

Tropical Coasts

A newsletter for policymakers, environmental managers, scientists and resource users.

Sponsored by • Sida Marine Science Programme • GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas and • Coastal Management Center

MARINE POLLUTION PREVENTION AND MANAGEMENT: OPPORTUNITIES FOR INVESTMENT

The Regional Programme for Marine Pollution Prevention and Management in the East Asian Seas (MPP-EAS) was established in 1994 to assist participating governments in controlling and managing marine pollution in the East Asian Seas. The Programme is the cutting edge initiative of 11 East Asian countries with the joint efforts of the Global Environment Facility (GEF), the United Nations Development Programme (UNDP) and the International Maritime Organization (IMO). Its objectives and integrative approach in coastal and marine area management are direct responses to Chapter 17 of Agenda 21 of the United Nations Conference on Environment and Development. In fact, the integrated coastal management (ICM) approach is considered a blueprint for sustainable development at the local level.

The Programme's vision is for land-based pollution to be effectively addressed at the local level with the full

participation of local governments and stakeholders. The Programme has demonstrated the feasibility and effectiveness of the ICM system at the local level with its adoption at two demonstration sites—Batangas Bay in the Philippines and Xiamen in the People's Republic of China. The ICM framework enables effective policy, management and technological interventions to address domestic pollution problems in the coastal areas.

In addition, the Straits of Malacca was chosen as the Programme's test site to demonstrate the success of existing efforts in resolving problems regarding navigational safety and control of marine pollution at a subregional level. The Programme believes that pollution risk management in subregional seas should be addressed through intergovernmental collaboration of littoral and user States. The Malacca Straits model involving three littoral States could then be modified and applied to control marine pollution in other straits and subregional seas.

A significant feature of the Programme is the promotion of public sector and private sector partnerships. The establishment of the demonstration sites provides a host of opportunities in which both the public and private sectors play significant roles. The public sector provides the "software", such as policy formulation, management and action plans, preinvestment feasibility studies, human resource development, and technical

(continued on page 3)



Sewage Treatment Plant, Yuan Dang Lake, Xiamen, China.

ECONOMIC OPPORTUNITIES IN MARINE POLLUTION MANAGEMENT

Environmental problems due mainly to human activities are threatening the life support system of our home planet. These problems include resource overexploitation, land degradation, destruction of biodiversity, unbridled economic development, climate change and pollution. They are being exacerbated by natural hazard events, and political and social instability. International and domestic efforts have been exerted to address these problems with minimal success. Many of the environmental programs and projects are very dependent on external funding and technical support. Many of these activities cover planning and research phases and stop short of implementation. While technical capacity may be beefed up, the continuity of efforts to resolve the identified environmental issues is either hampered or even dissipated due to the absence of a viable mechanism that will propel environmental programs and projects beyond their apportioned time. The resolution of environmental issues generally requires a longer time frame and, therefore, a sustainable system that is not dependent on external assistance must be established with the beneficiaries or recipients (e.g., government, communities) able to take on the responsibility. Thus, sustainability of efforts is a crucial element in the perpetuation and enhancement of programs and projects which cover not only the establishment of appropriate institutional and legal systems but, more importantly, the provision of viable financing mechanisms.

Among the critical environmental issues as by-products of economic development is marine pollution from both land- and sea-based sources. Traditionally, governments assume the task of mitigating marine pollution and its adverse consequences. However, government efforts have not always been efficient and cost effective because of the typically sectoral approach. Innovative and practical approaches and instruments to address marine pollution need to be developed and implemented. A sustainable approach to marine pollution prevention and management would be to ascertain the economic opportunities associated with them.

"Public sector-private sector partnerships" was the theme of a regional conference which was held in Manila from 14 to 16 November 1996. The opportunities and benefits of joint ventures in marine pollution programs were highlighted during the conference sessions in the East Asian Seas region. A series of recommendations were put forward by the conference, aimed at promoting and ensuring increased interaction between industry, donor agencies, NGOs, international agencies and the various levels of government.

This fifth issue of the *Tropical Coasts* highlights economic opportunities that galvanize stakeholders in the prevention and management of marine pollution, especially the conference theme on public sector-private sector partnerships. Such partnerships take advantage of the private sector's dynamism, technical expertise, financial resources and entrepreneurial spirit. On the other hand, the public sector contribution to such partnerships includes the setting up of the necessary legal system and infrastructures, providing technical support, identifying and evaluating social and economic benefits, quality control, setting of standards and sharing of information, among others. This issue also explores case studies such as the cleaning of rivers in Singapore, tourism development in Thailand and the management of subregional seas such as the Malacca Straits. It also covers case studies in the Philippines on the Build-Operate-Transfer (BOT) scheme and participation of NGOs, market-based instruments such as reducing tariff and fee system, as well as infrastructure and capacity that enhance marine pollution prevention and management like the marine electronic highway and the manpower resource from the seafaring industry. These case studies attest to the investment opportunities in marine pollution prevention and management. For such programs and projects to be effective as "environmental enterprises," the active participation of the private sector must be promoted as mitigating marine pollution is no longer the sole responsibility of the government. It requires a multifaceted perspective in which all stakeholders (i.e., government, communities, private sector, donors, etc.) must play actively within a cooperative and integrated framework with a shared responsibility.

Overall, a clear message was delivered by the conference. Partnerships are not only viable, but essential if marine pollution problems are to be addressed. The discussion of problems and constraints has run its course. It is time for action.



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assistance; whereas, the private sector contributes in the form of "hardware" investment such as waste collection, storage and treatment, sustainable maritime industry and development of environmental enterprise.

Marine pollution is a product of economic development. Appropriately, market-based instruments have been identified to address the issue of marine pollution most efficiently—particularly through the development of the environmental industry. The emergence and strengthening of environmental industries will create a strong voice in favor of environmental protection in conventional business communities.

The diagram below identifies some of the specific ventures that both public and private sectors may undertake in support of marine pollution prevention and management in the East Asian Seas.

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

Business ventures in environmental management may be undertaken more efficiently with the collaboration of donor and

international agencies, governments, NGOs, and the private sector. Collaboration can take place in the following suggested modes:

1. National government assisting local governments to establish and implement ICM programs through a national coastal policy, and technical and financial support; with the local government taking the initiative in incorporating integrative coastal planning and management into its development programs.

2. UNDP expanding its sustainable development efforts through

country Indicative Planning Figures (IPF) by encouraging national and local governments to develop the necessary integrative planning and management framework (or national "ICM software"); creating employment and alleviating poverty in coastal areas; strengthening the capacity of the local government by developing new ICM demonstration and parallel sites; and promoting intergovernmental collaboration to control marine pollution in subregional seas and congested straits using regional IPF to develop a regional management framework (or regional "software"), and pushing for technical cooperation as envisioned in the Technical Co-operation Among Developing Countries (TCDC).

Marine Pollution Programme East Asian Seas

Public Sector Investment "SOFTWARE"

- › Policy framework
- › Strategic and action plans
- › Zonation schemes
- › Institutional arrangements
- › Financial mechanisms
- › Legislation arrangements
- › Pollution monitoring framework
- › Information management
- › Law enforcement protocol
- › Research and development
- › Technical assistance
- › Capacity building
- › Infrastructure development
- › Preinvestment feasibility study



Private Sector Investment "HARDWARE"

- › Waste reception facilities
- › Sewage treatment facilities
- › Solid wastes collection, storage and treatment
- › Hazardous wastes collection, storage, and treatment
- › Waste recycling and minimization
- › Electronic information systems for ships
- › Remote sensing and other maritime technologies
- › Consultancies
- › Navigational safety facilities
- › Training and certification
- › Environmental impact assessment
- › Maritime industries development

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


The concept of establishing a local presence and capacity, and then proceeding to a more ambitious provincial and national program after developing sufficient experience, is prac-

3. Donors and multilateral banking institutions helping local and national governments in establishing, demonstrating, replicating and extending ICM programs in individual countries and regions, or in specific subregional sea areas; providing assistance in capacity building, preinvestment studies, research and other technical aspects, and more importantly, contributing significantly through bilateral or regional mechanisms to support the hardware requirements, such as the setting up of Build-Operate-Transfer (BOT) or Build-Own-Operate (BOO) facilities for marine pollution projects and promoting the development of the environment industry.

4. The private sector supporting national commitment and the management framework developed through ICM and subregional seas and programs, by providing hardware and support services; complying with discharge standards; and investing in pollution-related BOT/BOO projects to develop a viable environmental industry.

5. NGOs emphasizing their functional niche within the ICM program, especially in community mobilization, public awareness, social equity and protection of cultural heritage and the ecosystem.

Undoubtedly, the key to arresting the increasing threat of marine pollution lies in adequately planning and managing our economic development, integrating proactive and reactive measures to preserve our environment and sustain economic gains. For each opportunity, there are costs, benefits and risk factors that need to be explored, quantified to the extent possible, and translated into terms that are appreciated by politicians, decision-makers, potential investors and the general public. Opportunities that provide win-win outcomes with respect to public good and economic benefit are first priority in the evolution of sustainable marine pollution initiatives.

 Based on the paper by Dr. Chua Thia-Eng, Regional Programme Manager, Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas, at the Regional Conference on Sustainable Financing Mechanisms for Marine Pollution Prevention and Management: Public Sector-Private Sector Partnerships, 14-16 November 1996.

RECONCILING ECOLOGY AND ECONOMICS FOR THE MARINE ENVIRONMENT

Ecological economics encompasses issues and relationships between ecosystems and economic systems. Simply stated, it is the science which seeks to discuss issues arising from the use and abuse of natural resources that are considered as assets of the economy. The same field of study disclosed the concept of sustainable development through environmental preservation and conservation—in the case of the coastal environment, through marine pollution prevention and management. Thus, several environmental management programs were launched, mostly applying a direct, piecemeal and highly localized approach to address pollution problems and depletion of natural resources.

A few of these programs proved to be successful, as shown by their completion of expected targets. Unfortunately, these targets often concentrated on biological, physical, and chemical aspects, barely touching on socioeconomic factors as success parameters. Also, the scope of project impact assessment was often confined to the exact location of the project and its immediate proximate areas, even if impacts often extend over these bounds. Furthermore, program gains could not be sustained except with continued support and subsidy from national coffers. On the other

hand, economic projects initiated by national governments were often assessed based on their ability to generate revenues, while neglecting social and biophysical impacts. In the marine sector, recent developments focus on projects in marine pollution management, river clean-up, coral reef protection and tourism development, and fisheries management. The difficulty lies, however, in attracting government and the private sector—especially in developing countries—to willingly and enthusiastically venture into such projects. In response, economic valuation and the concept of market-based instruments were introduced, aimed at quantifying environmental indicators and identifying motivating factors to sustain projects into costs and benefits and their monetary equivalents.

Recent tools and frameworks have been developed to place values on natural resources and account for damages, benefits and costs. However, concrete evidence of benefits still need to be presented to prove that ecological balance is economically sound, and that environmental management endeavors can become profitable and viable investments. In many instances, environment programs remain beset by a serious lack of reliable data on socioeconomic benefits, due to the omission of these parameters during the planning stage.

One of the objectives of the GEF/UNDP/IMO Regional Programme on Marine Pollution Prevention and Management in the East Asian Seas is to promote sustainable financing for activities requiring long-term commitments. A survey conducted on ongoing and proposed marine pollution/coastal management projects in the East Asian region revealed large interest and financial commitment to address the issue of marine pollution. However, one still needs to examine whether these activities are sustainable and to concretely determine long-term benefits. In mid-1996, the Regional Programme initiated a cursory examination of case studies on various programs which incorporated aspects of the ICM framework to determine indications of socioeconomic benefit. The study focused on cases in the East Asian Seas following the themes of clean rivers, tourism development and fisheries management.

The Case of Clean Rivers

The Clean Rivers Program of Singapore covering Kallang and Sinjare Rivers, specified three direct targets: (1) public health; (2) tourism development; and (3) national discipline. These targets were identified through intensive research, planning and collaboration with several government agencies headed by the Ministry of Environment. Like the Philippines' Pasig River Rehabilitation Program (*see Tropical Coasts Vol. 3 No. 1*), which is currently in progress, components were delegated to line agencies already mandated to undertake specific tasks. Thus, the River Cleaning Program became part of the agenda of all these agencies. Planning was followed by activities, including: (1) zonation; (2) construction of relocation sites, including low-cost housing units, industrial estates and ports; (3) actual relocation; (4) sewerage cleaning and rehabilitation; (5) clearing waterways of obstruction, including sunken derelicts; (6) dredging or desilting and landscaping; (7) water quality monitoring; (8) designing a system of fines and penalties; (9) integrating an environment curriculum in schools; (10) increasing public awareness; (11) promoting private sector involvement; and (12) compliance monitoring.

The ultimate concern of Singapore behind the polluted River was its overall effect on the nation. The results of the cleanup definitely created positive externalities or spillover effects on other sectors of the economy. For instance, a clean environment overlaps with public health and labor productivity issues by providing for sanitation and hygiene, opportunities for rest and recreation, community involvement and cultural enhancement. The general improvement in public health

in Singapore was manifested by a 71% reduction in government expenditures for health and environment from 1980 to 1990 and the slow rate of increase in household expenditures for medical care relative to other expenses (approximately 3%) over the same period.

On the other hand, enhanced labor conditions can be seen in the 125% increase in average monthly earnings from 1980 to 1990, and value added per worker increasing at over 50% every 10 years. Though direct relationship has yet to be established,

studies by labor economists show a strong relationship between health, labor productivity and income. Thus, sound approaches to safeguard public health tend to enhance value added in production, promising investment activity, opportunities for employment and income generation, and an overall improvement in Gross Domestic Product (GDP) contribution.

In addition, river and city cleaning improves the "national image", as it affects the psyche of citizens and foreign visitors.

In accounting terms, this is synonymous to an investment in advertising. In the case of Singapore, efforts were geared toward promoting Singapore as a Convention City. The cleaning of the Kallang and Singapore Rivers contributed to the influx of tourists (108% increase between 1980 and 1990), effected an increase in value of land and property (16.8% increase between 1980 and 1990), and encouraged foreign investments into the country (US\$7.5 million in 1996). These are concrete manifestations of significant benefits generated, though indirectly, by the cleanup program.

Tourism Development

Tourism is an industry that is especially sensitive to sustainable development, depending upon the use of natural resources, a clean environment and market and non-market value to the client. The same program provides employment opportunities, whether they are artisanal or commercial fisherfolk, resort managers, souvenir shopkeepers, shell or coral crafts traders, or entrepreneurs renting out diving equipment and boats.

Tourism enthusiasts easily agree to the concept of marine parks development, as their motivation to preserve nature directly relates to the amount of revenues they are able to generate from their efforts at environmental protection. One

Table 1: Visitor Arrivals by Purpose, 1980 and 1990

PURPOSE	1980 (x 10 ³)	1990 (x 10 ³)
Holiday	1,644.2	3,312.4
Business	300.9	691.5
Business and Holiday	166.1	214.3
In transit	253.7	481.2
Others	200.1	623.4
TOTAL	2,562.1	5,322.9

Source: Singapore Tourist Promotion Board.

of the more successful marine park development programs involves Phuket Island in Thailand, as part of the Coastal Resource Management Project (CRMP) implemented from 1986 to 1992 by the United States Agency for International Development (USAID) and the Royal Thai Government. After four years of operation, the Project had established measures involving policy formulation, surveillance and enforcement, education and public support. The program also attained remarkable private sector and public support through extensive media coverage, education and scientific activities.

Thus, it was relatively easy to encourage the private sector to take part in the preservation campaign of Phuket's corals, inasmuch as businesses depended on corals, shells, diversity of marine species and clean beaches. Livelihoods depended largely on keeping the beaches in their pristine state.

Two years after the program started in Phuket, tourist arrivals and daily expenditures had increased extensively. From 1989 to 1995, daily expenditures of tourists grew by 115%, to about US\$114 per day. Revenues from tourism activities also grew, from 6.7 billion baht in 1989 to 33.9 billion baht in 1995. Developments in the environment affected and benefitted several other sectors, including agriculture and fisheries, forestry, hotel and restaurants, construction, mining, public works, communication and transportation, and sanitation.

Another case involves tourism development in Ko Samui, Thailand. The Tourism Authority of Thailand reported an increase in income and employment of the local population and more efficient use of natural resources, due to tourism development in the area. The population's highest source of income is tourism which generated a cash inflow of 499.3 million baht and 671.1 million baht in 1992 and 1993, respectively. Farmers' incomes are 5,020 baht/month, whereas tourism entrepreneurs earn as much as 56,774 baht/month.

The case of Pattaya is in stark contrast to Phuket. Pattaya was formerly the premier tourist paradise in Thailand, until problems with potable water supply, garbage and sanitation, forced tourists to search for other sites.

In spite of the tourism benefits to natural resource preservation and conservation in Thailand, the industry has not been able to adequately resolve the problem of pollution. In fact, there appears to be little effort by beach resort owners to preserve the environment outside of their own properties. There is a prevalence of beach resorts without adequate sewage and solid waste treatment facilities. Activities related to coral, shell and aquarium fish collection remain unchecked. In addition, construction and infrastructure activities accelerate erosion and sedimentation that destroy coral reefs and affect the marine environment.

Fisheries Management


Brunei Darussalam developed and adopted a coastal resource management plan through the CRMP in response to the need for alternatives to oil dependence. Brunei Darussalam has 735 oil wells that generated 4.709 million metric tons of crude oil and 8.063 million cubic meters of gas in 1990. Production comes essentially from seven oil fields offshore and two onshore, characterized by high productivity and value added per worker. However, this resource is projected to run out in 27 years. Hence, fisheries was identified as one of the alternatives to sustain the country's economy.

A National Interagency Committee on Environment was established to implement the plan to respond to the lack of a coordinating agency for environment, as well as the absence of legislation to address environmental matters. In addition, the Marine Department developed a National Oil Spill Contingency Plan in collaboration with the Brunei Shell Petroleum Co. Sdn. Bhd. to protect the coast in the event of an oil spill. Apart from coral reef protection, the productivity of coastal waters is being enhanced through artificial reef building using abandoned oil rigs. Also, a Red Tide Action Plan was formulated to address the red tide outbreaks including incidences of paralytic shellfish poisoning. Other actions were turfing and landscaping projects to arrest soil erosion whereas mangrove protection was delegated to the Forestry Department. Finally, as an expression of its continuing commitment to CRMP, Brunei Darussalam has been actively participating in marine pollution prevention and management programs.

Five years after the CRMP formally started, fish production increased by 6.2% and employment of part-time artisanal fishermen increased by 27%.

Case Study Overview

The case studies were based largely on measurements of quantifiable socioeconomic factors, while omitting non-use options, heritage and other values. Measures of well-being, including national revenues and per capita gross national or regional product, income and employment generation, health and leisure, labor productivity and efficiency, consumption patterns, fulfillment of the basic needs (e.g., food, clothing, shelter, education and health) and access to information, are only some of the factors that may be applied to determine the impact of projects to the national economy.

 Based on the papers by Mr. Pradech Phayakvichien, Deputy Governor for Planning and Development, Tourism Authority of Thailand and Ms. Catalina S. Tejam, Research Associate, Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas, at the Regional Conference on Sustainable Financing Mechanisms for Marine Pollution Prevention and Management: Public Sector-Private Sector Partnerships, 14-16 November 1996.

PROVIDING FOR SAFER AND CLEANER SEAS IN THE MALACCA STRAITS

The Straits of Malacca is one of the busiest waterways in the world and at approximately 500 miles, the longest strait used for international navigation.¹ It connects the Indian Ocean to the South China Sea and is measured to be the shortest route between the Persian Gulf and East Asian countries. In 1994, a total of 122,600 vessels called at ports along the Straits, with 31,755 ships observed passing the One Fathom Bank.

Natural resources abound in the Straits. For instance, 58.6% of all fisheries landings in Peninsular Malaysia in 1994 originated from the Straits. While in Indonesia, fishery catch from the Straits ranks second only to fishery landing from the north coast of Java. Large expanses of mangroves line the borders of the Straits, along with coral reefs in the waters of Malaysia and Indonesia.

Economic activities of the littoral States are highly dependent on the Straits. In Malaysia alone, 95% of its external trade is carried by sea, mainly through the Malacca Straits. Moreover, the country's major ports are located along the Straits, including specialized ports serving the petroleum and petrochemical industries. Also, 65% of the country's population live along the western corridor of Peninsular Malaysia.

Unfortunately, the profusion of both land- and sea-based activities resulted in marine pollution problems, causing the decline of water quality in the Straits. Worse, the possibility of a major oil spill occurring in the Straits increases with the volume of sea traffic (in 1994, 30% of vessel traffic passing the One Fathom Bank were tankers). Given its semi-enclosed nature, a major spill would be catastrophic to the communities living along the Straits, not to mention the potential damages to the existing ecosystems.

In formulating solutions to pollution problems in the Straits, the diversity of stakeholders provides a challenging situation not only to the communities of the littoral States

but also the international community that navigates through the Straits is equally liable and responsible. The issue of funding for environmental management and navigational safety, thus, becomes contentious. Nevertheless, there are grounds for international cooperation that can be analyzed within the context of the utilitarian needs of stakeholders and their altruistic aspirations for the Straits.

Value of the Straits

User States' interests are mostly economic in nature. Toward the latter quarter of 1995, 283,123,559 metric tons of oil were transported from the Middle East and Africa through the Straits. Tanker movement alone involved 2,441 voyages with more than 60% above 200,000 dead weight tons

(dwt). The high economic value of the Straits is based on the following:

1. The Straits is the shortest route from the Indian Ocean to the South China Sea. Very Large Crude Carriers (VLCCs) en route from the Persian Gulf to Japan would save approximately 1,000 miles or 3 days sailing through the Straits of Malacca as opposed to the Lombok and Makassar Straits.

2. VLCCs traveling from South Africa would save 200 miles using the Straits of Malacca as opposed to the Sunda Straits.

In dollar terms, the Japanese petroleum industry, for instance, saves up to US\$340 million annually.²

Meanwhile, as owners of the Straits, the littoral States' interests are more broad based and prominent. Should anything untoward happen to the Straits, they do not have the option to just bypass the incident, rather they will have to live with it. Hence, it is in their best interest to ensure that the Straits remains open at all times.

The Straits is a very important socioeconomic resource for local communities. There are 139 fishing villages along the west coast of Peninsular Malaysia supporting 70% of

Table 1: Types of Ships Observed Passing Through the Straits of Malacca at One Fathom Bank

TYPE OF VESSEL	NUMBER
Conventional cargo	11,620
Tanker	9,888
Container	5,244
Fishing crafts	1,622
Tug and tow	1,579
Ro-Ro	1,130
Passenger	440
Military vessels	252
Patrol crafts	172
Submarines	4
TOTAL	31,755

Source: Lloyd's Maritime Information Services (LMIS), 1994.

the area's populace. In 1994, total marine fish landings from the Malaysian side of the Straits amounted to 460,302 metric tons, compared to only 280,605 metric tons from the East Coast of Malaysia. Furthermore, the Straits hosts numerous aquaculture and mariculture ventures. A major pollution incident would cost the Malaysian fisheries sector up to RM1.2 billion. Equally important would be the effect of an oil spill on the tourism industry of Malaysia.

There is more than enough basis for cooperative effort among user and littoral States in promoting navigational safety and environmental management in the Straits of Malacca. At present, there are only two Traffic Separation Schemes (TSSs) in the Straits—the One Fathom Bank and Tanjung Piai (at the entrance of the Straits of Singapore).³ Outside of these areas, vessels are permitted to draw their own course. This makes navigation in the Straits difficult even at the best of times. From 1978 to 1994, a total of 476 casualties were reported (Table 2), averaging 30 per year. These include more than 50 casualties which resulted in oil spills. To date, Malaysia has shouldered RM7.7 million in cleaning up these spills.

Table 2: Reported Casualties in the Straits of Malacca by Type of Vessel (1978-1994)

TYPE OF VESSEL	NUMBER
General cargo	253
Tanker	98
Bulk carrier	32
Fishing vessels	21
Container ship	14
Liquefied gas tanker	8
Tug	7
Ore carrier	6
Unknown	4
Ferry	3
Landing craft	3
Passenger	3
Ro-Ro cargo vessel	3
Supply ship	3
Tug/Supply ship	3
Vehicle carrier	3
Livestock carrier	2
Aggregate carrier	1
Barge carrier	1
Cable layer	1
Crane pontoon	1
Destroyer	1
Drilling ship	1
Hopper/Dredges	1
Processing tanker	1
Refrigerated cargo vessel	1
Utility vessel	1
TOTAL	476

Source: Lloyd's Maritime Information Services (LMIS), 1994.

In order to minimize accidents, littoral States have invested in various precautionary measures, such as providing aids to navigation.

International Cooperation

There are opportunities for states to cooperate in improving navigational safety, a fact well recognized by members of the user community. Japan, for example, has continuously contributed toward this end—¥1.424 billion for the survey of the Straits of Malacca and ¥400 million to the Strait of Malacca Revolving Fund (Table 3).⁴ The main problem, though, is finding an acceptable, non-discriminatory funding mechanism for establishing a cooperative arrangement.

Hand in hand with navigational safety is the question of environmental management. Apart from managing pollution from land-based sources, marine environmental management in the Straits consists of the following elements: (a) being highly prepared to combat oil spills; (b) minimizing and preventing pollution from human activities on land; (c) enforcement of regulations for controlling vessel-based pollution; and (d) damage repair and compensation cost.

An adequate budget is needed to accomplish these requirements. Foreign funds have been received only for oil spill preparedness and response activities. International funding for environmental protection is contentious, to say the least, and remains unresolved. Global economic trends will even make foreign aid less available for the protection of the marine environment in the Straits of Malacca.

Financial Mechanisms

With this scenario, what then are the options for the littoral States in financing navigational safety and environmental management in the Straits?

The application of the user pays scheme is an attractive option, albeit an old one.⁵ Whenever vessels call in at ports in Malaysia, Singapore or Indonesia, port charges are levied on them. However, the problem is how to make transiting vessels pay. An additional concern is whether these dues are sufficient to support the costs of operating and maintaining navigational aids in the Straits. Light dues collection is never enough. Also, the method of collection needs to be revised to facilitate greater capture of revenue.

Establishing a burden-sharing mechanism in the Straits should not be confined to those who pay light dues. Instead, it should address the majority of the vessels which transit in the Straits. The UNCED principle that States have common but differentiated responsibilities

Table 3: Japanese Contribution to Navigation Safety and Prevention of Pollution in the Straits of Malacca

PROJECT	FISCAL YEAR	AMOUNT (million yen)
Hydrographic Survey	1968-1978	
Production of Common Datum Charts	1976-1982	359
Tidal and Current Studies	1976-1979	646
Removal of Shipwreck	1972-1978	1,435
Dredging Works in the Straits of Singapore	1979	1,001
Installation of Aids to Navigation	1968-1993	2,166
Cooperation in Maintenance of Aids to Navigation	1970-1993	1,358
Donation of Buoy Tender to the Government of Malaysia	1975-1976	52
OSPAR Cooperation	1990-1993	210
Donation of Oil Skimming Vessel to the Government of Singapore	1973	502
Donation of Revolving Fund	1980	400
Other International Cooperation by Malacca Strait Council	1968-1993	420
	TOTAL	9,973

Source: Mr. Akio Ono, Ministry of Transport, Japan

Note: This does not include the running costs of Malacca Strait Council and the personal expenses of officials involved in the projects. With the present exchange rate, the amount is equivalent to US\$92.8 million.

for sustainable development should also be considered. Before any form of burden-sharing arrangement is established, all the beneficiaries of the Straits should first be consulted, so that such a regime when in place does not appear to discriminate against anyone and is consistent with international practice.

A cursory examination of Straits users shows that they include private entities, coastal communities and nation states. Such a broad categorization makes apportioning responsibilities difficult. In examining the application of users pay policies in the Straits, it is also necessary to analyze the willingness of users to pay. The international shipping community, for instance, is willing to support efforts to enhance navigational safety, as illustrated by the 1993 draft statement of the Oil Companies International Maritime Forum calling for an expansion of the existing TSS in the Straits. However, the offer of cooperation comes with certain conditions. For instance, the Tanker Owner's Federation, INTERTANKO, indicated its willingness to pay higher dues if this is reciprocated by the revision of rates by littoral States with the promise that the latter will not discriminate against its members.

Before any form of burden-sharing arrangement is established, all the beneficiaries of the Straits should first be consulted, so that such a regime when in place does not appear to discriminate against anyone and is consistent with international practice.

The preceding point highlights the well-known pitfall in any effort to apply users pay policies: the maxim of "user pays, user says" still applies. The littoral States have to decide on how much control over the Straits would be shared with members of the international community. Nevertheless, their interests should remain paramount.

The list of activities for improving navigational safety and protecting the marine environment is an extensive one, ranging from updating of charts and carrying

out hydrographic surveys, to establishing an environmental monitoring system for the Straits (Table 4). Not all of the activities will receive financing from external sources, and littoral States will have to continue funding many of these. However, a situation should not develop such that littoral States will keep on providing subsidies to the international community. Littoral States should decide on a priority list of projects which require urgent funding, especially those which can be carried out on a regional basis.

The Way Forward

Straits States need to send a clear message calling for international cooperation in the Malacca Straits, emphasizing the need for international measures to implement generally acceptable principles in environmental management, e.g., the precautionary principle. One of the main questions arising from such measures that has to be

Table 4: Possible Projects in the Malacca Straits Requiring External Funding

ENVIRONMENT AND POLLUTION PROJECTS

- › Water quality monitoring
- › Effective oil pollution preparedness and strategies for Malacca Straits
- › Assets building inclusive of training and technical knowhow
- › Oil spill trajectory modelling
- › Finger printing of oil and sludge
- › Ship-based pollution sewerage study
- › Reception facilities for fishing vessels, oil and garbage
- › Study/project on marine pollution risk in the Malacca Straits
- › Project to research and produce maps of protected areas in the Straits
- › Resource maps (e.g., fishing ground)
- › Developing a database on physical, biological, and economic resources in the Malacca Straits to produce a database on oil pollution risk in the Straits
- › Develop a regional marine pollution surveillance and information management system

NAVIGATIONAL SAFETY

- › Navigational aids
- › Updating of charts and hydrographic surveys
- › Currents and tidal study
- › Surveillance report
- › Search and rescue (SAR) including Global Maritime Distress and Safety System
- › Vessel Traffic Management Schemes—radars, command and control equipment
- › Wreck removal
- › Straits of Malacca Navigational Information System; Alternative Route Study (e.g., landbridge concept)

Source: B.A. Hamzah and M.N. Basiron, *Funding a Partnership for Safer Navigation and Cleaner Environment in the Straits of Malacca—Some Preliminary Thoughts*.

resolved is how to collect and disburse funds for use in the Straits

There are a number of options available to Strait States. However, there are several prerequisites which have to be put in place:

1. A mechanism for collecting and disbursing funds for services rendered, consistent with their respective economic aims or policies.

2. A commitment among littoral States to improve the quality and quantity of navigational aids in the Straits.

3. Additional funds above and beyond what is already being collected or donated for environmental management, specifically for projects which would implement the precautionary protective principle in international law.

4. Extensive consultation with the International Maritime Organization (IMO) and other relevant organizations on any initiative to introduce charges for services in the Straits.

5. Development of a revenue collection system based on 'cost-recovery' rather than on profit-making from inter-

national navigation in the Straits.

6. The charges should be consistent with international practice and should be applied on a nondiscriminatory mode.

7. Extensive consultation with the stakeholders to get their support for a funding system.

Once these prerequisites are met, littoral States can then proceed to examine a number of options available for recovering the costs of providing services to users. One of these is to establish separate funds to support both safety of navigation and environmental management. This option will establish the capacity to fund

a wider range of activities not presently covered by existing schemes, such as the Strait of Malacca Revolving Fund. Different user parties can be requested to subscribe to the fund which is most appropriate to them.

Another option is to expand the scope of the existing Strait of Malacca Revolving Fund to include some of the activities mentioned above. This will require some operational modifications of the Revolving Fund, such as establishing a permanent office to administer collection, improving the mechanism for replenishment after disbursements, broadening the scope for its use, and accommodating new donors. An arbitrary figure of US\$25 million has been mentioned as a possible start-up amount for expanding the Fund.⁶

Recommendations made in the "Report of Lord Donaldson's Inquiry into the Prevention of Pollution from Merchant Shipping titled *Safer Ships and Cleaner Seas*" may further be considered. The report examines many of the questions related to pollution prevention at sea, and extensively discusses the question of who should pay for pollution prevention and navigational safety. It espouses the "polluter pays" and "user pays" principles and introduces new ideas such as making potential polluters pay for costs not covered under existing compensatory regimes, e.g., the

International Oil Pollution Compensation (IOPC) Fund. It also recommends the establishment of a "counter-pollution fund" to cover activities such as an emergency towing facility, establishment of counter-pollution capacity and purchase of cleanup equipment. The report, however, recognizes that there will be objections and difficulties in establishing new funds.


The issue of funding environmental management efforts is not as contentious as that of making users pay for navigating the Straits. In fact, there have been significant benefits from environmental research conducted through bilateral or multilateral cooperative arrangements, e.g., the ASEAN-Australia Project on Living Coastal Resources and the ASEAN-Canada Project on prevention of pollution.⁷ A "Trust Fund"⁸ can likewise be established to support both types of activities. Contributions from governments and the private sector should be voluntary.

It is clear that enhancing navigational safety requires a more complex framework compared to environmental management projects because it evokes an intensive consultative process involving external parties and international organizations.

Moreover, the agreement of major beneficiaries of international navigation needs to be secured before any new financial initiative is introduced in the Straits. Once agree-

ment is obtained, fundamental questions on fund management need to be resolved. There are many examples in doing this, one of which is the existing Strait of Malacca Revolving Fund. Similar funds can be created for improving navigational safety and upgrading navigational aids. Alternatively, the role of the Revolving Fund and its governing council could be broadened to accommodate other concerns.

The question of fund collection should not be seen as the "be-all and end-all" of navigational safety. It should be handled within the existing global framework of managing navigation, environmental management, global economics and a compensatory regime, including an insurance policy mechanism. These are the elements crucial in determining the willingness to pay. Finally, the question of financing should be underpinned by generally accepted principles in environmental management, such as the user pays principle, the polluter pays principle, and the precautionary or protective principle under international law.

 Based on the paper by Dr. B.A. Hamzah, Director, Maritime Institute of Malaysia (MIMA) and M.N. Basiron, Senior Analyst, Centre for Coastal Development, MIMA, at the Regional Conference on Sustainable Financing Mechanisms for Marine Pollution Prevention and Management - Public Sector-Private Sector Partnerships, 14-16 November 1996.

N O T E S

¹ Atlas of the World, 1993

² Raja Malik (1996) noted that monetary gain is not the only reason for vessels using the Straits of Malacca. Singapore provides excellent support facilities for vessels, as well as cheap bunker. Vessels will also benefit from traveling through the Straits of Malacca which has been better surveyed, outfitted with reliable navigational aids and is well-policed.

³ A decision has been reached at IMO in 1996 to connect the two TSSs.

⁴ While the contribution of Japan should not go unnoticed, the total contributions are considered minimal compared to the US\$340 million and the slightly less than US\$1 billion savings made by the Japanese petroleum industry and its bulk trade respectively (H. Morisugi, J. Marsh and N. Miyatake, 1992. Economic value of the Malacca Strait. In J.B. Marsh (ed.) Resources and environment in Asia's marine sector. Taylor and Francis, New York.)

⁵ For four centuries before 1857, Denmark used to collect transit dues (known as sound dues) on ships transiting through the Danish Straits. This practice was discontinued on 14 March 1857 (T. Scovazzi. Forms of cooperation between bordering states and user states. In B.A. Hamzah (ed.) The Straits of Malacca, Kuala Lumpur, forthcoming).

⁶ Under the Oil Pollution Act 1990, the United States has established a US\$1 billion Oil Liability Trust Fund for the purpose of paying for oil spill cleanup activities.

⁷ The activities in the Straits of Malacca are carried out as part of bigger regional cooperative programs, and to date there is no specific program or project for the Straits of Malacca.

⁸ Many international organizations like IMO, Food and Agriculture Organization, International Oceanographic Commission, and the United Nations Environment Programme have their own Trust Fund (Lennox Hinds, unpublished paper).

SUSTAINABLE FINANCING OPTIONS: CASE STUDIES IN THE PHILIPPINES

Past approaches in developing countries in sustainable financing of development programs involved mainly the allocation of domestic resources and provision of external resources to a host of infrastructure, environmental and social programs. These approaches are essentially budgetary and financial in nature contingent on the availability of funds. The external resources were largely from official development assistance (ODA) grants and concessional loans. Under these approaches, the funds were extended to the beneficiary programs through both government and nongovernment entities, as well as private voluntary organizations.

New approaches are currently being identified. These include: (a) economic in nature; and (b) market-based, and exhibit a potential for national and global resource mobilization. Integrating financial instruments into a country's economic framework and subjecting them to international market forces will make them sustainable over time, more adaptable to varying conditions and buoyant in uncharted academic and business waters.

However, institutional and political constraints have to be addressed. The experience with the application of command-and-control instruments (CACs) has been disappointing in developing countries. The inability of law enforcement authorities to institute appropriate and sufficient mechanisms to encourage or restrict behavior relating to the utilization of natural resources has aggravated problems of open access to natural resources and unmitigated environmental degradation. This increases the costs associated with the implementation of a number of CACs.

On the other hand, some new approaches will potentially be easier to implement than others. In terms of costs and units of economic and social development and of environmental improvement, some promise "win-win" outcomes; others may raise enough revenues to be self-liquidating; the rest will have net costs over any savings that may be generated. Ideally, those in the first category should be applied first.

Developed countries have aggressively shown interest in promoting the application of market-based instruments (MBIs) to generate financial resources for sustainable development based on the following reasons: (a) CACs have increasingly become more difficult to carry out due to some implementation and enforcement costs; (b) the tight fiscal

situation of both developed and developing countries requires new revenue sources to finance environmental policies and programs; and (c) MBIs are cost-effective relative to CACs, since they are motivated by the "user pays" and "polluter pays" principles.

There are four objectives that MBIs aim to achieve:

1. **Get the prices right.** This stems from instituting property and tenurial rights. When the right prices are applied, the pressure to provide subsidies and price support eases. However, higher prices may deter the poor from access to resources. This takes place when getting the prices right does not translate into increased incomes for the poor, which in turn are to be sourced from increased prices for the goods and services which they provide. Thus, the price of the poor's labor should be able to compensate for the increased price of goods in the market. In the marine sector, getting the right prices comes from suitable marine pollution charges. Revenue loss from curtailed legitimate fishing activities, mariculture damages, reduced tourist trade, and a costly oil and chemical spill cleanup are also bases for determining the right prices.

2. **Reduce public sector deficits.** This objective dovetails the first to the extent that subsidies and price support are diminished, thus, fiscal deficits are reduced. Likewise, fiscal systems are improved, especially those which catch economic rents and those which charge fees from users or on social and/or environmental externalities.

3. **Increase trade and investments.** The liberalization of foreign exchange is the key to a successful export promotion strategy as it "gets the prices right". Over the long term, increased trade, through increased exports will provide adequate employment to the population which will lessen the pressure on natural resource exploitation for subsistence living. Trade opportunities may be cut as well. Reducing tariffs and eliminating nontariff barriers (NTBs) can induce increased utilization of production inputs which are essentially resource-based. Increased manufacturing activities spell increased energy consumption as well. While new technologies may abate the pollution generated by such activities, it is possible that the absolute levels of pollution will increase. The appropriate response to this situation is not to resist the reforms but to identify complementary measures which could mitigate, if not negate, the expected adverse environmental effects of trade expansion.

4. **Promote private sector participation in sustainable development activities.** The realization that environmental costs are transborder, transgenerational and transcultural commands a common cause and responsibility from everyone. Sustainable development is everybody's concern. The true costs of private economic activities cover potential damages to both man and the environment. Hence, "greening" an economic activity's rate of return, such as attributing part of the profit to the public and good nature of the activity's environmental benefits, can slow down the utilization of natural resources.

The Philippine Experience

In the Philippines, private sector participation in public infrastructure provision is being actively explored by the government. The private sector, which normally has the comparative advantage in technical skills and business acumen, undertakes the investment activities on facilities or services. The public sector, which has to ensure society's equitable access to the facilities and services, performs the regulatory functions to concerned sectors. At every stage of the project's life cycle, public policy plays a fundamental role that can spell the success or failure of the project. The quality of the enabling environment, on which governments have a direct influence, will determine the quality of the partnership.

One of the most successful public sector-private sector partnerships that has been formed in the Philippines is the implementation of the Build-Operate-Transfer (BOT) scheme. The BOT is a contractual arrangement entered into by a private sector proponent with the government for the construction, financing, operation and maintenance of an infrastructure facility for a fixed period, after which the facility is transferred to the government. It is usually used by governments that are financially strapped in meeting their economies' capital investment requirements to sustain economic growth. The swift implementation of BOT projects can attest to the success of the scheme in providing infrastructure requirements for the Philippine economy.

BOT has been extensively used in providing additional power generating plants in the energy sector. The scheme allowed the government to meet the rising demand for energy during the early 1990s. Several factors contributed to the success of the partnership.

During the early 1990s, the country experienced power deficiencies. The government had to address the need to immediately put up additional power plants to avoid drastic contraction of the economy. To do this, laws were made.

One was the BOT Law, which allowed the private sector to participate in government infrastructure projects. Another law allowed one sole agency, the National Power Corporation (NPC), to directly deal with the private sector, thus reducing bureaucracy and red tape in having government projects approved and implemented. The legal environment made the efficient entry of the private sector possible and attractive.

The second factor for success was the provision of government guarantees to project proponents. The government guaranteed a minimum purchase of energy from the power plants. In other words, a certain amount of revenue was guaranteed. This allowed the project proponents to calculate their sales and revenues safely, without worrying about whether the power generated can be sold or not. Having government guarantees tend to spread the risk between the government and the private sector. Hence, the BOT concept of a partnership materializes, whereby both the public and private sectors are subjected to similar risks at the same time.

All 23 power plants set up to start operations from 1991 to 1994 were financed using the BOT scheme and its variants. The Sual 1,000 megawatts coal-fired thermal power plant is still under construction scheduled to start operations in 1999. The total cost of all 23 projects was US\$4.466 billion. Four more projects are lined up for bidding, with a total cost of US\$1.174 billion. From 1996 to 2005, 10 projects are in the pipeline, seven of which have a total cost of US\$1.961 billion.

One of the major criticisms about Philippine BOT projects is the high project cost involving large counterpart funding from the government side. Hence, an "avoided costs" concept was defined so as to justify the high-cost projects. Avoided costs refer to the least incremental cost that an electric utility would incur in meeting its antici-

ipated power demand, if such utility does not buy power from a private sector generating facility. If the amount of the project falls below or is equal to the avoided cost, then the proponent is granted the authority to construct, provided other requirements are met as well.

Probably the most decisive of all factors is the political will the government asserted in implementing BOT projects. The Philippine government recognized the potential of the

Sustainable development is everybody's concern. The true costs of private economic activities cover potential damages to both man and the environment.

private sector in providing infrastructure and services. It then acted swiftly in creating the legal environment that would make it conducive for the private sector to come in. It did not hesitate to provide guarantees for the private sector so that the commercial risks were spread more equitably. Because of this, the BOT process was implemented swiftly and efficiently.

In essence, this partnership sustained the Philippine government in solving the power crisis. At present, the BOT and its variant schemes are being applied in urban mass transportation, toll roads, information technology and water supply projects. But certain factors hinder the efficient implementation of BOT. The national government lacks technical and financial mechanisms in developing well-prepared project proposals. Recognizing such need influenced the authorities to establish a BOT Feasibility Fund facility. The Fund is expected to:

1. strengthen the solicited or competitive bidding track;
2. mitigate the asymmetry in information between the government and the private sector at project entry level; and
3. create an incentive for national government agencies, government-owned or -controlled corporations and local governments to shepherd projects to a successful competitive bidding.

NGO Partnerships

Another form of partnership that has been successful in the Philippines is between local communities and nongovernment organizations (NGOs). The Foundation for the Philippine Environment (FPE) is an NGO that administers an environmental endowment fund. The fund, through the US government contribution, provided financial assistance to NGOs and people's organizations (POs) engaged in natural resources management and environmental protection. It allows other NGOs/POs to embark on sustainable activities that would have otherwise been beyond their existing financial capabilities.

The FPE was set up to be a grant-maker, fund facilitator, and catalyst for cooperation. Its primary mandate is to provide grants to NGOs/POs undertaking biodiversity conservation. As a facilitator, it manages the Fund to offset inflation, and it seeks to generate more funds for NGOs/POs. It has fostered government organization (GO)-NGO/PO cooperation because of its ability to infuse substantial

funds where needed to create a positive environmental impact. FPE is pursuing a more aggressive financing scheme for its NGO/PO partners in view of its experience for the past three years.

Lessons Learned

There are some important lessons to be learned from the BOT and the FPE experience in the Philippines, most of which can be applied to the marine sector:

LESSONS LEARNED

1. *Single authority dealing with the private sector on marine pollution programs is necessary.*
2. *Local government capability building is needed.*
3. *Profusion of environmental laws and controls in the region should be recognized.*
4. *Private sector involvement in the risk-sharing feature of environmental facilities investment is vital in the success of the scheme.*
5. *Leading by example is a way in which the government can exhibit risk-sharing.*
6. *The government must be committed to play the role of an enforcer, facilitator, regulator and educator.*

1. It is important that there be a single authority that deals with the private sector on marine pollution programs. Bureaucracy and red tape can be reduced by allowing a single national agency to handle sectoral programs and projects. It should be noted, though, that in the case of marine pollution, there are two levels of government agencies involved: the national agency in charge of environmental management policies, and the local government units responsible for implementation. In this case, the distinction between their functions should be very clear to avoid confusion as to which agency the private sector should deal with in undertaking marine pollution prevention programs. Furthermore, the interface with the private sector needs to be at the local level, where implementation is occurring.

2. For local governments, their capabilities may be limited.

Training is indeed necessary—project proposal development, tendering process, administration of financial schemes, project management and others.

3. It is recognized that there is a profusion of environmental laws and controls in the region. However, law enforcement is weak. Enforcement of laws creates a

market for environmental services that will eliminate "low-cost" and "no-cost" options (e.g., waste disposal). The controls should be fair in nature, whereby not one industry is favored over another. In other words, if the government decides to enforce waste disposal laws, it should do so whereby all industries will be required to comply. Once the market is created because of environmental rules, the opportunity for investment by the private sector becomes apparent.

4. The government can further assist in encouraging the private sector to invest in environmental facilities by sharing in the risks involved. The risk-sharing feature of the BOT process in the power sector proved vital in the success of the scheme. Provision of guarantees, as well as financial incentives and benefits, can encourage more investors from the private sector. This is especially important for investments in environmental facilities, because such investments are new and untried.

5. One way for the government to share risks is to lead by example. All government operations and facilities can avail of the environmental facility or service that are newly provided. Still, government can provide financial support and incentives for projects, such as subsidies for capital investment in the form of differential interest rates, or provision of land, roads and other capital needs of investors.

6. Finally, it is acknowledged that many of the issues cited here are politically difficult to address. However, there is scope for innovation in developing the ap-

propriate approaches and solutions. The basic premise is the need to protect and manage the marine and coastal waters. Therefore, the government must be committed to play the role of:

- enforcer of environmental rules and regulations;
- facilitator in creating the proper investment climate;
- regulator of licensing operations and controlling user charges; and
- educator of their staff, the private sector and the general public.

The advantages of getting the private sector involved have been realized in a number of cases. Their main objective is a reasonable return on investment. On the other hand, environment protection and economic development are parallel goals of the government. Only when the respective objectives are targeted simultaneously can a true and lasting partnership ensue.

 Based on the papers by Atty. Donna Gasgonia, Executive Director, Foundation for the Philippine Environment, Mr. Eugenio Inocentes, Assistant Director, Public Investment Staff, National Economic and Development Authority, Philippines and Ms. Rina Rosales, Research Associate, Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas, at the Regional Conference on Sustainable Financing Mechanisms for Marine Pollution Prevention and Management: Public Sector-Private Sector Partnerships, 14-16 November 1996.

MARINE ELECTRONIC HIGHWAY

Managers of ocean resources through-out the world face a daunting array of challenges in addressing sustainable development and pollution control of complex ecosystems. These managers have wide reaching mandates and relatively limited resources, usually financed by national government sources. Ecosystems, particularly in the marine environment, do not follow national boundaries. Therefore, regional and global approaches are necessary, adding financial and managerial complexities.

The shipping industry has an important role in the environmental and sustainable resource management of marine areas. Marine transportation routes often pass through the

waters of many countries, as well as international waters. Today there are proven technologies available that improve the safety and efficiency of navigation and reduce the risk of oil spill pollution. Together, these "eco-efficient"¹ technologies and information systems form the basis of a "Marine Electronic Highway".

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The Marine Electronic Highway represents the integration of telecommunication technologies, Electronic Chart Display

and Information Systems (ECDIS) and Electronic Navigation Charts (ENCs), as well as the transmission of real-time water level and current information.

These spatial databases also provide an information infrastructure framework for other applications, including pollution control, as well as environmental and resource management. The infrastructure is based on a national and international network of databases that will serve the needs of the shipping community, resource managers, as well as many other users involved in marine and coastal affairs. By integrating the information needs of each of these sectors, a sustainable financing mechanism can be designed.

Until recently the acceptance of ECDIS was constrained by the lack of international standards. The development of ECDIS Performance Standards was undertaken by a joint International Maritime Organization (IMO)- International Hydrographic Organization (IHO) Harmonization Group and in late 1995, the IMO assembly adopted the necessary standards. Subsequently, Adam Kerr, Head of the IHO, wrote the following:

*"The IHO must now face, with great urgency, the objective of coordinating the activities of the HO's in the digital era. Now that the Performance Standard and its associated IHO and IEC specifications are reasonably well in place, the IHO must give high priority to the task of developing a worldwide coverage of digital data for ECDIS."*²

In another article, Adam Kerr wrote further on the World-wide Electronic Chart Database (WEND):

*"An updating service would be provided by each HO and the updates would also be integrated as regional packages and delivered to customers. Revenues from sales by regional centers would be redistributed back to the HO's providing the data, less overhead and costs borne by the regional center. Eventually, all regional centers would be available at any other center... The objective must always be to provide international shipping with fast, accurate and convenient delivery of chart data and updates."*³

From a sustainable financing point of view, this last statement is most important. The key to attracting shipping sector participation lies in delivering value. Users will pay for relevant, timely information, if increased profitability is the result.

Mobile data communications will be required on vessels using the Marine Electronic Highway to receive ENC update information, as well as real-time water level and current information. Vessels that add the small incremental cost of transponders will be able to transmit position information to shore-based Highway facilities, as well as receive the position information of other vessels in the area and

display the information on ECDIS, supplementing radar information.

The need for ENC production and development of regional services is well-known within the hydrographic community. Within the Asia region, several countries have the necessary ENC production tools and are either in production or are planning to begin production.

Although this is a large task, the financial paybacks for the shipping community should prove quite attractive. For example, it is possible that the combination of precise ENCs and timely water level information could enhance the margins of safety in critical areas such as the Straits of Malacca and enable carriage of larger loads well within safe limits. If this possibility can be developed into reality then significant increases in revenues to shippers and cargo owners can result, giving rise to a potential revenue source, part of which could offset the costs of infrastructure production.

It is important now that the application and implementation of ECDIS be more fully incorporated into the thinking and planning of the shipping community.

MARITIME TRAFFIC SAFETY IN THE ASIAN REGION

Although all indicators of marine transportation are important, the statistics on oil shipments are particularly instructive. Several countries of the region are experiencing dramatic increases in per capita energy consumption. Recent APEC estimates suggest that China's net external oil requirements alone will rise from some 600,000 barrels per day to over one million per day by 2000 and nearly three million per day by 2010.

*"In fifteen years, East Asia oil imports could easily triple to more than 15% of global consumption."*⁴

For coastal countries along oil tanker routes, these predictions are full of environmental implications and raise the urgency of assessing and implementing safety measures. For these countries the situation is complex, given the right of innocent passage through international waters and enforceability issues within Exclusive Economic Zones (EEZs). The imposition and enforcement of international safety rules are complex and time consuming to implement. Therefore, the voluntary compliance

It is important now that the application and implementation of ECDIS be more fully incorporated into the thinking and planning of the shipping community.

of the shipping industry, in implementing precise navigation technologies, would be more effective. This can be more easily achieved if the shipping sector can see increased profitability as a probable result. This means international cooperation to develop global port-to-port ENC services of the Marine Electronic Highway that allow companies to maximize their efficiencies and increase their profits, as well as improve safety.

A coordinated regional and global strategy is needed to enhance national authorities' capacities to encourage the adoption of necessary technologies by domestic shippers; enter into necessary international cooperation agreements to share data; and create an inviting legal framework by which private investment can be securely attracted.

Environmental and Sustainable Resource Management

The electronic chart databases provide the necessary framework into which marine spatial data and resource management information systems can be incorporated. This has been recognized in the San Francisco Bay demonstration project which will "integrate technology and data into products focused on navigation and safety, while providing tools for coastal management."⁵

The effective management of coastal zones is an area of intense interest worldwide. Intentional oil spill pollution, for example, often in the form of improper bilge pumping, is a serious environmental problem. The IMO is working to meet parts of this challenge with the Port State Control System, which will allow inspection information to be readily exchanged between countries to assist in the verification of proper discharges. The Highway infrastructure will be a valuable tool in augmenting Port State Control System activities.

Many projects are currently being planned and financed by governments often in conjunction with international financial institution (IFI) loans. One of the most effective tools for environmental management is the Geographic Information Systems (GIS) and the ECDIS is a special GIS application. Environmental and resource managers normally have limited resources to gather and manage multi-disciplinary data. Often the ability to keep databases updated and therefore relevant, expires simultaneously with the end of project funding. By tying electronic chart infrastructures to environmental and sustainable development infrastructures, it becomes possible to develop a financially sustainable plan to maintain the underlying databases for several user communities.

Financial Sustainability

Many Asian countries have considered and are considering the issues of private sector financing of infrastructure projects,

typically involving familiar undertakings, such as roads, rail systems and water treatment facilities. However, private sector financing is not easy to access.

*"Proposals for huge infrastructure projects are on the drawing boards all over Asia, creating a fierce competition for financing.... Most deals in Asia are one-off deals, because lots of countries don't have a systematic legal and administrative framework for private sector involvement in infrastructure."*⁶

A coordinated regional and global strategy is needed to enhance national authorities' capacities to encourage the adoption of necessary technologies by domestic shippers...

A Marine Electronic Highway is vital to the transportation of many important goods, not the least of which is oil. But a Marine Electronic Highway can be fully developed at a fraction of the cost of land-based highways. Mountains need not be moved, nor tunnels dug, nor residents displaced. Indeed, marine highways have existed for as long as there have been ships. Today's technical abil-

ity to produce precise electronic charts, to measure and transmit water level information, to interpret and transmit precise and positional information all exist at total costs which are a fraction of building land-based transportation systems.

James D. Wolfenson, President of the World Bank, has stated:

*"We recognize that the achievement of sound environmental practices depends upon a constructive partnership between businesses and governments. We hope that we can play a useful role in promoting such partnerships and in assisting governments to put into place incentives that ensure that economic growth is sustainable."*⁷

Such comments from the World Bank President are encouraging, particularly because World Bank infrastructure divisions are developing a keen interest in information infrastructure project development, as that institution's role in telecommunications and power infrastructures diminishes. The challenge to a financial institution, and to project developers, is to gain an awareness of the data and information disciplines and to define user group requirements and probabilities of revenue stream generation. The Marine Electronic Highway information infrastructure addresses the needs of a key industry user sector. National Highway sections will generate revenues to repay investors, public or private, and not simply rely on the general tax revenues of the various nations. In effect, countries should be able to construct and maintain valuable information infrastructure, vital for environmental management and protection, at very little, if any, ultimate cost.

A well researched business plan, written to evaluate capital and operating costs along with credible income projections

can attract financing sources to commit, within a secure legal framework.

The most important element of the business plan is the probability of revenue generation sufficient to maintain operations and, after a startup period, retire debt or pay dividends. If the oil tanker and cargo owners of the region, for example, become convinced that the use of ECDIS equals increased profitability, then indications of support from such users would be highly persuasive in dealing with financial sources. The ability to maximize loads safely, the ability to navigate precisely, the potential cost savings of automatic updating, the potential for decreased insurance costs are all important factors. For some owners the network need only be within a certain region, or between certain ports within a region to attract their interest, for others it must ultimately become a global port-to-port service.

The "construction" costs of producing reliable ENC's, including gathering additional hydrographic data where necessary, is generally an undertaking which national authorities finance. If the nation states have the financial resources and have prioritized the ENC production, only the incremental costs of networking those databases would be necessary. The Global Environment Facility (GEF), a two billion dollar grant facility, and its International Waters Protection section are committed to assisting in the reduction of barriers to new environmentally friendly technologies. It is probable that the GEF will look favorably upon assisting with the necessary costs of developing a regional network management capability. The GEF provides incremental finance, meaning the Highway countries will need to address the financial issues of their Highway sections. GEF grant participation would certainly assist in making a business case more financially feasible.

Some countries, however, may not have the financial resources, and in those areas, private sector funding may be possible in the context of a larger business plan. Alternatively, or additionally, in some areas, international aid agencies could be approached for necessary assistance.⁸

Finally, the public-private sector partnerships approach may be the most cost-effective means of delivering the services. It allows the government agencies to maintain control of the data and ensure quality control of the ENC's while allowing the flexibility of the private sector to customize and maximize services for the marketplace and, therefore, revenues. The revenue sharing agreement is determined within each of the partnerships that together comprise the Marine Electronic Highway. This arrangement also facilitates the international networking of the databases meeting the needs of the individual countries while providing a common service to the international shipping community, as well as to regional and global environmental and resource management programs.


The financing of a Marine Electronic Highway needs to be evaluated in light of a business plan that credibly addresses issues such as capital, operating costs, along with well thought out rev-

enue projections. The support of national authorities responsible for international cooperation will also need to be gained with assurances that the databases will remain as national property and with royalty revenues paid to the contributing country for data usage, after factoring in operating costs and debt service. When the Marine Electronic Highway is designed to meet the needs of a wide range of users and the services delivered through an international network based on common standards and convenient access, it provides the opportunity to maximize revenues that can attract a broader range of investments.

The public-private sector partnerships approach facilitates management of an international network with revenue generation to the participating agencies.

The hydrographic community is well aware of the urgency of creating the necessary databases to support widespread ECDIS usage. The interest and involvement of the shipping community is vital and needs to be attracted as expeditiously as possible.

There is a wide recognition of the need to address marine pollution issues which so greatly effect the well being of present and future world populations. What is needed is a plan of action.

 Based on the paper by Mr. A. Macdonald, President, Strategic Ventures Corporation, Canada and Mr. Neil Anderson, Vice-President, International Business Development, Nautical Data International, Canada, at the Regional Conference on Sustainable Financing Mechanisms for Marine Pollution Prevention and Management: Public Sector-Private Sector Partnerships, 14-16 November 1996.

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FINANCING THE DEVELOPMENT AND OPERATION OF SHORE RECEPTION FACILITIES: CASE STUDIES

One of the fundamental problems with respect to the commercial viability of shore reception facilities is the relative ease with which ships can discharge wastes illegally at sea. Although many ship owners are now increasingly aware of environmental issues and are responsible in the way they handle their wastes, there will always be some who will take the easy and cheaper option of dumping at sea. As such, port operators often get a distorted view of the need for reception facilities. The fact that ships do not request the use of reception facilities every time they call at a port does not mean that they are not needed. It could be that the vessel has recently discharged to a facility in another port but it could also mean it has discharged illegally at sea.

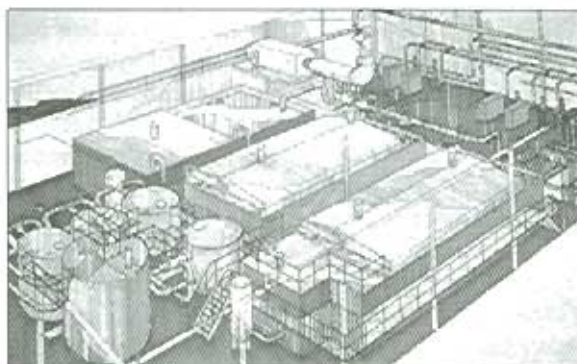
Generally speaking, the environmental business is driven by the introduction and enforcement of regulations. Unlike on land, where illegal dumping of waste is fairly visible and the source fairly easily traceable, the enforcement of anti-dumping regulations for ships is immensely difficult. The level of monitoring of shipping lanes required to provide the necessary enforcement is, in most cases, exorbitantly expensive and impractical. Ultimately, a regional Port State Control (PSC) approach such as that in Europe should assist in the enforcement of anti-dumping regulations, although this is likely to take many years to establish in Asia. It will require an effective information network among ports and a high level of coordination among governments in the region.

Given the problems associated with enforcement of ship-source pollution regulations, emphasis has recently been focusing on the development of innovative financing mechanisms, which not only sustain the development and operation of shore reception facilities but provide incentive for their usage by the shipping community. The following are some of the main criteria that have been considered when exploring such mechanisms:

- Will the mechanisms themselves contribute to the reduction of marine pollution by stimulating delivery of waste to ports?
- Will the mechanisms stimulate improved handling and waste reduction onboard vessels?

- Will the mechanisms interfere with interport competition?
- Do the mechanisms apply the polluter pays principle?

Most existing reception facilities charge the discharging vessel on the basis of waste volume or weight delivered, often referred to as the "fee system". The level of charges vary enormously around the world and, in some cases, the cost of discharge can be extremely high. The fee system can act as a disincentive to ships, and may even encourage illegal discharges. Although the fee system provides commercial viability in some ports and countries where enforcement of environmental regulations is strict and shipping numbers high, in many areas of the world it does not provide a sound basis for the establishment of reception facilities.



Reception and Treatment of Oily Waste can be a Complicated Business

Source: MARPOL: How To Do It (Manual on the Practical Implications of Ratifying and Implementing MARPOL 73/78), 1993.

The structure and application of financing mechanisms are presently being discussed at the Ship-Port Interface Group of the International Maritime Organization (IMO). The Group was originally considering a mandatory financing mechanism under MARPOL 73/78.¹ However, it has moved away from this, recognizing the huge variation in existing

mechanisms and maritime administrative structures around the world. A recent IMO Marine Environmental Protection Committee meeting noted that whatever system is used, it will be the responsibility of the Parties to the MARPOL convention (i.e., the governments) to ensure that ports provide and maintain shore reception facilities.

CASE STUDY - BREMEN, GERMANY

A pilot project, involving "free-of-charge" shore reception services for MARPOL Annex I (oily waste) and Annex II (noxious liquid substances) waste, was conducted over a three-year period by the Governments of the Federal Republic of Germany and the Federal Coastal States. The project was successful insofar as adequate facilities and services were installed in the participating ports and the number of ships using the services increased by 100% (i.e., approximately 10%-12% of all ships calling at the German ports used the shore reception services during the pilot

program). However, the pilot project was costly and unsustainable. When the pilot project and the "free-of-charge" reception service ended in 1995, the situation reverted to the days before the pilot project. The number of ships using the services decreased dramatically.

A new financial mechanism for sustaining shore reception services has been proposed by the Government of Bremen. The proposal is based on the polluter pays principle, but with an added feature. The charges will be distributed evenly between ships and cargo. The advantage of the proposed financial mechanism is that:

1. ships will not be charged for each individual collection, but will pay an environmental fee regardless of whether the shore reception service is used or not; and
2. an environmental surcharge will be levied on all cargo handled in the port, which contributes to the cost of the shore reception service.

Ship-generated Garbage

In Bremen, there is mandatory collection and disposal of household-type garbage (MARPOL Annex V waste) from ships. The service is provided by the port authority's contractor, who delivers a specified number of receptacles on arrival of the ship, based upon the ship's size. The contractor collects the receptacles prior to the ship's departure and transports them to licensed disposal facilities. The cost of the service is stipulated in the port tariff. The fee is charged and collected regardless of whether the service is used or not.

Integration of Sea- and Land-based Operations

A point highlighted in the Bremen case study refers to relationships between sea- and land-based operations. The amounts of waste generated onboard ships are very small compared to wastes generated by land-based activities. (An exception may be the generation of MARPOL Annexes I and II wastes, originating from cargoes in ports with oil refineries and chemical plants.) Investments in collection equipment, storage facilities, and treatment and disposal facilities are high. In order to get an adequate return on investment and to cover the operating costs, each facility requires a minimum throughput. Furthermore, to ensure an adequate utilization of the personnel employed, there must be a steady flow of waste. These two criteria will not normally be met by the collection of waste from ships alone. Waste collection companies and waste facility operators must, therefore, have other sources of waste in order to make their operations sustainable.

In Bremen, all the parties involved in the collection and treatment of ship-generated wastes are also collecting or treating land-based generated waste, or provide other related services.

Examples include:

- a. Annex I waste collectors operate either oil and gasoline storage facilities or gasoline stations, provide tank cleaning or oil collecting services for gasoline stations and private households, provide cleaning services for private households, or a combination of services;
- b. oil and chemical treatment plants treat wastes from land- and sea-based operations, including plastics, contaminated paint residues and other special wastes;
- c. the collector for Annex V waste is also the contractor of many municipalities for the weekly collection of garbage from households, and the collection of special waste from households, factories and building sites (construction debris); and
- d. treatment plants and landfill sites in Bremen receive wastes collected from urban areas, as well as the surrounding rural areas.

Unless land and ship-generated wastes are collected and treated in the same facilities, sustainability of services is unlikely. It is evident from the Bremen case study that there simply is insufficient income to cover operating costs and an adequate return of the investment from ships alone.

CASE STUDY - BANGKOK, THAILAND

In April 1995, a contract was awarded by the Industrial and Environmental Management Program (IEMP) of the Federation of Thai Industries to investigate the feasibility of developing a MARPOL waste oil reception and recycling facility in Bangkok Port and along the Eastern Seaboard of Thailand. Under the contract, 50% of the cost of the feasibility study was provided by United States Agency for International Development (USAID), while the other 50% was covered by the private company undertaking the contract (i.e., International Response Corporation, Thailand). The intention of the cost-sharing agreement was to bring in a company that had both the commitment and the resources to establish a facility should the feasibility study prove to be positive.

In many countries, facilities for the treatment of oily waste exist as a consequence of waste oil collection from land-based sources. In Thailand, the required treatment facilities are still lacking. As such, it is not possible to separate oily waste collection and the subsequent treatment. The feasibility study concluded that the proposed facility should be capable of providing a complete service. The viability of such facilities can be improved by including, where possible, the collection of waste oil from land-based sources to supplement the volumes received from calling ships.

With regard to the financing of the facility, the feasibility study concluded that:

- a. the facility could not rely solely on revenue from the recycling and sale of waste oil due to the difficulties in

predicting the volumes of waste that could be collected from vessels calling at Thai ports;


- b. a sustainable financing mechanism (e.g., user fees) would need to be developed through discussions between the private sector, the government and other interested parties in order to make the proposed facility commercially viable.

Following the completion of the feasibility study, the private company decided to continue with the pre-construction phase of the project. The environmental impact assessment and site investigation work are finished, and the detailed design is nearing completion. The precise nature of the proposed financial mechanism is still being developed by the relevant Thai authorities, but the intention is to create a situation which will provide the desired level of security to enable private sector investment while at the same time providing a cost-effective and efficient service to the shipping community. Agreement on the structure of the mechanism will be timed to coincide with the start of construction, and the introduction of the mechanism with the commissioning of the facility.

CONCLUSION

The approaches proposed and adopted by the Bremen and Thai authorities provide good examples of how the

public and private sectors can work together to solve marine environmental problems. The financial mechanisms provide governments with the necessary infrastructure to both ratify and fulfill its obligations under the MARPOL convention while the shipping community gets the service that is so often lacking, enabling them to conform to the increasingly stringent environmental standards being set by governments and the industry itself.

 Based on the papers by Mr. Neil Challis, Director, International Response Corporation, Thailand and Captain Hans Jurgen Roos, Harbour Master, Bremen Port Authority, at the Regional Conference on Sustainable Financing Mechanisms for the Prevention and Management of Marine Pollution: Public Sector-Private Sector Partnerships, 14-16 November 1996.

N O T E

- ¹ International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto.

OIL SPILL LIABILITY AND COMPENSATION IN STATE LAWS AND INTERNATIONAL CONVENTIONS

Liability and compensation schemes were designed primarily as immediate response mechanisms that serve to compensate for environmental damages effected by oil spills from tanker accidents.

The concern over the effects of oil spills led to the convening of the International Convention on Civil Liability for Oil Pollution Damage (Civil Liability Convention, CLC) by the International Maritime Organization (IMO) in Brussels in 1969 that laid the foundation of strict liability for ship owners and provided for a system of compulsory insurance. However, the CLC was considered inadequate as a mechanism to fully compensate victims of pollution damage, since the regime covered only damage within the territory of the Contracting State caused by persistent oil from a laden tanker after the incident had occurred. It did not cover damages caused by: a) non-persistent oil, including gasoline, light diesel oil, kerosene; b) spills from unladen tankers during a ballast voyage; c) spills of bunker oil from ships other than tankers; and d) "pure threat removal measures" or preventive measures which are successful

in such a way that no actual spill of oil from the tanker is involved.

Thus, a Diplomatic Conference was convened in 1971 to adopt the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (Fund Convention). The International Oil Pollution Compensation Fund or IOPC Fund, which was established by the latter Convention, compensates any person suffering from oil pollution damage if that person is unable to obtain adequate compensation under the CLC.

In November 1992, two new Protocols amended the CLC and Fund Convention to provide higher limits to compensation and to widen the scope of application. The more significant new amendments included the following:

- a. A special liability limit for owners of small vessels and a substantial increase of the limitation amounts;
- b. An increase in the limit of compensation payable;
- c. Extension of geographical application of the Convention to include the Exclusive Economic Zone (EEZ), as defined under the United Nations

- d. Convention on the Law of the Sea (UNCLOS);
- d. Compensation to include spills of persistent oil from unladen tanker;
- e. Admissibility of claims for costs of preventive measures even when no spill of oil actually occurred, provided there was grave and imminent danger of damage;
- f. Environmental damage defined as covering only costs incurred for reasonable measures to restore the environment; and
- g. The abolition of indemnification of the ship owner.

The IOPC Fund Protocol allows coverage of the following expenses:

- a. The cleaning or replacing of polluted property, subject to deductions for depreciation in case of replacement;
- b. Cleanup operations;
- c. Measures to prevent or minimize pollution damage;
- d. Additional costs incurred solely as a result of the incident;
- e. Loss of earnings by owners or users of contaminated property—also called *consequential loss*; and
- f. Measures to prevent *pure economic loss*.

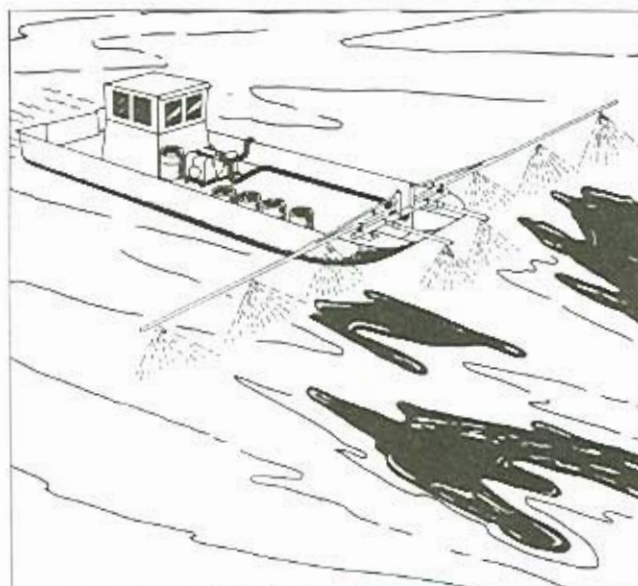
As stated above, the Fund does not cover *pure economic loss* or loss of earnings by owners or users of property that have been affected though not contaminated by the oil spill. Neither does it compensate damages to unexploited natural resources with no explicit owner. However, compensation applies to measures actually undertaken to prevent such losses.

All claims not acceptable to international conventions are expected to be under the jurisdiction of state laws that provide a more extensive and comprehensive coverage of damages and losses. For instance, the U.S. Oil Pollution Act of 1990 (OPA '90) maintains that parties responsible for the spill of any oil or refined petroleum product are liable for private, public and environmental losses, with authorized government trustees representing the interests of the public. In this case, liability is strict and carries with it the force of *Rebuttable Presumption*, whereby the trustees are presumed to be correct unless responsible parties can demonstrate otherwise by a preponderance of evidence.

In the case of state laws in the U.S., contention arises from the difficulty of quantifying damages in monetary terms. In any case, almost any type of loss—i.e., quantified from use, non-use, intrinsic and other values—may be admissible for claims, provided they may be quantified by means acceptable to the State. The criteria for laws such as the OPA is that responsible parties are liable for both tradable and non-tradable goods and

services. This covers a wide range of damages including the loss of productivity of mangroves, wetlands, fisheries resources, and other ecosystems and aquatic resources due to the impairment of their natural processes.

Though theoretically sound, the amount of damages can prove difficult to compensate, as claims can be difficult to estimate. Some of the more exhaustive coastal



Bow Spray System for Combating Oil Spills
Source: IMO, *Manual on Oil Pollution* (Section IV: Combating Oil Spills), 1988.

resource valuation work was done by Drs. Grigalunas, Opaluch and Diamantides of the University of Rhode Island. One of their case studies involved an examination of damage claims against the *Exxon Valdez*. The paper relates how claims were pressed by fishermen against *Exxon Valdez* allegedly for their loss of income, affected by the dip in prices of salmon after the oil spill. Based on estimates of the fishermen's expert, *Exxon's* damages cost \$895 million. On the other hand, *Exxon's* expert was able to show there was no evidence that the oil spill affected the price or supply of Alaskan salmon. The latter estimated damages at a maximum of \$113.5 million. To make a long story short, the jury awarded economic damages of \$286.8 million. Nevertheless, overall punitive damages against *Exxon* were placed at \$5.3 billion.

As shown above and in other cases, admissible claims include opportunity and income losses from:

- a. Hampering operations of vessel transport services;
- b. Lost catch of commercial fishermen;
- c. Impairing the natural propagation of aquatic resources;
- d. Lost recreational beach use;
- e. Lost recreational boating and recreational fishing;
- f. Loss of wildlife; and
- g. Oiling of shores.

As more sophisticated methods of valuation are developed, international conventions tend to become more representative of the concerns conveyed by state laws imposing strict liability regimes. For example, the Fund Convention incorporates a provision covering costs incurred to restore properties through cleanups. The basic problem with applying OPA provisions to international conventions concerns the scope of admissible claims, which proves to be too extensive for the amount of funds a responsible party is able to raise or secure through the CLC or IOPC Fund. Thus, international conventions and P&I Clubs had to limit the scope of ship owner liability, based on their ability to pay compensation. On the other hand, the hugeness of the compensation itself provides an incentive for vessels to avoid oil spills by practicing navigational safety. However,

another issue concerns the tedious work involved when settling claims through Courts of Justice. In fact, the IOPC Fund was created to encourage immediate settling of claims out of court.

 Based on the papers by Mr. Hideo Osuga, Legal Office, International Oil Pollution Compensation Fund, UK and Dr. Thomas A. Grigalunas, Professor, Department of Resource Economics, University of Rhode Island, USA, et al., at the Regional Conference on Sustainable Financing Mechanisms for Marine Pollution Prevention and Management: Public Sector-Private Sector Partnerships, 14-16 November 1996.

SOCIOECONOMIC ISSUES OF THE SEAFARING INDUSTRY

Shipping plays a major part in almost every country's economy. Some countries dominate the shipowning business, while others provide the bulk of supply of seafarers. Even with the availability of speedier forms of transport, the majority of the world's trade is still directly linked to the maritime sector. The Institute for Shipping Economics and Logistics (ISEL), a Bremen-based organization, estimates that 85% of international trade volume is carried by sea.

Between 1990 and 1994, world seaborne trade rose by 3% annually. Container traffic is forecast to increase by 7.7 - 8.5% annually for the period 1995-2005. According to Ocean Shipping Consultants, this will translate into a 125% increase in container handling over 10 years. In 1995, global container fleet consisted of 1,590 ships (35.9 million dead weight tons [dwt] capacity). ISEL projects various levels of increase in container volume: 6.2 - 7.5% for 1995-2000; 5.6 - 6.5% for 2000-2005; and 5.0 - 5.5% for 2005-2010.

Given these developments in world trade, the demand for adequate maritime transport will certainly expand. An ESCAP study² estimates the increase in the number of ships worldwide: "Of special interest... is the increase in the number of ships from 23,861 ships in 1985 to 27,860 in 1994, an increase of 3,999 vessels." The study further states that: "The burgeoning increase in world trade and shipping presents new challenges and opportunities for maritime labor supplying countries." Assuming an average of 22 crew members manning a vessel, plus a backup crew of around 11 other seafarers, an additional demand for 131,967

crew members occurred over the 9-year interval. In addition, an attrition rate of 7 to 10% per year indicates a need for additional seafarers to replace retired or deceased seafarers over the same period.

Asta has been a major supplier of labor to the shipping industry. On the basis of previously stated demands, it is evident that some 15,000 trained seafarers are required each year to satisfy the market. Recent surveys have shown that there is an ongoing shortage of ship's crew. The previously referenced ESCAP report indicated that the region's merchant shipping fleet has grown significantly, requiring more seafarers to man the additional ships. It was estimated that for India alone, demand will increase from 21,800 to 32,400 ratings. By 1997, there will be a forecasted shortage of 9,600 officers and 5,200 ratings, implying that training levels will need to be increased over the 5-year period by 40% for officers and 50% for ratings just to maintain the status quo of 1992.

"The burgeoning increase in world trade and shipping presents new challenges and opportunities for maritime labor supplying countries."

The Philippine Situation

The Philippines is regarded to be one of the leading suppliers of seafarers worldwide, and their contribution to

Table 1: Average Distribution of Filipino Seafarers

CATEGORY	EMPLOYMENT (%)	SUPPLY (%)
Licensed deck and engine officers	16 - 21	3.5 - 6
Deck and engine ratings	11 - 28	13 - 14
Special ratings	13 - 27	14 - 20

the growth of the country's economy cannot be underestimated. An inter-agency study entitled "Manpower Development Plan for Seafarers (1993-1998)" stressed that the dollar remittance of sea-based Filipino workers amounted to \$438.2 million in 1993, which was 29% of the total official receipts generated from overseas contract workers. It predicted that by 1998, the amount will reach \$1 billion. Using the conservative estimate of \$1,000 average income per seaman per month, this would amount to \$10,000 in remittances per year, which when multiplied by 160,000 seafarers currently deployed, would result in a total of \$1.6 billion earnings from Filipino seafarers per year. Indirect contributions of the seafaring industry to the economy include hefty revenues for airlines, schools and training centers.

During the period 1984 to 1993, the number of deployed Filipino seafarers more than doubled from 67,042 in 1987 to 145,673 in 1993. Total deployment for 10 years reached 933,199 seafarers. Comparative forecasts of placement vis-à-vis supply growth rates indicate the following average distribution:

Six years ago, there were only a handful of maritime training centers handling mostly basic safety courses like fire fighting, first aid and emergency response. Today, there is a continuing rush to establish courses and training centers for seafarers, not only in Metro Manila, but in other parts of the country as well. Recent reports indicate that there are 38 training centers operating nationwide, two of which are foreign-controlled. Similarly, maritime schools have mushroomed, bringing the total number to 120, according to the Maritime Training Council. However, while the supply of maritime schools and training centers has offered opportunities to meet the shortage of crew, it has caused a deterioration in the quality of graduates. Although the supply has increased, there are a number of requirements that have to be met before a graduate is considered qualified to be a seaman. The question is, "Can Filipino graduates meet the requirements?"

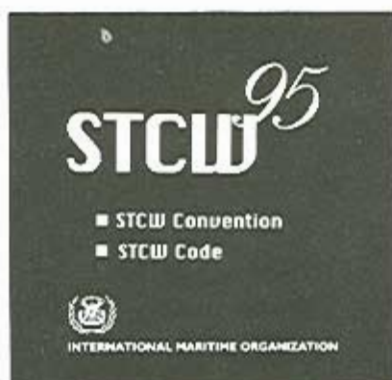
The country's position as the world's premier supplier of seafarers is being threatened by the growing share in the

development of international seafarers by other countries in Europe, Asia and the United States. Hence, there is an urgent need to adopt concrete measures designed to equip graduates produced by the existing schools with the quality required by the industry. For several years now, the Philippine maritime private sector has been made to assume the lead role in the training, certification and overall development of Filipino seafarers. Traditionally, the role of the government has always been in the promotion, support and financing of activities in few, well-defined program areas as

seen fit by concerned agencies. Nevertheless, both sectors have begun to respond by instituting reforms in the education and training systems, in the license and accreditation system, and in the policy environment of the entire maritime sector.

In the Philippines, a lot of emphasis is being placed on upgrading courses for seafarers. One cannot get a seaman book from the Maritime Industry Authority without having undergone Safety of Life At Sea (SOLAS) courses, an upgrading prerequisite to enter the seafaring profession. In addition, some government regulatory agencies are planning to require training courses for fish workers (i.e., those who will work onboard fishing vessels, which have tremendously

increased recently), before they are given a seaman book or before they are allowed to be deployed overseas. Also, the Professional Regulation Commission will not renew the licenses of ship officers without having undergone its so-called Continuing Professional Education (CPE) program. Finally, international maritime conventions have raised the standards of seafaring, e.g.



IMO STCW Convention and Code (1995)

the Standards for Training, Certification and Watchkeeping for Seafarers (STCW) 1978 Convention and the International Safety Management Code (ISM). Both conventions have raised fears that Filipino seamen may not cope with the international standards set, making it more difficult to meet the increasing demand for qualified seafarers.

Thus, while the shortage of ship crew is felt by the shipping industry, the greater demand for quality crew is more pressing. How to marry these two demands to benefit the global economy is the problem of both industry and government. The ESCAP paper enumerates some appropriate measures that need to be undertaken:

1. meeting the new and more stringent requirements of international maritime training and certification regulations, specifically the STCW revised convention;


2. improving management of the seafaring industry, including solving the problem of high wastage of trained seafarers;

3. undertaking forward planning to estimate the needs and requirements of both the domestic shipping industry, as well as promoting overseas employment of local seafarers; and

4. establishing closer cooperation at all levels to raise standards and to meet new challenges ahead.

Seafarers are committed to keeping themselves properly trained in order to meet the requirements of the indus-

try. It must be noted, however, that stakeholders in the maritime sector need to consider further the capacity, needs and well-being of this most valuable resource, and not just focus on increasing demands for improvement.

 Based on the paper by Capt. Constantino Arcellana, Jr., General Manager, Mid-Ocean Ship Management Corporation, Philippines, at the Regional Conference on Sustainable Financing Mechanisms for Marine Pollution Prevention and Management: Public-Private Sector Partnerships, 14-16 November 1996.

N O T E S

¹ Lloyd's List, March 1996.

² Chia Lin Sien. 1995. Maritime manpower for the shipping industry in the Asia-Pacific region. United Nations, New York.

The New Coastal Resource Management Project in the Philippines

The Coastal Resource Management Project (CRMP), Philippines, an initiative of the Government of the Philippines that began in 1996, is funded by the United States Agency for International Development (USAID) for about seven years to address the pressing needs of coastal conservation in the country.

The CRMP will identify, cultivate and promote the current and future coastal resource leaders in the country for implementation of coastal resource management plans. It will promote an integrated coastal management approach that focuses on sustainable coastal use and the direct impacts on coastal resources from fishing, aquaculture and tourism. It will also consider land-based activities, such as deforestation and urbanization. This integrated approach will be accomplished by collaborating with ongoing projects of the municipal and national governments and other donor-assisted projects focused on the coastal environment and its governance. It also entails a variety of strategies and activities such as:

- Participatory coastal resources assessment
- Coastal resources management planning
- Economic development for coastal resource users
- Implementation of limited access regimes such as marine reserves and sanctuaries
- Training in skills relevant for CRM implementation
- Legal instruments required for effective support of CRM
- Policy analysis and formulation

- Monitoring and evaluation

The CRMP vision for the future of Philippine coasts is that:

- Communities will effectively manage their coastal resources
- Limited access regimes will become accepted and common
- Income for coastal resource users will be stable
- Local and national governments will have clear mandates and roles in CRM
- Participatory monitoring will continue the planning cycle refining CRM plans
- Increased private and public investment in CRM will expand the process
- Coastal enterprises less dependent on natural coastal resources will thrive

The CRMP is jointly implemented by the Department of Environment and Natural Resources, Department of Agriculture/Bureau of Fisheries and Aquatic Resources, Local Government Units, nongovernment organizations and other assisting organizations. Technical support and management are provided by PRC Environmental Management, Inc.

For more information, contact the Coastal Resources Management Project, 5th Floor, Cebu International Corporation Towers, North Reclamation Area, Cebu City, Philippines. Tel. (63-32) 232-1821 or 1822; Fax (63-32) 232-1825; E-mail prccebuc@usc.edu.ph. Attention: Dr. Catherine Courtney, Chief-of-Party or Dr. Alan T. White, CRMP Coordinator.

The Global Environment Facility (GEF)/United Nations Development Programme (UNDP)/International Maritime Organization (IMO) Regional Programme for Marine Pollution Prevention and Management in the East Asian Seas (MPP-EAS) is now on its third year of implementation. The Programme is participated in by Brunei Darussalam, Cambodia, China, DPR Korea, Indonesia, Malaysia, Philippines, Republic of Korea, Singapore, Thailand and Vietnam. This section highlights recent activities of the Programme from June to December 1996.

REGIONAL CONFERENCE ON SUSTAINABLE FINANCING MECHANISMS

This Conference held on 14-16 November 1996 was co-sponsored by the GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas (MPP-EAS), the Coastal Management Center, the Philippine Department of Environment and Natural Resources, the Swedish International Development Agency, the International Development Research Centre of Canada and the Danish Cooperation for Environment and Development. It was supported by the Asian Development Bank and the United Nations Environment Programme/Coordinating Body on the Seas of East Asia.

The Conference concluded that sustainable financing mechanisms of marine pollution management in East Asian Seas is a shared responsibility by government, international agencies, national and multilateral financial institutions, industry, the private sector, nongovernment organizations, academe and the general public and it was recommended that such entities should commit to work cooperatively.



During the Opening Session of the Conference, seated from left to right: Dr. Anders Granlund (Sida) (partly hidden), Sec. Victor Ramos (DENR), Dr. Chua Thia-Eng (MPP-EAS), and Ms. Sarah Timpson (UNDP, Manila).

The proceedings of this conference, consisting of thirty papers, will be available in mid-1997.

INTEGRATED COASTAL MANAGEMENT (ICM) IN XIAMEN, CHINA

Marine legislation strengthened. Three new regulations were drafted, namely: (1) *Xiamen Marine Environmental Protection Regulations*; (2) *Xiamen Sea Area Use Management Regulations*; and (3) *Xiamen Intertidal Aquaculture Management Regulations*. The regulations, approved by both the Xiamen Municipal Government and the Xiamen People's Congress, are to be implemented in 1997.

ICM operational mechanism established. The Xiamen Municipal Government Marine Management Office was officially established upon the recommendation of the Xiamen Marine Management and Coordinating Committee. A unique feature of the Marine Management Office is its law enforcement function. It has successfully shut down four electroplating factories which did not comply with discharge standards. It has also ordered six factories to improve their pollution emission control.

Functional zonation scheme approved. The Xiamen Municipal Government approved the Marine Functional Zonation Scheme prepared by the Project. Functional zones are areas allocated for specific and/or prioritized economic development, management, nature conservation and protection. Zones are delineated based largely on the ecological and biophysical characteristics, socioeconomic potential of the area, and national and local government development priorities. Four major development zones were established, namely: shipping and port, tourism, aquaculture and resource conservation. The zonation scheme will serve as a mechanism to ensure the optimal use of sea space and natural resources without compromising the functional integrity of ecosystems. The scheme is also a preventive measure to reduce multiple resource use conflicts.

Management efforts to clean Yuan Dang Lake. A second lakewater treatment plant (with a capacity of 100,000 m³/d) recently installed by the Yuan Dang Lake Management Authority is now operational with a flood drainage pumping station (40 m³/s capacity). A 1.2 km embankment and 4 ha of greenbelts were constructed. A total of 45,000 m³ of sludge were dredged from the lake bottom. Other environmental enhancing activities included the purchase of two garbage collecting boats and the assignment of personnel for garbage collection. Lakewater quality is being monitored quarterly with support from the Project.

ICM DEMONSTRATION PROJECT IN BATANGAS BAY

Voluntary agreements on integrated waste management between the public and private sectors. Twelve industries and nine shipping companies

signed voluntary agreements with concerned government agencies at the national and local level. The agreements attempt to reduce waste generation and to improve the management of hazardous and non-hazardous wastes from industries, ports and ships over a five-year period. The agreements provide incentives for companies which establish and implement schedules for achieving waste management goals; a format and schedule for monitoring progress; and collaboration in the development and implementation of both transitional and long-term waste management programs.

Integrated Waste Management Action Plan. In August, the Batangas Bay Council adopted the Integrated Waste Management Action Plan for the Batangas Bay Region. The

Action Plan is a framework to effectively carry out waste management and disposal, consistent with national, regional and provincial policies in accordance with developmental goals and environmental standards set in the Region. It provides a cross-sector and cross-media approach to waste management, utilizing the combined resources and capacities of the public and private sectors.

RISK ASSESSMENT AND MANAGEMENT IN THE MALACCA STRAITS

IPS/IMO International Conference on Navigational Safety and Control of Pollution in the Straits of Malacca and Singapore, 2-3 September 1996. This conference in Singapore served as a forum to discuss ways and means of ensuring that the Straits of Malacca and Singapore remain safe for navigation and free from maritime pollution. The conference focused on cooperation among the littoral and user States and the implementation of UNCLOS and IMO conventions. One hundred seventy participants representing shipping and oil industries and other users attended the conference, including the Secretary-General of IMO and senior staff of the Regional Programme.

Environmental profile completed. The final draft of the Malacca Straits Environmental Profile identifies the Straits as a unique tropical estuarine environment and records concerns on the health of the environment and their implication on human and eco-

system health. The profile describes living and non-living resources in the Straits, current policies, strategies and initiatives taken by the littoral States, regional and international organizations in the management of land- and sea-based sources of pollution, and information on key management issues that require



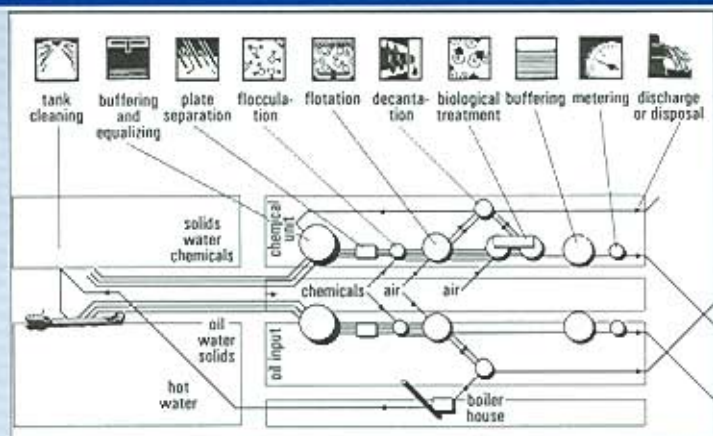
Voluntary agreement on port/ship waste management has been forged in the Batangas Bay among concerned agencies and the shipping industry which will contribute to the reduction of marine pollution in the bay area.

attention. The profile provides baseline information on the state of the environment.

Initial risk assessment study initiated. This risk assessment study appraised the environmental effects (i.e., ecological, human and societal effects) of contaminant emissions from land- and sea-based human activities. It estimates the likelihood of hazards occurrence and the potential levels of contaminant exposure. The study, based mainly on the completed environmental profile, is being undertaken by Prof. Peter Calow of Sheffield University, UK; Dr. Valery Forbes of Roskilde University, Denmark; and staff of the MPP-EAS and will lead to establishing a more detailed risk assessment framework within the context of a subregional sea. The study will provide an initial assessment of the evidence showing human activities to have already affected the environment (retrospective assessment) and an assessment of the probable future effects of human activities on the environment (prospective assessment). The risk assessment study will be presented in a Consultative Meeting on Malacca Straits to be held in the Philippines in March 1997.

Feasibility of designating the Malacca Straits as a Special Area under MARPOL 73/78. The draft report on the need and feasibility of designating the Malacca Straits as a Special Area under MARPOL 73/78 concluded that the Straits is a potential candidate for Special Area designation under Annex V or I of MARPOL 73/78. The report was prepared by an IMO consultant. The report stated that as a Special Area, it will be:

- necessary to provide adequate reception facilities; and
- useful to develop an enforcement system,



Typical Layout of a Reception Facility

Source: IMO, *Comprehensive Manual on Port Reception Facilities*, 1995.

including aerial surveillance, aimed at detecting unlawful discharges from ships.

The report will be presented for review during the Consultative Meeting on the Malacca Straits in Cebu in March 1997 and then forwarded to the respective littoral governments for their consideration.

MARINE POLLUTION MONITORING AND INFORMATION MANAGEMENT

Strengthening marine pollution monitoring capacity: Cambodia, DPR Korea and Vietnam. As part of the efforts to upgrade the monitoring capacity of the three countries, the MPP-EAS provides support in terms of training and basic sampling and laboratory equipment. Arrangements are being made to purchase equipment which are expected to be delivered to the respective countries in due course.

MPP-EAS web page. The Regional Programme is now linked to the Internet with a home page <<http://www.cnl.net/~imo>>. It includes details of Programme objectives and strategies; a description of technical services offered by the Programme in terms of the publication of studies, workshop and conference proceedings; linkages to other institutions concerned with marine pollution prevention and management; a Legal Information Database to provide legal information requirements of participating countries; and future Programme activities.

INTERNATIONAL CONVENTIONS

Workshop on the Ratification and Implementation of MARPOL 73/78, Singapore. Sponsored by IMO, Asia Pacific Center for Environmental Laws (APCEL), and the Maritime and Port Authority of Singapore (MPAS), the workshop discussed the operational details of the Norwegian supported project on the ratification and implementation of MARPOL 73/78. The workshop mapped out a course of action and strategies for strengthening the legal instruments, infrastructures and capacities of the participating countries for ratifying and implementing the MARPOL. Eight participants representing Cambodia, Indonesia, the Philippines and Vietnam, attended, together with staff from the MPP-EAS, IMO, MPA and APCEL. The workshop was held from 30 October to 1 November 1996.

Assessment of national legislation on marine pollution. An initiative has been undertaken in May to assess the status of national legislation and regulations on marine pollution in Cambodia, Indonesia, Malaysia, the Philippines, Thailand and Vietnam, and to identify the constraints that affect ratification and implementation of the international conventions. The report of this initiative is expected to be available early next year.

CAPACITY BUILDING

Second Regional Training Course on the Application of ICM System in Marine Pollution Prevention and Management. The Second Regional Training course on ICM application was held on 4-28 October in the Philippines, People's Republic of China and Singapore. Twenty-three partici-

pants from Cambodia, Democratic People's Republic of Korea, Indonesia, Malaysia, People's Republic of China, the Philippines, Thailand, Vietnam, Kenya and Sri Lanka, representing government officials, scientists, and the academe, attended the training. The training course demonstrated the application of ICM system at different levels of development.

Geographic Information Systems (GIS) for pollution planning and management. On December 1996, Mr. James N. Paw and Mr. Noel Robles from the MPP-EAS provided training on the use of the OS/2 and SPANS GIS software in the Xiamen Demonstration Site. Four staff from Xiamen were trained. The use of GIS will provide decision-makers with the necessary information to generate various scenarios that will aid them in policy formulation, reform and management.

Training for marine pollution monitoring. Two staff from the Batangas Bay demonstration site underwent a three-week intensive training course on pollution chemistry in Xiamen from 26 November to 22 December 1996. This training aimed to develop skills in analytical techniques on marine pollution monitoring.

Integrated environmental impact assessment. The Coastal Management Center (CMC), in collaboration with the MPP-EAS, organized the second workshop of experts on 12-14 June 1996, to develop training materials on integrated impact assessment for coastal management. A working panel was established to prepare the training modules based on a course outline prepared in March. The interdisciplinary expert panel, consisting of experts from the region, was headed by Prof. Chou Loke Ming (National University of Singapore) with Dr. C. Kwei Lin, Dr. John Hambrey (Asian Institute of Technology), Dr. Haosheng Hong (Xiamen University, China), Dr. Rudolf Wu and Dr. Paul Lam (City University, Hong Kong), Dr. Gil Jacinto and Dr. Cesar Villanoy (Marine Science Institute, University of the Philippines), Atty. Stella Regina Bernad and Mr. James N. Paw (MPP-EAS). The training modules are being reviewed and will be tested in a forthcoming training course in 1997.

— a n n o u n c e m e n t s —

ICM Training

The *Third Regional Training Course on the Application of ICM System in Marine Pollution Prevention and Management* will be held from 6 to 26 October 1997. The ICM training course is focused on strengthening the capabilities of the participants to analyze coastal management issues, especially marine pollution problems, and the application of integrated planning and management approaches to resolve those issues. The training is limited to 25 participants. MPP-EAS will provide up to 8 fellowships for participants from East Asia whereas Sida/CMC will provide 6 fellowships for participants from Sri Lanka and East Africa. Interested participants should send in their application as soon as possible.

OPRC Training Courses

The MPP-EAS will conduct OPRC training courses on 16-20 June 1997 in Bangkok, Thailand for the Gulf of Thailand and on 23-27 June 1997 in Serasa, Muara, Brunei Darussalam for the southern South China Sea. The training courses, which are supported by the IMO headquarters, are aimed at strengthening national and regional capacities and cooperation to effectively respond to and combat the occurrence of oil spills. The courses are designed in accordance with the IMO Model Courses for Level 2 Supervisors/On-Scene Commanders in order to provide the basic response strategies and tactics, as well as the operational supervisory staff in tackling major spills.

Participants of these courses will come from government and industries, who have knowledge of and supervisory responsibility for oil response planning and operations. The Gulf of Thailand training participants will come from the four littoral countries of the Gulf of Thailand, namely: Thailand (Central), Malaysia (East), Cambodia and Vietnam. On the other hand, the southern South China Sea training will have participants from the four littoral countries of southern South China Sea, namely: Brunei Darussalam, Malaysia (Sarawak and Sabah), the Philippines and

Vietnam. Efforts have been made to secure resources so that the training can be extended to other subregions in the East Asian Seas.

Internship Program

The MPP-EAS welcomes applications to its Internship Program for 1997. The Internship Program is open to highly motivated young scientists from the East Asian region intending to enhance their work experience for a period of six months to a year in the areas of ICM; marine pollution monitoring; oil spill prevention, response and management; international marine environmental law; GIS application; waste management; EIA; environmental accounting and economic analysis. International travel, local accommodations and a modest per diem will be provided by the MPP-EAS. Interested parties should send their application and curriculum vitae to the MPP-EAS at the address below.

Risk Assessment Workshop

A two-day workshop on risk assessment in the Malacca Straits will be held on 24-26 November 1997. The workshop will be an opportunity to learn about the use of risk assessment as a management tool framework and how it was applied in the Malacca Straits.

ICM Technical Meeting

An ICM Technical Workshop is scheduled for 12-14 November 1997. Its objective is to consolidate experiences and lessons learned in the application of ICM from various countries using the approach, specifically in the East Asian Seas region.

Interested parties may address inquiries and correspondence to:

GEF/UNDP/IMO
Regional Programme for the Prevention and Management
of Marine Pollution in the East Asian Seas
P.O. Box 2502, Quezon City 1165
Metro Manila, Philippines
Telefax No.: (632) 926-9712

PUBLICATIONS

NOW AVAILABLE

- Strategic Environmental Management Plan for the Batangas Bay Region.** 1996. 88 p. ISBN 971-91646-5-4.
- The Coastal Environmental Profile of the Batangas Bay Region.** 1996. 146 p. ISBN 971-91646-1-1.
- Integrated Waste Management Action Plan for the Batangas Bay Region.** 1997. 76 p. ISBN 971-91646-8-9.
- Strategic Management Plan for Marine Pollution Prevention and Management in Xiamen.** 1997. 60 p. ISBN 971-91646-7-0.
- Enhancing the Success of Integrated Coastal Management: Good Practices in the Formulation, Design and Implementation of Integrated Coastal Management Initiatives** (In four versions: English, Vietnamese, Korean and Bahasa Indonesia). 1996. 26 p. ISBN 971-91646-3-8.
- Integrated Coastal Management in Tropical Developing Countries: Lessons Learned from Successes and Failures.** 1996. 82 p. ISBN 971-90140-2-4.
- Marine Pollution Prevention and Management in the East Asian Seas: From Planning to Action** (1996 Annual Report). 1996. 44 p. ISSN 1027-6378.
- Tropical Coasts Newsletter, Vol. 3, No. 1, July 1996.** ISSN 0117-9756.
- Marine Pollution Updates, Vol. II, No. 3, September 1996 and Vol. II No. 4, December 1996.**

FORTHCOMING

- The Coastal Environmental Profile of Xiamen
Malacca Straits Environmental Profile
Pusan Oil Spill Proceedings
Proceedings of the Regional Conference on Sustainable Financing Mechanisms for the Prevention and Management of Marine Pollution: Private Sector - Public Sector Partnerships
Enhancing the Success of Integrated Coastal Management: Good Practices in the Formulation, Design and Implementation of Integrated Coastal Management Initiatives (Translated into: Chinese, French, Portuguese, Thai and Swahili)

For copies interested parties may contact:

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P.O. Box 2502, Quezon City 1165
Metro Manila, Philippines
Telefax No.: (632) 926-9712

ICM International Conference

The Intergovernmental Oceanographic Commission (IOC) of UNESCO, the Coordinating Unit, Mediterranean Action Plan of UNEP, the International Centre for Science and High Technology (ICS) of UNIDO and the International Centre for Coastal and Ocean Policy Studies (ICCOPS) will hold an International Conference on *Education and Training in Integrated Coastal Management. The Mediterranean Prospect* in Genoa, Italy, on 25-29 May 1998. Interested parties may contact:

Adalberto Vallega

Conference Scientific Co-ordinator

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READERS' CORNER

Tropical Coasts invites readers to send comments or submit short write-ups (250-300 words) about the various topics covered by the newsletter. Items should be concise and to the point. The editors reserve the right to shorten or condense the write-up as they see fit and to ensure that it is appropriate to the themes of *Tropical Coasts*.

READERS' CORNER

FACTS AND FIGURES

Sea Areas Covered by Agreements for Environment Protection Purposes.

Countries which are Contracting Parties to the London Convention 1972 are shown in dark blue. Light blue areas indicate that a regional convention has been signed.



1. Mediterranean (a) (b) (d); 2. The Gulf Region (d); 3. The Wider Caribbean (d); 4. West and Central Africa; 5. Eastern Africa; 6. East Asia (c); 7. Red Sea and Gulf of Aden (d); 8. Southwest Pacific (a); 9. Southeast Pacific (a) (b); 10. South Asia (c); 11. Oslo and Paris Convention area (a) (b); 12. Baltic Sea (HELCOM) (a) (b) (d); 13. Black Sea (d) (e); 14. North Sea (a) (b) (d); 15. Antarctica (f).

a. Area covered by a dumping protocol; b. Area covered by a protocol against pollution from land-based sources; c. Area covered by a regional Action Plan but not by a regional convention; d. Area having special protection under MARPOL 73/78 (under one or more annexes) as Special Area; e. A regional convention is in preparation; f. Out of 26 Contracting Parties to the Antarctic Treaty 21 are also London Convention Contracting Parties.

Source: Modified from IMO. 1991. The London Dumping Convention: The First Decade and Beyond. International Maritime Organization, London, p. 49.

Tropical Coasts is being published to stimulate exchange of information and sharing of experiences and ideas with respect to environmental protection and the management of coastal and marine areas. This newsletter is published twice a year and distributed free of charge to individuals and relevant organizations in the developing countries. Readers are strongly encouraged to send their contributed articles to:

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"I conceive that the great part of the miseries of mankind are brought upon them by false estimates they have made of the value of things."
- Benjamin Franklin