

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 • Coastal Management Center

INTERNATIONAL MARINE ENVIRONMENT CONVENTIONS: OBLIGATIONS AND OPPORTUNITIES

One goal of the GEF Regional Programme on the Prevention and Management of Marine Pollution in the East Asian Seas (MPP-EAS) is to change the perceived "financial burden" associated with international conventions. Marine environment and maritime conventions, in general, have economic opportunities associated with them. They merely require recognition and development of such opportunities. For instance, if the shipping industry needs more and better qualified personnel, maritime training institutions will thrive; and if sea disposal of industrial waste is prohibited, demand for new or improved technologies, facilities, and services will help the "environmental industry" flourish.

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Tons of wastes are being generated daily as a consequence of burgeoning population and rapid economic growth in many countries worldwide and disposal of such wastes remains a seemingly daunting task. In East Asia, for example, proper disposal of wastes is often grossly inadequate and inefficient, with industrial wastes typically dumped in the oceans. With the effectivity of the global ban on ocean dumping of industrial wastes (adopted by the Contracting Parties to the London Convention 1972, beginning January 1, 1996), the need to manage non-industrial wastes alongside industrial wastes in land-based facilities will require concerted efforts from the stakeholders—from consumers, government, and the private sector.

Wastes or pollution generated by economic activity, particularly of industries, are often left to the government to act upon and to address adverse consequences. Until recently, the private sector has been largely uninvolved in this supposedly shared responsibility. There are government subsidies and tax exemptions afforded economic ventures, but none for minimizing wastes and environmental protection. Clearly, it is imperative that we look into the issues of waste management and pollution prevention (i.e., minimizing wastes) within a holistic framework involving all stakeholders, including the private and public sectors—a framework that contains potentials for investment and enterprise.

This third issue of *Tropical Coasts* contains a number of articles dealing with market opportunities in waste management and pollution prevention, which the government and private sector can consider. International conventions, for example, contain venues for investment that governments can take advantage of upon ratification and implementation. Such opportunities include waste reception and processing facilities; recycling and waste recovery; technical, scientific and legal support; and training and certification. Experience in waste management and minimization, especially in the maritime industry, involving disposal and recycling of waste (in Germany), use of clean technologies (in East Asia and the Caribbean), and waste exchange (in the Philippines) can be profitable enterprises. Certainly, partnership between the government and the private sector in addressing waste management issues will have significant positive impacts on the sustainability of resource use and the protection of the environment. Complementing the efforts of such partnership are the emerging international standards, the ISO 14000 series of Environmental Management System (EMS), that will provide guidance and assistance to organizations, particularly the industries that are implementing or improving an EMS. Thus, the various legal, institutional, and technical initiatives in waste management and pollution prevention should serve as impetus toward the development of "environmental industry".



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INTERNATIONAL MARINE CONVENTIONS

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A challenge for national governments of developing and newly industrialized countries is to facilitate the ratification and implementation of international conventions, without compromising their national economies' development and strength. The dilemma for most governments lies in the fact that perceivable expenditures (e.g., construction and operation of a shore reception facility in a port) are often easier to cost than the global or regional goals of the conventions (e.g., sustainable development of coastal and marine resources).

Although the concept is quite straightforward, the adoption of a market-creation approach to the implementation of international conventions is not well-established. This is because it requires changes in the role and attitude of government and the private sector. These changes are slow to occur, for each sector prefers to maintain the status quo. However, in the East Asian region, the unparalleled growth in national economies, the expanding domestic purchasing power, and the surging investments by the private sector and foreign investors, coupled with an environmental awakening by the general public, have created a situation where central governments and industry are reevaluating their roles and accountabilities with respect to environmental programs. This movement toward the decentralization of political power and a new division of tasks and responsibilities among levels of government and the private sector provides a platform for the development of market opportunities in marine pollution prevention and management in the East Asian region.

In general, the new configuration for sustaining the national marine environment programs involves four key stakeholders:

1. Central government;
2. Local government;
3. Private sector enterprises; and
4. Nongovernment Organizations (NGOs) and community-based organizations.

Potential Market Opportunities for Selected IMO Marine Environment Conventions

MARKET OPPORTUNITY	MARPOL 73/78 ¹	OPRC 1990 ²	LC 1972 ³
Technical, scientific, and legal support	▲	▲	▲
Training/certification	▲	▲	▲
Monitoring and assessment			▲
Inspection and enforcement	▲		▲
Management and administration	▲	▲	▲
Waste avoidance/minimization	▲		▲
Recycling/waste recovery	▲		▲
Collection, transport, and/or disposal service	▲	▲	▲
Salvage service		▲	
Facilities and equipment supply	▲	▲	▲
Research and development	▲	▲	▲
Technology transfer	▲	▲	▲
Information management and dissemination	▲	▲	▲

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

2 International Convention on Oil Pollution Preparedness, Response, and Cooperation, 1990.

3 London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters.

Central Government

The central government assumes a critical role in fostering new financing for investment in marine environment programs. Central governments must ensure a rational regulatory framework. Too often, national regulations are simply adopted from mature industrialized countries with little regard for the infrastructure required for administration and enforcement; for the facilities and services necessary to allow industry to comply; or for the scientific, technical, and legal systems needed in order to effectively implement and enforce regulations. Thus, a primary responsibility of the central government is to ensure that national policies and regulations adopted in accordance with international conventions can be practically applied. The central government needs to focus its efforts on the proper balance among the elements that are desirable, those that are achievable, the process (i.e., capacity-building program), and the timeframe for evolving from one process to another.

Other efforts that can be initiated by the central

government to enhance market creation opportunities in the marine environment sector include:

- **Devolving regulatory frameworks to local communities, particularly monitoring and enforcement activities.** Local governments and their constituencies must live with coastal and marine environmental degradation. Therefore, they are in the best position to implement, monitor, and enforce regulations.
- **Streamlining roles and responsibilities for marine pollution programs within the central government.** This is closely aligned with the first action and aims to reduce bureaucratic red tape that results in confusion, conflict, and indecision both inside and outside the bureaucracy. By identifying a single body or agency with the authority to act in its behalf, the central government becomes a more effective facilitator and regulator in collaboration with the local government and the private sector.
- **Creating new sources of finance for marine pollution programs that will encourage investment by the private sector.** Two types of financing need to be considered, namely: (a) the initial capital investment for new or refurbished equipment and facilities; and (b) the ongoing costs associated with their operation and maintenance over time. Providing financial incentives for inward investment by industry and the private sector (e.g., tax-free holiday; exemption from import duty on foreign equipment; access to foreign investors) can create the right climate for investment in the environmental industry. Disincentives to continue unacceptable practices, such as uncontrolled discharge/dumping of wastes (e.g., fines; pollution taxes) and revenue-generating mechanisms (e.g., service fees; permits), supported by a committed legal and judicial system, also create markets for the environmental industry.
- **Ensuring a “level-playing field” among government-owned facilities, existing industry, and new investors.** This prevents unfair competition among those who do not contribute to the facilities and services intended to prevent and manage marine pollution. In the case of existing stakeholders, this means that all enterprises may be required to use centralized facilities and services, unless they can validate the availability and use of adequate alternatives. In the case of new investors, environmental assessment will be required to ensure that environmental risks are

Central government needs to focus its efforts on the proper balance among the elements that are desirable, those that are achievable, the process, and the timeframe for evolving from one process to the other.

accounted for, and that the responsibility for the management of identified risks are incorporated into the planning and financing of all investments.

- **Fostering the use of economic instruments: property rights, service fees, liability, compensation and resource valuation, fiscal measures, performance bonds, and deposit/refund systems.** These instruments, combined with regulatory instruments, need to be designed and applied bearing two objectives, namely: (a) to change the behavior of different sectors of society; and (b) to generate revenue that supports marine pollution program activities. Although the applicability of such instruments at the local level needs to be assessed, the availability of a “tool box” containing various instruments is a service best provided by the central government.
- **Building capacity at the community level to ensure a level of competence whereby each constituent is able to take responsibility for implementing a marine pollution prevention and management program.** Such an activity includes formal education, information dissemination, and public-awareness programs. These actions assist in rationalizing investments in marine pollution programs by making costs and benefits clear to all stakeholders. By taking on this role, the central government creates the conditions for agreement between the public and private sectors at the community level.
- **Mobilizing external resources to stimulate and complement national marine pollution prevention and management programs.** Central governments have access to, *inter alia*: overseas development agencies; international and regional financial institutions; UN agencies and specialized organizations; international and regional expert groups; international NGOs; and professional associations. By accessing and channeling appropriate resources and expertise from external

sources, central governments can reduce initial costs and financial risks of local government, the private sector and other investors. Likewise, it can minimize potentially unfair treatment of stakeholders through the services of a third party that can act as the "honest broker".

Local Government

As mentioned earlier, within the community, the most concerned in protecting marine environment resources are those whose livelihood depends on them. Together with the constituents' local government, they are in the best possible position to provide cost-effective and efficient regulation. Unfortunately, the local capacity to actually provide these services and to monitor, report, and enforce marine environment regulations is mostly inadequate in the East Asian region. Therefore, building collaborative capacity at the local level needs to be addressed.

Private Sector Enterprises

The private sector in East Asia has become increasingly active in promoting and contributing to environmental priorities in the region. Globally, it is estimated that this

A concerted effort is required to instill confidence in the general public that the private sector is a willing and able partner in implementing solutions.

contaminated coastlines, dwindling fish resources, and uncontrolled discharges of industrial waste. A concerted effort is required to instill confidence in the general public that the private sector is a willing and able partner in implementing solutions. This task is not a short-term endeavor. Demonstration of positive, responsible actions is required to realize pollution remediation measures dealing with sectoral issues; more so, to improve or protect the interests and development opportunities of other, more vulnerable neighbors in the local community.



Fishing at Batangas Bay, Philippines.

NGOs and Community-based Organizations

NGOs and community-organized groups play more active roles in the financing and sustainability of marine pollution prevention and management programs worldwide. In the East Asian region, these contributions are growing, as NGOs provide the expertise and latitude not available in government and the private sector. One notable NGO in the East Asian region is the Coastal Management Center (CMC), based in Manila. CMC has banded together top marine scientists and resource managers from the region aiming at strengthening regional capacity to effectively manage the coastal and marine environments of the East Asian Subregional Seas. The combination of local knowledge, contacts with national government and industry, and a well-established international network enables NGOs of this type to fill the gap between the local needs and the demands of the central government, coupled with the expectations and resource potential of the international

sector, valued at \$200 billion in 1990, will grow to \$300 billion by the year 2000. Opportunities for the development of an environmental industry abound in all countries of the region, with some early examples of success. However, there are still evidences of past mistakes, including oil-

community. The potential value-added service of NGOs has local, national, and global implications.

Perhaps, community-based organizations are even a more important link between the needs of the local people

and the demands of government, for they represent those who are directly affected. Furthermore, they can help reduce the overall costs of projects and ensure a successful outcome. Their potential contributions to the development, implementation, and sustainability of projects or programs need to be tapped early in the planning process. Such contributions include identifying the impacts of proposed developments, proposing solutions to problems identified, securing financing, providing in-kind resources to execute solutions, and managing programs themselves. Another contribution of NGOs lies in the development and management of environmental funds. These funds come from people and organizations committed to long-term approaches to environmental protection and sustainable development. They form part of the movement to create local solutions to environmental challenges and to provide an alternative to short-term, one-of-type projects.

As an example, the Foundation for the Philippine Environment (FPE), a nonprofit, nongovernment organization formally registered in 1992, describes its mission as "...an active, self-reliant, sustainable, and innovative catalyst of biological diversity and sustainable development of the communities in critical areas needing protection and conservation." Thus, the FPE assumes the role of a grantmaker, fundraiser, and catalyst for cooperation. Although not many NGOs in the region are experienced in managing environmental funds, they offer an alternative to traditional top-down planning and financing of community-based projects, and donor-driven agenda that fail to respond to community needs. However, their design and capacity as effective instruments in marine pollution programs in the region definitely warrant further development.

Financing Mechanisms in Marine Pollution Prevention and Management

The fact that only a limited number of innovative national and local programs are in place suggests a need

There are two mechanisms in the East Asian region being tested involving the government and the private sector:

- ***Public-private Sector Partnership, and***
- ***Privatization.***

for development, demonstration, and promotion of creative financial mechanisms and instruments to support marine pollution prevention and management. There are two mechanisms in the East Asian region being tested involving the government (i.e., local/national) and the private sector:

- Public-private Sector Partnership, and
- Privatization.

A **public-private sector partnership** is an alternative to the traditional approach that views local government as solely responsible for the administration and control of facilities and services, such as potable water supply and waste disposal. Its purpose is to break away from the situation where the private sector waits for the public sector to build a facility, establish a service, or enforce a regulation. The partnership is established on terms that are of mutual benefit to each sector. For the public sector, benefits include access to technical and business skills not available in the local government. For the private sector, benefits include participation and collaboration in defining a long-term management program.

A key consideration to both parties is financing. One goal of the partnership is to distribute the initial costs for planning, development, and start-up of programs among all interested parties. As the program gets established, the financial burden should shift to the direct users and beneficiaries. The nature of partnerships can vary, ranging from bilateral agreements to shared ownership between the public and private sectors, with the latter given the latitude to achieve the business objective of the partnership. Examples of public-private sector partnerships already existing in the region, include:

1. **A formal agreement between government and industry, where industry volunteers to comply with negotiated objectives within a definite time frame.** Indonesia initiated the PROKASIH (clean rivers) Programme in 1989, in response to the growing pollution loads in critical watersheds. The programme is based on voluntary "letters of commitment" by industry to reduce pollution by 50 percent. To date, some 2,000 firms have signed voluntary agreements.
2. **A joint venture among the central government, local government, and industry, where the central government provides the initial capital investment for a facility or service.** In 1987, Thailand's Ministry of Industry financed the construction of a special treatment facility for hazardous industrial waste and contracted out its operation to a private company. The company takes care of collection, treatment and disposal of wastes, and collects service fees from the users of the facility.

Public-private sector partnerships work best within a system of contracts and understandings that are not jeopardized by subsequent political change.

government's role in this scenario is principally that of regulator to ensure that the facilities and services comply with existing standards or requirements. There are various advantages and disadvantages to privatization. These include:

3. **A government-led cooperative approach with an international investor/contractor, where government remains in control but contracts out the design, construction, and operation of the facility.** A notable example is the municipal sewage treatment and disposal facility which has recently been commissioned for Xinglin Bay in Xiamen, China, as a consequence of a negotiated agreement between the local government and an international waste management company.
4. **A joint venture led by an international contractor, usually with a local private sector partner, with government as a minority shareholder.** The hazardous waste disposal facility in West Java, Indonesia, was established with shareholding of 70 percent by an international waste contractor, 25 percent by a local partner, and 5 percent by the government. In this case, the government's equity was in the form of land.

Whatever partnership model is selected, adjustments in attitudes, ways of working, and the time frame for decisions have to be made to ensure success. Public-private sector partnerships work best within a system of contracts and understandings that are not jeopardized by subsequent political change.

The **privatization** mechanism confers total responsibility for the provision of required facilities and services on the private sector. The

1. The private sector's ability to bear capital investment and operating costs without the need for government assistance. In practice, however, it is common for private investors to balk at the idea of providing costly new or expanded facilities or services without guarantees from government. Some issues that may need government intervention in the implementation of privatization programs include: (a) rigorous enforcement of regulations and standards among all stakeholders and "competitors"; (b) secure controls for sufficient periods of time to allow investors to achieve a reasonable return on their investment; and (c) availability of incentives, such as tax holidays, exemption from import duty on foreign equipment, and access to offshore finances.
2. The private sector's versatility and available expertise to provide tailor-made solutions that suit each stakeholder's needs. There is a possible disadvantage though, like the monopolization of services, e.g., waste collection and disposal. Such services benefit the public and, even when they are privatized, the government has the responsibility to safeguard the public against unfair treatment and pricing.
3. The private sector possesses the capacity and experience to provide goods and services in a cost-



The Caltex refinery in Batangas Bay area, Philippines.

effective and profitable manner. The affordability of fees, duties, and taxes imposed by regulations and standards is a key question in privatization schemes, based on the ability of users to pay. Governments need to recognize that not all users will have the technical capacity and financial capability to get involved in privatization schemes. In some cases (e.g., for small and medium-sized enterprises), the government may have to take steps to strengthen the markets through training and

subsidy, especially during the early stages of program implementation.

A summary of policy instruments and possible combinations of regulatory and economic instruments which may be appropriate for addressing selected components of marine pollution prevention and management programs is shown in the table below.

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IMO



Examples of Policy and Economic Instruments for Selected Components of Marine Pollution Prevention and Management Program.

COMPONENT ACTIVITY	REGULATORY INSTRUMENTS			ECONOMIC INSTRUMENTS							
	Municipal By-laws	National Regulation/Standards	Permits/Licenses	Fiscal Instruments	User Charges	Deposit/Refund	Subsidies/Grants	Cargo tax	Liability and Compensation	Public-private Sector Partnership	Privatization
Municipal waste	■	■	■	■	■	■	■			■	■
Industrial waste	■	■	■	■	■	■	■		■	■	■
Vessel waste	■	■	■	■	■			■	■	■	■
Dredged material		■	■	■	■			■	■	■	■
Institutional waste	■	■	■	■	■		■		■	■	■
Hazardous waste	■	■	■	■	■	■	■		■	■	■
Agricultural waste	■	■	■	■		■	■		■	■	■
Oil spill preparedness and response		■	■	■	■			■	■	■	■
Marine pollution monitoring	■	■	■	■	■					■	■
Training		■	■	■	■			■	■	■	■
Applied research and development		■		■	■		■		■	■	■

THE INTERNATIONAL ORGANIZATION FOR STANDARDIZATION'S 14000 SERIES

As concern grows for maintaining and improving the quality of the environment and protecting human health, organizations of all sizes are increasingly turning their attention to the potential impacts of their activities, products, and services. The environmental performance of an organization is of increasing importance to internal and external interested parties. Achieving effective environmental performance requires organizational commitment to a systematic approach and to continual improvement.

Many organizations have undertaken environmental "reviews" or "audits" to assess their environmental performance. On their own, however, reviews and audits cannot provide an organization with the assurance that its performance meets and will continue to meet the requirements of legislation and its own policies. To be effective, reviews and audits need to be conducted within a structured management system that is integrated with the overall management activity and that addresses all relevant characteristics of the desired environmental performance. Reviews and audits are only two components of an effective management system.

At the June 1992 United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro, Brazil, over 100 countries agreed on the need for further development of international environmental management programs. The International Standardization Organization's (ISO's) 14000 Series of Environmental Management System (EMS) documents is one response to that expressed need.

The general purpose of the ISO 14000 Series is to provide guidance and assistance to organizations (e.g., industries) that are implementing or improving an EMS, regardless of size, type, or level of sophistication. It supports the UNCED goal of sustainable development and is compatible with diverse cultural, social, and organizational frameworks, providing practical advice on implementing or enhancing EMS. However, it is intended for use as a voluntary internal management tool and is not intended for use by EMS Certification/Registration bodies as a specification standard.

The potential benefits associated with an effective EMS include:

- meeting the customers' environmental expectations;
- maintaining good public/community relations;

The general purpose of the ISO 14000 Series is to provide guidance and assistance to organizations that are implementing or improving an EMS, regardless of size, type, or level of sophistication.

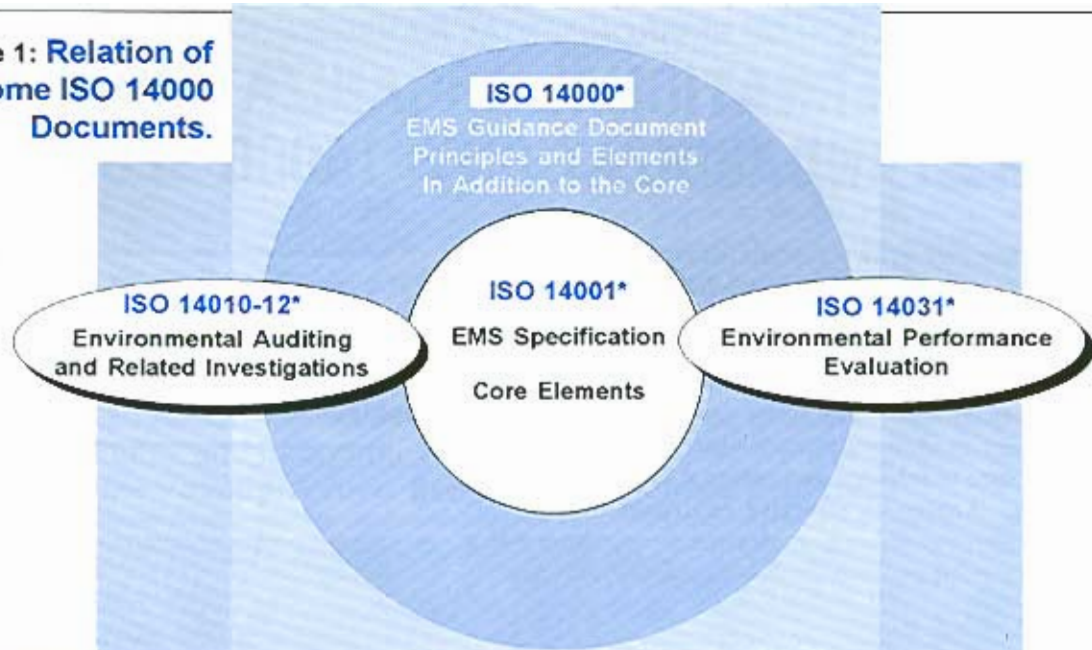
- satisfying investor criteria and improved access to capital;
- obtaining insurance at reasonable cost;
- enhanced image and market share;
- meeting vendor certification criteria;
- ability to dispose of waste;
- cost control;
- liability limitation;
- demonstration of due diligence;
- conservation of input materials and energy;
- easier site selection and permitting;
- technology development and transfer;
- improved industry-government relations; and
- improved environmental performance and state of the environment.

Different size organizations may consider various uses of the ISO 14000 series:

1. Utilization of the standards, or parts of it, to initiate and/or improve its environmental management systems, without aiming at certification
2. Application of the ISO 14001 Environmental Management System Specification to achieve third-party certification
3. Options in between, like self-declaration or second-party recognition between contracting parties, which may be suitable for some business relationships
4. Utilization of related documents, for example: ISO 14011 - Auditing of Environmental Management Systems, in the overall formulation of the EMS.

The path chosen will depend on factors, such as company policy; the existence or non-existence of a management scheme that can facilitate the introduction of systematic environmental management; any advantages and disadvantages of its utilization; the influence of certain factors, such as market position, existing reputations, external relations; and the size of the organization. Whichever path is chosen, the ISO 14000 series of documents is intended to provide the essential elements of an effective environmental management system.

Figure 1: Relation of Some ISO 14000 Documents.



Possible Other Issues

ISO 14000 Series Documents

- 14000** Environmental Management Systems-
General guidelines on principles, systems,
and supporting techniques
- 14001** Environmental Management Systems-
Specification with guidance for use
- 14010** Guidelines for environmental auditing-
General principles
- 14011/1** Guidelines for environmental auditing-
Audit procedures Part 1 - Auditing of
environmental management systems
- 14012** Guidelines for environmental auditing-
Qualification criteria for environmental
auditors

*Under development
(numbers reserved)

ISO/TC 207/SC 1 'Environmental Management Systems'

ISO/TC 207/SC 1 conducted its third meeting last June 1995 in Oslo, Norway. In that event, it was agreed that both ISO/CD 14000.2 and ISO/CD 14001.2 should be elevated to Draft International Standard (DIS) stage. The best possible timetable is now as follows:

Mid-July 1995	Texts sent to ISO/CS by BSI Secretariat.
End July 1995	ISO/CS circulated texts to all ISO member bodies for 6-month voting period (Parallel CEN process).
End January 1996	End of DIS voting period (Parallel CEN process).
End February 1996	Revised DIS circulated for 2 months voting period (parallel CEN process).
End April 1996	End of voting period (International and European Standards agreed or International Standard proceeds separately from European Standard).
End July 1996	Publication (subject to ISO/CS agreement to expedite process).

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ISO/TC 207 and the 'ISO 14000 Series'

ISO/TC 207 'Environmental management' was set up in June 1993. Its scope is 'Standardization in the field of environmental management tools and systems'. It has six Subcommittees and 17 Working Groups currently working on 25 standards. Several documents deal with EMS in the areas of environmental auditing and environmental performance evaluation. Others encompass product considerations in the areas of environmental labeling, environmental life-cycle assessment, and the inclusion of environmental aspects in product standards. (See Figure 1.) ISO/TC 207 collaborates closely with ISO/TC 176 'Quality management and quality assurance' (responsible for ISO 9000) in the field of environmental management systems and audits.

ENVIRONMENTAL PROTECTION STRATEGIES FOR THE MARITIME INDUSTRY

Unlike the situation in many industries where pollution problems are often hidden or less obvious to the general public, marine pollution problems associated with the maritime industry, such as oil slicks, chemical and oil spills, as well as various wastes dumped in the oceans, are highly visible, especially in beaches and coastal waters; and are causes for serious public concern. This is further compounded by the fact that only a small minority of ports in the developing countries have adequate facilities for receiving ship-generated wastes of both hazardous and non-hazardous types. A recent World Bank report noted that, whereas Asian economies are doubling every ten years, pollution levels increase by a factor of five to ten¹. This is a direct result of the dominant philosophy in many industrializing countries of placing economic growth as a priority with little or no regard for environmental protection.

In recent years, there have been increasing pressures to adopt global standards for environmental protection. The concepts of sustainable industrial development were clearly outlined at the 1992 United Nations Conference on Environment and Development, where the resulting recommendations called for guidelines to the sound management and disposal of hazardous wastes. Also, pressures for improved environmental systems have led to the establishment of international standards, such as the International Standardization Organization (ISO) 14000, which provides companies with guidelines on managing, measuring, improving, and communicating the environmental components of their operations in a systematic way. (See related article on page 9.)

While ISO 14000 and its derivatives will almost certainly affect the maritime industry, a more immediate concern is the terms of the Marine Pollution Convention (MARPOL) 73/78 Protocol that requires ships to retain their wastes on board, discharging them only at the first port of call. Furthermore, ports are required to provide adequate reception facilities to receive these wastes, which are categorized under MARPOL into five groups (See box on page 14), of which substances in bulk are the most relevant to the present discussion. States wishing to ratify MARPOL must accede to Annexes I and II, while compliance with Annexes III to V is optional.



A mobile off-shore drilling unit. Source: IMO, MARPOL: How to do it

Management of Ship-generated Wastes

The management of ship-generated wastes presents special problems for the maritime industry in many newly industrializing countries. Most are ill-equipped to meet MARPOL criteria for management of Annexes I and II wastes. Barriers include the absence of firm environmental regulatory infrastructure at the national level which, in turn, leads to the lack of effective collection, transport, and treatment facilities for these wastes. Similarly, at the port or shipyard level, there is lack of adequate reception facilities capable of receiving the various classes of wastes. The final barrier is the generally poor appreciation of environmental concerns by ship owners and crew, especially on issues of waste minimization and pollution prevention.

From an environmental engineering standpoint, the most significant categories of hazardous wastes generated by ships, including wastes generated during service and refitting at docks and shipyards, are:

1. Oily wastes: oil sludges (tanker cleaning wastes), oil in water (tanker slops), or water in oil (bilge wastes).
2. Painting and paint wastes: lead (Pb)-based and organotin anti-fouling paints.
3. Solvents used in general cleaning, especially of engines and power plants.
4. Miscellaneous Annex II type wastes, such as those from transported hazardous materials, surface treatment, and from specialty repairs.

Reception Facilities

Under MARPOL rules, docks and shipyards are supposed to maintain adequate reception facilities for the collection of Annexes I and II wastes. Ideally, these include:

As a prerequisite to adopting any type of treatment strategy, all waste generators should implement standard procedures known variably as pollution prevention, waste minimization, or "clean production".

collection; storage; possibly pre-treatment tanks for the various liquid wastes; and retention facilities for solid wastes, especially paint wastes containing toxic metals.

Experience in Emerging Industrial Countries

In a survey carried out by the authors, in almost all cases, no reception facilities for Annexes I and II wastes, in some countries in East Asia and the Caribbean Basin Region, appear to be in place. This reflects the fact that governments have not established policies on hazardous waste management, nor do they have any collection or treatment facilities to manage the various wastes. However, some shipyard managers are already under some pressures, usually from property owners or estate managers, to manage their wastes. As a result, some wastes (such as paint wastes) are collected and disposed of by private haulers, most likely in a sanitary landfill. Those familiar with urban waste management in developing countries will realize the risks involved, particularly on health, as most urban landfills attract substantial numbers of scavengers who search the wastes for recyclables, such as plastics, paper, and glass. Under the circumstances, direct skin contact with heavy metals like lead or, even worse, compounds like organometallics of the organotin variety could be very hazardous.

Oily chemical and solvent wastes are packaged and returned to the vessel which bears the responsibility of disposing them elsewhere. Little imagination is required to ascertain what the common practice is (i.e., dumping overboard). In some cases, shipyard managers complained that the absence of adequate collection facilities, especially for receiving oily wastes, hurt their business as ships requiring a refit with these wastes on board cause diminishing demand for their business.

Economies of Scale

One of the problems facing docks and shipyards providing reception facilities for MARPOL wastes is the disposal of small quantities of wastes. By segregating recyclable wastes, however, substantial economies of scale are achieved by collecting waste oil and solvents from several dock and shipyard reception facilities.

Treatment Strategies

There is a clear evidence that management of ship-generated wastes can form part of a national strategy

for handling all hazardous and industrial wastes². Furthermore, waste oils, tanker slops, bilge oils, and cleaning solvents can generate revenue through recycling and recovery for reuse as fuels. Some options are discussed below.

1. Aqueous wastes remaining after separation of oily wastes can normally be discharged directly to the sea. In some cases, pH control or the use of settling ponds may be required to allow the breakdown of any residual oils or organics.
2. Paint wastes containing lead or organotin compounds (typically, tri-alkyl tin fluoride), used as an anti-fouling agent, require treatment and safe disposal. The recommended practice is to separate the wastes from the grit or other abrasives, recycle the grit, and then compact and stabilize the residue using pozzolan or cement. Solidification in this fashion prevents the heavy metals from being leached out (e.g., by slightly acidic rainwater). Solidified wastes are then stored in a cell of a secure hazardous waste landfill sitting on a synthetic liner equipped with an underground run-off collection and monitoring system.
3. Both chlorinated and non-chlorinated solvent wastes are readily amenable to recycling. Although the use of chlorinated solvents is discouraged due to their toxic and carcinogenic properties, the practice is still widespread.
4. Marine oily wastes can be integrated with other industrial wastes, such as industrial cutting fluids and automobile lube oils. Various options are available for treatment. Oil sludges and tanker bottoms can be incinerated completely or partially using a new process which recovers oil in two fractions—light and heavy. The light oil is used to dilute the sludges for easier feeding into the furnace and, directly, as boiler fuel. Typical charges for sludge treatment amounts to US \$200 per ton, although oil slops may be accepted at no charge due to their calorific value as fuel.

Most oily wastes can either be used as fuel or as raw material in an incinerator or a cement kiln. When used as fuel, most incinerators and cement kilns require a reasonably steady supply in order to optimize combustion conditions. Oily/water wastes can also be separated by

By segregating recyclable wastes, substantial economies of scale are achieved by collecting waste oil and solvents from several dock and shipyard reception facilities.

physicochemical means in a treatment tank by a combination of heating and/or addition of proprietary emulsion-breaking chemicals. The oil phase can then be drawn off and the wastewater treated before discharge.

Oil tank ballasts and slops will often be accepted by oil refineries for processing. However, many refineries have limited reception capacity for oil/water wastes and may also be concerned about possible contamination.

Cleaner Production

As a prerequisite to adopting any type of treatment strategy, all waste generators should implement standard

procedures known variably as pollution prevention, waste minimization or "clean production". A more general term currently being used is "cleaner production", which encompasses a wide range of activities, from housekeeping changes to the adoption of "clean technology". "Clean technologies" are technologies applying either non-polluting processes or generating products easier to treat. The shift from lead or organotin-based paints to a non-toxic copolymer paint is one example of a "clean" technology. Other examples are provided in Table 1.

The most effective options in cleaner production, however, are those common-sense engineering and housekeeping practices that aim at avoiding actual production of wastes. Many docks and shipyards, like many smaller firms in newly industrializing countries, do not practice cleanliness and good housekeeping, which are important for minimizing the generation of hazardous wastes.

Business Opportunity

The selection of optimum treatment strategies for ship-generated wastes, particularly those that offer potential as fuel or are recyclable, will depend on local economics. The major barrier is often the disparate nature of the wastes—each ship generating relatively small, uneconomical quantities. As soon as the MARPOL recommendations on the provision of waste reception and collection facilities are in place, the economics of waste management will change dramatically. Sufficient wastes will be available to make recycling commercially feasible. Options include the use of wastes as fuel, for example, in a cement kiln or in full-scale oil/water separation. Treatment systems for physicochemical separation of oil/water wastes or thermal desorption techniques for recovering oil from sludges range in cost from US\$ 1-10 million.

Table 1.

Examples of Clean Technologies.

Oily wastes

A revolutionary clean technique has been developed, using fluorescence synchronous spectra for oil pollution identification. This can identify the type of oil in water, as well as in hexane extracts from water samples. New engine designs, including diesel electric machinery with enhanced alternating current (AC) propulsion drive configurations, selective catalytic reduction systems, higher speed engines, or using slower speed engines, represent some new advances.

Paint and paint wastes

It is a common practice to use lead-based paints combined with trimethyltin fluoride (organotins), as they have long-lasting and good anti-fouling properties. But this causes health and safety problems for crew and dockside workers—by their exposure to toxic substance and/or potential for flash fires from paint vapours. Clean technologies include copolymer paints and, in some cases, pine tannin additives as a rust inhibitor; or squalene, a natural compound found not only in human perspiration, but also in soft coral, as alternative anti-fouling agents.

Solvents

Traditional chemical solvents are highly flammable. These were replaced by chlorinated, non-flammable solvents; but these can be toxic and carcinogenic. Alternative technologies will not contain chlorine. The current trend is toward less harmful, though more expensive, solvents using water-based detergents or mineral-based solvents.

Aqueous wastes

Aqueous waste is generically all liquid waste. Present technology allows ships to evaporate seawater, leaving up to 50 tons of potable water per day. Other ship board technologies include improved water conserving urinals, hand-held showers, and laundering techniques.

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In conjunction with a project supported by a consortium of agencies, including the International Development Research Centre (IDRC) Program on Sustainable Technologies, the authors are currently preparing a feasibility study and business plan for a MARPOL-based waste reception and management facility in the East Asian and Caribbean Basin regions. The project promotes a public-private partnership approach to addressing environmental protection concerns of the maritime industry. The salient features of this report can be made available to interested parties.

RECEPTION, TREATMENT AND MANAGEMENT OF SHIP WASTES IN GERMANY

Most ports in Germany either belong to a coastal state or a municipality within that state, each with its own waste management plan. For this reason, the management of wastes collected from ships is handled differently in each port.

This paper recounts only the situation in the ports of the Free Hanseatic City of Bremen, particularly those of Bremen and Bremerhaven. However, since national legislation on waste management is applicable to all federal states and the facilities available at the North Sea coast are used by all ports in that area, other areas are also discussed to provide additional information.

General Legislation Relating to Waste Management

The collection and treatment of wastes in Germany is primarily based on the federal waste law, which requires that all wastes produced within the Federal Republic of Germany be legally disposed within the boundaries of Germany unless no adequate facility or treatment plant is available in the area. In the latter case, waste may be exported to another country where it can be treated in an environmentally sound manner. Permission, however, from the appropriate authority in Germany and of the receiving country has to be obtained prior to shipment.

Individual states that have ratified the federal waste disposal administrative laws and by-laws take responsibility for their implementation. Based on this legislation, each municipality has prepared its own waste collection and disposal plan which is approved and regularly monitored by the environment protection agency of the particular state.

Waste collectors, intermediate storage operators, waste

dumping sites, incinerators, and treatment plants are licensed by the environment protection agency. Treatment plants and incinerators have to be operated in accordance with very high emission standards set by the federal government. Implementation of and compliance with these standards are again the responsibility of the environment protection agency of the individual states. The agency also sets up a system that monitors the waste from collection to disposal.

The collection and transport of any waste to a treatment plant or final disposal site—an incinerator or dumping site—are implemented under a waste transport bill. Both waste producer and collector have to sign an acknowledgment of the quantity and quality released and collected, respectively. Upon delivery to the treatment plant or final disposal site, a receipt is issued to confirm arrival of such waste and to account for its disposal. Waste transport bills and receipts issued by the treatment plants or final disposal sites are submitted to the environment protection agencies for controlling and monitoring purposes.

Facilities Available

A total of five treatment plants are available for MARPOL Convention¹ Annex I type (i.e., oily) waste. (See box for MARPOL classified waste types below.) All of these treatment plants are privately operated. Two plants that have a capacity of approximately 250,000 m³ per annum are available in Hamburg; while three plants located in Bremen and the lower river Weser estuary have a capacity of approximately 130,000 m³ each. In the treatment plants, oily residues are separated by machines and the oil recovered is sold and re-used as ship fuel. Oil residues unfit for ship's engine consumption are either burned in

Categories of Pollutive Substances under MARPOL 73/78.

ANNEX I	Regulations for the Prevention of Pollution by Oil (e.g., asphalt solutions, gasolines, naphtha and oils).
ANNEX II	Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk (e.g., acids, alkali, alcohols, acetones, ether).
ANNEX III	Regulations for the Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form, or in Freight Containers, Portable Tanks or Road and Rail Wagons (e.g., marine pollutants listed under the International Maritime Dangerous Goods Code like heavy metals, radioactive substances).
ANNEX IV	Regulations for the Prevention of Pollution by Sewage from Ships (e.g., drainage and other wastes from toilets, urinals, medical premises, spaces containing living animals).
ANNEX V	Regulations for the Prevention of Pollution by Garbage from Ships (e.g., all kinds of victual, domestic, and operational waste, excluding fresh fish and parts thereof, generated during the normal operation of the ship and liable to be disposed of continuously or periodically).

incinerators and steel mills or used as oil cake. Eleven intermediate storage installations possessing a total capacity of approximately 30,000 m³ are operated by private companies in various ports along the German coast.

For MARPOL Annex II (hazardous) wastes, three privately operated and licensed treatment plants are available in Bremen with capacities varying according to the type and amount of wastes to be disposed.

No facilities are presently available for Annex IV (sewage) wastes. Annex V (garbage) waste is incinerated in two facilities operated by the municipalities of Bremen and Bremerhaven. Special wastes will be disposed at facilities available within Germany, depending on their type and the capability of and license held by the individual treatment plant or disposal site.

Handling of Annex I Waste in the Ports of Bremen and Bremerhaven

Since June 1988, the reception and disposal of oil mixtures and slops as a result of ship operation are free of charge provided that specific requirements are met. One

This system is unique in the North Sea region but, so far, there has been no complaint from the shipping industry. This system has proven to be effective with regard to protecting the environment at a competitive rate.

This process of collecting and transporting ship waste to treatment plants are handled by private companies subcontracted by the port authorities. Based on quotations received as a result of a tender, the two port authorities in Bremen and Bremerhaven selected the five most competent companies (out of nine) that have been registered and licensed as waste collectors and transporters by the state of Bremen. These companies have facilities—such as tank trucks, barges, or both—for the collection of oily residues or slops. The contract involves the removal, intermediate storage, transport to a treatment plant, and final disposal.

The most suitable contractor is selected by the port authority based on the required 24 hours notice from the ship or its agents. It includes the quantity and quality of the residues, expected time of arrival, expected berth, and requested time of operation. Prior to actual operation, an inspector of the port authority goes on board and determines the quantity for discharge free of charge and the pumping time allowed. A certificate is issued to the ship's command with a copy for the removal contractor. The contractor is required to take samples of the residues for analysis and classification. When presenting an invoice for payment, the contractor has to submit the certificate issued by the inspector together with the receipt of the treatment plant.

An average of 48 ships use this "free-of-charge" service per month in the port of Bremen alone. This accounts for approximately 12 percent of the total number of ships calling. The average amount of residues received from a ship is 12.6 m³ at an average cost of deutsche mark (DM) 1,591. The state of Bremen pays a total of 3.6 Million DM per year for this service in Bremen and Bremerhaven. Since this is not seen to remain

feasible in the long term, discussions are in progress with other ports in the region to establish a common reception system based on the "polluter pays" principle.

Cargo residues classified under MARPOL Annex I, Annex II, and others delivered by ships when calling at shipyards will also be accepted although these have to be arranged by the ship on its own account with a licensed contractor.



Garbage collection at the port of Bremerhaven.

Source: H. J. Roos

important provision is that only 30 percent of the total engine consumption of the ship, since its last removal operation, is accepted free of charge. Quantities in excess of 30 percent which also have to be discharged are charged certain fees. A second important requirement is that ships have to possess a minimum pumping capacity of 5 m³ per hour, for discharge quantities of up to 20 m³. Beyond 20 m³ on board, the ship's pump capacity must be able to discharge the total quantity in four hours or less. Pumping requirements in excess of four hours have to be paid for by the ship.

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WASTE EXCHANGE:

THE PHILIPPINE EXPERIENCE

... the principle of industrial waste exchange... The waste material of one company can become the raw material input of another.



Source: *Business and Environment*, Vol. 1, #2

In the last three years, the Philippine business sector has been supplementing its green efforts (i.e., conservation) with brown efforts, which are directly related to industrial operations, like pollution prevention, waste management, and cleaner production. This sector realized that they must also be concerned with the environment in order to sustain their existence. Indeed, environment has become a definite and legitimate business concern.

Maximizing the use of available resources helps ease the pressure imposed by industries to the environment. This is where the principle of industrial waste exchange comes in. The waste material of one company can become the raw material input of another. What one industry considers as useless can be useful to another. For example, shrimp heads which are wastes generated by prawn exporters are raw materials for animal feed millers. Brite dip, a liquid waste with high silver content generated by semiconductor manufacturers, can be used by contractors of concrete electric posts. Foil trimmings, generated by packaging material manufacturers, can be used as raw material by handicraft and ceramic manufacturers.

Who benefits from such exchanges? The first beneficiary is the waste generator who, at the minimum, saves on waste disposal or waste treatment cost and, oftentimes, derives revenue from the sale of these wastes. The second is the waste buyer who can acquire cheaper raw materials which can be obtained from a stable source. The general public can be considered the third beneficiary. The exchange prevents wastes from straining the very inadequate garbage collection system and, ultimately, protects the environment.

Industrial Waste Exchange Program

In 1988, the Industrial Waste Exchange Program (IWEP) was first implemented by the Environmental Management Bureau (EMB) of the Philippines' Department of Environment and Natural Resources (DENR), under a grant from the International Development Research Centre (IDRC) of Canada. EMB developed a database of waste materials available and waste materials wanted. However, because of government restrictions on fund management, the EMB was not allowed to collect fees in any form for the project, making it unsustainable. Thus, when the grant ran out in 1991, the project ceased.

A number of successful matches were effected during the project.

Millscale for ferrosilicon alloy manufacturing. The National Steel Corporation (NSC) located in Iligan City in Southern Philippines generates millscale waste with iron content of as much as 70 percent, in its washing/descaling system. The company used to dump this material in a site within their compound. Their immediate neighbor, Maria Christina Chemical Industries (MCCI) manufactures ferrosilicon alloys and uses steel scrap as raw materials. Since NSC produces about 15,000 tons/year of millscale, the two companies entered into an agreement whereby MCCI would buy a portion at P420/ton to replace its steel scrap as raw material.

Pineapple pulp as cattle feed. Del Monte Philippines generates about 36,000 MT of waste pulp annually, which the company uses to transport at P300/trip to a disposal site. This resulted in an annual maintenance cost of P52,000 to the company in the 1980s. When Philippine

Sinter Corporation established a plant site six kilometers from Del Monte, it began buying the waste pulp, using the excess heat from its sintering operations to dry the fruit pulp. The dried pulp is packed into bags and exported to Japan as cattle feed at very profitable prices.

Coconut water as beverage. Peter Paul (Phils.) Corporation is a desiccated coconut processing firm that generates a load of 80,000 liters/day of coconut wastewater. This waste is estimated to have a biological oxygen demand (BOD) load of 70,000 mg/liter. Another company, Chia Meci, processes 40,000 liters of coconut water into a beverage and exports it to Taiwan. It currently buys 50 percent of the waste coconut water of Peter Paul and uses it as raw material.

Change of Hands

In 1992, a group of concerned industries banded together to form the Philippine Business for the Environment (PBE) to help address issues related to the environment. A nongovernment organization called the Philippine Business for Social Progress, through its Center for Corporate Citizenship, encouraged PBE to revive the waste exchange program initiated by the EMB, and PBE took the challenge. Fortunately, the idea attracted such overwhelming interest that PBE was able to access grants from private companies, like San Miguel Corporation, the Philippine Investment Management Consultants, Inc. (PHINMA) Group, and international donor agencies, like IDRC, the United States Agency for International Development, and the World Bank Metropolitan Environmental Improvement Project, to support the program.



Source: *Business and Environment*, Vol. 1, #2

As part of the program, PBE keeps a database of waste materials available and waste materials wanted. At present, there is a total number of 981 entries from 520 participating companies, broken down into 829 materials available and 152 materials wanted in 11 categories. These are published in **Business and the Environment**, a bimonthly publication of PBE, which serves as the principal vehicle for disseminating information regarding company waste generators and waste buyers. The list is also published in the electronic bulletin board of the Philippine Sustainable Development Network (PSDN), of which PBE is a board member. The PSDN is an autonomous body that provides services to organizations espousing sustainable development.

Aside from maintaining the database, PBE proactively searches for potential matches for waste exchange.

Since the time the program was revived, there has been a number of successful waste exchanges. These include the glass cutlets generated by the Philippine Electrical Manufacturing Company, which are bought by Republic Glass Asahi as raw material for its glass manufacturing process and the used steel drums of Sterling Products International, which is bought by Hoechst Philippines for the packaging of its surfactants and textile auxiliaries.

Environment and Profit

The concept of industrial waste exchange has caught the interest of many people in the industry. The concept makes good sense and, given time, should be widely practiced. If it succeeds, it will be another proof that, for business, environment can be a profitable concern.

Categories for Industrial Waste Materials Listed for Exchange

Acids	Organic Chemicals
Alkalis	Plastics & Rubber
Inorganic Chemicals	Solvents
Metals & Metal	Textiles & Leather
Sludges	Wood & Paper
Oil & Waxes	

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GOVERNMENT AND INDUSTRY'S PARTNERSHIP IN OIL SPILL PREPAREDNESS

A major marine oil pollution incident, from any source (e.g., from tankers; offshore oil production; pipelines; shoreside storage; or handling facility) can pose a serious threat to the marine environment and related interests of one or more countries well beyond their capability to deal with it. Thus, the International Convention on Oil Pollution Preparedness, Response and Cooperation, 1990 (OPRC Convention) was enacted and came into force on May 13, 1995, with currently 27 Contracting Parties. The main objectives of this Convention are to facilitate international cooperation and mutual assistance in preparing for and responding to oil spill incidents and to encourage states to develop and maintain adequate capability to deal credibly with oil pollution emergencies. The Diplomatic Conference that adopted the Convention recognized that its principles are equally applicable to marine pollution incidents involving hazardous substances other than oil. Hence, the International Maritime Organization (IMO) has begun the process of formally expanding the Convention to include hazardous substances.

Developing countries represent a high proportion of those at risk from oil pollution incidents, and the Convention recognizes the importance of building the capacity of these countries to respond to such risks through technical cooperation and transfer of technology. Indeed, the ultimate effectiveness of the Convention will depend on the extent by which collaboration of governments and industries at the national, regional and global levels can build the capacity of countries to prepare for, respond and mitigate the effects of oil pollution incidents.

Government-industry Cooperation

The OPRC Convention explicitly accepts the *polluter pays* principle and the importance of involving the oil and shipping industries in the establishment of viable oil spill response arrangements. The first cooperative IMO-industry venture was in a series of joint regional seminars based on the "tiered-response" approach to the contingency planning process, aimed at promoting government and industry cooperation. Within 1991-1994, eight seminars were held, with the first in Jakarta, Indonesia. The seminars emphasized the need to support continuing action, in the form of funded projects and industry

commitments, to develop national response systems and related training programs. One such response is a joint project, entitled *IMO-Industry Global Oil Spill Planning Initiative (GOSPI)*.

The GOSPI Project and Its Activities

The overall objective of the GOSPI project is to improve and sustain the capacity of developing countries to protect their marine and coastal resources at risk from an oil pollution incident, through the Convention. To meet this objective, a series of subprojects are proposed over a five-year period, utilizing industry's expertise and resources, government participation, and financing by bilateral and multilateral funding sources.

Contingency planning process. Countries differ according to the degree of exposure to the risk of oil pollution incidents and their environmental and economic consequences, and the degree of preparation to cope with such incidents. Assistance will be provided; but it will depend on the extent of such risk and the status of national contingency planning. Areas covered include risk assessment, environmental sensitivity and index mapping, evaluation, and

testing of existing contingency plans, development of response strategies, identification of equipment needs, and the initiation and further development of a national response system. This includes oil pollution emergency plans for ports, offshore units, and oil handling facilities, as well as training and application programs for response personnel.

Training. Training activities will center on the *IMO Model Course Programme on Oil Pollution Preparedness and Response*. The programme components include trainer's training material that caters to operators, supervisors, and managers. The project will provide resources to deliver each of the Model Courses (i.e., a self-contained package of instruction materials and trained trainers) in cooperation with industry and designated national or regional institutions. Follow-up assistance will be provided to such institutions in firmly establishing the courses and integrating them into existing curricula of marine studies.

Sustainability. The long-term success of this project will depend on the extent by which participating countries are able



An oil tanker berthing at an oil terminal.
Source: IMO, MARPOL: How to do it

to sustain the project activities, given other high-priority issues and limited resources. The project will also provide resources to explore and develop appropriate sustainable financing mechanisms involving public sector-private sector partnerships.

Implementation Strategy

Implementation of project activities will involve participating countries, through the national and local industry focal points, using local experts and institutions. Where viable regional centers, organizations, or programs exist, they will be used to coordinate and integrate activities at the regional level, like those under the United Nations Environment Programme (UNEP) and IMO. Clearly, the GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas (MPP-EAS) could fall into this category. The project will be coordinated at the global level by IMO and the International Petroleum Industry Environmental Conservation Association (IPIECA), in conjunction with other technical organizations (e.g., International Tankers Owners Pollution Federation (ITOPF) and the GEF partners (World Bank, UNEP, UNDP). Most importantly, government and industry in participating countries will work in partnership to define project activities and to confirm commitments.

New Initiatives

In the past, oil pollution preparedness and response projects have been the subject of independent IMO technical cooperation projects, regional initiatives, bilateral aid programs, and ongoing industry activities in countries where they operate. However, the key innovative feature of the GOSPI project is the emphasis on strengthening industry-government cooperation by mobilizing the international oil industry's marine environmental protection capacity (e.g., expertise; facilities; research capacity; training). A second innovative aspect is the intention to provide assistance from the development stage to a fully tested or exercised national contingency plan, including the related training package. It is expected that, through the coordination of IMO and IPIECA with related international and regional organizations, duplication will be avoided and synergy will be achieved by countries in the region sharing experiences among themselves.

Current Status and Prospects

Although industry will not be contributing cash to the project, the value of its resources are expected to match the funds being requested from potential bilateral and multilateral donor organizations, estimated at US\$ 30 million for five years. Given current conditions of the national budget and the relatively low funding levels assigned, for example, the GEF component on the protection of international waters, obtaining the required funding to reach a "critical mass" represents the greatest challenge. However, it may be possible to begin the project activity on a pilot basis in those regions most attractive to donor funding, or where ongoing programs may benefit from relatively low-cost "gap-filling" activities.

With the support of the GEF/World Bank, United Kingdom Overseas Development Administration, the South African

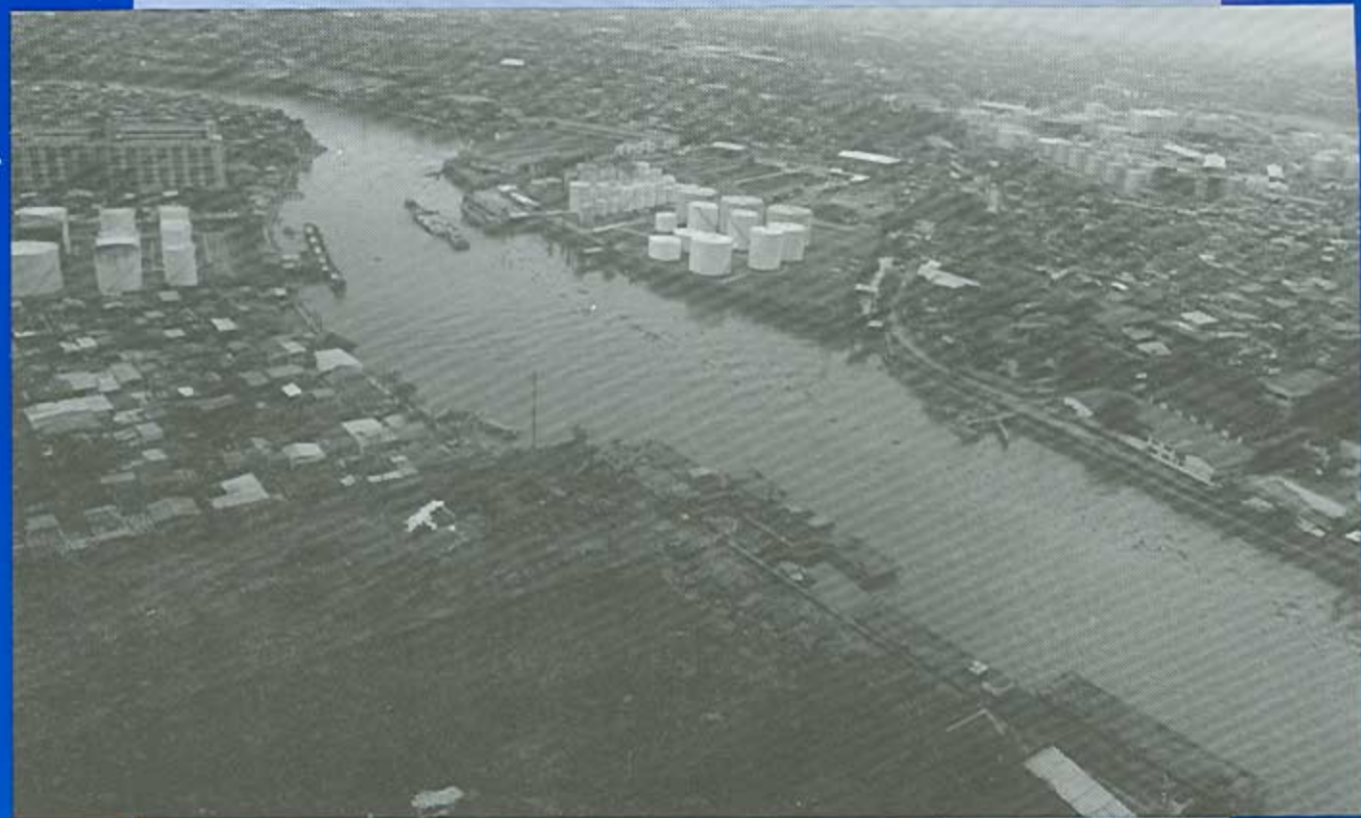
The key innovative feature of the GOSPI project is the emphasis on strengthening industry-government cooperation by mobilizing the international oil industry's marine environmental protection capacity.

Government and the Oil Industry, the first phase of the project will be launched in Africa starting with an *IMO-Industry Oil Spill Planning Meeting* in Cape Town in March 1996, to develop subregional needs and national project activity profiles. This meeting will be preceded by team visits of experts from IMO and industry to three African coastal countries to determine specific needs, to agree to a program of activities, and to determine the inputs required from industry and government. On the basis of presentations from these and other countries, the meeting will develop subregional needs and national project activity profiles. It will be followed up by joint missions to countries wishing to participate in the project. It is anticipated that a comprehensive regional project for Africa will be proposed for favorable consideration by the GEF and interested bilateral donors.

Application to the Wider East Asian Seas Region

The Southeast Asian Seas region, particularly the straits, are at considerable risk from oil pollution incidents associated with tanker accidents and other offshore activities. However, there have also been corresponding oil pollution preparedness activities carried out by the countries at risk with the support of the Association of Southeast Asian Nations (ASEAN), UNEP-Coordinating Body on the Seas of East Asia (COBSEA), IMO, and bilateral programs; (e.g., of Japan, Denmark, and Norway). The Malacca Straits Demonstration Project (MSDP) is one of the MPP-EAS's most recent activities aimed at pollution-risk assessment and management in the Malacca Straits. Given the relatively high level of preparedness established by governments and industry in the Malacca Straits, the application of the GOSPI project will have to build on previous work and aim to fill any gaps identified by the participating countries in the region, not covered by any ongoing projects (i.e., of government/industry). The activities of the MSDP with respect to the valuation of the Malacca Straits, the development of an environment profile, and the identification of financial mechanisms should, at least, be incorporated in the GOSPI project to benefit other regions. Unfortunately, none of the 11 countries participating in the MPP-EAS has ratified the OPRC Convention. Although ratification is not a prerequisite for participation in the GOSPI project, it is considered by donor agencies to be an indication of government commitment to the objectives of the project and would doubtlessly facilitate financial support.

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Aerial view of the Pasig River, Philippines.

Source: Pasig River Rehabilitation Program

SAGIP PASIG

REVIVING THE PASIG RIVER

The Pasig River passes through the center of the Manila Metropolitan area, the Philippines' national capital region, linking the freshwater Laguna de Bay to the Manila Bay which drains into the South China Sea. Its complex network of tributaries includes the Marikina and San Juan rivers that pass through several cities and municipalities of Metro Manila. Before the 1500s, the river served as a trade route for the local inhabitants and Asian traders. With the coming of the Spanish *conquistadores*, the areas along the lower reaches of the Pasig River to Manila Bay were transformed into a city over the next three centuries; the river mouth turned into a port for the galleon trade. Since then and especially after World War II, the Pasig River has begun to deteriorate.

Cleaning up the Pasig River seemed to be an impossible task. Many tried but none succeeded. The task required not only a face lift but a holistic long-term approach. The feasibility study conducted by the governments of the

Republic of the Philippines and Denmark to save the river prescribed a 15-year program, involving the collaboration of various government agencies, civic groups, business and other private organizations, as well as the help of every resident in Metropolitan Manila.

In June 1993, the Pasig River Rehabilitation Program (PRRP) formally commenced. For its first five years, efforts are directed at reducing the river's pollution loading from industrial, commercial and domestic sources; improving the general environmental condition in the communities along the Pasig River and its tributaries; and institutionalizing interagency and private sector cooperation.

Two years have passed since and with guidance from the Presidential Task Force on Pasig River Rehabilitation, the PRRP and its partners were able to achieve extensive mileage toward its objective of bringing the historical river back to life.

The people should continue to advocate and work to revive the river, coordination channels have to be institutionalized, and financing assistance need to be sought and made secure. Above all, political will is necessary for the Program to keep its commitments.

First, Environmental Liaison Offices in seven key government agencies were created to strengthen linkages among the partner agencies designated to implement various projects of the PRRP. The City of Makati donated three million pesos for the construction of two skimmer boats, with help from the Philippine Navy, to collect floating debris along the Pasig River System. These efforts are augmented by collection boats acquired by the Metropolitan Manila Development Authority and the Department of Environment and Natural Resources (DENR) River Rehabilitation Service. The Municipality of Marikina expanded its River Park; while the Cities of Makati and Mandaluyong developed their own riverside parks.

As its share in the endeavor, the Department of Public Works and Highways constructed a 320-linear meter gravity wall along the San Juan River and dredged 100,000 m³ of sediments at the mouth of the Pasig River. About 1,730 urban poor families residing along the river were transferred to various relocation sites through the efforts of the various local government units, the National Housing Authority, the Office of the President, and the Armed Forces of the Philippines.

To date, the Program has completed the detailed design of its Manila Second Sewerage Project (MSSP) and an environmental impact study (EIS) is currently under review by the Environmental Management Bureau of the DENR. This year, only 2,700 of the year's target of 5,000 septic tanks were desludged due to problems on sludge disposal sites. Once implemented, the MSSP is expected to increase desludging of septic tanks in the metropolis to 60,000 per year. This will reduce biochemical oxygen demand (BOD) loading from septic tanks by about 50 percent.

To augment the capabilities to respond to Program needs, about 128 months of skills development and capability-building trainings were conducted for the PRRP partner organizations.

Second, with the full compliance of 10 major water polluting firms to environmental standards, BOD loading from industrial sources was effectively reduced by 11 metric tons per day by May 1995. For the Phase 2 of the Industrial Liquid Waste Minimization Program, the PRRP partners will be extending technical assistance to 16 textile and snack-food companies. In support of the program, an information data bank was established covering an initial 1,000 companies and involving a number of government specialized bodies and agencies, such as the Laguna Lake Development Authority, the Metropolitan Environmental Improvement Program and the DENR-National Capital Region.

Third, in line with community efforts on waste management, 14 *barangays* (villages) were organized by *Sagip* (Save) *Pasig* Movement. Three large-scale clean-up activities and a number of community-based clean-up drives were conducted in the participating *barangays*. New microprojects were launched, such as school and community-based composting and solid waste collection and projects to strengthen junkshop cooperatives. To increase awareness among the youth, journalism contests were conducted in schools, while teaching modules on Pasig River-related concepts for elementary and high schools are being prepared.

Finally, the Program initiated the fund-raising campaign called *Piso Para sa Pasig* (A Peso for the Pasig), which was launched in 7 October 1995. It organized an exhibition golf show with the Philippine President participating and held at the Malacanang Golf Course last September 1995. The fund now amounts to 6.2 million pesos.

A significant sign that the river is improving included a more pleasurable cruise along the Pasig River, which used to be repulsive in 1990. The banks of the Pasig River have improved in aesthetic quality with the construction of river parks in strategic areas, the relocation of more than 10 percent of urban poor families, regular clean-ups, and other waste-management activities; while, dredging activities and the salvaging of sunken vessels have improved transport and navigational activities.

Indeed, much has been done; but more is required. The challenge is to sustain these activities in the next 13 years. The people should continue to advocate and work to revive the river; coordination channels have to be institutionalized; and financing assistance needs to be sought and made secure. Above all, political will is necessary for the Program to keep its commitments.

Renato D. Cruz
Assistant Project Director
PRRP



CAN SMALL ISLAND STATES MANAGE THEIR LARGE COASTAL AREAS EFFECTIVELY?

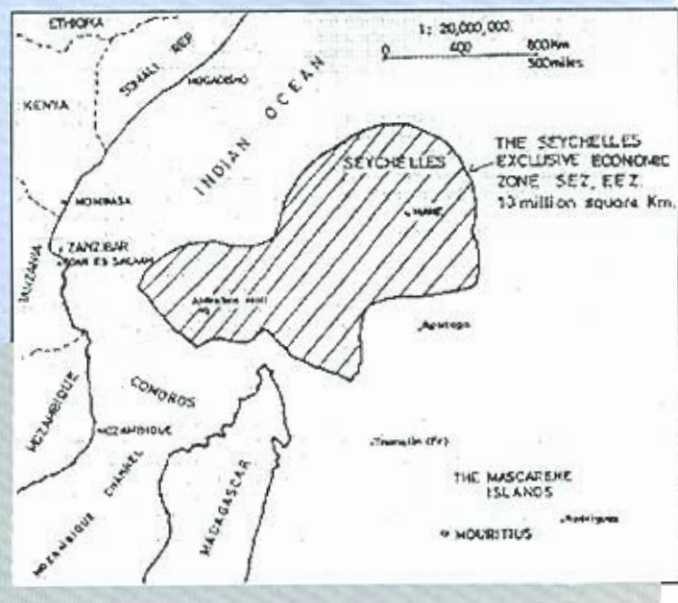
A PERSPECTIVE FROM THE SEYCHELLES

For those of us in small islands, virtually the entire island population can be considered coastal. That simple fact alone means that coastal areas or zones should be brought to the forefront of international debate on environment and sustainable development of Small Island Developing States (SIDS).

Small island states like the Seychelles, characterized by great expanses of marine territory, have a large coastal area proportional to its land mass ratio. These coastal areas are the most productive and richest natural "capital" of the country. On the other hand, these are also the areas where use conflicts for space and resources are most pronounced. In these cases, one recognizes that a new approach to development and management—which is integrative, precautionary, and anticipatory, as recommended by UNCED's Agenda 21—becomes necessary.

The Republic of Seychelles is made up of 115 islands spread over a 1,374,000 km² Exclusive Economic Zone. The total land area is only 455 km² and situated in the Western Indian Ocean between 4° and 11° south of the equator. Mahe is the main island and the seat of government. Forty-one islands have granitic soil structure and all found within a radius of 50 km from the main granitic island of Mahe. With a land area of 148 km², Mahe amounts to one third of the total land area of the archipelago. The remaining 74 islands are all coralline. The furthest island from Mahe is the coral atoll and World Heritage Site, Aldabra, 1,150 km to the south. The population of 73,850 individuals is distributed in the three islands of Mahe, Praslin, and La Digue, while the coralline islands support a population of 300 persons. Most of the Seychelles, particularly the coralline ones, can be considered coastal zones in their entirety due to their size and homogeneity, even in the highly granitic islands, where the elevated terraces or plateaus are the most easily recognizable portions of the coastal zone.

Historically, human activities had led to the modification of the coastal ecology of the islands. Freshwater marshes and mangrove wetlands have been destroyed and reclaimed for human settlement, tourism development, fisheries, and light industries. Most of the coastal vegetation had been



Location map of the Seychelles Islands, East Africa.

replaced with coconut plantations. To date, the country has five Marine National Parks; four Shell Reserves; four Special Nature Reserves, two of which also include marine areas; two islands (and submerged banks) that are Protected Areas; and eight islets that are Nature Reserves. However, only six of these are actively managed.

Eighty-seven percent of the population and activities are centered on the small narrow coastal strip of Mahe. This strip has now become the environmental hotspot of the country. Pollution, solid-waste disposal, overfishing, sale of marine souvenirs, and exploitation of endangered sea turtles are all major threats to the environmental integrity of the country's coastal zone. Erosion of beaches has, in particular, drawn much government and public attention recently, although very few people are aware of the ramifications. Open access to resources underlies the continued overexploitation of coastal and marine resources in the Seychelles. Where legal regimes exist, lack of adequate enforcement is a pressing concern. In many small islands, "everybody knows, or is related to, everybody else" and this poses severe constraints on the proper functioning of enforcement and judicial systems.

There is no single oversight organization for this zone and interdepartmental problems are compounded by the

continued on page 27

WHO WINS IN ENVIRONMENTAL PROTECTION?

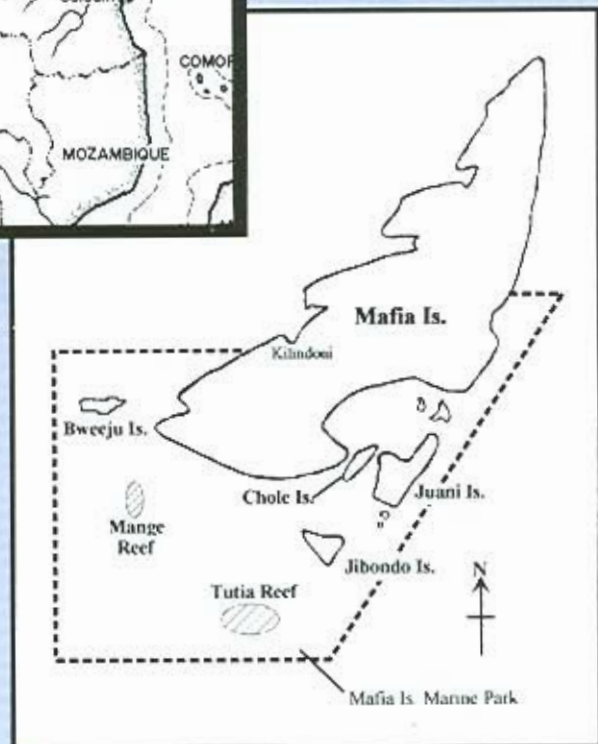
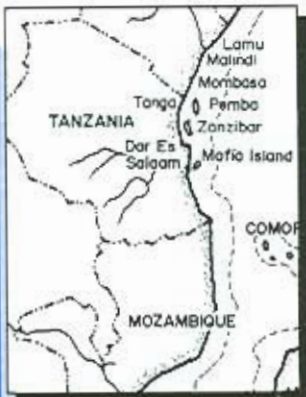
THE CASE OF THE MAFIA ISLAND MARINE PARK

Conservation projects or other attempts to protect the environment are seldom carried out without resistance, especially for coastal communities directly dependent on the marine environment for resources. This is true in many developing countries, characterized by a large number of people relying on the coastal environment. These people often belong to groups with varied and opposing interests, typically represented by conservation groups, donor agencies, local resource users, commercial investors, the local government, and the national authority mandated by laws and regulations to guard their rights. Often, these interest groups rightfully claim a share of the conservation "cake". Thus, the problem involves dividing this "cake" in a way that allows for sustainable resource use but at the same time addressing the needs of each group fairly.



Various resources are obtained and utilized within the coastal zone. Fishing boats are built from local timber and, in addition to fishing, they are also used to collect and transport other resources, such as the coral blocks pictured. These are an important local-building material on Mafia Island.

Photo by J. E. C. Andersson



Map of the Mafia Island, location within the East African coast in inset.

In this regard, there has recently been much emphasis on local community participation in conservation projects aiming at protecting the rights of stakeholders in a proposed conservation area (Andersson and Ngazi, 1995; McNeely and Miller, 1984; McNeely, 1988; Wells and Brandon, 1993a&b). This approach has shown that community participation is extremely important in the development and implementation of protected areas or parks. The most important factor is that these communities possess an intimate knowledge of their local environment based on centuries of experience in resource extraction and utilization. This indigenous knowledge of historical "natural" capacity for extraction, seasonal characteristics of the resource, as well as perceived linkages between ecosystem components in the area, provides a level of protection. While indigenous knowledge is often questioned or ignored by environmental researchers, various investigators have shown them to be quite accurate and well-developed, even if the "language" used is not in accordance with accepted terminologies of science or economic research (Berkes et al., 1993; Gadgil et al., 1993; Ostrom, 1991).

When studying marine protected areas, we need to consider that the knowledge gained from implementing and managing terrestrial parks and sanctuaries cannot always be applied in marine conservation projects. This is largely because of the great difference in the specific nature of the two ecosystems and their resources. Scientific data required

This approach has shown that community participation is extremely important in the development and implementation of protected areas or parks.

for effective management of the marine environment are often much more difficult to obtain. Thus, our understanding of the relationships, effects, and consequences of human activities is even more constrained compared to that of terrestrial ecosystems. This is particularly true in the case of human extraction of marine resources, where catch statistics are often unreliable and difficult to monitor. For example, small-scale fisheries often lack conventional markets and well-organized landing sites in coastal villages. Other sources of uncertainty, such as corruption and black markets, further influence the quality of official figures. Also, the marine product sector is heavily dependent on surrounding infrastructure systems because the harvest is often a perishable product that requires quick and safe distribution. In addition, most artisanal fishermen are simultaneously involved in more than one activity. In the case of Mafia Island in Tanzania, the majority of marine resource users are involved in at least three different activities. Finally, there is the problem of monitoring since the sea is characterized by an infinite number of entry points such that the ability to control activities in the open seas is very limited.

A recent study on Mafia Island involved a survey of economic benefits from the marine environment by local resource users (Andersson, 1995). This area has been the subject of conservation planning for the last 20 years but was only declared by the government as a national marine park in early 1995. Mafia is situated in the Western Indian Ocean south of Zanzibar, approximately 20 km from mainland Tanzania. The waters surrounding Mafia are considered to be among the richest in the East African coast and the area contains samples of the majority of biotopes and ecosystems characteristic of a tropical marine environment. It includes coral reefs, mangroves, seagrass beds, and lagoon ecosystems. The waters surrounding Mafia are relatively pristine but, with the increasing destructive activities, came the move to vigorously promote the conservation or protection of this area in recent years. In accordance with the character of the region and the related resource users, Mafia has been classified as a multiple-use management area. The number of marine resource users living within the park area is approximately 4,000 (Andersson, 1995) composed of artisanal resource users, using dugout canoes or smaller locally built fishing vessels, who apply traditional methods to harvest marine resources.

The overall objective of the Mafia study was to determine the true value or benefit that the local communities obtained from the marine environment given their present lifestyle. This information is significant considering the fact that economic benefits, when altered or removed from this group of people and not replaced or properly compensated, incur a cost on society through a loss of welfare. In economic terms, this is considered not *Pareto optimal* (i.e., a state of less than optimum welfare). In the case of Mafia Island, the claim is that introducing another interest group (such as tourists) as a new source of income and employment will increase the benefits to local resource users. To verify this premise, however, we need to assess the present benefits before any restrictions or alterations take place and the effect of the introduction of tourism.

Results showed that the marine environment at the time of the survey provided for a significant source of income, food, and other sources of well-being to the local resource users. Not surprisingly, the benefit that provided the largest economic value was the direct use value defined as a combination of production value and consumption value. Production value is the benefit received from trading the resource; while consumption value is the benefit provided by the resource exclusively for the household. The estimated total direct use value amounted to approximately US\$ 3.8 million per year, of which US\$ 0.7 million was used for subsistence purposes. The marine resources covered in the study were finfish, octopus, corals, sea-shell, and sea cucumber, but there are several others not included, such as algae, mangroves, and the production of fishing gear. This means that the actual value is much higher.

Also noteworthy are the values not usually considered when carrying out projects in developing countries; i.e., non-use values such as existence and bequest values. These were also seen to play a significant role for the well-being of the local community in Mafia. These types of benefits are not considered marketable. Therefore, these values need to be estimated by other methods, such as eliciting people's willingness to pay for non-marketable or public goods, called the Contingent Valuation Method prevalently applied in developed countries. In this study, non-use value was estimated to be approximately US\$ 2 million yearly. Among the most common reasons behind the values given

The sum of the different benefits for the community should increase, and never decrease, such that the intrinsic incentive is to support the marine park itself.

by the respondent was that they enjoyed their life as marine resource users (i.e., as free agents) and that they wanted their children to grow up in the same environment as they did.

Clearly, these values represent a significant economic value. Thus, even as new interest groups, such as tourists, may well represent an equally great or greater economic input in the short term, it is essential that the pre-existing values of the environment are adequately accounted for such that community well-being is not compromised in the long term.

To complete the study, however, the total economic value must include destructive activities that are seen as costs since they degrade the environment and lower the welfare of the community. In Mafia, the actual threat to the marine environment did not come from local resource users but from external or visiting resource users (i.e., fishermen). This constitutes an even greater danger since there is no direct long-term incentive to use the resource sustainably. When one area is depleted, visiting resource users move to new fishing grounds which are economically more profitable to fish in.

In Mafia Island, these visiting fishermen come from the coasts of mainland Tanzania. Some have been fishermen for generations; but others are previously unemployed people from the cities who took to fishing as a secondary source of income. Many of these fishermen travel long distances as their area of origin have already become economically nonviable due to overfishing and the use of destructive fishing gears, such as dynamite and small mesh-sized nets. In some areas, such as Dar es Salaam and Tanga, this has effected a decrease in productivity and near-depletion of certain resources/species. Visiting fishermen often move into new fishing areas bringing harmful techniques with them as fast and less costly methods of resource extraction; and these are then slowly adopted by the local fishermen in the new area. Thus, dynamite fishing is becoming more common in Mafia Island. Two days of work using dynamite brings a net income of about 30,000 TSh (Shillings) or approximately US\$ 70 per individual fisherman, which is more than three times the monthly



Weighing the octopus catch on Mafia Island prior to sale. The octopus is purchased both by local consumers, as well as by sellers from other distant towns and cities such as the capital, Dar es Salaam.

Photo by J. E. C. Andersson

salary of a fishery officer (Andersson and Ngazi, 1995). It should be emphasized that the income earned from illegal fishing does not represent the true income to society, since it involves negative externalities, i.e., costs that are not accounted as part of production costs but incurred by a loss of resources and productive ecosystems resulting from the use of harmful methods. Removal or alteration of such activities will improve social welfare.

What then is the *Pareto-optimal* solution - the solution that will provide all interest groups with the same or better level of well-being once the Mafia Island Marine Park is implemented? The small survey conducted is yet unable to answer this. However, certain points are clear. First, it is important that, relative to their present lifestyle, all existing benefits for the community and resource users need to be taken into consideration. Second, evaluation should include negative externalities to determine

methods to sustain the welfare of the present society in Mafia. The sum of the different benefits for the community should increase, and never decrease, such that the intrinsic incentive is to support the marine park itself.

Jessica Andersson and Ron Johnstone

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COASTPLAN

CCOP'S INITIATIVE TO HELP SHAPE A FUTURE FOR SOUTH AND SOUTHEAST ASIAN COASTAL ZONES

Over the last few years, many initiatives have been undertaken to assess various perspectives in resolving coastal zone management (CZM) problems. Being aware of the fragility of the coastal zone under the threat of global climatic change, the Coordinating Committee for Coastal and Offshore Geoscience Programmes in East and Southeast Asia (CCOP) sponsored a workshop on the role of geosciences in global climatic change in 1989. The CCOP is a regional body established in 1966 with 11 member countries from East Asia, including Papua New Guinea. Its mission is to initiate applied geoscience programmes for the sustainable development of coastal and offshore areas in East and Southeast Asia. The Committee has established a CZM component in its work program. In the early 1990s, with support from cooperating countries, the Committee conceived the COASTPLAN. This was submitted to the government of the Netherlands for funding.

What is the COASTPLAN ?

The COASTPLAN is a geoscience-based plan to mitigate possible adverse effects of development in the coastal zone. It provides Committee member countries with a framework to integrate geoscientific, engineering, environmental, and socioeconomic data; therefore, applying a multidisciplinary and multisectoral development planning approach.

The COASTPLAN aims at creating a framework for the implementation of geoscience in integrated natural resources and environmental management, land-use planning, vulnerability assessment, and human resources development. Furthermore, it seeks to develop common Southeast Asian standards for integrated CZM through case studies and seminars. Its ultimate goal is increased awareness among political leaders and decision-makers regarding ICZM as fundamental to the sustainable development of coastal areas.

The plan seeks to: (a) improve government planning; (b) alleviate poverty; (c) improve health conditions of the population; and (d) promote sustainable development. To be most effective, participants are expected to be actively involved in their country's coastal zone management efforts, even after the project life. Hopefully, Committee member countries can develop a national policy plan with geoscience contributing to the management of coastal zones.

In recent years, a number of programmes ensued bearing the same objectives as COASTPLAN. However, the Plan differs primarily in its advocacy of the geoscientific approach. In any case, it collaborates closely with other ICZM programmes following common procedures (e.g., the Intergovernmental Panel on Climate Change criteria and internationally accepted frameworks). The Plan ensures that it does not duplicate existing programs in the region; rather, it complements related programs (e.g., UNEP Regional Seas Programme, ESCAP Urban Geology).

Phases of the Plan

The COASTPLAN has three phases for its 1995-1997 operation.

Phase I (April 1995): It involved the appointment of an ICZM expert assigned in the CCOP Bangkok office.

Phase II (July 1995): It involved the organization of roving seminars which were opened to Committee member countries. The seminar objectives were: (a) to transfer knowledge on ICZM to regional and national bodies; (b) to bring together participants in national COASTPLAN study teams; and (c) to prepare and support the implementation of national and regional COASTPLAN case studies. Three roving seminars were organized and implemented near the sites identified for further study. The seminars were a mixture of theory and practice, with portions appropriate to policy and decisionmakers.

Phase III (January 1996): It involves the compilation of instructive case studies on areas in East and Southeast Asia that experience significant coastal zone problems.

Thus, case studies at the national and regional levels, together with the roving seminars, can prove to be the most effective approach to encourage integration of geoscience in resolving some of the coastal zone problems. As the COASTPLAN is applied, coastal areas chosen as potential case study sites may be characterized by the following geological features:

- (a) Tropical erosional island arc
- (b) Temperate accretional continental margin
- (c) Tropical erosional continental margin.

The COASTPLAN aims at creating a framework for the implementation of geoscience in integrated natural resources and environmental management, land-use planning, vulnerability assessment, and human resources development.

Simplified Organizational Diagram of COASTPLAN

National Working Group

National Working Group

National Working Group

International Agencies and Cooperating Countries

Regional Working Group

Task Force Support Group

CCOP Technical Secretariat
Project Coordinator

The COASTPLAN Organizational Structure

COASTPLAN maintains a simple organizational structure with short communication lines to ensure swift development of CZM skills among member countries with minimum cost.

Majority of CCOP member countries have either existing CZM projects or projects in their preparatory stages. The effectiveness of COASTPLAN can be facilitated by compiling experiences and evaluating existing projects of the Committee member countries. Also, scientific data resulting from the implementation of case studies can be translated into appropriate policy actions.

Bert van der Valk
CCOP Technical Secretariat



CCOP member countries: Cambodia, China, Indonesia, Japan, Korea, Malaysia, Philippines, Papua New Guinea, Singapore, Thailand, and Vietnam

THE SEYCHELLES

(from page 22)

severe lack of local experts within the government. For example, the recent virulent vascular wilt disease that struck coastal *Alexandrian Laurel* or "Takamaka" trees took government a year to respond, after the disease was identified and mitigating measures were recommended.

Apart from the government, there are two international NGOs, a local NGO and a quasi-NGO, involved in coastal conservation, and a private firm specializing in coastal and marine environment management in the Seychelles.

The Environmental Management Plan of Seychelles for 1990-2000 contains several coastal zone projects, but many have yet to be implemented owing to human and financial constraints. At present, donor-driven coastal projects include the GEF projects for the Aldabra World Heritage site, Protection of Marine Turtles, and the implementation of the MARPOL Convention; the Commission de l'Océan Indien (COI) regional project; and the European Union (EU)-financed Biodiversity Conservation and National Parks Program being partly implemented by the World Conservation Union (IUCN). However, concessionary aid,

in general, to the Seychelles has fallen by 66 percent since 1990, primarily owing to the country's relatively high per-capita income.

The sustainable development of the coastal and marine areas of Seychelles rests squarely on the nation's ability to mobilize its institutional capacity for adequate conservation, monitoring, management, and education. In addition, realistic and long-term priorities must be set and adhered to. At present, "fire-fighting" is the norm and "too few people doing too much work" is the usual complaint. The movement of Seychelles experts from government service to private enterprise is continuing, especially in the face of a liberalizing economy. Thus, innovative methods of management must be adopted very urgently, including: (a) subcontracting to private enterprise; (b) supporting and encouraging NGO participation; (c) providing more flexible work hours in government, particularly for women with special skills; (d) using modern information technology; and (e) harmonizing and consolidating similar projects and programs.

Nirmal Jivan Shah
Chief Executive, ENVLRO.



ISO/TC 207/SC 2 'Environmental Auditing and Related Environmental Investigations'

At the Oslo meeting, ISO/TC 207/SC 2 also agreed that ISO/CDs 14010.2, 14011/1.2 and 14012.2 should be elevated to the Draft International Standard (DIS) stage. The SC 2 documents will follow the same timetable as the SC 1 documents. Therefore, all five documents are expected to be published together.

The Eco-Management and Audit Scheme (EMAS) Regulation, the European Commission (DG11), the Article 19 Committee, and CEN/PC 7

The draft ISO 14000 documents have been circulated to various countries worldwide for comments and review and the result is forthcoming. Thus, the following sections relate to the countries of the European Union (EU); in particular, the United Kingdom (UK) experience.

The EMAS Regulation was published in 1993 and came into force in April 1995. Its implementation in any EU country is voluntary. The CEU issued a mandate to CEN to write standards in order to provide an implementation mechanism for countries wishing to participate in the EMAS. Upon its acceptance of the Mandate in October 1994, CEN was allowed 18 months to provide the standards in draft on or before April 1996. CEN expects that the EMS and EA standards being written in ISO by TC 207 would fulfill the requirements of standards set by the CEU and thus, has implemented a parallel voting procedure under the Vienna Agreement on 14001, 14010, 14011/1, and 14012.

At each stage in the development of the draft ISO standards, CEN/PC 7, the CEU, and the 'Article 19 Committee'—made up of the governments of the EU states—reviewed the

documents to determine its potential to fulfill the mandate and to ascertain whether or not CEN should start work on complete standards/additional text. A CEN/PC 7 task force met in London in August 1995 to evaluate the latest batch of documents produced in Oslo in June 1995.

The Role of the British Standards Institution (BSI)

BSI holds the Secretariat of ISO/TC 207/SC1 'Environmental management systems'. The first revision of BS 7750 was published in 1994, after an extensive pilot programme that provided feedback on implementation. A number of countries have developed EMS standards based on BS 7750, including Ireland, France, and Spain.

The BSI Committee that developed BS 7750 now oversees the work in ISO/TC 207/SC 1. It comments on all drafts and send delegations to the meetings of SC 1 and experts to the meetings of SC 1/WG 1 and SC 1/WG 2.

The BS 7750 Linkage to the EMAS Regulation, UK Accreditation and Certification/Verification Arrangements

BS 7750 specifies requirements for the development, implementation, and maintenance of EMS. This does not include certification provisions, but provides the requirements allowing certification. EMAS encompasses a total scheme which, in addition to specifying requirements for EMS, requires independent verification of compliance and the production of a public environment statement. Article 12 of EMAS allows the CEU to recognize standards and appropriate certification procedures in compliance with the corresponding requirements of EMAS. BS 7750 broadly covers these requirements and it is expected that the standard—along with the certification procedures governed by NACCB's accreditation criteria—will

RECEPTION, TREATMENT AND MANAGEMENT OF SHIP WASTES IN GERMANY

(from page 15)

Handling of Annex V Waste in the Ports of Bremen and Bremerhaven

In their waste collection and disposal plan, the municipalities of Bremen and Bremerhaven agree that ships calling at their ports have to be treated like any other households within their jurisdiction. Thus, ships have to deliver their accumulated household-type wastes to the incinerator plants. The execution of this regulation is entrusted to the port authorities. Previously, the amended port by-laws required all ships to discharge all wastes prior to their departure.

The port authorities entered into a contract with a private company, licensed as a garbage collector and transporter, that has a certified intermediate storage facility. The contract covers the distribution of receptacles—either plastic bags or garbage bins—by the contractor to each ship on its arrival, the collection of the bins prior to or upon the departure of the ship (whereby the ship is requested to assist returning the receptacle to shore), the separation of the garbage at the contractor's premises (if

not already separated on board by the ship's crew), transportation to the incinerating plants, and incineration. For collection and transport, the contractor uses a normal open lorry with separation compartments.

The contractor is paid for services rendered based on the number of receptacles provided and collected. Monitoring is fairly easy as the amount of receptacles placed on board is based on the gross tonnage of the ship. As required, additional receptacles are ordered by the ship through the port authority. Of the total amount paid to the contractor, approximately 2 percent covers costs for providing the receptacles, 8 percent goes to the final disposal of the contents of each receptacle, and 90 percent to distribution, collection, and transport. With regard to the latter, the labor and transport costs form the basis for negotiations. At the same time, it provides an adequate profit to the contractor. The costs to the port authority are recovered by charging the ships in accordance with the official port tariff. Fixed charges are levied for every two-day stay in the port. For ships above 500 gross tonnage (GRT), each

soon receive formal recognition as a means of meeting these EMAS requirements. NACCB-accredited certification of conformity with BS 7750 will then be officially recognized as meeting the EMAS requirements for EMS. The NACCB will accredit verifiers, who are competent to validate environmental statements, as well as certifiers to BS 7750.

Eight certification bodies, including BSI, have been accredited by the NACCB as certifiers to BS 7750; and 20 companies have already been awarded BS 7750 certificates. Confirmation is expected soon from the Council of Ministers to upgrade BS 7750 to an EMAS award, with the production of a verified environmental statement.

ISO 14001 and BS 7750

In the event that ISO 14001 is considered suitable to fulfill the EMS part of the EMAS Regulation, CEN is likely to adopt it as a European Standard. If this happens, then all member bodies of CEN must adopt the EN ISO 14001 and withdraw any competing or conflicting standards. This means that BS 7750 would have to be withdrawn and the UK EMS standard would be BS EN ISO 14001. It is highly probable that companies already implementing BS 7750 will need to implement nothing more in order to comply with BS EN ISO 14001.

Documents in the Public Domain

Some time ago, ISO CDs 14000, 14001, 14011/1, and 14012 were issued by BSI as Drafts for Public Comment. When the DISs of these standards are issued by ISO/CS, they will be advertised in BSI News and offered for sale. The Sales Department Number is 0181 996 7000 London.

Fiona J. Russell
British Standards Institution

receptacle of 120 liters costs DM 28.10. Ships weighing less than 1,601 GRT are required to take two receptacles every two days; ships weighing 1,601-5,000 GRT take four; and ships above 5,000 GRT take six. Any additional receptacle placed on board comes with an additional levy of DM 15.30.

This system is unique in the North Sea region but, so far, there has been no complaint from the shipping industry. This system has proven to be effective with regard to protecting the environment at a competitive rate.

Hans Jurgen Roos
Harbour Master
Port of Bremen Authority

¹ MARPOL 73/78 relates to the International Convention for the Prevention of Pollution from Ships, 1973, adopted by the International Conference on Marine Pollution convened by the IMO in 1973. This was subsequently modified by the Protocol of 1978, adopted by the International Conference on Tanker Safety and Pollution Prevention convened by the IMO in February 1978. The five annexes contain regulations covering the various sources of ship-generated pollution.

ENHANCING MARINE POLLUTION MONITORING CAPABILITIES IN VIETNAM

The Workshop on the State of the Marine Environment in Vietnam was held at the Haiphong Institute of Oceanology (HIO) in Haiphong, Vietnam, last 16-20 August 1995. This workshop was one of the many activities of the capacity-building program jointly undertaken by the Swedish International Development Agency (Sida) Marine Science Programme and IMO, with the Ministry of Science and Technology and the Environment of Vietnam as national counterpart. The workshop reviewed two reports on the state of marine environment of the northern and southern coasts of Vietnam. Over 40 scientists from the academe and the national environment agency attended the workshop.

The meeting identified and prioritized existing and potential environmental management issues, research areas and projects, manpower and facilities requirements. Four projects were identified for consideration focusing on developing pollution monitoring capability in the Gulf of Tongkin and Nha Trang Bay, as well as environmental impact studies of human activities on coral reefs and seagrass beds.

Gil S. Jacinto




Marine pollution monitoring in Vietnam.

ICM TRAINING COURSE CONDUCTED

The first regional training course on the application of integrated coastal management system in marine pollution prevention and management was conducted on 2-24 October 1995 in the Philippines, the People's Republic of China (PR China), and Singapore. As part of the efforts to implement the MPP-EAS strategies in capacity-building, the training course had the objective of increasing the knowledge and skills of coastal environmental managers, planners, and implementors in the application of integrated coastal management (ICM) for marine pollution prevention and management. The training course consisted of lectures on ICM principles, techniques, and methods. It was enriched by field visits and hands-on exercises in 16 selected sites in the three countries.

The training course was attended by 20 participants from Cambodia, Democratic People's Republic of Korea, Indonesia, Malaysia, PR China, Philippines, Republic of Korea, Thailand, Vietnam, Kenya, and Tanzania. There were 22 experts from universities, research institutions, government, and nongovernment organizations in the Philippines, PR China, and Singapore who served as lecturers/resource persons in the training course.

Spearheaded by the Programme, the training course was co-organized with the Marine Science Institute of the University of the Philippines, the Environmental Research and Development Centre of the Xiamen University, the Department of Zoology of the National University of Singapore, and the Coastal Management Center (CMC). The course was co-sponsored by the Programme, Sida, and CMC, and is offered until 1998. The second session of the training course is on 4-28 October 1996.

Bresilda M. Gervacio 



A lecture session of the First Regional ICM Training Course.

MPP-EAS ACTIVITIES DREW STRONG SUPPORT FROM NATIONAL FOCAL POINTS

MPP-EAS activities drew strong support from the National Focal Points who participated in the 2nd Programme Steering Committee (PSC) Meeting in 11-13 December 1995. A number of activities, including those of the demonstration sites, will be implemented beginning next year. Of particular interest was the adoption of the concept and strategies for the Sustainable Financing component of the Programme, whose workplan was revised last year following several discussions and workshops in New York and Washington, D.C. The 2nd PSC also supports the Programme's ongoing efforts to mobilize external funding sources to implement its training activities, under its capacity-building component. In addition, the PSC recommended that existing collaborative and cooperative activities and linkages with other United



Participants to the Second Programme Steering Committee meeting.

Nations agencies and programmes be maintained. Furthermore, the Programme is encouraged to continue to mobilize in-country and external resources to assist the establishment of national ICM demonstration or parallel sites in the participating countries.

The meeting was held in the Club Andaman Beach Resort, Phuket, Thailand, with delegates from the 11 participating countries; representatives from IMO London, PDMO Manila, UNDP New York, Bangkok, and Manila; and observers from the government of Japan, the Malacca Strait Council, Japan Association for Preventing Marine Accidents, IDRC, CMC, Sida, the ASEAN-Canada Cooperative Programme on Marine Science Phase II, and the Global Ocean Observation System (GOOS)/Health of the Ocean (HOTO). The meeting was hosted by the Royal Government of Thailand, represented by the Honorable Deputy Minister of Transport and Communications, Mr. Chaiyapak Siriwat, who gave the keynote address. It was chaired by Mr. Kevin McGrath, UNDP Resident Representative for the Philippines, with Mr. Vichet Rojanadhamkul of Thailand as co-chairman, and Mr. Robert Jara of the Philippines as rapporteur. In the latter part of the meeting, a tripartite review of the Programme was conducted with Dr. Nay Htun, UN Assistant Secretary General and concurrent Assistant Administrator and Regional Director of the UNDP Asia and Pacific Bureau, in attendance. The Third PSC will be held in Malaysia in December 1996.

James N. Paw 

MPP-EAS

Announcement of Forthcoming Activities

Internship Program

The MPP-EAS welcomes applications to its *Internship Program for 1996*. The 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 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 and local accommodations will be provided by the MPP-EAS. Interested parties should send their applications and curriculum vitae to the MPP-EAS at the address below.

Legal Network Inception Workshop

The MPP-EAS is inviting participants to an *Inception Workshop of the Regional Network of Legal Experts on Marine Pollution* to be held in **Manila, Philippines**, from **18-19 March 1996**. The workshop is being convened to discuss implementation strategies of the Legal Network which is a priority activity of the Programme's component on International Conventions. Persons interested in the legal aspects of marine pollution, ratification and implementation of international conventions, and regional networking are encouraged to participate.

EIA Meeting

The CMC will hold a *Meeting on Integrated Environmental Impact Assessment (EIA)* on **21-23 March 1996**, in **Manila, Philippines**. The gathering is aimed at developing training materials on EIA intended for a series of short-term (2 weeks) training courses for regional and international audiences. This initiative will be carried out in collaboration with the Sida Marine Science Programme and the MPP-EAS.

ICM International Workshop

An international workshop on *Integrated Coastal Management in Tropical Developing Countries: Lessons Learned from Successes and Failures* will be held on **24-28 May 1996**, in **Xiamen, People's Republic of China**. The workshop is being organized by the MPP-EAS, CMC, and the Municipal Government of Xiamen; and jointly sponsored by the Sida, Danish Cooperation for

Environment and Development, the State Oceanic Administration, the Coastal Resources Center of the University of Rhode Island, and the MPP-EAS. The workshop will bring together practitioners in coastal management to share their experiences, methods, and approaches in ICM in their respective countries; to discuss lessons learned from past successes and failures; and to formulate basic principles and guidelines for future endeavors.

Workshop on Oil Spill Modeling

The *Workshop on Coastal Monitoring, Prediction, and Modeling* with special reference to the Malacca Straits will be held on **13-16 June 1996**, in **Pusan, Republic of Korea**. It is a joint effort of the MPP-EAS, Korean Ocean Research and Development Institution and IOC/WESTPAC. Experts will be invited to assess the development of coastal environmental monitoring and prediction system, including oil spill modeling as well as various issues on the applicability of the systems in the region.

Regional Conference on Sustainable Financing

The government of the Republic of the Philippines invites participants to a regional conference entitled *Sustainable Financing Mechanisms for Marine Pollution Prevention and Management: Public Sector-Private Sector Partnership* from **6-8 November 1996** (tentative date), in **Manila, Philippines**. The conference will gather government senior officials in finance, environment and economic planning; industrial managers and investors; and officials of financing institutions to discuss the viability and prospects of investment in environmental industry. This endeavor will be sponsored by the MPP-EAS, Sida, Asian Development Bank, and the International Development Research Centre; and organized by the CMC, Department of Environment and Natural Resources (DENR) of the Republic of the Philippines, and the MPP-EAS.

Interested parties may address inquiries and correspondence to:

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of Marine Pollution in the East Asian Seas

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FACTS AND FIGURES

Country	International Protection Systems ^a				Marine and Coastal Protected Areas ^b		Globally Threatened Fish Species (Number)
	Biosphere Reserves		Wetlands of International Importance		Number	Area (000 ha)	
	Number	Area (000 ha)	Number	Area (000 ha)			
Brunei Darussalam	NA	NA	NA	NA	NA	NA	NA
Cambodia	--	--	--	--	--	--	5
China	9	2,247	6	529	20	1,184	7
Indonesia	6	1,482	1	163	68	8,941	29
DPR Korea	1	132	--	--	--	--	--
Rep. Korea	1	37	--	--	3	285	--
Malaysia	--	--	--	--	9	52	6
Philippines	2	1,174	--	--	5	31	21
Singapore	--	--	--	--	--	--	1
Thailand	3	26	--	--	10	625	13
Vietnam	--	--	1	12	2	34	4

Notes: NA - not available; * - Areas listed often include nationally protected systems; -- Country is not a party to the Ramsar Convention of 1971/World Heritage Convention of 1982; Source: World Resources Institute, 1994-1995, pp. 318-319

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. It is published bi-annually. Readers are strongly encouraged to send their contributions to the Executive Editor, P.O. Box 2502, Quezon City 1165, Metro Manila, Philippines.

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If we produce a million dollars worth of carcinogens, this weighs as much as the Gross National Product (GNP) scale as a million dollars worth of antibiotics. If we hire a housekeeper, this counts in the GNP; but when one's spouse manages the household, this doesn't count. Teaching counts, but learning doesn't. GNP gives no measure of the hungry, the unemployed, the sick, the ill-housed, the illiterate, the oppressed, the frightened, the unhappily employed, or those who have reached the highest level of fulfillment. Furthermore, it does not measure the waste of resources, the spending of our natural capital such as oil, or the befoulment of our life support systems.

Russell Petersen, Former Head, White House Council on Environmental Quality on the problem of using GNP as a guideline for progress.

Source: Miller, G.T., Jr. 1994. *Sustaining the Earth: An Integrated Approach*, p. 306. Wadsworth Publishing Co., California, USA

