dolphin (*Sousa chinensis*) in Xiamen, China



“Risk assessment is the first step in the process of moving from a state of environmental inventory to a more detailed analysis of pollution risks and possible needs for management action.”

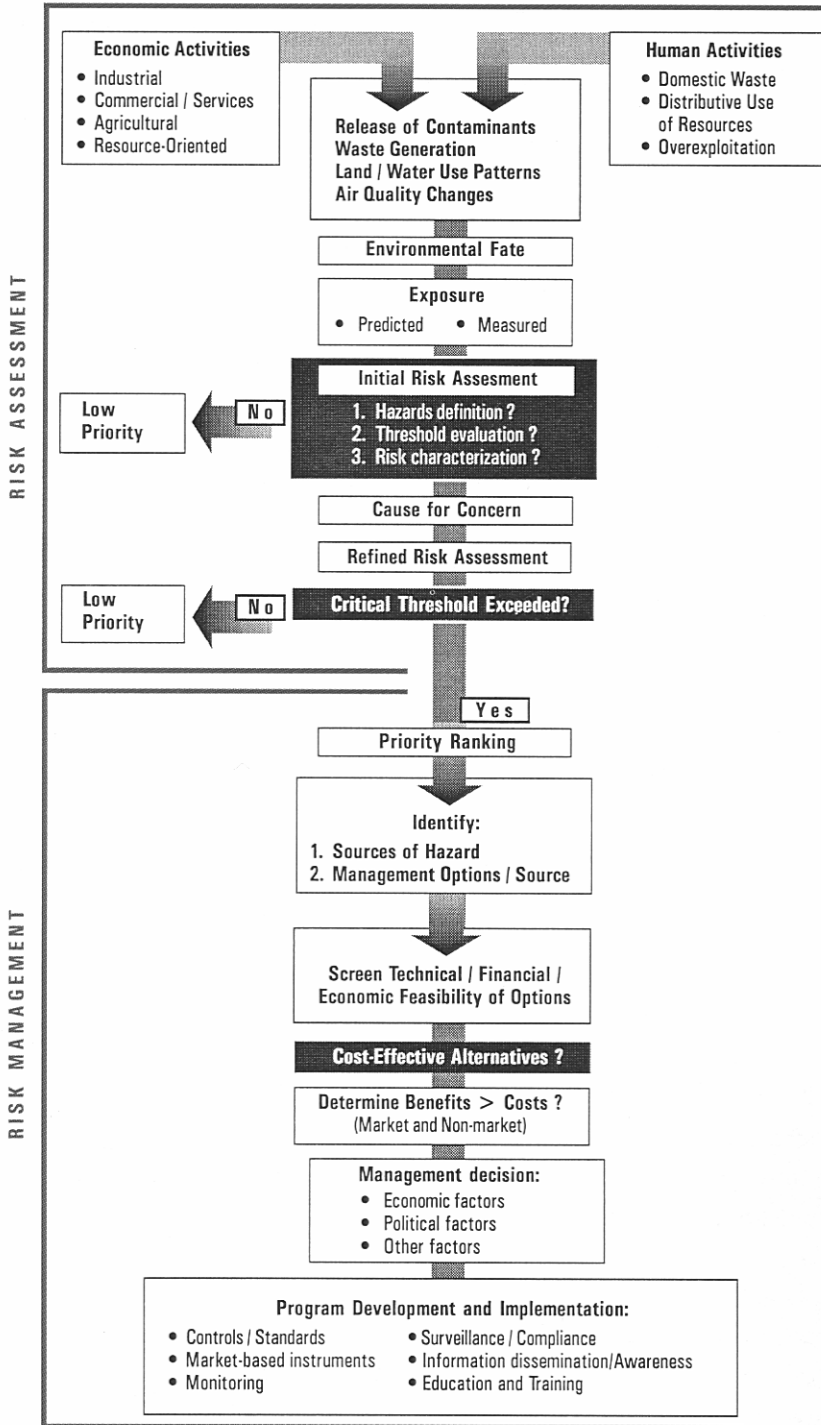
Professor Peter Calow and Dr. Valery Forbes
Malacca Straits: Refined Risk Assessment
GEF/UNDP/IMO Regional Programme
December 1998

Describing and assessing the states of the environment are central parts of environmental protection. Yet what to measure, and how to relate observed changes either to the consequences of some contaminating processes, or to the implementation of some environmental protection measure, is far from straight forward. Largely, this is because in a complex world, it is often hard to identify specific causes and effects. Nevertheless, state of environment reports and environmental impact assessments are repeatedly being compiled at various scales, from global to regional, national and local. All these reports tend to consider aspects of the environment that are conveniently measured, and to judge “state” either in terms of the presence of hazardous substances or in terms of change in selected variables over time.

Major Achievements:

- Development and verification of a systematic process for assessing and managing transboundary marine pollution in the Straits of Malacca
- Creation of an environmental database containing temporally and spatially referenced data on coastal and marine resources and the land- and sea-based activities within and along the Straits
- Calculation of the total economic value (TEV) of coastal and marine resources in the subregion, including services rendered directly and indirectly to various users and beneficiaries
- Formulation of a project proposal on behalf of the three littoral States, related to the development of a self-sustaining information management and distribution system, known as the “marine electronic highway”

Risk Assessment / Risk Management Framework



A problem with this approach is that it is often hard to pick up relevant and significant effects and changes in a naturally dynamic world. Noise often overwhelms the observations.

The risk assessment approach presumes that it is possible to specify the likely consequences of human activities on ecological systems and on human health. This is frequently accomplished with regard to chemical quality of the environment. It is further often presumed that there will be states of the environment, arising out of human influences in terms of processes and emissions that are associated with a low probability of harm to human health and ecosystems. This suggests that human activities can be managed to achieve these levels, without the need to impose zero emission requirements.

The four goals of environmental risk assessment/risk management of the Malacca Straits were:

1. to demonstrate the application of the risk assessment/risk management approach in a tropical subregional sea area;
2. to identify circumstances of risk in the Straits that invite management attention;
3. to establish areas of scientific and technical need, in terms of information, measurement and possibly research; and
4. to build awareness and confidence among scientists, professionals and managers within the subregion, regarding the use of risk assessment/risk management as a tool for improved environmental management.

Risk Quotient

A simple but quantitative approach to risk assessment, which has the potential for more sophisticated development, is risk quotient (RQ), where:

$$RQ = \frac{\text{Estimated Exposure Concentration (distribution)}}{\text{Threshold No-Effect Concentration (distribution)}}$$

Although one can precisely estimate the probability that RQ exceeds one, a precise probability of adverse effect cannot be calculated. However, when RQ is greater than or equal to one (environmental concentration is greater than the no-effect level), it is presumed that there is likelihood of effect that increases with the size of the ratio. On the other hand, when RQ is less than one (environmental concentration is less than the no-effect level), the likelihood of effect is low and not of concern.

In reality, there will be much uncertainty in the estimates of exposure and critical thresholds, and the RQ assessment should always be associated with an uncertainty analysis, involving qualitative (descriptive) or quantitative (statistical) assessments.

Environmental Risks in the Malacca Straits

In 1998, a refined risk analysis of land- and sea-based sources of pollution and their effects on living and non-living resources in the Straits was completed. The result was a comprehensive document on environmental risk assessment of the Malacca Straits.

The refined risk assessment focused on two priority activities and contaminants in the Malacca Straits, as identified in the initial risk assessment (1997), namely:

1. Human health effects, by exploring:
 - fish/seafood consumption; and
 - contamination of fish/seafood by metals, pesticides and hydrocarbons.

2. Ecological effects, by exploring measured environmental concentrations for hydrocarbons and hydrocarbon composition, and their impact on the ecosystem.

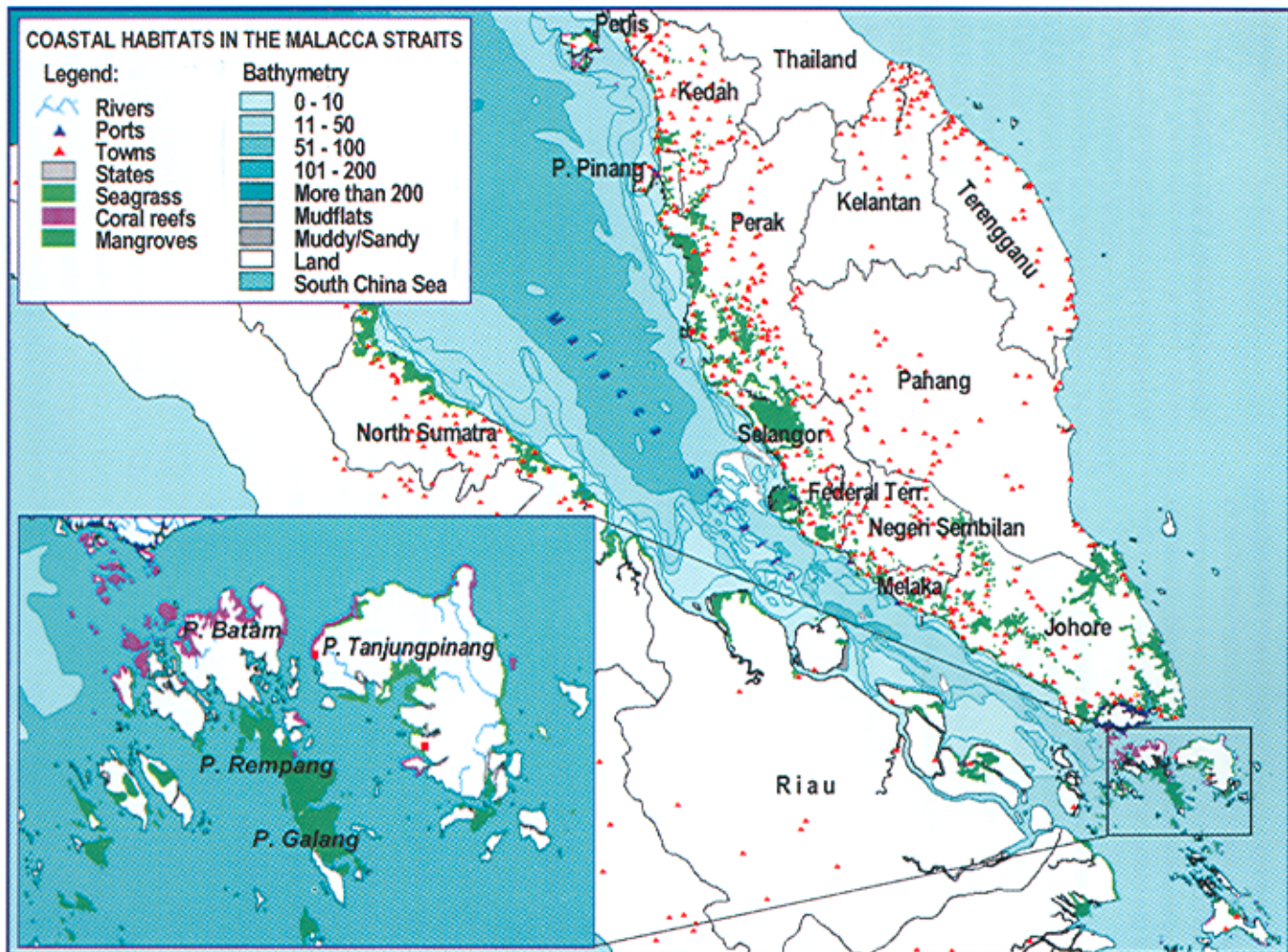
Retrospective Risk Assessment

Within the Malacca Straits, retrospective risk assessment of coastal and marine resources primarily relies on anecdotal information and land use maps. The overall greatest risks to the mangrove forests appear to be associated with intentional clearance of the mangrove areas for other purposes. The area of the Straits at greatest risk lies on the Indonesian side, along which mangroves constitute a relatively large area of coastline, which appears to be experiencing the greatest rates of decline, and for which management programmes to date appear to be relatively ineffective.

Retrospective Analysis of Declines in Key Habitats for the Straits

Habitat Type	Areal Extent	Decrease in Quantity	Decrease in Quality	Ecological Consequences	Economic Consequences
Mangroves	Large	Large	Moderate ^S	***	**
Peat Swamps	Large	Large	NI	***	**
Coral reefs	Small	NI	Moderate to Large	**	*
Seagrass Beds	Moderate	NI	Moderate ^S	**	*
Soft Bottoms	Large	No Decrease	Moderate	**	**

Areal extent is an estimation of the relative abundance of each habitat type as large, moderate or small; evidence indicates decrease in habitat quantity (i.e., areal extent) and quality indicates a large decrease, moderate decrease and minimal decrease, or no decrease. Judgements on the relative seriousness of consequences for the ecology of the Straits, and the economies of the littoral States, are indicated by the number of asterisks, (i.e., more asterisks, more serious), NI indicates that no information was provided. A superscript "S" indicates information for Singapore only.



Prospective Risk Assessment

The risk pathways in the Malacca Straits make it clear that deterioration in environmental conditions can have important impacts on human health and wealth generation through, for example, impacts on fisheries, exploitation of other ecological resources, such as mangroves, and tourism. The subsequent risk analyses, both retrospective and prospective, have demonstrated impairment of fisheries and mangroves and the possibility of serious risks to habitats and biodiversity in general from various contaminants, with likely implications for productivity and yield of ecological resources, and negative effects on tourism.

To gauge the seriousness of each contaminant and their relative importance in societal terms, it is necessary to translate them into units that reflect societal impacts. These are generally monetary units. Thus

$$\text{Society risk} = f(\text{likely loss or impairment of an entity})(\text{economic value})$$

where value is not intended as an absolute, but as a measure of societal needs and preferences in a situation where resources are limited. It is usually judged by willingness to pay for the entity at risk, in real or imaginary market places.

Comparative Risk and Uncertainty Assessments for Ecological Entities within the Straits of Malacca Exposed to Waterborne Contaminants

RQs Contaminant	< 1	1 - 10	10 - 100	100 - 1000	1000	Uncertainty (major sources)
Metals			—		•	Standards
Pesticides	—			•		Variability in MECs
TBT		—		•		Variability in MECs
BOD	—					Lack of MECs
TSS	—					Lack of MECs
Oils and hydrocarbons			—		••	Lack of standards and MECs for Specific HCs

Line shows the range of RQs determined in the prospective analysis and based on **measured environmental concentrations (MECs)** given in the Malacca Straits Environmental Profile. Selected compounds or sites having particularly high RQs are indicated with filled circles. Metals are based on national standards and Danish water quality standards. Pesticides are based on the Aquatic Life Standard. TBT is based on UK Standard. The largest source of uncertainty in the RQs (variability in MECs, lack of MECs, or standards) is indicated in the right hand column.

Source: Malacca Straits: Refined Risk Assessment, December 1998

Natural Resource Damage Assessment

Managing pollution from land- and sea-based activities in the Malacca Straits raises two inter-related issues. One is the appropriate scale of measures to prevent and control pollution. A second issue has to do with the institutional framework, methods and standards that might be used to assess the monetary value of natural resource damages when a pollution event occurs or is established.

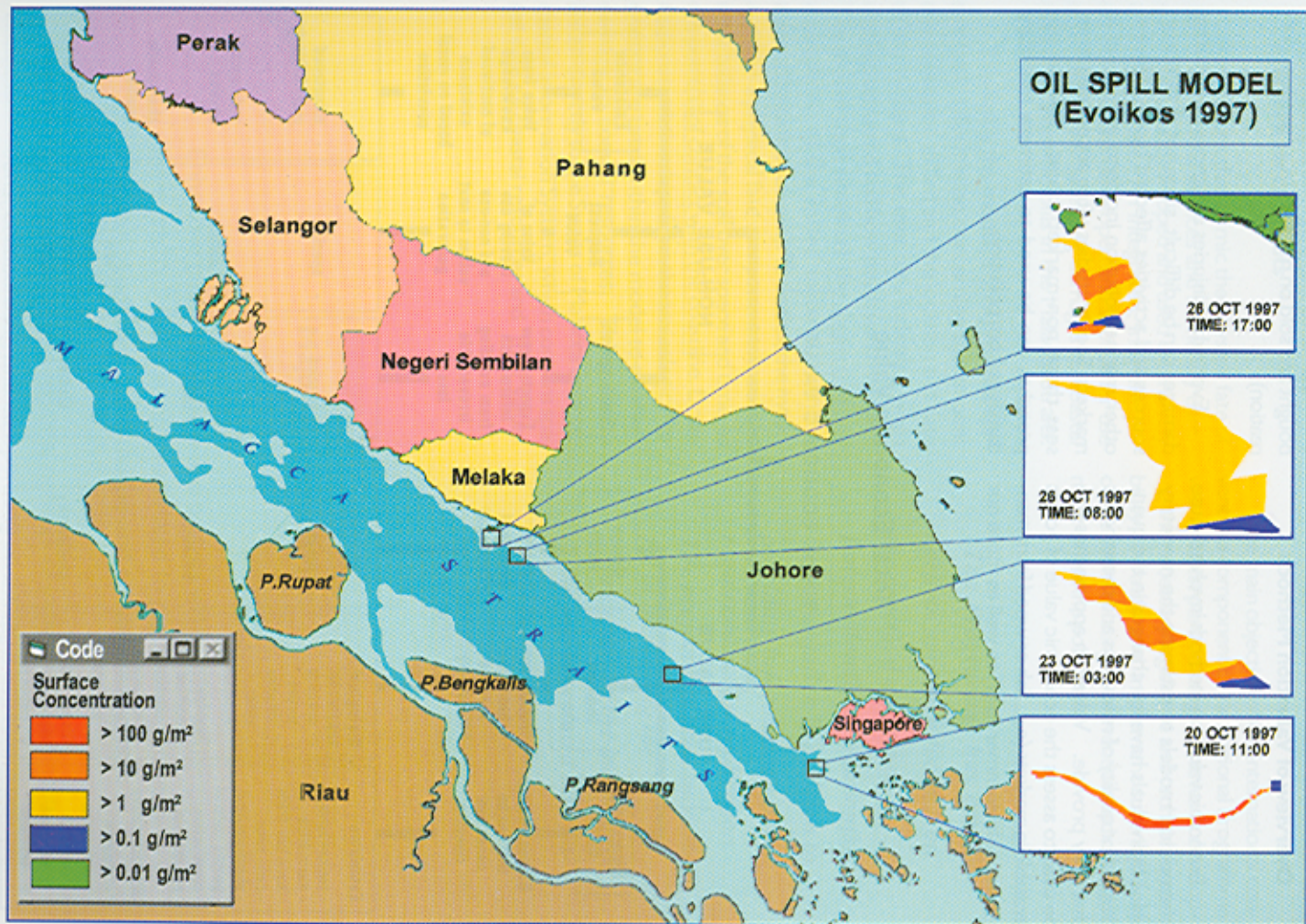
For example, despite many preventive and control actions, the risk of oil spills in the Malacca Straits will persist. When spills happen, it is necessary to decide whether to assess damages, which losses can be compensated for, the best method(s) to be used to assess damages, and the institutional framework within which such assessments take place. This is where natural resource damage assessment becomes important.

Interest in NRDA by public bodies stems from its promise in helping to achieve two important environment policy goals. First, it provides a framework for pursuing compensation for the many costs that can result when natural resources, coastal activities, and property are adversely affected by oil and other marine pollution. Many types of pollution damages currently are not compensated for, and as a result, these costs are borne by coastal states.

The NRDA approach using economic value is a human-based view of pollution effects. Under this approach, resources have value only insofar as they provide services that are directly or indirectly valued by *people*. This is an important (and for some, controversial) view in that it does not allow that resources may have a value in and of themselves. Compensation for pollution damages under international conventions now also allows for restoration costs in some cases.

Difficulties in Implementing the Malacca Straits Demonstration Project:

- Lack of consensus among the three littoral States on the objectives, strategy and processes for completing an assessment of transboundary marine pollution issues and management programmes in the Straits in early phase
- Different perspectives on the primary service and relative values of natural resources within the Straits
- Inaccessibility of reliable scientific and technical information and mapping on natural resources and human activities
- Blending multidisciplinary groups of scientists, technicians and professionals from the three littoral States into an international team of resource persons focused on the production of tools and mechanisms for strengthening pollution prevention and management in the Malacca Straits

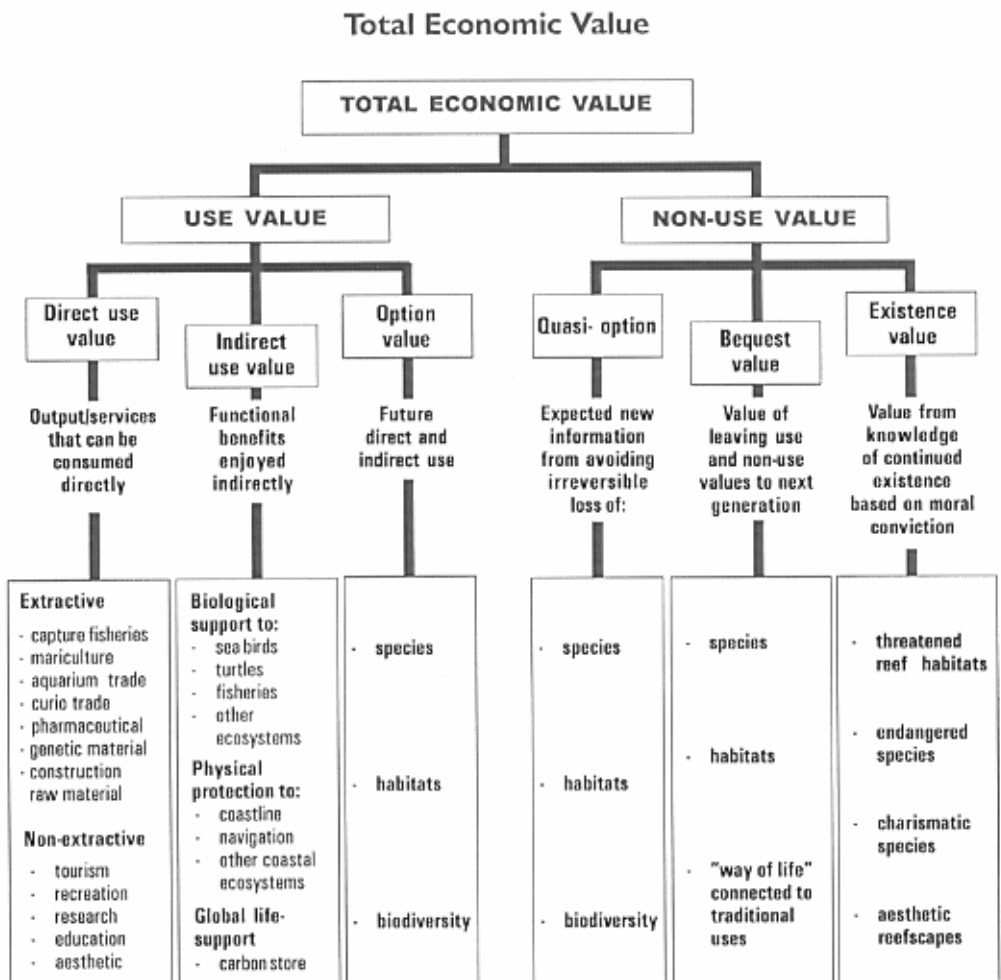


Overview of Valuation Methods

Economic valuation methods involve the use of empirical models to estimate the monetary value individuals have for changes in the quantity and/or quality of resources and the services that they provide. Valuation approaches can be used to assess the economic value of goods available in markets (e.g., fish or wood from mangroves sold commercially) as well as those not

bought and sold on markets (e.g., outdoor recreation).

Even when injuries are known, estimating damages can be difficult, since not all of the resources and activities affected by oil spills and other marine pollution incidents are valued in markets. Special studies often are needed to assess these non-market values. Several approaches can be used to estimate monetary damages from pollution.



Source: From Spurgeon (1992), as presented in the Benefit-Cost Analysis of Tourism Development and Sustainability in the Malacca Straits, June 1998.

Assessing Damage from Oil Spills in the Malacca Straits

Simulations that mimic the physical fate of a spill, injury, lost services and monetary damages have been developed and used extensively in other regions. An integrated, interdisciplinary model was developed and applied for use as a method for assessing damages to coastal resources from oil spills in the Malacca Straits.

To employ the model, a user provides certain basic information concerning the amount and substance spilled and the location and date of the incident. The user also indicates when cleanup occurred and how much was removed. The model then simulates the dispersion and degradation of the spilled material (within a mass-balance framework). To do this, the model contains a physical fate component to track the mass balance of the spill over space and time, to the point(s) of contact with the coastline. Dose-response relationships from the toxicological literature are used within the model to estimate damage to coastal resources. The model is linked directly to the Straits of Malacca Environmental Information System, which contains spatial data on coastal resources and their value.

The main objective of the international conventions component of the Regional Programme was to assist participating countries in developing the necessary legislative and technical capability to ratify and implement international conventions relating to prevention and management of marine pollution.

“The Programme has developed an approach focused on the practical aspects of [international] convention(s) implementation in addition to providing information on the requirements for replication. The project has been successful in increasing the awareness...of the importance of the marine related international conventions.”

Final Evaluation Report
August 1998

Major Achievements:

- Enhanced public awareness and political will to ratify and implement international conventions related to prevention and management of pollution of the marine and coastal environment
- Implementation of a regional network of individuals and institutions, collaborating and co-operating on the legal aspects of pollution prevention and management of the East Asian Seas

Some innovative concepts and approaches were introduced during the Programme, in order to enhance awareness, political will and technical capacity among the participating countries. First, the focus of the work was not just the legal obligations of global agreements, but also the prospective benefits to be derived by the States Parties. The creation of economic opportunities, the potential role of the private sector and the environmental and social implications of international conventions were examined in vari-

ous workshops and conferences held in Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam. As a result of these undertakings, national action plans were developed in Indonesia, Philippines and Vietnam to strengthen implementation capabilities in various conventions.

A second innovative aspect of the programme was the establishment of the Legal Information Database on marine pollution, containing more than 600 reference materials per-

Review of National Legislation in the East Asian Region

TYPES OF LEGISLATION										
	Cambodia	China	DPR Korea*	Indonesia	Malaysia	Philippines	R.O. Korea	Singapore	Thailand	Vietnam
Framework Environmental Law	✓	✓	✓	✓	✓	✓	✓		✓	✓
Biodiversity		✓		✓		✓	✓			
Other Environmental Legislation	✓	✓		✓		✓				
Environmental Impact Assessment (EIA)		✓		✓	✓	✓			✓	✓
General Law on Pollution				✓		✓				
General Law on Marine Pollution		✓	✓	✓		✓	✓	✓	✓	
Specific Laws on Marine Pollution										
• Sea-Based Sources				✓		✓				
Navigation/Maritime/Shipping	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Exclusive Economic Zone				✓	✓					
Continental shelf				✓	✓					
Fisheries		✓		✓						
• Land-Based Sources		✓			✓				✓	
Water Pollution		✓		✓		✓	✓	✓	✓	
Toxic and Hazardous wastes		✓		✓	✓	✓	✓	✓	✓	
Agricultural wastes		✓		✓	✓	✓				
Mineral wastes		✓		✓					✓	✓
Sewage/Industrial wastes	✓	✓		✓	✓			✓	✓	
Domestic waste		✓				✓	✓	✓		
Others		✓								

*based on a country report to the Legal Training Workshop, 21-23 September, 1998, Bangkok.

Guidelines for National Legislation

The *Guidelines on National Legislation on Marine Pollution Prevention and Management for East Asian Countries* are designed to provide countries in the East Asian region with a readily-available and common source of reference for the preparation of an orderly and up-to-date body of legislation concerning marine environmental law. The guidance is based upon internationally-accepted legally binding instruments as well as non-legally binding instruments.

To promote a systematic approach to legislation development, each international convention is broken down into common and special elements. Conventions covered in the guidance include MARPOL 73/78, the London Convention 1972, OPRC 1990, CLC 69, FUND 71, UNCLOS and Basel Convention. Elements include:

1. Objective
2. Scope of Application
 - .1 Geographical Coverage/Jurisdiction
 - .2 Vessel Types
 - .3 Polluting Substance
3. Prohibited Acts
4. Elements of Implementation

The last item provides the aspects of implementation which are special to each convention.

The Guidelines are supplemented by the *Model Framework of National Marine Pollution Legislation for East Asian Countries*, which was developed to apprise countries of the technical and legal implications that will be encountered by governments in the formulation of an orderly and up-to-date body of legislation for marine pollution management. The Framework outlines the different forms and levels of policy instruments within the broad range of "legislation" or "laws", and the different approaches to addressing the legal stipulations found in the marine pollution conventions.

taining to marine pollution, including national and international resource documents.

Third, a review of national legislation in the region was completed, from the perspective of legal obligations and administrative and reporting responsibilities as assigned under pertinent international conventions. The review provided guidance on the strengths and weaknesses of current implementing legislation, which facilitated the development of practical materials to guide countries in updating existing legislation, or developing new laws.

Finally, the establishment of a Regional Network on the Legal Aspects of Pollution Prevention and Management was accomplished. The Network was a source of information and

technical support in the assessment of national capacities, and in the development of materials and instruments for strengthening capabilities to ratify and implement international conventions. The Network continues to serve the region as a core of expertise on the legal aspects of marine pollution prevention and management.

Philippine Government Moves toward Ratification of MARPOL

With support from the Regional Programme, the Philippine government, in collaboration with the shipping and oil industries, began taking steps toward the ratification and implementation of MARPOL 73/78. The Philip-

Participating Country Ratification of International Conventions (by year)

COUNTRY	C O N V E N T I O N S																			
	U N C L O S 82	MARPOL					London Convention		Intervention		CLC			Fund			S A L V A G E 89	O P R C 89	B A S E L 89	H N S 96
		73/78 Annex I/II	III	IV	V	VI	CONV 72	PROT 96	CONV 69	PROT 73	CONV 69	PROT 76	PROT 92	CONV 71	PROT 76	PROT 92				
Brunel Darussalam	96	86										92	92		92					
Cambodia		94	94	94	94					94										
China	96	83	94		88	85		90	90	D	86	99				94	98	92		
DPR Korea		85	85	85	85															
Indonesia	86	86									78			78					93	
Malaysia	96	97			97						95			95			97	93		
Philippines	84					73						97				97			93	
Republic of Korea	96	84	96		96	93					D	92	97	D		97			94	
Singapore	94	90	94								D	81	97			97			96	
Thailand																			97	
Vietnam	94	91																	95	

Numbers in boxes refer to year of ratification/accession

■ Ratified 1994 and after

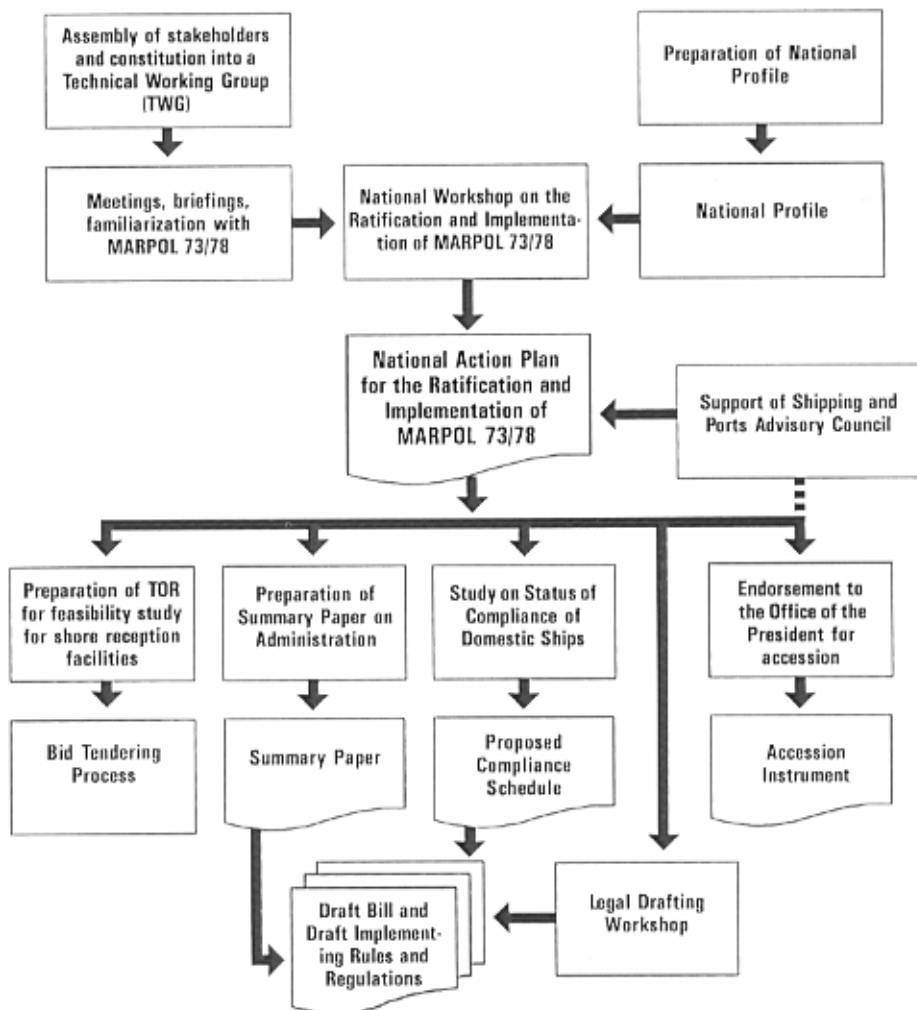
D Denounced, in accordance with the 1992 Protocol

piners' National Action Plan for the ratification and implementation of MARPOL 73/78 was developed in June 1997. A Technical Working Group, comprised of representatives from the public and private sectors, was given the task of executing the action plan.

The following milestones were achieved over the next 18 months:

- preparation of the National Profile on the status of the implementation of MARPOL 73/78 in the Philippines
- summary paper outlining the various administrative, legislative and regulatory obligations under MARPOL 73/78 and the current capacities and constraints regarding the fulfillment of such obligations

Process for the Ratification and Implementation of MARPOL 73/78 in the Philippines



- draft bill for the implementation of MARPOL 73/78
- draft implementing rules and regulations of MARPOL 73/78
- agreement for Department of Transportation and Communication to be the designated national authority for MARPOL and the Multisectoral Task Force on Maritime Development (MTFMD), under the DOTC, to be the secretariat
- agreement for Philippine Ports Authority to be lead agency for the provision of shore reception facilities
- agreement with the shipping industry for a proposed compliance schedule for MARPOL implementation
- instrument of accession to MARPOL 73/78, signed by the President of the Philippines

In March 1998, the instrument of accession to MARPOL 73/78, signed by President Fidel V. Ramos, was transmitted to the Philippine Senate for the latter's concurrence. Because of the May national elections and consequent change of administration, the process was interrupted. Transmittal to the Senate is expected in early 1999.

Marine Pollution Monitoring

The Regional Programme has attempted to instill the notion that marine pollution monitoring works when it is targeted on selected critical issues and parameters, and within a manageable area. The purpose of marine pollution monitoring is to provide direct inputs to the formulation of cost-effective management strategies. The advantages of this approach are that the programmes are more likely to be cost-effective, practical and relevant. The results are quickly perceived by managers and decision-makers as providing an "added value".

Difficulties in Implementing the International Conventions Component of the Regional Programme:

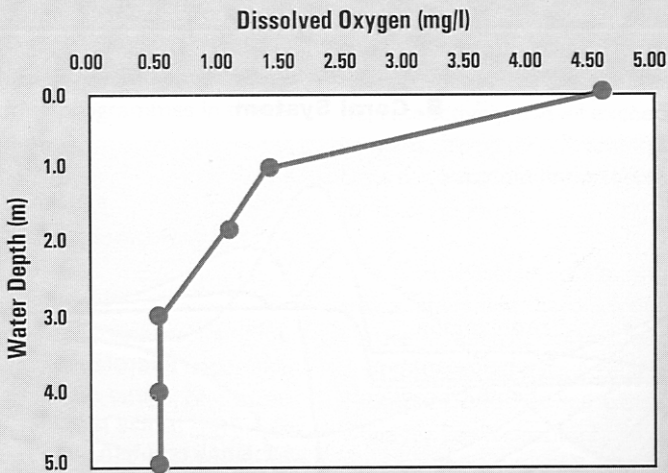
- Lack of legal professionals in the region, who are experienced in the ratification and implementation of international conventions on marine pollution
- Inaccessibility of legal information and reference materials, which can be employed by and for countries to develop and strengthen national and local laws on marine pollution prevention and management
- Differences in legal systems, languages, demographic and social characteristics and economic development among participating countries

Monitoring Traces Fish Mortality

Massive mortality of about 1,000 tonnes of cage cultured fish occurred in Maluanwan Bay, Xiamen, in August 1998. The sea-farmers attributed the mortality to waste discharges from nearby industries, and brought forward an adjudication case against the industries, seeking compensation for damages. The Xiamen integrated marine pollution monitoring team concluded that the mortality was caused by oxygen depletion in the water column, a result of intensive cage culture activity, an enclosed water system, high evaporation, and an abrupt change of salinity. The conclusion was based on monitoring surveys and data analysis. The event demonstrated the value of environmental monitoring for decision-making and management interventions.

As a consequence, the local government has taken steps to improve monitoring of Maluanwan Bay, to regulate "free entry" of cage culture into the Bay, and to study the development of early warning capabilities of eutrophication and red tide.

Dissolved Oxygen in the South Harbour of Maluanwan Bay, Xiamen, China



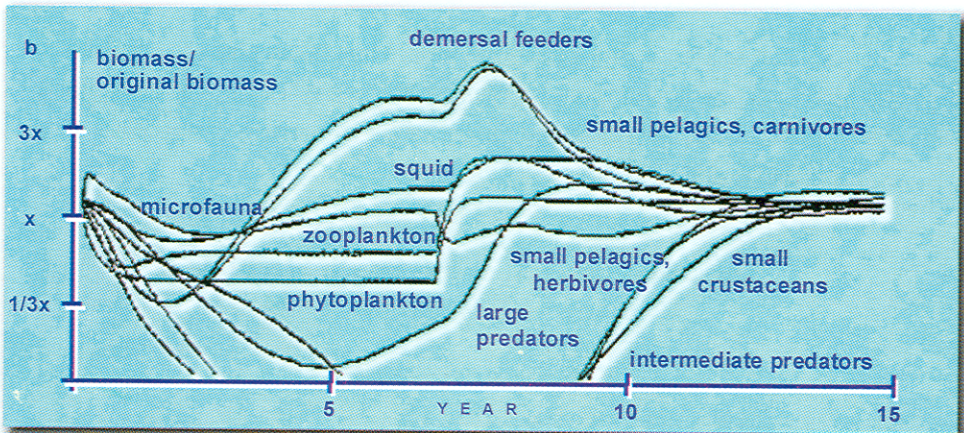
Note: As shown in the figure, the DO level in the South Harbour where significant fish kills occurred ranged from approximately 0.5 to 1.5 mg/l, at water depths from 1 and 5 m. Caged fish cannot survive at these oxygen levels. The national DO standard is set at >5 mg/l.

Scientists Assess Fisheries Management

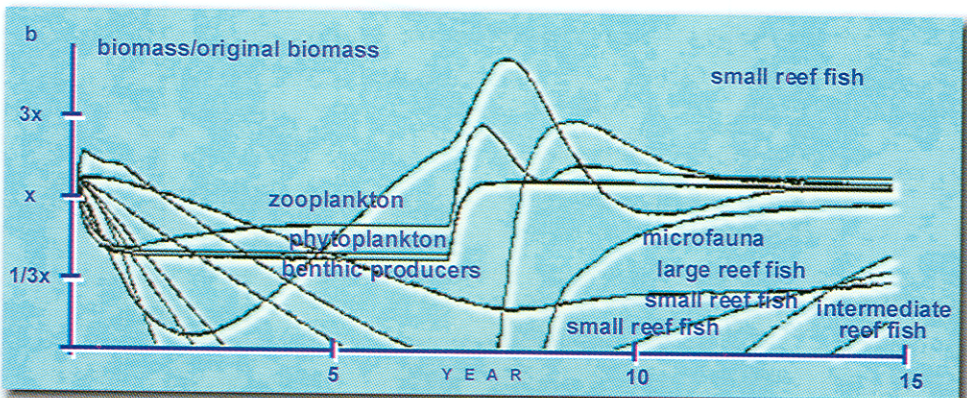
Scientists from the University of Philippines in collaboration with professionals from local fisheries sector undertook a study of fisheries resources in the Batangas Bay through field survey and Ecopath modeling. The study showed that the pelagic fish resources had a potential annual sustainable yield of 3 metric tons per square kilometer. This capacity has been exceeded in Batangas Bay. Measures to insure sustainable fish resource uses within the integrated coastal management framework were developed, including restructuring fisheries management, reduction of fishing efforts and creation of an alternative livelihood programme for the surplus labor in pelagic fishing. Reef fish resources with a potential yield of 5 metric tons per square kilometer per year were considered underutilised. However, in view of the fragility of the reef ecosystem as confirmed by the Ecopath modeling, designation of the reef area as a marine protected area was recommended.

Ecopath Modeling in the Batangas Bay

A. Pelagic System

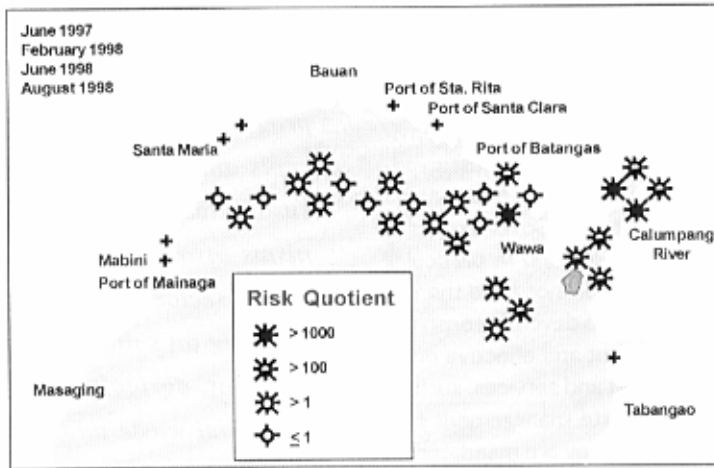


B. Coral System



Note: Ecopath modeling using Ecosim (vers.4.A) estimates the rate of recovery for the stressed pelagic and coral reef ecosystems. Assuming 30% reduction in phytoplankton and microfaunal biomass, the pelagic system may not fully recover to its original status within a 10 year period, whereas the reef system is not able to recover within 15 years.

Risk Quotient for Fecal Coliform in Batangas Bay Using Class B Criteria



The Regional Programme has developed monitoring sites in China and the Philippines. Monitoring sites in Cambodia, North Korea and Vietnam are also being developed. A major effort is devoted to the building of technical capacities through the provision of equipment, "on-site" training in the use of equipment and training in specialised laboratories on marine pollution field and laboratory techniques. Monitoring standards and guidelines are being promoted. A manual for marine pollution monitoring and analysis has been published to serve as a reference for site-specific pollution monitoring programmes in the region.

Marine Pollution Monitoring in Batangas Bay

Based on the preliminary results of four intensive water sampling activities undertaken in Batangas Bay, the parameters of concern were found to be coliform and oil and grease inside and near Calumpang River, the largest tributary entering the bay. The criteria value for total coliform for Class C and SC waters (water intended for the propagation and growth of fish and other aquatic resources) is 5,000 MPN/100 ml.

On three out of four occasions, water samples exceeded the criteria, with a risk quotient (RQ = measured environmental concentration/environmental criteria value) ranging from 1.4 to 3. The source of contamination is believed to be domestic sewage discharges into the river, either directly or indirectly through municipal drainage systems, and agricultural runoff. Of concern is the continued exposure of people (including children) to pathogenic bacteria when swimming in the river or during sand-mining activities. Total coliform and fecal coliform criteria for water intended for contact recreation are 1000 and 200 MPN/100 ml, respectively, a level exceeded in all the river samples. Using this criteria value, the RQ ranges between 5 and 20 for total coliform and 1 to 100 for fecal coliform.

These baseline results, although not conclusive, suggest that there is a potential health risk. Further investigation of pollutant sources and their control is warranted. A related management issue that emerged from the baseline studies is that while the Bay is classified primarily for the propagation and growth of fish and other aquatic life and not for contact recreation, there are swimming beaches on the western side of the Bay. Continued use of this area for swimming will need to be complemented with regular monitoring of coliform counts and health advisories.

The concept of public-private partnership is founded on an understanding that private sector participation in environmental management is not just an advantage, but an essential element to achieving sustainability. Governments in the East Asian region, and in particular local governments, do not have the expertise or financing to develop, construct and operate efficient and effective environmental facilities and services, such as municipal solid waste management systems, even though they are mandated to do so. Public-private partnerships offer the advantages of private sector dynamism access to finance, knowledge of technologies, managerial efficiency, entrepreneurial spirit—combined with the social responsibility, environmental awareness, local knowledge and job creation concerns of the public sector.

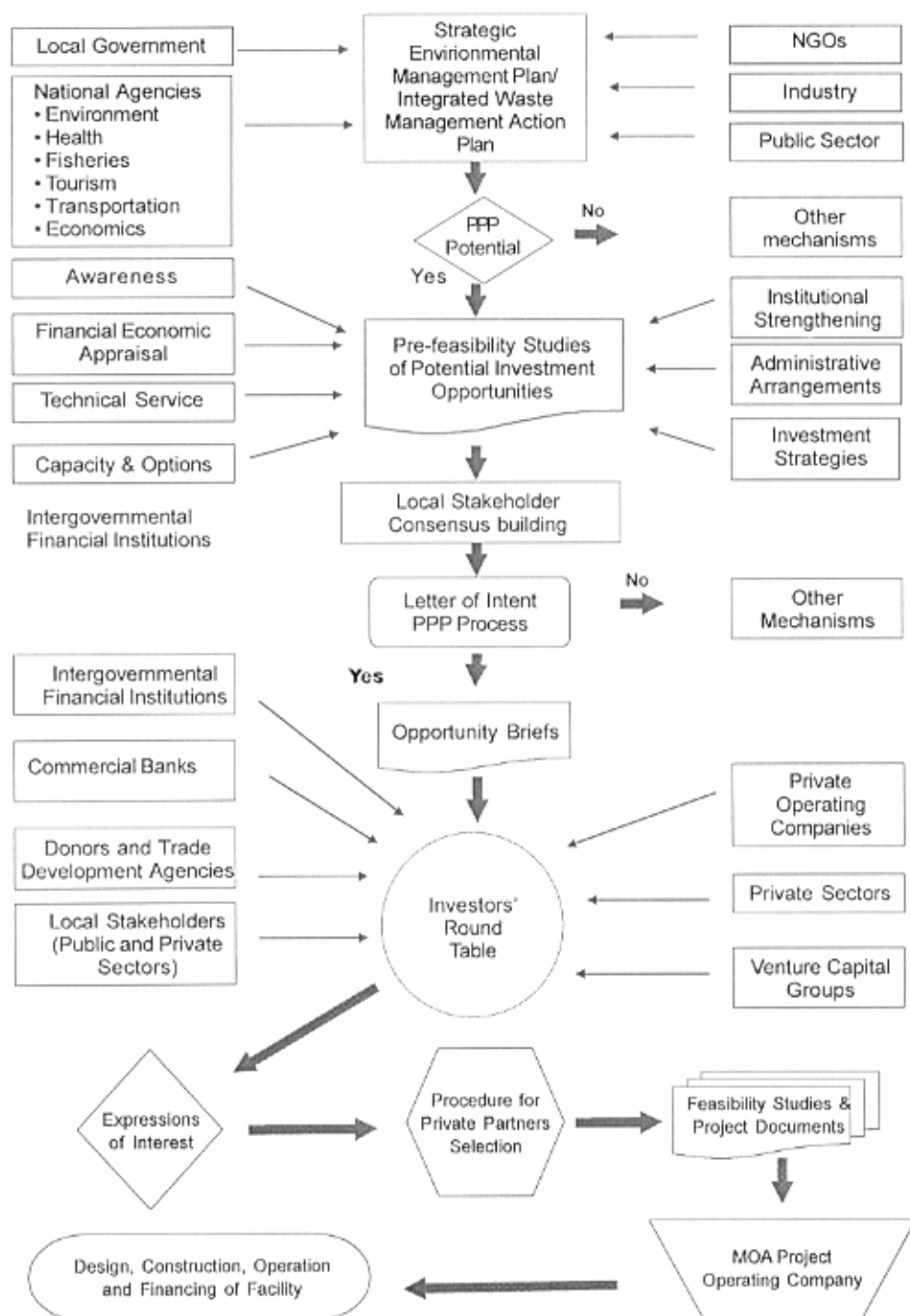
“The project has made progress in developing concepts and approaches for sustainable financing mechanisms involving private sector-public sector partnerships focusing on solid waste management, agricultural waste, industrial waste and ship-borne waste.”

Final Evaluation Report
August 1998

Major Achievements:

- Establishment and verification of institutional mechanisms for sustaining ICM programmes
- Adoption and implementation of a public-private partnership (PPP) process, to provide pollution prevention and management facilities and services at the local level, while realising sustainable economic rates of return on the investment
- Substantiation of a paradigm shift in marine pollution management programmes, attitudes and priorities as recognised and practised at the local government level

Public-Private Partnership Process in the East Asian Seas



In 1998, the Regional Programme accelerated its activities in this area, teaming up with Sustainable Project Management, the Executing Agency of the UNDP programme entitled, "*Public Private Partnerships for the Urban Environment*". Batangas Bay Demonstration Project was identified under the UNDP programme for collaboration in forming public-private partnerships.

The focus of PPP development in Batangas Bay was enhancement of waste management services. Four potential projects were identified in accordance with the Integrated Waste Management Action Plan, which had been adopted by the Batangas Bay Environmental Protection Council. The four projects included municipal solid waste, agricultural waste, ship and port waste and industrial hazardous waste.

Investment opportunity briefs were prepared for the four projects, in conjunction with local stakeholders from the public and private sectors, and presented at the Investors' Round Table on Public-Private Partnerships, which was held in Manila on 9-10 November 1998. Representatives from investment groups, private operating companies, intergovernmental financial institutions, venture capital groups and commercial banks attended the two-day briefing on near-to-market and emerging opportunities, within the context of public-private partnerships.

Expressions of interest for the four Batangas projects were submitted by six companies, and the process of selecting partners was initiated by the local stakeholders, with assistance of the Regional Programme Office and Sustainable Project Management.

Difficulties in the Sustainable Financing Component of the Regional Programme:

- Lack of trust and confidence within and among public and private stakeholders at the local level regarding an environmental programme founded upon, and implemented through, interagency and intersectoral partnerships
- Inability to package local environmental projects, thereby making them attractive to commercial banks, local and international investors and operating companies and other international and intergovernmental agencies and institutions
- Inexperience of the public and private sectors to the institutional, social, political and economic considerations of developing, negotiating, constructing and operating a mixed ownership (public-private sector) environmental facility

**Letter of Intent for the Development
of a
Provincial Solid Waste Management Facility**

Signatories to the Agreement:

Province of Batangas, Philippines, represented by its Governor

City of Batangas, represented by its Mayor

City of Lipa, represented by its Mayor

32 Municipalities of Batangas, represented by the President of the Batangas
Municipal Mayors' League

International Maritime Organization, represented by the Regional Programme
Manager of the GEF/UNDP/IMO Regional Programme

Sustainable Project Management, represented by its Executive Chairman

Objectives:

1. Implementation of an Integrated Waste Management Action Plan, developed as a collaborative endeavour of the Provincial Government of Batangas and the IMO to provide a framework by which waste management and disposal can be effectively carried out in Batangas consistent with national, provincial and LGU policies, and in accordance with the development goals and environmental standards of the Province; and
2. Planning and development of a Provincial municipal solid waste (MSW) facility for the Province of Batangas, in accordance with the Integrated Waste Management Action Plan.

Commitments of Signatories:

1. Application of the Public-Private Partnership Model and participation in its associated processes, an outline of which are provided hereunder:
 - i) The establishment of a profile of needs for a prospective Private Sector Partner, and the employment of that profile in the shortlisting of potential Private Sector Partners;
 - ii) The selection of a Private Sector Partner from a shortlist of potential candidates, and in accordance with a selection process, time schedule, procedure and criteria as agreed by all parties;

continued

- iii) The development of a Project Document, in conjunction with the selected Private Sector Partner, outlining the legal, technical, financial and environmental aspects of a Provincial MSW facility, including the selection and environmental evaluation of (a) suitable site(s) for a Provincial MSW Facility within the Province of Batangas, and the identification of appropriate and adequate user pay schemes for the operation of such a facility; and
 - iv) The drafting and negotiation of a Memorandum of Agreement between the parties and the selected Private Sector Partner to create a Project Operating Company, which shall in turn design, build, finance, operate and maintain the Provincial MSW facility as identified in the Project Document, while always realising sustainable economic rates of return.
2. The adoption and implementation of appropriate legislation, ordinances, policies and programmes to ensure that all municipal solid waste generated within the Province of Batangas is managed and disposed of in accordance with the terms and conditions of the Memorandum of Agreement between the parties and the selected Private Sector Partner;
3. Co-operation in the selection of (a) site(s) for a Provincial MSW facility, in accordance with pertinent national, provincial and local legislation, ordinances and processes, and the promotion of public acceptance and approval of the selected site(s) through:
 - i) implementation of public education/awareness campaigns and programmes aimed at establishing public acceptability of the selected site(s);
 - ii) identification of social, economic and environmental benefits of the facility to the LGU(s) and to the Province;
 - iii) delineation of land requirements, buffer zones, environmental control measures and future uses of the site(s) upon decommissioning of the Provincial MSW facility;
 - iv) negotiation of compensation packages for the LGU(s) and/or for local residents in the vicinity of the site; and
 - v) assessment of the private sector's investment in the Provincial MSW facility and the community, returns on investment to the LGU(s), and the benefits created and/or derived to complementary commercial activities and support services for the LGU(s).

The following is an offering of several concepts, guidelines and approaches, which have been distilled over the course of this project. In some instances, the subjects have been developed and applied as part of the project. Others have only emerged as concepts and approaches to be tested in follow-on activities. Collectively, it is hoped that they will contribute to the knowledge base for improving marine pollution prevention and management practices in the East Asian Seas Region.

ICM Project Performance Indicators

Bench-marking ICM programme performance has been a subject of debate for some time due to the complexities involved. Based on the ICM practices in Batangas and Xiamen, as well as the experience gained from other ICM projects in the region and elsewhere, a system of indicators for performance evaluation has been identified and verified. These indicators are developed for identifying and assessing the level of project progress in: (a) problem identification, prioritisation and programme formulation; (b) project implementation; (c) programme sustainability; and (d) programme impacts. Both Batangas and Xiamen are considered making significant progress by the indicators for programme formulation, implementation and sustainability. Beneficial ecological and socio-economic impact of the projects is recognised in Xiamen, but yet to become evident in Batangas.

The Seven Principles of ICM Good Practice

1. Adopt a systematic, incremental approach.
2. Involve the public.
3. Integrate environmental, economic and social information.
4. Establish mechanisms for integration and coordination.
5. Institute sustainable financing mechanisms.
6. Develop ICM capacity at all levels.
7. Monitor the effectiveness.

Batangas and Xiamen ICM Demonstration Projects: Progress Evaluation by Performance Indicators

I. Programme Formulation

Batangas Xiamen

	Batangas	Xiamen
1. Problems identified and prioritised; environmental profile prepared; Management boundary defined	✓	✓
2. Programme planning undertaken; stakeholders consulted	✓	✓
3. Primary data related to programme formulation gathered	✓	✓
4. Public awareness created	✓	✓
5. EIA/risk assessment performed	✓	✓
6. Strategic management plan formulated and adopted	✓	✓
7. Issue or special area plan developed and adopted	✓	✓
8. Organisational and legal arrangements proposed	✓	✓
9. Financial options developed	✓	✓
10. Environmental monitoring protocol developed	✓	✓
11. Information management system	0	0

II. Programme Implementation

Batangas Xiamen

	Batangas	Xiamen
1. Interagency, intersectoral council/committee/group established	✓	✓
2. Co-ordinating agency/office for programme implementation established	✓	✓
3. Capacity and information generating arrangements established	✓	✓
4. Prioritised agenda for management actions undertaken	✓	✓
5. Financial mechanism for programme implementation established	✓	✓
6. Environmental monitoring mechanism established and operational	✓	✓
7. Concerned ordinance/legislation developed and approved	✓	✓
8. Law enforcement established	✓	✓
9. Progr. monitoring and evaluation protocols developed and implemented	✓	✓

III. Programme Sustainability

Batangas Xiamen

	Batangas	Xiamen
1. Perception and attitude changes amongst stakeholders detected	✓	✓
2. Critical mass of local/national officials knowledgeable about ICM formed	✓	✓
3. Major stakeholders participated in programme implementation	✓	✓
4. Human and financial resources by stakeholders committed	✓	✓
5. Implementation of the action plan committed by local government	✓	✓
6. Integration of ICM project into local sustainable development programme	✓	✓

IV. Programme's Impacts

Batangas Xiamen

	Batangas	Xiamen
1. Environmental quality shows sign of improvement	0	✓
2. Some environmental degradation arrested	0	✓
3. Interagency conflicts reduced or resolved	✓	✓
4. Use conflicts minimised or resolved	✓	✓
5. Evidence of ecological improvement	✓	✓
6. Evidence of socio-economic benefits	0	✓
7. Additional financial support from national government/external sources	✓	✓

Note: "✓" - Progress. "0" - slow or no progress.

Lessons Learned from Practising ICM in Southeast Asia

In the December 1998 issue of *Ambio* (Vol. 27 No. 8, page 599), the Regional Programme Manager reflected on the 13-year history of ICM programmes at 8 sites in South-east Asia. The key lessons described in that article were summarised in 12 points.

- 1. ICM Concept:** ICM is a learning process and, as such, evolves with time. Its principles and approaches should be understood by all concerned stakeholders in order to avoid unrealistic expectations of immediate results.
- 2. Project Timeframe:** With the experience and formulation of better ICM guidelines, the project timeframe should be reduced to 3 to 5 years, and preferably coincide with the planning cycle of the local government.
- 3. Performance Monitoring:** Performance indicators are essential in order to determine the success or failure of a project. ICM performance indicators can be grouped into 4 categories: i) process indicators; ii) stress removal indicators; iii) sustainability indicators; and (iv) environmental status indicators. These should be installed right at the beginning of the project.
- 4. Project Design:** For an ICM project to generate the required results, it is essential that the planning, development and implementation phases of the project are considered and included in the project design. The early development of performance indicators will help to achieve this goal.
- 5. Selection and Prioritisation of Management Issues:** Project sites can have many relevant issues. While strategic management plans need to address the range of issues present, specific effort should be focused on one or two only, with the development and implementation of a concise action plan.
- 6. Management Boundary:** It is advantageous in early phase of the project to limit the management boundary, where appropriate, within the administrative zone of the local government. With ICM framework in place and experience at hand, the project will be better equipped to extend the scope of management over the entire watershed/catchment area, or exclusive economic zone.
- 7. Research and Study:** To maximise the inputs of natural and social sciences, problem-oriented research needs to be encouraged, with a clear view of information requirements for improving management actions.
- 8. ICM Programme Development and Implementation Cycle:** The cycle has six stages: preparing, initiating, developing, adopting, implementing, and refining and consolidating. The timeframe for each cycle may vary from site to site, depending on the size and complexity of the programme.
- 9. Local Government Commitment:** The commitment and full involvement of local government is critical for the entire ICM cycle.
- 10. Institutional Arrangements:** Legally constituted interagency and multi-sectoral co-ordinating and management bodies are key to the effectiveness and sustainability of ICM programmes.
- 11. Public Awareness:** Creating public awareness is a continuous process in ICM implementation. It helps generate support, raises environmental awareness and promotes civil advocacy for environmental protection and sustainable development.
- 12. Building Local Capacity:** By linking local and national universities to ICM project initiatives, a core of technical expertise is es-

tablished, which is then capable of participating in the training of local officials.

These lessons can contribute to the further improvement of coastal management practices in the region and in other regions of the world that have similar environmental and socio-economic characteristics.

Straits-wide NRDA Framework for Transboundary Pollution?

Transboundary pollution poses a substantial threat to the Malacca Straits. National laws in the three littoral States prohibit pollution, and national laws and the CLC 1969 and Fund 1971 conventions provide for compensation for response and cleanup costs, and for some costs of oil spills, including damages to real property, lost earnings in some cases, and for some environmental damages.

However, national laws seem to establish a broad umbrella, with no clear statement of damage categories to be pursued and methods to be employed. The CLC 1969 and Fund 1971, and the 1992 Fund Protocol, provide substantial guidance for admissibility of claims. The 1992 Fund Protocol expands the costs for which compensation will be allowed and establishes a higher liability limit than the 1971 Fund. An obvious course is that all regional states might become parties to the 1992 Fund and by that, avail themselves of the compensation provided by this Fund. However, even as the most expansive international convention, the 1992 Fund adopts a relatively narrow view of: a) the incidents covered; and b) the damages for which compensation will be paid. As a result, many incidents of potential importance in the Malacca Straits fall outside of the scope of the conventions and will be uncompensated unless national laws can be made to apply.

Countries that rely solely upon the CLC, the 1971 Fund, or the 1992 Fund Protocol, will

not be compensated for many losses due to oil spills. Transboundary pollution incidents may impose several environmental costs upon the three littoral States of Indonesia, Malaysia, and Singapore for which they might not be compensated.

As part of the Malacca Straits Demonstration Project, the potential benefits and concerns of a Straits-wide application of Natural Resource Damage Assessment were evaluated. Introduction of a Straits-wide approach for damage assessment will have many consequences. These include: (1) the impacts that a damage assessment process will have on various parties; and (2) institutional mechanisms and related issues having to do with the development and implementation of a Straits-wide NRDA approach, including:

- the nature of liability
- the scope of incidents covered
- the scope of impacts (injuries) for which damages can be assessed
- allowable damages
- methods for estimating damages
- standards to be applied in weighing the results of such methods
- means for limiting transaction costs.

One very important issue examined concerned the process and institutional structure within which a Straits-wide approach to NRDA is developed, implemented, and refined, as necessary, over time. It seems very desirable to have an administration center, comprised of scientists, economists, lawyers and perhaps others. A single group would allow certain economies to be realised, facilitate the development of a consistent set of methods, and enhance co-operation and co-ordination. Such a group would presumably be funded at least in part out of assessment funds collected from responsible parties after pollution incidents, although use of a small fee per barrel of oil delivered might be a better alternative. Many co-operative mechanisms currently exist among

the littoral States that would provide a suitable institutional home for a central NRDA group. It might be desirable to have a NRDA group work in close collaboration with existing, regional co-operative groups focusing on spill and pollution response, given the overlap in issues facing both groups.

MALACCA STRAITS: A Special Area?

Pollution of the seas from ships, whether it results from routine operations, such as tank cleaning, or from an accident tends to be more serious when it is close to land. Even a minor incident can have serious consequences in a sea area where the environment is more vulnerable. The MARPOL convention recognises that such regions deserve extra protection and so a number of "Special Areas" have been recognised in various regions of the world.

Within a special area, States parties to the Convention are required to observe distinct mandatory methods for the prevention of sea pollution, which are more stringent than those applied elsewhere. The mandatory provisions apply to the control of oily waste, noxious liquid substances carried in bulk and garbage.

The question whether or not it is useful or feasible to designate the Malacca Straits as a Special Area was reviewed by the Regional Programme in 1997. The results of that review indicated that:

- information on ecological characteristics of the Straits of Malacca satisfy the Special Area criteria;
- the Malacca Straits is intensively used by ships, and therefore satisfies the Special Area criteria with respect to vessel traffic;

"There are two primary dimensions of international co-operation in the management of the Straits of Malacca and Singapore. One dimension involves co-operation among the three Straits States. The other involves co-operation between the Straits States and the extra-regional User States."

Dr. Mark Valencia
Senior Fellow
Programme on Regional
Economics and Politics
East-West Center
"Marine Pollution Management
in the Malacca/Singapore
Straits: Lessons Learned"
February 1998

- information with respect to the seriousness of the pollution caused by operating discharge from ships in the Malacca Straits is limited, whereas evidence of environmental degradation of coastal and marine resources within the Straits is present;
- management measures within the Straits, including measures aimed at sources of pollution other than ships, are being implemented;
- the nature of shipping in the region, and in particular the major shipping routes from the Indian Ocean through the Andaman Sea, Straits of Malacca and South China Sea create the possibility that discharges will be made in sea areas outside the Straits should the Malacca Straits be designated as Special Area.

The Malacca Straits is a good candidate for Special Area designation. Strong cases can be made for Special Area designation with respect to oily waste and garbage discharge from ships. Special Area status would provide added incentive for coastal states to ratify Annex V (garbage) of the MARPOL convention (i.e., Indonesia and Singapore; Malaysia has ratified Annex V) and to ensure the provision of adequate shore reception facilities in ports along the Straits.

A Perspective on Dues and User Fees in the Malacca Straits

The actual cost of services provided by the littoral States of the Malacca Straits, as well as those contemplated in the future, can and should be quantified. However, government departments oftentimes have difficulty in costing their services. The Government of Malaysia has recently attempted to determine some of their service costs in relation to navigational safety and pollution prevention in the Malacca Straits. These include the cost of navigational aids and their maintenance, as well as surveillance, surveys, communications, search and rescue, and oil spill cleanup and response. As an example, the Malaysian Vessel Traffic Service (VTS) system is estimated to cost RM 100 million (about US\$28 million) and to involve annual operating costs of RM 10.5 million (US\$2.8 million). Singapore and Indonesia no doubt also incur substantial costs but, as stated, systematic consolidation of these costs has not been completed or is not available.

As part of a study of sustainable financing mechanisms conducted by the Regional Programme, the potential significance of dues and service fees were put into some quantitative perspective. If one assumes that the *incremental* costs (i.e., expenditures beyond those necessary for purely domestic reasons) of all Malacca Straits' safety/pollution prevention mea-

asures is US\$100 million per year, then to gain some perspective on this, what kinds of dues or fees might be needed to cover this amount each year?

In 1995, some 7 million barrels of oil per day passed through the Straits. Assuming vessels carrying the equivalent of 80% of this amount enter ports within the Straits, then 2.044 billion barrels per year may be subject to a service fee. A hypothetical fee of as little as US\$0.02 per barrel would result in revenue of about US\$40 million per year; a fee of US\$0.04 per barrel would generate revenue of about US\$80 million annually. Alternately, consider a hypothetical fee on containers. A fee of, say, US\$2 per TEU (twenty foot equivalent unit) on the 4.24 million containers estimated to be delivered to ports throughout the Straits would result in annual revenues of almost US\$8.5 million per year. Finally, a due or fee of US\$100 per vessel on the estimated 80,000 vessels calling at a port would garner US\$8 million annually. Obviously, there are an infinite combination of dues and fees that could raise the US\$100 million.

How might such dues or fees be administered? A uniform fee might alleviate any concerns about changes in the relative competitiveness of ports. Administrative costs for collecting dues and fees would likely be small in total. However, administrative costs might fall more than proportionately on the busiest ports, so for fairness administrative costs might be compensated for out of the collected dues and fees. As discussed, many details would have to be resolved concerning covered vessels, and the distribution of the dues and fees among the littoral States would have to be negotiated. These are all-important issues, but not insurmountable considering the financial and economic stake of the coastal States to ensure adequate and effective management of the Malacca Straits.

Marine Electronic Highway: Bridging Navigational Safety and Marine Environmental Management

The Marine Electronic Highway (MEH) is an information superhighway. It consists of a network of national Electronic Navigational Chart databases (ENCs), integrated with a Differential Global Positioning System (DGPS) technology and vessel-positioning information (transponder positioning information), and linked to the transmission of real time oceanographic data, such as water levels, wind, tide and currents. Shipping companies and maritime authorities within the region are aware of these technologies and the benefits to be derived as a result of "precision navigation".

The Regional Programme has introduced an additional component into the construction of the MEH, based on the information needs and investment opportunities identified during the Malacca Straits Demonstration Project. By integrating environmental datasets into the MEH, such as data on coastal and marine resources, marine water quality, oil spill response capacities, etc., the potential for extending Highway application to a larger group of subscribers is enhanced. These linkages offer direct benefit in improving the management and safety of vessel operations in the Straits, while at the same time serving as a useful instrument to environmental and coastal and marine resource managers in the coastal States.

In collaboration with the three littoral States and IMO, the Regional Programme prepared a project proposal, entitled "*Development and Demonstration of a Marine Electronic Highway in the Straits of Malacca and Singapore*". The proposal was reviewed at a regional workshop, held in Singapore in October 1998. The workshop supported the concept of an "integrated" information superhighway, and agreed to proceed with the development of a GEF grant request, for submission to World Bank. The purpose of the grant is to finance the development of a GEF Project Brief, with the collaboration and co-operation of public and private sector stakeholders, for a marine electronic highway demonstration project in the Straits of Malacca and Singapore. Should the demonstration project verify the expected navigational safety, environmental and economic benefits of the MEH, the viability of extending the system throughout the East Asian Seas region, and throughout other regions of the world, will be established.

IMO has taken up the development of the grant request, in collaboration with the three littoral States. The Regional Programme will continue to provide technical support in the development and implementation of the MEH demonstration project, specifically assisting the littoral States with the integration and use of information on coastal and marine resources in the Straits.

Marine Pollution Monitoring

Developing a capability with the local government unit where the culture and experience of environmental monitoring is not yet in place requires time and resources. The development of partnerships with industry, academic institutions and government agencies builds up this capability more efficiently and reduces overlap.

Marine Pollution Monitoring Programmes at ICM Sites

Marine pollution monitoring programmes exist in the region, yet the information is not necessarily:

- in a form readily useful to managers and policy-makers

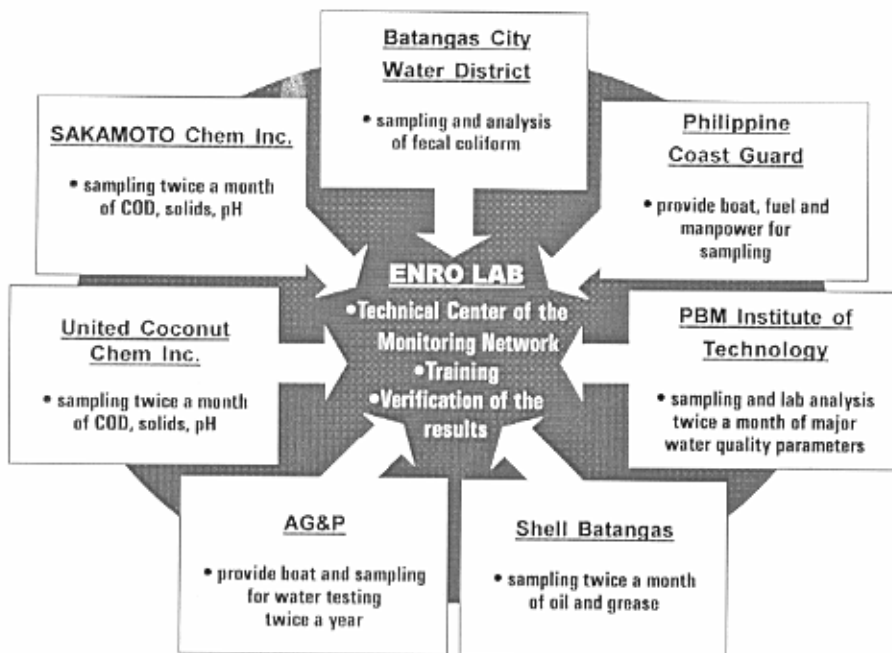
- utilised for and translated to management strategies and interventions
- reliable or relevant because of deficiencies in planning and design of programme.

Oftentimes there is also a lack of assessment of the value of the monitoring activity itself, partly due to the ambiguity of the objectives of the programme.

The shotgun approach is also frequently used in pollution monitoring programmes, resulting in:

- too many parameters measured simply because they are in a standard list and have always been determined without serious consideration of the major contaminants

Partnerships in Batangas Bay Ambient Water Quality Monitoring



Note: Monitoring efforts and facility indicated are contributions from the participating institutions. ENRO stands for Environment and Natural Resources Office of the Provincial Government.

- in the area and their sources, or the appropriateness of the contaminants and matrices being monitored to indicate long-term changes
- information that may not be directly useful in addressing the fundamental pollution problems and concerns.
- collect data that serve as useful input to the formulation of cost-effective strategies
- involve the various users and custodians of the marine environment in the monitoring, safeguarding and management intervention processes.

Among the options to current practice, experience indicates that the following considerations contribute to an effective pollution monitoring programme:

- target selected critical issues, problems and parameters at specific sites
- more cost-effective programmes
- practical and relevant information
- sustainability (financially, politically and socially)
- area specific and therefore manageable
- makes use of available resources in the area.

The advantages of this approach include:

Xiamen Case Study: Pollution Monitoring

Strategy

1. Integrate, rationalise and improve upon monitoring strategy and activities of various agencies tasked with monitoring Xiamen Bay.
2. Divide tasks, with each agency focusing on parameters that they are most comfortable and competent in determining, and periodically submitting, validating, and aggregating monitoring results.
3. Conduct interlaboratory comparisons and methods validation to increase reliability and comparability of data.
4. Link monitoring to the ICM activities.

Achievements/Outputs

1. Human and financial resources for monitoring used more efficiently.
2. Field and laboratory methods standardised, enhancing data quality and comparability.
3. Data and information shared among participating agencies and with management council.
4. Use of pollution index and feedback provided on the effectiveness of management interventions.

Batangas Case Study: Pollution Monitoring

Strategy

1. Develop monitoring capacity, including human resources, facilities, equipment and programme.
2. Base monitoring capability within the local government unit.
3. Involve the private sector, other government agencies, and other groups, as appropriate.
4. Implement monitoring that is reliable, cost-effective and useful for management purposes.
5. Conduct public information and education campaigns.

Achievements/Outputs

1. PG-ENRO lab facilities set up.
2. Staff trained in proper field and laboratory monitoring and analytical methods.
3. Relevant environmental parameters identified and sampling design developed.
4. Commitment of private sector and other government agencies—7 MOAs signed.
5. Data packaged and submitted to management council.
6. Information disseminated to public.

Marine Pollution Monitoring Networks: Case Study in Development of a Network

Strategy

1. Assist countries (Cambodia, DPR Korea, Philippines and Vietnam) to develop and upgrade marine pollution capabilities by providing on-site or off-site training.
2. Acquire appropriate hardware and software for selected sites to facilitate monitoring of basic environmental parameters.
3. Utilise a tiered approach in identifying appropriate parameters to monitor at each site, in accordance with management concerns and scientific and technical capabilities.
4. Develop acceptable information exchange strategies and formats.
5. Provide a compendium of recommended field and laboratory methods.
6. Adopt performance-based field and laboratory methods for environmental monitoring.

Achievements/Outputs

1. Implementation of training workshops for Network members.
2. Interaction among Network members by email service.
3. Acquisition of equipment, supplies, software and reference materials for current and planned monitoring sites.
4. Provision of graphical software, certified reference materials (CRMs) and database (ASFA) to demonstration sites and other planned monitoring sites.
5. Linkage and complementation with other initiatives in the region (ASEAN-Canada CPMS II).

Coastal and Marine Resources as Natural Assets

The natural resources of the Malacca Straits and other subregional sea areas can usefully be thought of as natural assets that contribute to the well being of residents and visitors. A distinguishing feature of assets, natural or otherwise, is that they can provide a substantial stream of valuable services to people over time, if properly used and maintained. Indeed, the value of subregional seas natural assets can be expanded, perhaps greatly, through improved risk management of sea lanes, mangroves and corals; other actions to control marine pollution; and through improved management of open access resources, e.g., fisheries.

Natural assets provide services to people. The services provided by subregional sea resources can be direct and indirect. Direct services include for example, use of sea lanes, harvests of fish, exploitation of mangroves for wood, viewing of corals and fish and beach use. Indirect services occur, for example, when fish that spend their juvenile stages in a mangrove, are harvested offsite, perhaps many kilometers away.

For those services where benefits and costs are traded in organised mar-

kets, appropriate values can be determined directly. For example, marine transportation, offshore oil, port activity, commercial fishing and tourism are all activities that take place on organised markets. Normally, market data (prices, quantities and costs) are available to estimate the benefits and costs of these activities, although information may be difficult to obtain in some cases.

Non-market methods are needed to estimate the economic value of resource services not traded on organised markets. Non-market methods include a variety of approaches and methods for placing value on non-market services such as biodiversity conservation, traditional use and shoreline protection.

As part of the Malacca Straits Demonstration Project, valuations were completed for coastal and marine resources in each of the three littoral States. Both market and non-market services were considered, using 1996 as the baseline year. The results, although still considered "order of magnitude" estimates, give a good appreciation of the relative benefits derived from the natural assets of the Straits.

**Valuation of Coastal and Marine Resources of
the Malacca Straits (US\$ Million)**

	Indonesia Coastline	Malaysia Coastline	Singapore Coastline	Straits-wide
	Market ¹ and Non-Market	Market ¹ and Non-Market	Market ¹ and Non-Market	
Coastline (km)	1,641	956	130	2,727
Coral Reefs	79.65	32.62 (10.21)		112.27
Seagrass		2.99 (10.50)	0.10	3.19
Seaweed		1.02		1.02
Mangroves	3,509.49 (165.99)	1,582.15 (357.70)	42.54	5,134.18
Mudflats		0.85 (49.42)	0.02	0.87
Beach		640.08 (0.03)		640.08
Fisheries	329.92	686.44	8.40	1,024.76
Aquaculture	170.94	97.85	18.60	287.39
Sea Lanes ²				340.00
Totals	4,090.00	3,044.00	69.66	7,543.66

¹ Fisheries and aquaculture resources found in coral reefs, seagrass beds, seaweeds, mangroves, mudflats and beaches are enclosed in brackets to avoid double counting.

² The estimated annual value of the Straits for shipping petroleum imports to East Asian countries, based on the additional cost of shipping via an alternate route, namely the Lombok Strait [from Morisugi et al. 1992. *Economic Value of the Malacca Straits*, p. 307. In James Barney Marsh (ed.) *Resources and Environment in Asia's Marine Sector*. Taylor and Francis, New York].

This section describes follow-on activities. A brief description is provided of a follow-on initiative that has been endorsed by the participating countries of the region and approved by GEF. The second phase of the Regional Programme is scheduled to commence in July 1999.

Building Partnerships for Environmental Protection and Management of the East Asian Seas

Priority Activities

The Regional Programme has advanced an integrated management working model for managing marine pollution and other environmental problems in the coastal and marine areas across the region. The next step is to build upon this base of experience and knowledge, and replicate and extend the practice beyond the three sites that were involved in the project. The adoption and application of the experience will enable the concerned governments to effectively protect and ensure sustained use of the seas of East Asia. While some "sensitivity" tuning will be required at each new location, the generic framework is transferable and replicable throughout the coastal areas of the region.

The implementation of international conventions related to environmental management is also seen as an effective means for governments to progress toward preventing or mitigating transboundary environmental concerns. It is essential that countries in the region not only ratify international conventions, but also develop

the necessary capacity and resources to implement them. The Regional Programme has developed the groundwork in this area with the provision of legislative guidelines, training, networking of marine legal experts and encouraging good practices at the local level. Follow-on activities can build upon these initiatives.

Barriers to Progress

It is recognised that there are some substantial barriers to overcome in the extension and replication of the Regional Programme's products and experience, including policy, financial, human resource capacity and information dissemination encumbrances. While all participating countries have made enormous progress and commitments in addressing environmental problems, available financial and human resources are simply insufficient to arrest large-scale environmental degradation. Environmental management is still low on the national and political agenda of many countries. The basic challenge is to change the mind-set and perception among planning agencies and political leaders, in order for environmental management to be included in national economic development programmes. The Regional Programme demonstrated paradigm shifts in concept, approaches and methodologies pertaining to environmental management of coastal and marine areas. Such shifts need to occur at the national and regional levels. Political and financial barriers will be reduced when environmental management is seen as an investment, which contributes to the GDP, economic revival, employment and social well being of a country, and not just as another file in the social envelope of government responsibilities. As a recent example, the

governments of China and Japan have now included environmental infrastructure improvement as one of the investments to prime national economic growth, in response to the current Asian financial crisis.

Most countries of the Region have yet to develop a national policy on the integration of sea-use and land-use planning. Also, while some countries have devolved authority to the local government for environmental management, many others have yet to make that decision, or to render appropriate policy changes to give greater environmental management responsibilities to local government. Further, it is evident that increased harmonisation among local and national, and even international, legislation is needed in order to achieve cost-effective enforcement programmes. These examples are typical of the various policy barriers that need to be overcome in the region.

Environmental management requires an immense amount of financial resources, especially those pertaining to mitigation and remediation of environmental damage. Alternatively, if environmental concerns are included in development plans, these considerable costs can be avoided or at least reduced. However, it is well recognised that the environmental impact assessment process is not employed consistently or effectively in development projects across the region. Mitigation measures are seen as an additional cost for project proponents, representing a negative return on the investment. Overcoming this barrier requires the adoption of alternative mechanisms and approaches to assessing, financing and sustaining environmental projects and programmes. The Regional Programme has explored some innovative investment approaches involving collaborative efforts of the public and the private sectors, as well as methods for analysing the total economic benefits of development projects, and these have application throughout the region.

Perhaps the most serious barrier in several countries is the lack of capacity to plan and manage the coastal and marine areas. Countries normally address environmental concerns on a sector-by-sector basis. Many existing structures of governance have no institutional arrangement for policy and functional integration and co-ordination at the local or national level. Agencies work independently, and have no experience in the integrated management approach. The Regional Programme has established demonstration sites, which can be used as training laboratories for coastal managers to learn how the integrated management model would operate within their political, cultural and socio-economic setting. To accelerate replication of the working model throughout the region, national demonstration sites need to be established in each country, which will serve as a domestic training ground for coastal managers.

Finally, despite the rapid advance of information technology, a large number of local municipalities and administrative units are poorly connected with the outside world. Many outputs from the Regional Programme have yet to reach users at the local level. The connectivity between national agencies and pertinent sources of information and assistance needs to be strengthened to ensure rapid dissemination of results to those who need help and guidance most urgently.

Intergovernmental, Intersectoral and Interagency Partnerships

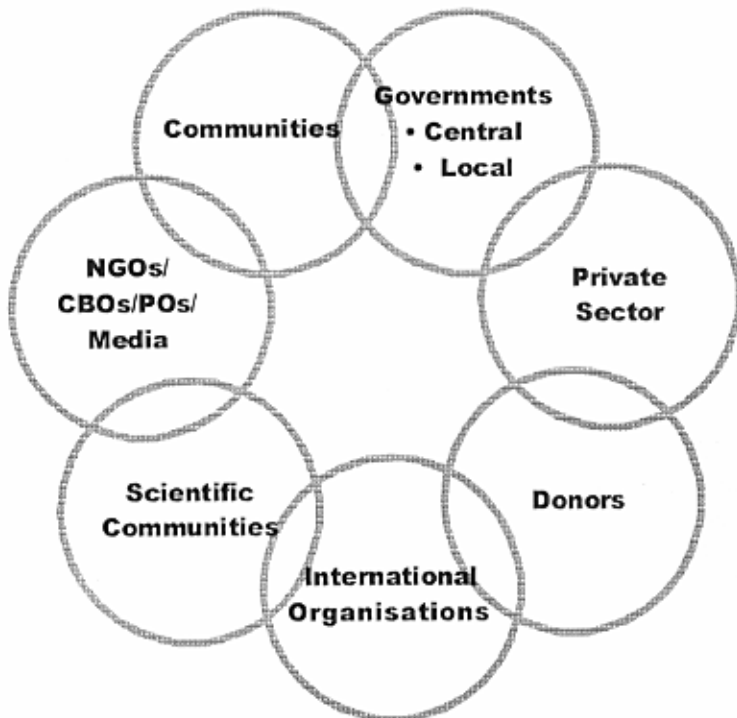
In a region of changing and diversified economies, and amidst regional and extra-regional competition for goods and services, it is evident that a "programmatic approach" is required to remove or lower critical barriers that are having a negative effect on environmental management. The key to implementation and

sustainability of this approach is the collective commitment of the stakeholders, and the development of intergovernmental, interagency and intersectoral partnerships. Current intergovernmental mechanisms, specifically those related to transboundary and global environmental concerns, are the basis upon which partnerships can be built. But intergovernmental partnerships at the subregional level are also important. For example, the Tripartite Technical Expert Group (TTEG) for the Straits of Malacca and Singapore is a subregional mechanism which enables experts from the three littoral countries to collectively address navigational safety in a subregional sea area of common interest and concern. The ASEAN mechanism is another example of a forum that has been developed to collectively address the concerns of Southeast Asian nations.

The New Initiative and Its Components

It is with the above considerations that follow-on activities have been developed and endorsed by countries of the East Asian Seas region. The ultimate objective of the follow-on work is the enhancement of regional capacity and government resolve to protect the marine environment and ensure sustained use of its resources. The follow-on programme has been approved by the Global Environmental Facility, with the United Nations Development Programme as implementing agency, and the International Maritime Organization continuing to serve as executing agency. The Programme is comprised of seven main components, as briefly described below:

Building Partnerships for Environmental Protection and Management of the East Asian Seas



Capacity Building

The follow-on programme places considerable emphasis on capacity building. National ICM demonstration sites will be developed and used as a showcase for coastal administration. Each demonstration site will address a different environmental issue. Collectively, the experience will enhance the effective use of the integrated management approach for issues across the re-

gion. Setting up national ICM demonstration sites, and parallel ICM sites, and linking them with local research institutions or universities will facilitate practical training of local officials. The associated universities or research institutions will play a strong role in training national and local staff in the application of new management approaches, methodologies and techniques.

Summary of Strategies, Approaches and Activities for Achieving Development Objectives and Reducing Barriers

Development Objectives	Protect the life support systems of the East Asian Seas
Operational Strategies	Implement integrated management for coastal areas and subregional seas throughout the country and across the region Implement marine environment related international conventions
Operational Approach	Integrated, programmatic approach with multi-area, multi-focus
Barriers	Policy, financial, capacity, information barriers
Activities	<ol style="list-style-type: none"> 1. Build capacity to effectively plan and manage coastal and marine areas through: <ol style="list-style-type: none"> a) national ICM demonstration and parallel sites; b) risk assessment and management of subregional seas and pollution hot spots; c) technical and environmental management capability building; and d) strengthened networks. 2. Increase environmental investment through mobilisation of private sector resources; 3. Use scientific results for policy and management interventions; 4. Develop site specific integrated information management systems; 5. Collaborate with NGOs, environmental journalists, religious groups and other interested people's organisations; 6. Promote national policy to include coastal and marine area management and develop policy guidelines; 7. Support or establish a regional mechanism to implement marine environment related international conventions.
Implementation Strategies	Intergovernmental, intersectoral and interagency partnerships

Increase Environmental Investments

The Programme will promote a regional transformation from a highly public-sector driven environmental management regime, to a public and private sector driven environmental industry. The private sector, which may include large, medium and small enterprises, co-operatives or associations, as well as in-country financial institutions (e.g., rural banks) will be encouraged to invest in a wide range of facilities, services and technologies. To this end, the focus of the Programme will be packaging of environmental management action plans into discernible, bankable projects, and identifying potential opportunities and implementing activities to foster and establish partnerships.

Use Scientific Results for Policy and Management Interventions

The main effort in this component is focused on sourcing scientifically sound information that can be used to strengthen coastal and marine policies and management interventions. The application of scientific methods and approaches to generate reliable socio-economic, ecological and technological information for decision-makers will require interdisciplinary investigations. Uncertainties such as the quantification of ecosystem carrying capacity and tradeoffs between economic development and ecological impact, have long been bottlenecks to decision-makers. The Programme will aim to address these issues and others, and provide managers with information and instruments with which to strengthen policy and management interventions.

Establish Integrated Information Management Systems

The objective is to establish an integrated information management system (IIMS) at each national demonstration site. The IIMS combines baseline information on ecology, socio-economic characteristics, geography, demography and legal and institutional arrangements, with environmental quality information. By incorporating the database into a geographic information system (GIS), and linking the system to basic management software packages, each site will have a facility that enables effective planning, management and evaluation functions. An added value will be the linkage of the sites into an intra- and inter-country network, leading to a systematic exchange of information at the ground level.

Collaborate with NGOs, Environmental Journalists, Religious Groups and Other Interested People's Organisations

The main purpose of this component is to strengthen the knowledge and technical skills of interest groups in marine environmental management. This will enable them to be more effective in championing and advocating the cause for environmental protection, and to serve as a catalyst for government and people to work together. It also serves as an instrument for ensuring transparency and objective assessment of the project during the planning and implementation phases. In addition, the Programme will establish a media resource information centre to facilitate accessibility of credible information by interest groups and journalists.

Promote National Policy to Include Coastal and Marine Area Management and Develop Policy Guidelines

The essential policy elements in coastal and marine environmental management will be evaluated in the context of their importance and effectiveness in relation to the socio-economic, political and cultural characteristics of the countries. The verified elements will be incorporated into guidelines that can be used for developing national policy. National workshops will be organised to increase political and public awareness of the benefits of coastal and marine management, including benefits arising from international conventions related to the marine environment and a better understanding of government obligations and commitments.

Support or Establish a Regional Mechanism to Implement Marine Environment Related International Conventions

The purpose of the regional mechanism is to assist interested governments to achieve the net benefits of global agreements and conventions related to the marine environment. The mechanism will serve as the regional focus for mobilising external resources to support national efforts in implementing international conventions and to undertake collaborative programmes to address transboundary environmental issues. In addition, the mechanism will serve as a regional framework within which national efforts to fulfill obligations of regional and global agreements can be enhanced.

Conclusion

In conclusion, it can be stated that the Regional Programme has set in motion actions to reinforce the GEF programmatic approach for resolving transboundary environmental issues. The next phase seeks to consolidate and build on those experiences, to scale up the activities for providing balanced coverage across the region and to support a comprehensive and systematic action programme that will create a sustainable, productive future for the East Asian Seas. This could well serve as a model for other regions of the world.

List of Major Activities, Achievements and Outputs 1994-1998

1994

- Xiamen Demonstration Project public awareness campaign launched
- Batangas Bay Demonstration Project cleanest coastal village contest introduced
- IMO/IPIECA Seminar on Contingency Planning for Oil Spill Response, Hong Kong
- First issue of *Tropical Coasts*
- First Programme Steering Committee Meeting, Manila, Philippines

1995

- First issue of *Marine Pollution Updates*
- Training Course on Marine Water Sampling and Field Measurements, Vietnam
- National Workshop to Identify Environment Management Issues and Information Gaps, Vietnam
- Regional Training Needs Survey
- First Regional Training Course on the Application of ICM System in Marine Pollution Prevention and Management, Philippines, China and Singapore
- Concept Paper on Sustainable Financing
- Second Programme Steering Committee Meeting, Phuket, Thailand

1996

- Xiamen Marine Functional Zonation Scheme approved by the local government
- Coastal Environmental Profile of Xiamen
- Strategic Environmental Management Plan for Xiamen
- Environment and Natural Resources Office (ENRO), established by the Batangas Provincial Government
- Batangas Bay Environmental Protection Council established by Provincial Ordinance
- Workshop on Fishery Resource Assessment, Batangas
- Strategic Environmental Management Plan for the Batangas Bay Region
- Coastal Environmental Profile of the Batangas Bay Region
- Integrated Waste Management Action Plan for Batangas Bay Region
- Regional Programme presentation at the IPS/IMO International Conference on Navigational Safety and Control of Pollution in the Straits of Malacca and Singapore
- Consultative Meeting on Malacca Straits Demonstration Project, Manila
- Regional Network on the Legal Aspects of Marine Pollution, Inception Workshop, Manila

- IMO/APCEL/MPA Workshop on the Ratification and Implementation of MARPOL 73/78 in the East Asian Seas, Singapore
 - Training Course on Marine Water Quality Sampling and Field Measurements, Vietnam
 - International Workshop on the Integrated Coastal Management in Tropical Developing Countries: Successes and Failures, Xiamen
 - In-service Training (GIS/Application Software), Xiamen
 - Regional Workshop on Oil Spill Modeling in the East Asian Region, Pusan, Republic of Korea
 - Second Regional Training Course on the Application of Integrated Coastal Management System in Marine Pollution Prevention and Management, Philippines, China and Singapore
 - Training on Analytical Measurements, China
 - GIS Training for Bauan Municipal Staff, Batangas
 - Follow-on Training (GIS/Application Software), Xiamen, China
 - Staff exchange between Batangas and Xiamen for training in Xiamen chemical laboratory
 - Voluntary Agreements on Integrated Waste Management, Batangas
 - Regional Conference on Sustainable Financing Mechanisms for the Prevention and Management of Marine Pollution: Public Sector-Private Sector Partnerships, Manila
 - Marine Pollution Monitoring/Information Management Network Inception Workshop, Manila
 - IMO Mid-Term Review of the Regional Programme
 - Interns from DPR Korea and Vietnam join the Regional Programme Office
 - Third Programme Steering Committee Meeting, Kuala Lumpur, Malaysia
- 1997**
- Local ICM legislation approved by the People's Congress of Xiamen
 - Three new ICM parallel sites in Southern China established with UNDP country IPF funding
 - Cross-sectoral marine environment monitoring program in Xiamen
 - Sea use zoning by the Municipal Government of Xiamen
 - National Evaluation Workshop for Xiamen Demonstration Project, Xiamen
 - Contingent Valuation Survey in Batangas
 - Workshop on Environmental Risk Assessment of Pesticides, Batangas

- Batangas Bay Demonstration Project Evaluation Workshop
- Initial water use zoning scheme for Batangas Bay
- Environmental Management Atlas for Batangas Bay
- Agreement between littoral Countries to implement the Malacca Straits Demonstration Project
- Malacca Straits Environmental Profile
- Malacca Straits: Initial Risk Assessment
- Workshop on Resource Valuation/Cost-Benefit Analysis in the Straits of Malacca
- Workshop on the Development and Application of a Risk Assessment/Risk Management Framework for Subregional Sea Areas: Malacca Straits Demonstration Project
- Legal Information Database on Marine Pollution
- National Workshop on IMO Conventions for the Prevention and Management of Marine Pollution, Hanoi and Ho Chi Minh City, Vietnam
- National Workshop on Ratification of MARPOL 73/78, Philippines
- Oil Spill Response Training, Brunei and Thailand
- Brainstorming Workshop on Building Partnerships, Philippines
- Study Tour: Comparative Study of River Cleanup, Philippines and Singapore
- In-service Training (GIS/Application Software), Philippines
- Third Regional Training Course on the Application of the Integrated Coastal Management System for Marine Pollution Prevention and Management, Philippines, China and Singapore
- Regional Workshop on Partnerships in the Application of Integrated Coastal Management, Chonburi, Thailand
- Interns from Indonesia, China and Vietnam join Regional Programme Office
- First Regional Training Workshop on Integrated Environmental Impact Assessment, Hong Kong
- Regional Programme Website launching
- Translation of "ICM Good Practices" into nine languages
- Participation in IW:LEARN, a UNDP-implemented distance learning project
- Second Technical Workshop of the Regional Network for Marine Pollution Monitoring and Information Management, Chonburi, Thailand
- Directory of Research and Management Institutions in the Coastal and Marine Environments of the East Asian Seas uploaded to Regional Programme Website

- Programme Mid-Term Evaluation
 - Workshop on the Protection and Management of the East Asian Seas, Subic Bay, Philippines
 - Comparative Study on River Cleanup in the Philippines, China, Singapore
 - Regional Programme Review presented to the GEF Council, Washington, D.C.
 - Fourth Programme Steering Committee Meeting, Hanoi Vietnam
- 1998
- Contingent Valuation Survey in Xiamen
 - Batangas Marine Environmental Laboratory launching
 - Workshop on the Establishment of an Optimal Vessel Traffic System for Batangas Bay
 - Environmental Management Spatial Database of Batangas Bay (CD ROM)
 - Malacca Straits: Refined Risk Assessment
 - Marine Pollution Management in the Malacca Straits: Lessons Learned
 - Cost-Benefit Analysis of Tourism Development and Sustainability in the Malacca Straits
 - Effective Marine Pollution Preventive Measures for the Malacca Straits - Singapore
 - Marine and Coastal Resources and GIS database - Singapore
 - Marine Pollution Sources and GIS Database - Singapore
 - Workshop for Subregional Cooperation in Oil Spill Modeling in the Malacca Straits, Jakarta, Indonesia
 - Effective Marine Pollution Preventive Measures in the Malacca Straits - Indonesia
 - Cost-Benefit Analysis of Habitat Conservation in the Malacca Straits
 - Marine and Coastal Resources Mapping for the Malacca Straits - Indonesia
 - Marine Pollution Sources Database and GIS mapping for the Malacca Straits - Indonesia
 - Regional Workshop on the Marine Electronic Highway: Bridging Navigational Safety and Environmental Management in the Malacca Straits, Singapore
 - Draft proposal on Marine Electronic Highway Demonstration Project: Malacca Straits
 - Technical Report on National Resources Damage Assessment in the Malacca Straits
 - Manual and Workbook on Natural Resource Damage Assessment for Tropical Ecosystems
 - Manual and Workbook on Environmental Risk Assessment: A Practical Guide for Tropical Ecosystems

- Effective Marine Pollution Prevention and Management in the Malacca Straits - Malaysia
- Marine and Coastal Resources Valuation for the Malacca Straits
- Marine and Coastal Resources Mapping for the Malacca Straits - Malaysia
- Development of a Regional Database System and GIS for the Malacca Straits
- Marine Pollution Sources Database and GIS for the Malacca Straits - Malaysia
- President Fidel V. Ramos, Philippines, signs an accession instrument on MARPOL 73/78
- Technical review of national implementing regulations for MARPOL 73/78 in Vietnam
- Guidelines for Marine Pollution Legislation
- Action Plan for Strengthening the Implementation of the Local Government Code in relation to ICM, Philippines
- Cost-Effective Shore Reception Facilities MARPOL Workshop, Jakarta, Indonesia
- National Workshop on the Implementation of CLC and FUND, Philippines
- Legal Training Programme on Strategies, Tools and Techniques for Implementing International Conventions on Marine Pollution, Bangkok
- Legal Information Database Reference system launching
- In-service training for 3 chemists from DPR Korea in Dalian, China
- Study tour for local officials from Batangas to Xiamen sanitary landfill
- ICM Study tour of senior officials from China, Philippines, Thailand and Nigeria
- Training on Marine Pollution Monitoring Techniques, Dalian, China
- In-service training for 4 chemists from Cambodia in Xiamen
- Training Course on Marine Water Sampling and Field Measurements, Cambodia
- Training Seminar for Senior Managers and Administrators on Oil Pollution Preparedness, Response and Cooperation, Dalian, China
- Fourth Regional Training Course on the Application of the Integrated Coastal Management System for Marine Pollution Prevention and Management, Philippines, China and Singapore
- ICM study tour for senior officials from Cambodia, Indonesia, DPRK Korea and Vietnam
- Training Programme on Environmental Risk Assessment and Natural Resources Damage Appraisal for Tropical Ecosystems, Singapore

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- Xiamen Delegation to the Philippines and Singapore (Sea Use Planning), Philippines and Singapore
 - Second Regional Training Workshop on Integrated Environmental Impact Assessment, Singapore
 - Investment Opportunity Briefs for Facilities and Services in the Batangas and Xiamen
 - Sustainable Financing Mechanisms for the Malacca Straits
 - Investors' Round Table on Public-Private Partnerships on Pollution Prevention and Management, Manila
 - Regional Programme presentation at the STAP Expert Group Workshop on Leading Edge Information Technology in the Marine Environment
 - Regional Programme presentation at the First General Assembly of the Global Environmental Facility, New Delhi
 - Final Project Evaluation
 - Fifth Programme Steering Committee Meeting, Bali, Indonesia

List of Publications and Reports

Workshop/Conference Proceedings

- Regional Network on the Legal Aspects of Marine Pollution. Workshop Proceedings 1, 144 p. (1996)
- Marine Pollution Monitoring and Information Management Network. Inception Workshop. Workshop Proceedings 2, 89 p. (1996)
- Proceedings of the IMO/APCEL/MPA Workshop on the Ratification and Implementation of MARPOL 73/78 in the East Asian Seas, Singapore. Workshop Proceedings 3, 106 p. (1996)
- Proceedings of the Consultative Meeting on the Malacca Straits Demonstration Project. Workshop Proceedings 4, 50 p. (1997)
- Oil Spill Modelling in the East Asian Region. Workshop Proceedings 5, 304 p. (1997)
- Sustainable Financing Mechanisms: Public Sector-Private Sector Partnership. Conference Proceedings 6, 352 p. (1997)
- Proceedings of the National Workshop on IMO Conventions for the Prevention and Management of Marine Pollution, Vietnam. Workshop Proceedings 7, 50 p. (1997)
- Proceedings of the National Workshop on the Ratification and Implementation of MARPOL 73/78 in the Philippines. Workshop Proceedings 8, 51 p. (1997)
- Summary of the Batangas Bay Demonstration Project Evaluation Workshop. Workshop Proceedings 9, 22 p. (1997)
- Regional Workshop on Partnerships in the Application of Integrated Coastal Management, 12-14 November 1997, Burapha University, Bangsaen, Chonburi, Thailand. Workshop Proceedings 10, 167 p. (1997)
- Proceedings of the National Workshop on the Implementation of MARPOL 73/78 in Indonesia: Cost-Effective Shore Reception Facilities. Workshop Proceedings 11, 66 p. (1998)

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- Enhancing the Success of Integrated Coastal Management Initiatives. Technical Report 2, 32 p. (1996)
Also available in:
 - Bahasa Indonesia [Mengembangkan Keberhasilan Pengelolaan Pesisir Secara Terpadu]
 - Chinese
 - French [Accroître de succès de la gestion intégrée des zones côtières]
 - Korean
 - Portuguese [Apurando o Sucesso da Gestão Integrada da Zona Costeira]
 - Spanish [Extender el éxito de la Gestión Costera Integrada]
 - Swahili [Uimarishaji wa Mafanikio ya Usimamizi wa Pamoja katika Ukanda wa Pwami]
 - Thai
 - Vietnamese [Phát Huy Thành Quả Quản Lý Tổng Hợp Vùng Bờ]

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- Strategic Environmental Management Plan for the Batangas Bay Region. Technical Report 3, 71 p. (1996)
 - Integrated Coastal Management in Tropical Developing Countries: Lessons Learned from Successes and Failures. Technical Report 4, 66 p. (1996)
 - Coastal Environmental Profile of the Batangas Bay Region. Technical Report 5, 148 p. (1996)
 - Coastal Environmental Profile of Xiamen. Technical Report 6, 110 p. (1997)
 - Strategic Management Plan for Marine Pollution Prevention and Management in Xiamen. Technical Report 7, 46 p. (1997)
 - Marine Pollution Prevention and Management in the East Asian Seas (1996 Annual Report). Technical Report 8, 40 p. (1997)
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 - Malacca Straits Environmental Profile. Technical Report 10, 259 p. (1997)
 - Manual of Practice: Contingent Valuation Survey for Integrated Coastal Management (ICM) Applications. Technical Report 12, 28 p. (1997)
 - Integrated Coastal Management (ICM) Contingent Valuation Survey in Batangas Bay, Philippines. Technical Report 13, 52 p. (1997)
 - Environmental Management Atlas for Batangas Bay. Technical Report 14, 132 p. (1997)
 - Pollution Prevention and Management in the East Asian Seas (1997 Annual Report). Technical Report 15, 45 p. (1998)
 - Initial Environmental Risk Assessment of Pesticides in the Batangas Bay Region, Philippines and the Xiamen Seas, China. Technical Report 16, 49 p. (1998)
- Forthcoming Technical Reports**
- Benefit-Cost Analysis of Tourism Development and Sustainability in the Malacca Straits. Technical Report 17, 53 p.
 - Cost-Benefit Analysis of Habitat Conservation in the Malacca Straits. Technical Report 18, 48 p.
 - Manual of Economic Instruments for Coastal and Marine Resource Management. Technical Report 19
 - Straits of Malacca Environmental Information System: A Regional Database
 - Natural Resource Damage Assessment Manual for Tropical Ecosystems
 - Environmental Risk Assessment Manual: A Practical Guide for Tropical Ecosystems
 - Malacca Straits: Refined Risk Assessment
 - Marine and Coastal Resource Valuation for the Malacca Straits

- Assessment of National Marine Pollution Legislation in East Asia
- Guidelines on National Legislation on Marine Pollution Prevention and Management for East Asian Countries
- Legal Training Programme on Strategies, Tools and Techniques for Implementing International Conventions on Marine Pollution
- Integrated Coastal Management Contingent Valuation Survey in Xiamen
- Malacca Straits: Initial Risk Assessment. MPP-EAS/Info/97/117, 82 p.
- Report on the Third Regional Training Course on the Application of Integrated Coastal Management System in Marine Pollution Prevention and Management in the Philippines, PR China and Singapore, 6-26 October 1997. MPP-EAS/Info/97/142
- Sustainable Financing Mechanisms and Policy Instruments for the Prevention and Management of Marine Pollution in the Philippines by Rina Maria P. Rosales. MPP-EAS/Info/97/147, 238 p.

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- Working Document for the National Workshop on State of Marine Environment in Vietnam, 17-19 August 1995, Go Son Marine Station, Haiphong, Vietnam. MPP-EAS/Info/95/54
- Report on the Regional Training Course on the Application of Integrated Coastal Management System in Marine Prevention Pollution and Management. MPP-EAS/Info/95/64
- Report of the Regional Workshop on Operational Oil Spill Modelling, 31 May to June 1996, Pusan, Republic of Korea. MPP-EAS/Info/96/85
- Report on the Second Regional Training Course on the Application of Integrated Coastal Management System in Marine Pollution Prevention and Management, Philippines, PR China and Singapore, 4-28 October 1996. MPP-EAS/Info/96/99
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- A Study on the Status of Compliance of the Philippine Domestic Merchant Fleet with the MARPOL 73/78 Convention by Diane Factuar. MPP-EAS/Info/98/173, 15 p.
- Report of the Fourth Regional Training Course on the Application of Integrated Coastal Management System in Marine Pollution Prevention and Management, Philippines, PR China and Singapore, 7-25 September 1998. MPP-EAS/Info/98/179.

- Report on the Environmental Risk Assessment and Natural Resources Damage Appraisal for Tropical Ecosystems Training Workshop, 21-29 October 1998, Singapore, MPP-EAS/Info/99/186.

Forthcoming Information Series

- NRDA and the Malacca Straits
- Sustainable Financing for Ship-based Pollution Prevention for the Management of Malacca Straits
- Socio-economic Assessment Framework and Guidelines for ICM
- Marine Pollution Prevention and Management in Subregional Sea Areas: A Benefit-Cost Framework
- Malacca Straits: A Special Area?
- National Coastal Policy for the East Asian Seas: Status Review and Model Policy Development
- Development of Model Local Government Laws on Integrated Coastal Management
- Strategy Package for the Facilitation of National Legislation on Marine Pollution: Project Report
- Project Report on Ratification and Implementation of MARPOL in the Philippines
- Environmental Guarantee Fund and Environmental Monitoring Fund as Economic Instruments

Meeting Reports

- Proceedings of the First Programme Steering Committee Meeting, Quezon City, Philippines, 1-3 June 1994. MPP-EAS Meeting Report 1
- Proceedings of the Second Programme Steering Committee Meeting, Phuket, Thailand, 11-13 December 1995. MPP-EAS Meeting Report 2
- Proceedings of the Third Programme Steering Committee Meeting, Kuala Lumpur, Malaysia, 10-12 December 1996. MPP-EAS Meeting Report 3
- Proceedings of the Fourth Programme Steering Committee Meeting, Hanoi, Vietnam, 15-18 December 1997. MPP-EAS Meeting Report 4
- Proceedings of the Fifth Programme Steering Committee Meeting, Bali, Indonesia, 2-5 December 1998. MPP-EAS Meeting Report 5

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- December 1994—Vol. 1, No. 1—The 1994 Colloquium on Tropical Coastal Zones
- July 1995—Vol. 2, No. 1—Environment and Enterprise: The Case of Malacca Strait
- December 1995—Vol. 2, No. 2—International Marine Environment Conventions: Obligations and Opportunities

- July 1996—Vol. 3, No. 1—Conservation to Management—Initiatives for the Coastal Zones in East Africa
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- July 1998—Vol. 5, No. 1—Coastal Tourism
- March 1996—Vol. 2, No. 1—Xiamen Project Shows Significant Achievements
- June 1996—Vol. 2, No. 2—The Batangas Bay Demonstration Project
- September 1996—Vol. 2, No. 3—IMO Secretary-General Urges Philippine Government to Ratify Marine Pollution and Maritime Safety Conventions
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- January 1995—Vol. 1, No. 1—Organization and Appointments
- April 1995—Vol. 1, No. 2—Appointments
- June 1995—Vol. 1, No. 3—Xiamen Demonstration Project
- September 1995—Vol. 1, No. 4—XDP’s Newly Approved Subprojects
- January 1996—Vol. 2, No. 1—GEF Marine Pollution Prevention and Management Programme Draws Strong Regional Support in East Asia
- March 1997—Vol. 3, No. 1—Initiatives to Strengthen Regional Capacity in Pollution Prevention Management
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- June 1998—Building Regional Management Capacity for a Better Marine Environment in the 21st Century

CD-ROM and Manual

- Paw, James N., Noel A. Robles and Edmond Titus A. Calderon. 1998. CD-ROM Environmental Management Spatial Database of the Batangas Bay Region. GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas and the Department of Environment and Natural Resources, Quezon City, Philippines [includes a Manual on How to Use the Environmental Management Spatial Database of the Batangas Bay Region. 17 p.]

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