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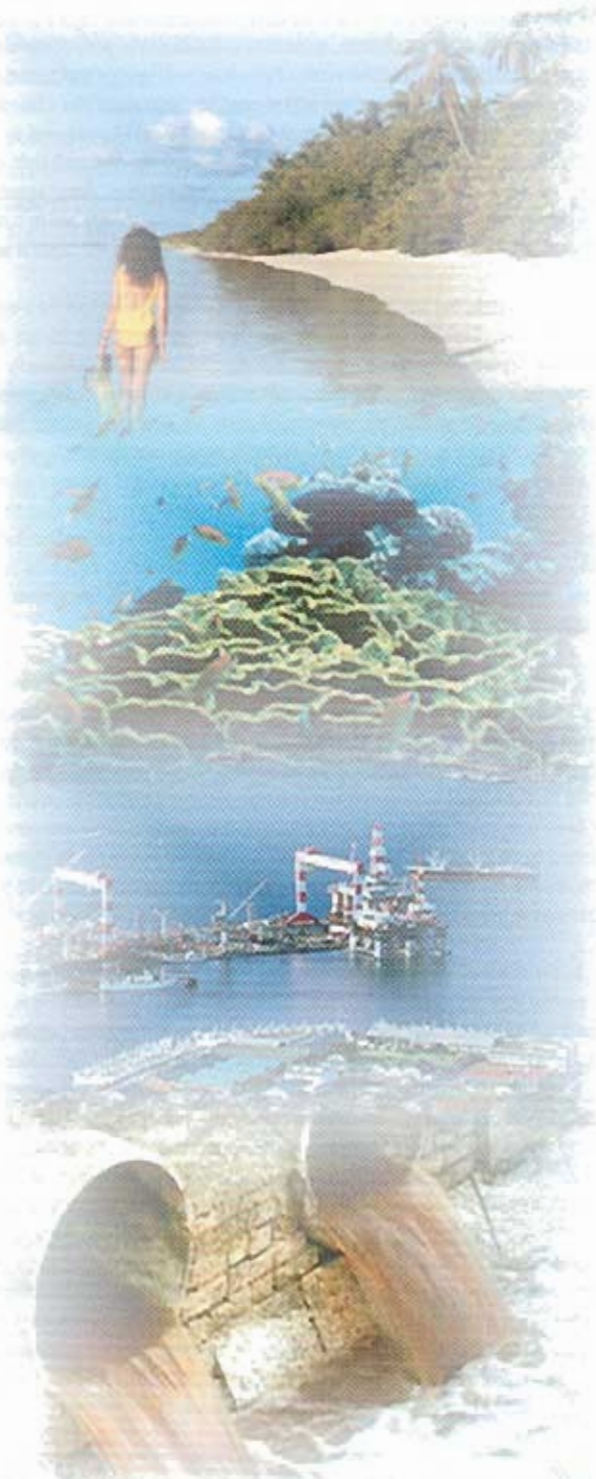
Public-Private Partnerships in Coastal and Marine Resource Management



EDITORIAL

In November 1996, a regional conference was held in Manila, Philippines, to introduce the subject of public-private partnerships. The event was entitled, "Sustainable Financing Mechanisms for the Prevention and Management of Marine Pollution: Public Sector-Private Sector Partnership", and attracted more than 180 participants from 26 countries. The conference succeeded in achieving its primary goal, that being to provide a forum for dialogue between senior representatives of the public and private sectors on: (a) the feasibility of public-private partnerships in a region with diverse political, social, economic and legal attributes; (b) potential opportunities for public-private partnerships in marine pollution prevention and management and (c) the way forward to demonstrate public-private partnerships as a viable alternative financing mechanism. No magic formulae were apparent; in fact many of the case studies presented at the time were inconclusive with regard to the success of the process. It was too early to draw conclusions, especially in developing regions of the world. However, a sense of optimism prevailed throughout the event. Participants recognized the potential advantages of the new delivery mechanism. Certainly there was a need to think about the roles and responsibility of each sector in such an arrangement. A change in mind-set would be required by both sectors. This was reflected in the conference statement, which requested national and local governments, the private sector, regional bodies, international agencies and organizations, donor agencies, multilateral financial institutions and NGOs to commit themselves to work cooperatively and in a complementary fashion to arrest and reduce the impact of land-based human activities on the coastal and marine environments.

Unfortunately, but not unexpectedly, the conference did not specify a working model or definition for all to follow. Looking around at the time, it was apparent that Europe and North America had a definition for public sector-private sector collaboration, which was primarily aimed at downsizing the public sector's investment and resource commitments to 'commercial' oriented public services. Included were projects such as the operation of ports and airports, road and bridge construction, and the performance of municipal services such as water supply, wastewater treatment and disposal and solid waste management. Privatization of government services and issuance of service management contracts seemed to be the West's answer to reducing government spending through the engagement of the private sector. But this approach held little promise for the environmental sector of the East Asian region, or other developing regions of the world. Few developing countries possess the hard municipal infrastructure or environmental services that are an attractive investment in the West. So it was necessary to consider other tactics and opportunities.

As reflected in this issue of *Tropical Coasts*, the challenge of developing a 'public-private partnership working model' is being taken up in East Asia, South Asia, the Caribbean and Central America. The reported efforts cover a variety of environmental issues, ranging from port development and operation, to protection of a coral reef, to integrated waste management, and each evolved as a mechanism to respond to a practical local problem. Although the described public-private partnership mechanisms have been developed and tested in isolation of one another, there are common elements that were expressed by each, namely: (1) enhancement of the ability of the local community, and the stakeholders therein, to manage their local environment; (2) sustainability of environmental programs and (3) socioeconomic benefit derived to the local community as a result of improved environmental programs.

In the wake of these practical lessons, the substance of public-private partnerships appears to have evolved to a new level of understanding over the past three years. It is apparent that partnership design is a function of local need. There is no single model for public-private partnerships that can cut across all environmental, economic and social circumstances or project objectives. Some are founded upon a 'public good' approach, where awareness and commitment to environmental protection and conservation of coastal and marine resources are the qualifying conditions. Others are more business-oriented, where the primary conditions of the partnership are capital investment, revenue generation and return-on-investment. A variety of combinations exist between these two. Further, regardless of final form, there is a process at work. Public-private partnerships are now seen as a component of an overall management approach and framework. Whether that framework is called integrated coastal management or an environmental management plan, the foundation upon which the partnership is developed and operates is a mechanism with fixed objectives, functions and limits that have been institutionalized within the public sector. Such a scheme is seen to provide the necessary political will, institutional commitment and legal and economic instruments that give direction and longer-term energy to the arrangement. Otherwise, public-private partnerships may continually be subject to 'notions of commitment', which are held by the individual members.

S. Adrian Ross, *Issue Editor*

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PUBLIC-PRIVATE PARTNERSHIPS: ALTERNATIVE DELIVERY MECHANISM FOR ENVIRONMENTAL SERVICES IN THE EAST ASIAN SEAS REGION

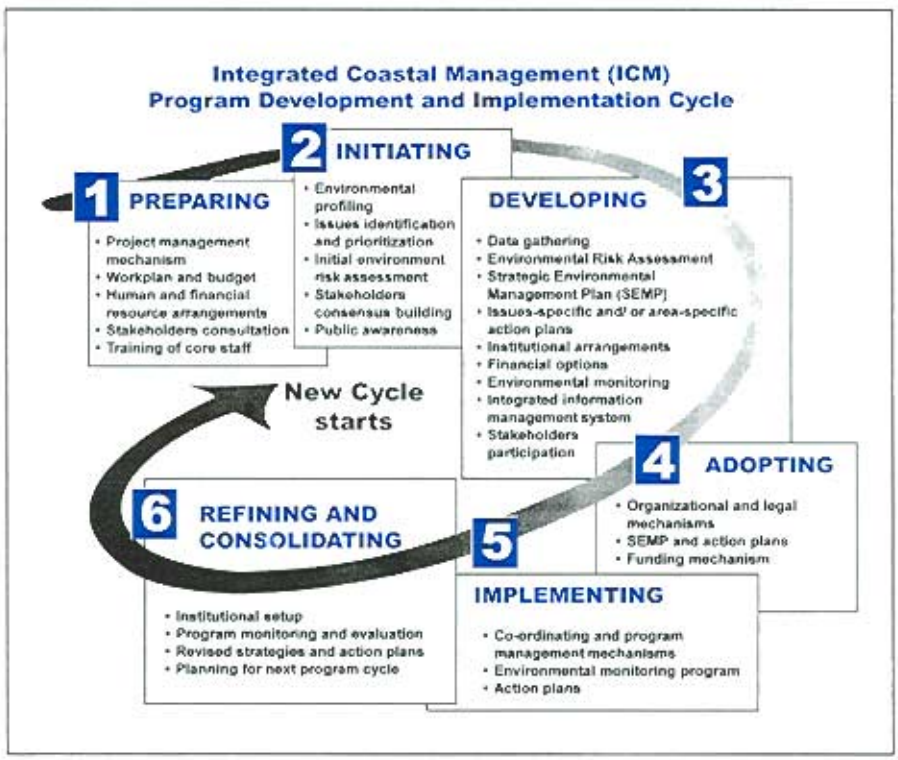
Burdened by burgeoning populations and demands for improved human health protection, employment, poverty alleviation and environmental protection, governments of the East Asian region are focusing on new ways to deliver required services to the public. In many cases, this has led to offloading responsibilities to local governments, under the posture that local governments are closer to the problem, and can implement such services more efficiently and effectively. The net result, however, is that the ability of local governments to provide services that require investment in infrastructure and/or highly skilled or specialized human resources continues to be constrained, while demands grow.

Coastal and marine resource management, and the sustainable economic use of coastal resources, is one of the challenges being confronted more frequently at the local government level. The GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas has been working with local governments over the past five years, testing and corroborating a working model on integrated coastal management (ICM), as an instrument to aid performance of this management function. The working model includes six stages, namely: preparation, initiation, development, adoption, implementation, consolidation and refinement, which follow a cyclical pattern (Chua et al., 1999). One essential component of the ICM framework, and a formidable indicator of the evolution of an ICM initiative at the local government level, is the adoption of paradigms and policies that promote sustainability.

Sustainability, within the definition of ICM, involves a wide range of interrelated constituents, including institutional arrangements, laws and control mechanisms, management strategies, processes and tools, human resource development, public awareness and education and financial and economic instruments. It is within this milieu that the Regional Programme explored the 'public-private partnership' mechanism. Public-private partnerships (PPP) are innovative tools of public policy. In addition to maximizing efficiencies and creativity of private enterprise, public-private partnerships aim to provide much needed capital to finance local government programs and projects of a commercial nature, thereby freeing public funds for core economic and social programs.

Finding the PPP Niche

There are numerous definitions of public-private partnerships, depending on the particular reference or application, ranging from informal, voluntary agreements to joint ventures and mixed ownership operating companies. The following definition, which seems most consistent with the ideal of integrated coastal management, has been adopted from the Canadian Council for Public-Private Partnerships (Carr, 1998):



"A cooperative venture between the public and private sectors, built on the expertise of each partner, that best meets clearly defined public needs through the appropriate allocation of risks, rewards and responsibilities."

The leap from definitions and ideals to an enterprise founded upon the principles of public-private partnerships is not an easy hurdle for either sector. Nor is it well known ground for commercial or intergovernmental lending institutions, venture capital groups or financiers. Thus, a priority activity in establishing public-private partnerships is awareness and confidence building with regard to the mechanism and the new relationship between the prospective partners. Further, PPP cannot and should not be presented as a mechanism for all situations. The approach is recognized as having a certain niche, specifically with regard to the provision of hard infrastructure. That is not to say that there may not be wider applications. At least with respect to East Asian experience, the full potential of PPP for the provision of information technology and soft services, such as training and education, is relatively unexplored.

Water supply, sewage treatment and solid waste collection and disposal are the most obvious environmental services provided by local governments that have commercial potential. Over the years, the focus in this sector has been on mega-projects, involving hundreds of millions of dollars' investment and debt servicing by governments. There was no apparent market in the medium- and smaller-sized community using traditional approaches to project development, simply because the profit margins were too low when weighted against the project risks. Now, in the aftermath of the economic crisis that has swept the region, the attitudes of international contractors appear to be changing, such that they increasingly avoid lead contractor roles on projects, more frequently seeking financial O&M contracts that run over the medium to longer term (Faulkner and Cowan, 1999).

Sustainable Project Management (SPM), an international NGO concentrating on public-private partnership initiatives in urban infrastructure, suggests that optimum investment range for PPP projects is between US$5 and US$50 million (Faulkner and Cowan, 1999). Some of the rationale for this are:

- projects in this range are not usually part of the investment portfolio of intergovernmental financial institutions, such as World Bank and Asian Development Bank;
- local investor appeal is normally low because of the perceived risk and the limited rate of return on investment;
- undertaking projects of this size using traditional approaches to project development and financing increases the investment and places a higher burden of debt servicing on the proponent;
- smaller projects with proven successes have a higher potential for being repeated.

In short, the niche for public-private partnerships is well suited for infrastructure and servicing projects in small- to medium-sized municipalities. Other potential 'software' applications are apparent for PPP. Both areas would appear to be relatively unexplored in the East Asian region.

Promoting Partnerships

In general, privatization of public services carries an enigma for government, that of surrendering a public trust or creating a monopoly that will be devoid of social conscience. Retaining a role for government, as part of an alternative delivery system, enables an enhanced level of comfort to policy-makers and the general public over the privatization option.

At the local government level, partnering has a number of other positive implications. One obvious benefit is the private sector's access to financing. The early mission of the private sector in the prospective partnership is to prepare a bankable project document, which is then used to raise the necessary investment capital. This action involves the use of technical and financial expertise to find solutions that are effective in: (a) meeting public needs and (b) having the potential to generate revenue to recover the investment cost. Expertise of this type is not common in the public sector. The public sector's *modus operandi* has been to contract the services of experts to complete the necessary technical studies, preliminary designs, budget estimates, tendering documents, tender reviews, etc. However, even though the solutions developed under such arrangements may be technically adequate, there is no assurance of financial or economic soundness. Public-private partnerships, with the 'shared risk-shared reward-shared responsibility' inducement, provide an incentive for solutions that meet the technical and economic targets of both parties, from the project development stage through construction, commissioning and into facility operation.

Partnership with the public sector raises several possibilities for the private sector. Political risk is perhaps one of the greatest constraints to investment by the private sector in the developing world, due to a real or perceived lack of political will, project commitment and transparency of process. The advantage of the PPP procedure is that political will and, subsequently, governmental commitment to a transparent process, are detailed early in the procedure.

Attracting the private sector to a partnership opportunity implies that the intended public partner is aware of the need and advantages of the arrangement, understands the PPP methodology and has completed a preliminary assessment of the required services. In other words, the public sector invests time, effort and resources in packaging the opportunity. Thus, the prerequisites of political will and commitment to the project, and selecting, negotiating and working with private partners, are established well before the search for a private partner begins.

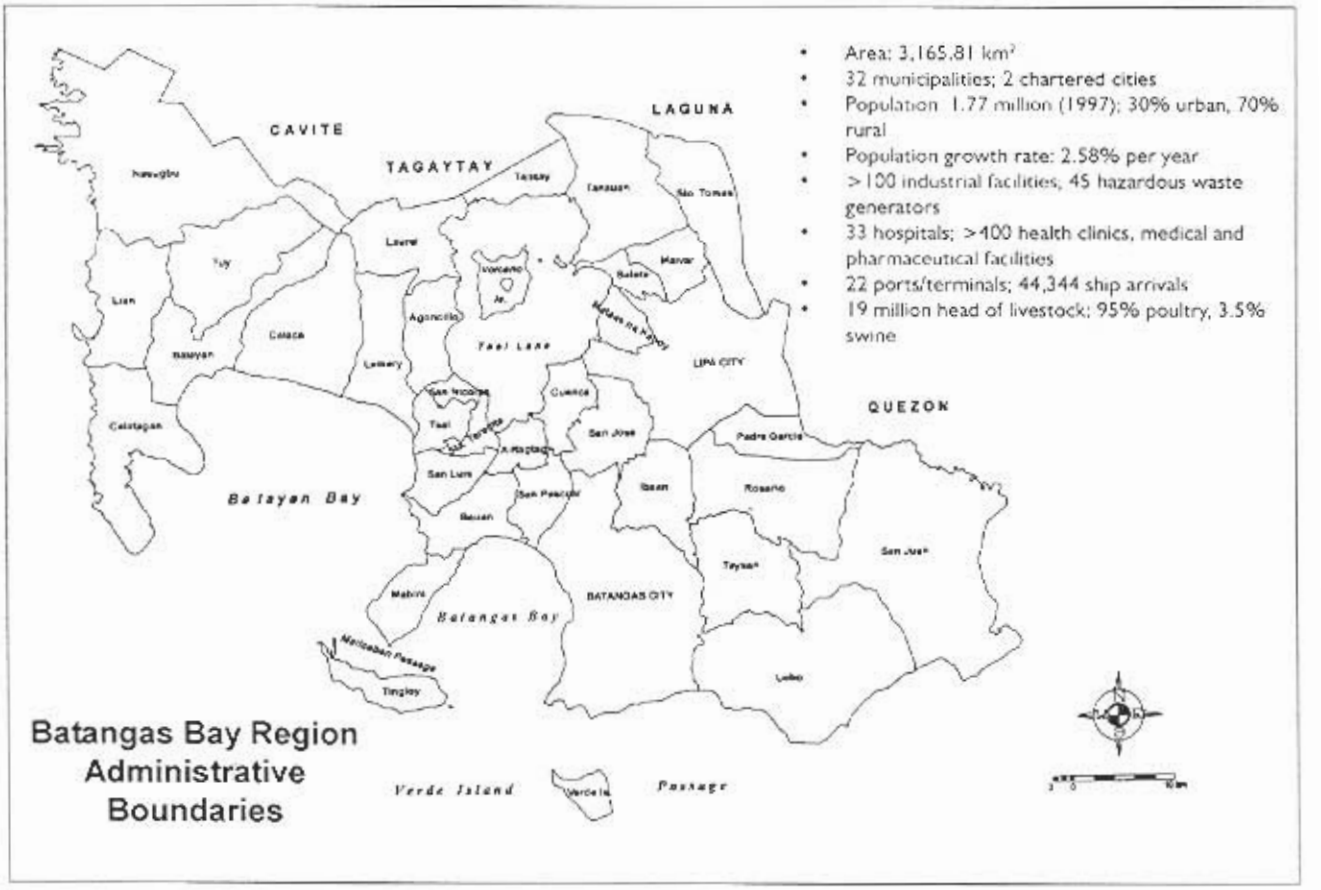
Business risk is the other major concern of the private sector, covering investment costs, the cost of capital and the ability to make a reasonable profit within an appropriate period of time. Advantages of the PPP process include:

- up-front costs for the preparation of project proposals and/or competitive tenders are substantially eliminated;
- the cost of entry into the partnership is the investment in a feasibility study; the feasibility study is the basis for future decision-making and negotiation between the partners;
- project development, planning, approval and financing are shared responsibilities; each partner has certain strengths, the combination of which results in a time-efficient, pre-construction phase of activity;
- ownership and management arrangements for an 'operating facility or service' are negotiated, including the rate of return on the private sector investment and the project duration;
- innovation in planning and design, well-managed construction, effective budgetary control, timely delivery and efficient facility operation result in rewards to both parties;
- contributions of local capital by local partners minimize foreign exchange risk.

The concept of PPP was recently tested in the Philippines. The project involved the planning, construction and operation of a waste management and disposal system for the Province of Batangas, a coastal province with a total population of 1.77 million people.

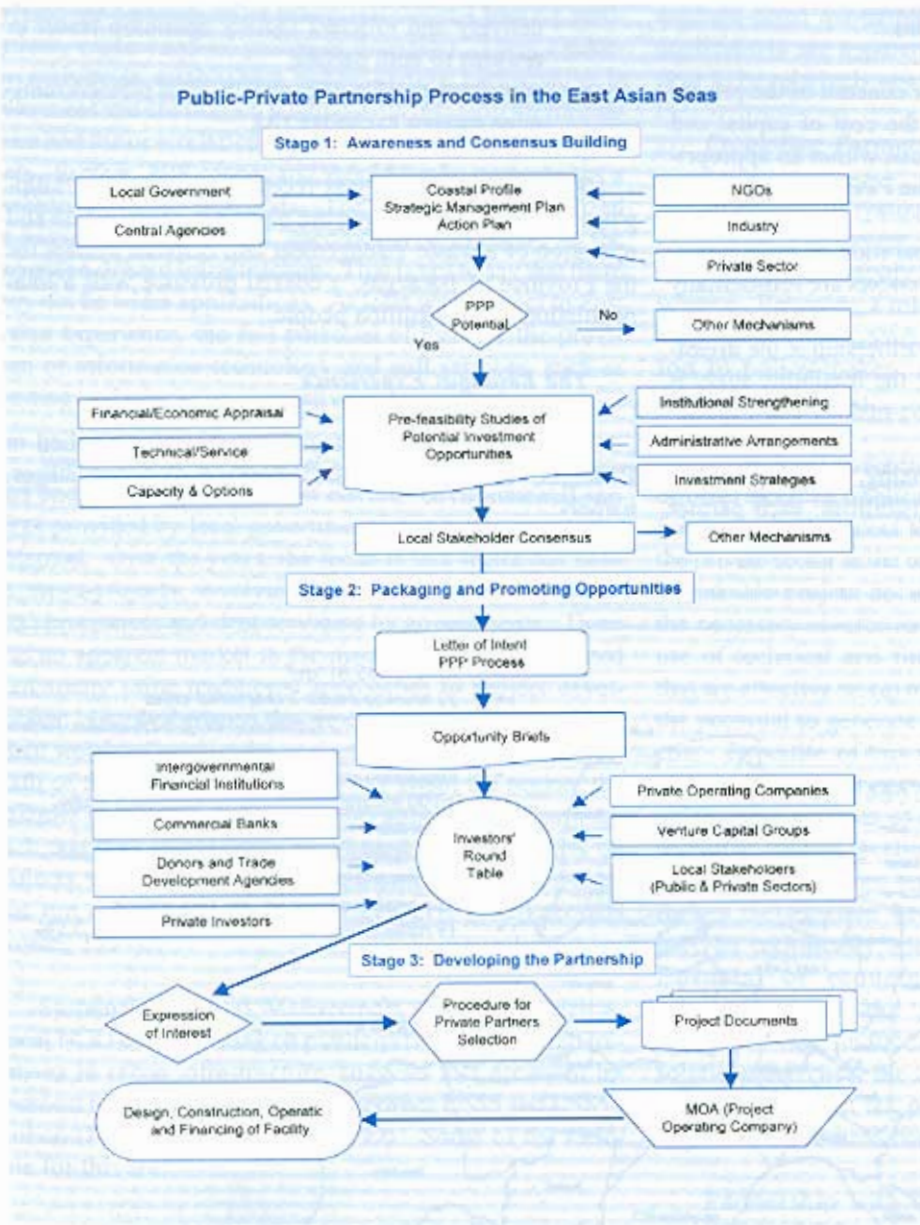
The Batangas Experience

The public-private partnership process, as applied in Batangas, Philippines, consisted of three evolutionary stages, namely:



Batangas Bay Region Administrative Boundaries

- awareness, consensus building and partnering among local stakeholders;
- packaging and promoting opportunities to private sector partners and investors from outside the Batangas region;
- selecting a private partner and establishing a mixed-ownership (ie., public sector-private sector) operating company.



Stage 1: Building Awareness and Consensus among Local Stakeholders

Engagement of public and private sector stakeholders within the Province of Batangas, along with interested central government agencies of the Philippines, began in early 1994, with the startup of an integrated coastal management (ICM) project. Important early outputs generated over the first two years of the project, through the cooperative efforts of local government, industry and scientific and technical institutions, included an environmental and socioeconomic profile of the coastal area (Multidisciplinary Team of Experts, 1996), a strategic environmental management plan (Environment and Natural Resources Office of the Provincial Government of Batangas, 1996) and an action plan on integrated waste management (MPP-EAS, 1996). The joint outputs accomplished two objectives. First, the products were the building blocks for the ICM program in Batangas. Major environmental problems and management issues were identified, institutional, technical and economic interventions to tackle the issues were formulated, and short-term action oriented initiatives were agreed to by local stakeholders as a first step toward the long-term vision for the Bay. Second, interaction between the sectors provided a better understanding of the respective concerns, capacities and limitations of a 'command and control' relationship between the local public and private stakeholders. For example, upon reaching consensus that the handling and disposal of waste was a crucial problem in all economic sectors, and that government alone did not have the financial means or technical capability to solve the problem, the mood shifted among stakeholders. The Batangas Bay Region Environmental Protection Council was created, comprised of membership from the provincial and municipal governments, central agencies, non-government organizations and an industry-based NGO representing major industries operating in the Bay area. The Governor of the Province chaired the Council. One of the first actions of Council was to formally adopt the 20-year Strategic Environmental Management Plan for the Bay, along with a 5-year integrated waste management action plan. The Council began to oversee the implementation of the action

program, as well as provide a forum for discussion and consensus-building regarding development policies and management interventions in the Bay. Trust and confidence took seed between the sectors. Commitments were made by both sectors under 'voluntary agreements'. Among others, responsibilities were taken on to reduce the quantity of waste generation to argeed target levels, to eliminate illegal dumping of waste, to jointly develop an affordable long-term waste management system for both hazardous and non-hazardous wastes and, by the year 2000, to have the required facilities and services in place. The voluntary agreements were signed by both sectors in September 1996.

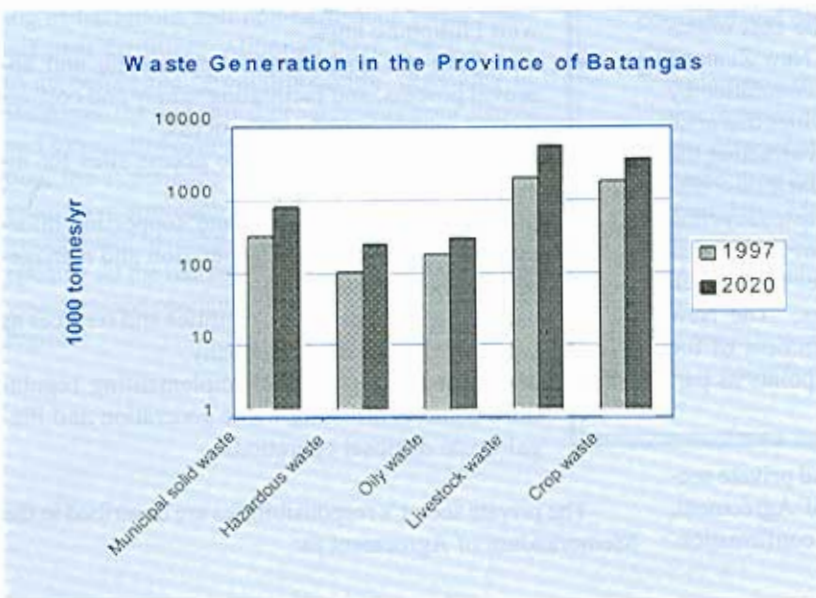
Over the next 18 months, prefeasibility studies were completed on four priority wastes in Batangas, namely hazardous waste, municipal solid waste, ship and port waste and agricultural waste. The studies were implemented under the direction and coordination of local multi-sectoral technical working groups. Technical options and financial and economic analyses were completed and promoted among the sectors. Shortly thereafter, necessary actions began taking form. On the basis of the cost estimates, local stakeholders, including the 32 municipalities of the Province, recognized that individually, they could not afford the required waste management services. However, the studies demonstrated that the quantities and types of waste available in Batangas collectively represented a commercial-scale package, although there was no experience within the Philippines with which to assess or compare the commercial viability. Through discussion, it was also apparent that the privatization option was not an attractive alternative among the local government units. A joint undertaking, which would keep the public sector involved as a facilitator, regulator and part owner of the service, was preferred. As a result, in October 1998, local stakeholders made the decision to proceed with the next stage of the public-private partnership process, and seek outside investors and partners for a joint undertaking.

Stage 2: Packaging and Promoting Opportunities

Two key actions were required in this phase. The first involved the development of a package of information on the Batangas situation that would be attractive to investment groups, private operating companies, venture capital groups and commercial banks. The second required identifying which of these groups were interested in environmental projects in the Philippines, and public-private partnership as an alternative to the traditional tendering and contractual relationship with the public sector.

Four investment opportunity briefs were prepared by the Regional Programme in conjunction with the local public and private sectors, focused on the four priority waste areas. The briefs were a consolidation of information on the quantities and nature of wastes being generated, 20-year projections on economic and population growth and predicted waste volumes, cost estimates of alternative technologies and servicing options, current market prices for recycled materials within the Philippines, and an analysis of the *Integrated Coastal Management Contingent Valuation Survey in Batangas Bay* (Tejam and Ross, 1997). This last component reviewed the general public's willingness-to-pay for improved waste management services in Batangas.

Sustainable Project Management (SPM) addressed the second action. Through a global network of investors, venture capital groups and operating companies, SPM was able to secure interest from parties in North America, Europe, Asia, Australia and New Zealand. Commitments were made by these parties to participate in an Investors' Round Table, to receive a briefing on the investment opportunities, to discuss the opportunities with the local partners, and to learn more about the terms and conditions of the PPP process. Thirty-two representatives from private investment groups and companies attended an Investors' Round Table held in Manila in November 1998.



The Investors' Round Table provided the private sector with a clear definition of the available opportunities. Two other issues were affirmed during the event, namely: (a) the political will and commitment of local stakeholders and (b) the transparency of the PPP process. The public sector's requirements for prospective private partners were also

outlined, as was the process to be followed for the selection of partners. It was further emphasized that the Regional Programme would serve as focal point between the public and private sectors throughout the selection process, and that both SPM and the Regional Programme would oversee the process to its completion. A time schedule was delineated for each stage of application and review; the entire process to be completed in four months.

Profile of a Private Sector Partner (generic)

1. Good business track record
2. Regional history/experience
3. Technical/scientific capability in project area
4. Financial backing/access to financing
5. Project startup and delivery experience
6. Demonstrated willingness to work within the PPP process
7. Technology transfer and capacity building capability
8. Evidence of proven technology and/or services

Stage 3: Selecting a Private Partner and Establishing A Mixed-Ownership Operating Company

In March 1999, a consortium of New Zealand companies was identified as the successful candidate among a total of six companies submitting expressions of interest on the individual projects. The New Zealand group satisfied the selection committee's prerequisites for a private partner. Second, the consortium's proposal encompassed all four waste streams, presenting a strategy for leveraging revenues generated from one stream to offset the cost of another less lucrative stream. In addition, the New Zealand submission made in-roads with the selection committee by acknowledging the political and social sensitivities that arise with the introduction a new scheme or system affecting the general public. Issues such as location of facilities, displacement of people, disruption of informal waste recycling enterprises, traffic congestion, employment of local firms and labor and provision of affordable services were given high consideration by the local stakeholders. The New Zealand consortium proposal indicated awareness of the issues and an openness to inclusion of these points as part of the feasibility study for the project.

Initial negotiations between the public and private sectors, prior to signature of a Memorandum of Agreement, focused on several points of clarification and confirmation.

Procedure for Selecting a Private Sector Partner

1. Establish a multi-sectoral selection committee, comprised of appropriate local stakeholders from the public and private sectors
2. Invite interested companies to submit company profiles in line with the stated Private Partner criteria
3. Review company profiles and shortlist potential Partners
4. Invite shortlisted companies to submit formal proposal, based on a descriptive outline provided by the selection committee
5. Review proposals submitted by companies, and screen potential Partners
6. Invite screened potential Partners to make an oral presentation to the selection committee
7. Committee assessment and consensus on the selection of a Private Partner, based on written and oral presentations

From the private sector's viewpoint, the role, responsibility and *modus operandi* of the public sector during the feasibility study, leading to the formation of a mixed ownership operating company, required definition. On its part, the public sector wanted further assurances regarding the consortium's member companies, the proposed technologies and the coverage to be provided by the new waste management service. A Memorandum of Agreement was eventually drafted between the Parties. In the MOA, the public sectors commitments include:

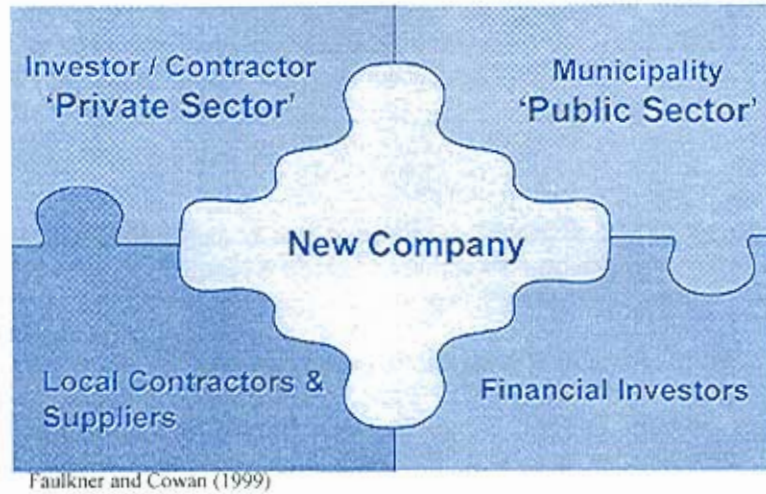
- ensuring that all activities of the partners and the proposed operating company are in compliance with Philippine laws;
- clarifying the government's permitting and approval process, and facilitating timely and cost-effective submissions to the process;
- assisting the private sector to access sites for investigative field studies;
- providing available reports and supporting information concerning waste generation and management in Batangas;
- valuating public property, facilities and services as equity in the operating company;
- developing, adopting and implementing regulations/controls affecting waste generation and illegal waste disposal operations.

The private sector's responsibilities are described in the Memorandum of Agreement as:

- financing and conducting the feasibility study;
- developing a bankable project document for submission to investors and lending institutions;
- preparing a plan and schedule for constructing and commissioning of the facilities.

The Memorandum of Agreement was signed in July 1999, and a feasibility study is currently underway. The commercial viability of the proposed integrated waste management system will be understood within the next two to three months. At the present time, best estimates on the capital investment are between US$13 and US$16 million.

A Commercial Model for Public-Private Partnerships



Faulkner and Cowan (1999)

Undoubtedly, there will be future lessons for both parties to this partnership as Stage 3 of the PPP process unfolds. Each party is looking for benchmarks that will satisfy their respective constituents. The mind-set of the public and private sector players, however, is clearly one of confidence, in terms of the partnership and the integrated waste management system for Batangas.

Conclusion

Back in 1996, the multi-sectoral Batangas Bay Region Environmental Protection Council adopted an integrated waste management action plan, which targeted the year 2000 for the commissioning of hazardous and non-hazardous waste management facilities. Although there is still a way to go before the 'ground-breaking' ceremony in Batangas, the fact is that progress has been steady and substantial over the past three years. In addition, the experience has provided insight into an innovative approach to scaling and packaging environmental investment opportunities, and thereby opening up the market to a new-sprung stock of investments and operating companies in the East Asian region.

Challenges of Public-Private Partnerships

- Strong political leadership and will are essential to success.
- Public accountability is a requisite of government. The private sector has a certain naivete in this regard. Third party monitoring can ensure that integrity and efficiency are maintained by both parties.
- When developing PPP's, process needs to be balanced with desired outcome. Be less rigid on specifications and procedure. Typically, the nature of the partnership, and the methodology used to create the partnership, should reflect the size and scope of the project.
- Innovative approaches and good ideas are to be encouraged and rewarded for both sides of the partnership.
- Transparency, trust and confidence are the three basic characteristics of a successful PPP.
- Unnecessary paperwork and bureaucracy, and the associated time losses, add to the investment cost of the partnership. Identify bottlenecks, clarify constraining factors and facilitate speedy delivery.
- Success and failure are the responsibility of both partners.
- The result is worth the effort. A new delivery mechanism is being forged. Don't give up.

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MANAGING ENVIRONMENTAL ISSUES IN PORT DEVELOPMENT AND OPERATION: COMPLIANCE AND COST CONSIDERATIONS

Asia is one of the world's most developmentally diverse regions and this condition is reflected in the nature of its infrastructure including the size and sophistication of its ports. Asia's ports range from major, world-class shipping centers, to large existing ports which are struggling to modernize, to new ports created to handle projected demand from rapidly developing hinterlands. For this reason it is difficult to generalize regarding the operational and management challenges facing Asia's ports. Nevertheless, it is likely that all ports will over time face increasing scrutiny on environmental issues from government regulators, potential investors and clients, and the general public.

This growing environmental awareness may manifest itself as stricter regulations, greater enforcement of existing regulations, or additional pressure to adopt voluntary agreements or practices. Ignoring these developments could lead to incurring penalties for violations, or result in delays in obtaining necessary permits or other approvals for maintenance or expansion. Failure to provide state-of-the-art environmental services as part of the overall port package (e.g., MARPOL facilities or oil spill response equipment) could lead to loss of clients which require these facilities under their corporate policies and thus lead to declines in market share. Environmental issues should also be considered in making investment decisions, since environmental liabilities associated with particular facilities could elevate costs. In addition, regulators are increasingly looking to investors to be environmentally responsible and to lead by example.

This paper discusses three issues of particular relevance to environmental management of port operations: capital and maintenance dredging, oil spill response and MARPOL waste facilities. In addition to presenting trends in environmental aspects of these operations, with examples drawn from Asian ports, this paper focuses on the compliance and cost issues inherent in port management decision-making. These discussions emphasize the importance of a proactive approach to managing environmental issues which goes beyond a strict interpretation of regulatory compliance.

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Capital and Maintenance Dredging

Dredging of sediments is an essential element of operations in most ports worldwide. Clearing fairways of siltation, deepening channels for larger vessels, constructing and maintaining breakwaters and forming land for port expansion are commonly achieved through dredging. However, dredging activities are often criticized for their unwanted side effects including unsightly plumes of suspended sediments, dispersion of contaminated mud and the effects of these on aquatic organisms.

The importance of dredging activities to port operations depends heavily upon whether dredging is required by natural hydrodynamic conditions and whether it is necessary for port expansion. The importance of dredging as a management issue, however, is often determined by the regulatory scheme governing dredged material. Special requirements for handling and disposing of contaminated sediments can be major hurdles to be cleared by port operators. The following sections describe three issues influencing the management of contaminated dredged material.

Disposal of Contaminated Dredged Material

Regardless of the sophistication of the local regulatory scheme, there are usually special requirements which must be addressed if dredged material is known or suspected to be contaminated. In Hong Kong, contaminated dredged materials must be disposed at a confined open water disposal site which is administered by a 24-hour site management team and monitored continuously for changes in water quality, sediment quality and marine organism body burdens. This higher level of management for contaminated material requires a fee of HK$55.4 (US$7.15) per cubic meter *(in situ* volume) to cover administration and monitoring costs. In the People's Republic of China, separate offshore disposal sites are designated for contaminated dredged material. For the Shenzhen/Zhuhai area of Guangdong province, the contaminated dredged material disposal site is more than 50 km offshore of the Chinese mainland. The additional transport costs alone could influence costs dramatically; any charges for use of the contaminated disposal sites would further elevate these costs. In Taiwan, although there are no specially designated sites for contaminated materials, such materials cannot be disposed within 12 km of shore.

Given that special requirements for contaminated dredged materials will incur greater costs, as a first step, port operators should consider the presence of contaminated sediments on site as a potential liability. Following on from this, it is important to prevent ongoing contamination of coastal sediments through proper handling and disposal of waste materials in ports and harbors. If sediments are contaminated and cannot be left in place, the costs associated with disposal and monitoring must be factored into cost-benefit ratios for projects. In areas with sophisticated environmental management programs for contaminated dredged materials, such as Hong Kong, the cost of handling contaminated materials may be substantial.

Even in areas where environmental regulations are presently limited or are weakly enforced, proactive planning should account for the possibility of international standards being imposed. This is particularly an issue for projects which involve foreign investment. International best practice regarding dredged material disposal derives from the Waste Assessment Framework (WAF) of the London Convention 1972[1]. The following elements of the WAF are expected to become more frequently encountered in local regulatory schemes as they evolve over time:

- Designation of multi-user disposal sites based on a set of selection criteria which may require baseline studies of the potential site(s);

[1] Asian Contracting Parties to the London Convention 1972 include the People's Republic of China, the Republic of Korea and the Philippines.

- Implementation of a permitting system for dredged material disposal operations which may require submission of formal environmental assessment documents;

- Specification of monitoring requirements at the dredging site and the disposal site to verify and manage the impacts predicted in the site designation or permit issuance processes.

Ports which structure their management of dredged material around these issues will be better placed to respond to existing and future regulatory requirements.

Identification of Contaminated Dredged Material

Another trend in the regulation of dredged material involves the methods used to classify contaminated and uncontaminated mud. The evolution of sediment classification schemes generally follows a progression beginning with using sediment chemistry results of a few easily analyzed parameters (e.g., heavy metals) to identify contaminated materials. The next level of complexity involves expanding the number of chemical parameters to include organic contaminants such as polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs) and pesticides. For sediment chemistry based approaches, criteria are usually set based on reference values from the literature which are thought to represent a threshold of adverse environmental effects.

However, the most advanced systems of dredged material characterization are today based on an assessment of the sediments' effects on marine organisms. This characterization method, referred to as biological or ecotoxicological testing, is recommended under the London Convention's WAF and is practiced in the United States and Europe. It involves collecting samples of sediments proposed for dredging and exposing test organisms, with known sensitivities to contaminants, to these sediments under laboratory conditions. The determination of whether sediments are considered contaminated is based on statistical comparison of mortality (or other test "endpoints" such as abnormal growth) in dredging site sediments with mortality in clean or "reference" sediments. The biological testing approach, though more costly, is technically preferable to the sediment chemistry approach as it integrates the impacts of a variety of potentially present contaminants and accounts for whether contaminant concentrations are actually bioavailable to, and toxicologically harmful to, marine organisms.

Hong Kong is currently moving toward a new dredged material characterization scheme which would combine sediment chemistry screening values with biological testing. It is expected that this approach, or similar approaches, will eventually also be adopted by environmental authorities across Asia. Therefore, it is important for port and shipping interests to consider the implications of

> ...the most advanced systems of dredged material characterization are today based on an assessment of the sediments' effects on marine organisms...

this type of scheme for their operations. Costs of dredged material characterization using biological testing may be higher, depending on the number of sediment chemistry parameters required under a chemistry-based approach. This is particularly true in areas which do not have local capacity to conduct tests and require international shipping of sediments for testing. Biological testing results are also frequently difficult to interpret. Lack of expertise in this field, on the part of both project proponents and government officials, may lead to prolonged debates on sediment quality and subsequent project delays.

While it is not recommended that biological testing of dredged material be pursued in the absence of regulatory requirements, it is important to remain abreast of locally evolving sediment characterization requirements. This information can then guide exploration of cost-effective means of satisfying these requirements using local and/or international expertise.

Introduction of New Dredging Technologies

Another environmental management issue relevant to capital and maintenance dredging requirements is the opportunity to apply new dredging technologies. In response to a growing market for both environmental remediation technologies and environmentally-friendly dredging techniques, dredging companies have, in recent years, developed new capabilities for dredging and other sediment handling practices. With the mobility of the worldwide dredging fleet, these technologies are increasingly being proposed for use in Asian ports. Although the cost of utilizing these new technologies may be higher than using locally-available plant, they may be advantageous in achieving an overall cost savings. This may occur either through more rapid project completion times, or in reduction of otherwise imposed mitigation or monitoring measures.

Two such proposals have occurred in Hong Kong in recent years. The first case involved a simple substitution of one type of dredging plant for another and the second case involved employing a new type of dredger in Hong Kong for the first time. Although local authorities appreciated the potential benefits associated with each proposal, in both cases field trials were required before the technologies could be permitted. These field trials are often expected to be funded by the contractor, but in some cases there may be an opportunity for cost sharing with local authorities. In the first case, the trial was partially successful; the project was permitted to proceed with the operations that met the acceptance criteria but had to develop an alternative solution for the unsuccessful operations. In the second case, the trial is still pending availability of the dredging plant and agreement of the details of the trial with Government.

It should thus be understood that introduction of new technologies may require field trials or other documentation with corresponding time and cost implications. Therefore such opportunities should be carefully explored with local authorities before any assumptions are made regarding their use.

MARPOL Wastes

The International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) consists of five annexes which define regulations for the control of ship generated pollution including oil (Annex I), noxious liquid substances (Annex II), harmful substances in packaged form (Annex III), sewage (Annex IV) and garbage (Annex V). Signatory parties to Annex I of the Convention agree to: *"ensure the provision at oil loading terminals, repair ports, and in other ports in which ships have oily residues to discharge, of facilities for the reception of such residues and oily mixtures as remain from tankers and other ships, adequate to meet the needs of the ships using them without causing undue delay to ships."*

Ratification of the Convention restricts the discharges of such wastes into the marine environment and is generally thought to reduce the number and severity of reported incidents. Although the practice of disposing oil wastes at sea has occurred for many years, with the increase in oil production and shipping in the past few decades, international concern with uncontrolled sea disposal has been heightened. For example, in response to a number of pollution incidents in the vicinity of ports in the Bangkok area and on the Eastern Seaboard of Thailand, the Thai Government has taken a Policy Decision to ratify MARPOL 73/78. The Hong Kong Government has operated a MARPOL facility since 1992 when it opened the Chemical Waste Treatment Facility at Tsing Yi. The PRC has ratified four of the MARPOL annexes and provides MARPOL waste treatment facilities at a number of locations. Indonesia, Malaysia and Singapore have ratified some of the MARPOL annexes and provide waste handling and treatment facilities of varying standards[2].

As Asian coastal regions continue to develop, it is expected that concerns regarding uncontrolled discharges of ship waste will lead to stricter regulation and enforcement

[2] The following Asian countries have ratified MARPOL: Brunei (Annexes I and II); Cambodia (Annexes I-V); China (Annexes I-III and V); DPR Korea (Annexes I-V); Indonesia (Annexes I-II); Malaysia (I-II and V); Republic of Korea (I-III and V); Singapore (I-III) and Vietnam (I-II)

of these discharges. Port and shipping interests should be aware that although enforcement is at present generally lax, regulations governing ship-based discharge may be enforced under national laws even in the absence of MARPOL ratification. Therefore, it is advisable to be aware of the locations and capacities of regional MARPOL facilities and to utilize them as necessary. It is also important to be aware of the potential liability involved in contracting for waste disposal with unauthorized private operators whose practices do not meet international standards. It should also be acknowledged that use of private operators in ports with existing MARPOL-standard facilities also siphons revenues away from the facilities and jeopardizes their viability.

Ports without MARPOL facilities may consider either identifying local sources of capital investment or locating a foreign investment partner to assist with construction of waste handling facilities. The latter route will generally involve an agreement on the part of the local authority to implement regulations requiring ships to use the facility. This type of agreement is often necessary to ensure that the facility generates enough revenue through user fees to defray the capital costs. While this foreign investment route may appear preferable, it should be acknowledged that local pollution control regulations may be difficult to implement and the time required may result in major delays in the commissioning of the facility.

Oil Pollution Contingency Planning

In addition to concerns regarding small-scale, but often routine, oil discharges from ships, a growing concern regarding major spill events has resulted in a proliferation of regional agreements for oil spill response and an increasing focus on incident contingency planning. The potential benefits of contingency planning include:

- more effective and efficient response to an incident, reducing ecological and commercial damage and subsequent claims;
- clear reaffirmation of business/governmental concerns for environmental priorities.

Although a great deal has been achieved in recent years, much of the oil spill preparedness and response work has focused on technological advances in incident prevention, spill control and environmental remediation. Comparatively little attention has been focused on prevention of oil spills through eliminating the factors that lead to human errors. It is estimated by the U.S. Coast Guard that operator errors, errors in judgment and improper actions were the underlying cause of the majority of incidents involving human casualties. A useful framework for gauging whether the human factor has been adequately addressed in contingency planning is provided by a combination of MARPOL 73/78, the IMO-recommended Standards Training Certification and Watchkeeping (STCW) code, and the International Safety Management (ISM) code (which focuses on preventing human errors in shipping). If fully implemented, these three codes of practice would greatly reduce the remaining risks associated with oil transport. In addition, improving the 'software' aspects of oil spill response (i.e., organization, planning, strategy and training), is equally as important as keeping abreast of the latest advances in response technology.

Another area of contingency planning which has not received due attention is the environmental and socioeconomic component of oil spill risk. Traditionally, contingency planning has been structured around responding to worst credible spill size. However, more advanced methodologies also account for the environmental and socioeconomic impacts of oil spills in calculating overall risk. This methodology allows contingency planning to focus on those spills with the highest associated risk rather than simply the spills with the greatest probability of occurrence. For example, under the traditional approach a port authority might structure their oil spill contingency plan around the most commonly-occurring type of spill incident. However, if the more advanced approach was applied it might indicate that the highest risk spills would be of a smaller size but in highly sensitive areas (e.g., a mariculture zone or a marine reserve). The recommendation resulting from this approach would involve specific measures to protect high risk areas potentially including *in situ* shoreline protection (e.g., booms), specific contingency plans for individual sensitive sites, and/or location of response equipment near sensitive sites.

The latest advances in oil spill contingency planning involve both a greater emphasis on the 'software' aspects of prevention and response, and an increased focus on environmental and socioeconomic components of risk. Inclusion of these elements in an overall response management system will facilitate technically correct and justifiable response actions which will in turn support large claims for cleanup costs from compensation bodies. Explicit consideration of both issues in contingency planning will not only result in improved environmental protection but may also reduce financial liabilities.

Conclusions

This discussion has shown that environmental issues can directly influence business risk and thus are, and will continue to be, important factors in port development and operations. Management of capital and maintenance dredging issues will increasingly involve considerations of the environmental effects of activities on the marine

ecosystem. Such considerations may manifest themselves as more stringent requirements for disposal site selection and/or monitoring, dredged material characterization and use of new dredging technologies. Handling of ship-generated wastes will increasingly be regulated under the MARPOL annexes. Shipping interests should therefore track the development of MARPOL facilities and be aware of inherent risks and liabilities associated with alternative practices. Finally, oil spill contingency planning is evolving from a technologically-focused, response-oriented process to one that is more human-based and environmental/socioeconomic risk-oriented. This new focus is expected to represent the best approach to reducing the remaining shortcomings of oil spill prevention and response systems.

For these reasons, attention to environmental issues will be essential for port and shipping interests who wish to remain abreast of changes affecting costs and compliance. By anticipating, rather than reacting to, new developments in local regulations and international practice, operators can plan new developments more effectively, avoid costly delays in project approvals and minimize environmental liabilities. This proactive approach is recommended not only for its overall environmental benefits, but for the potential cost savings to be achieved both in short-term and long-term operations.

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SMALL AND MEDIUM ENTERPRISES IN SHIP AND PORT WASTE MANAGEMENT: CHALLENGES AND OPPORTUNITIES

The Urban Waste Expertise Programme (UWEP) is funded by the Netherlands Development Assistance and executed by WASTE. One of UWEP's objectives is to examine, analyze and document the existing ship and port waste management system in developing countries, focusing on the role of small and medium enterprises (SMEs) and community-based organizations.

The Legal Framework

The International Maritime Organization (IMO) is the United Nations body with the mandate to ensure navigational safety and prevent marine pollution from shipping-related activities. The IMO drafts and promotes the adoption of rules, regulations and conventions. The legal framework for ship and port waste management is internationally regulated by the MARPOL 73/78 (International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978) regulations.

Ship and port waste management refers to the on-board generated waste of vessels, and the waste generated by activities in the port area. The MARPOL regulations stipulate that ports have to cater for environmentally sound port reception facilities at which vessels can dispose of various kinds of waste. Nations are encouraged to ratify these regulations and to modify the national legal framework accordingly. National port authorities are therefore under international pressure to upgrade port operations to meet the MARPOL standards.

However, the reality is that many ports in developing countries have not yet lived up to this standard, because of technical, financial and institutional impediments. In improving the prevailing system, one of the first steps is the

Waste collection at the Karachi Port, Pakistan

development of a waste management strategy, including options for prevention, storage, collection, recycling and disposal. Although the MARPOL regulations prescribe the establishment of an environmentally sound system, it leaves the system choice open and dependent on local conditions and the nation's waste management policies. The IMO provides assistance to port authorities by issuing guidelines and providing training for people responsible for waste management in the port and on ships.

Ship and Port Waste in UWEP

WASTE decided to include ship and port waste management in UWEP because:

- Ports are places where large volumes of waste are generated and landed in a relatively small area.
- The economic value of the waste materials is relatively high, including oil residuals, plastics, paper, dunnage, etc., and therefore offers opportunities for income generation and employment.
- Being a planned and delineated area, a port environment offers good possibilities to arrange for reception facilities allowing for on-site separation and, possibly, further processing.
- The port environment offers a good institutional setting for establishing public-private partnerships in waste handling, thereby recognizing the contribution that SMEs already have or could have.

Of special interest for UWEP is to examine how the basically informal waste management activities of SMEs can be attuned to the international legal framework set by the MARPOL regulations. UWEP initiated case studies in the port of Medan, Indonesia, the port of Karachi, Pakistan and the ports of Vacamonte and San Cristobal, Panama. All the case studies were executed by local researchers.

Conclusions from the UWEP Case Studies

The UWEP case studies, discussions with resource persons and a review of the literature indicated that:

- Community-based organizations and NGOs seldom participate in the port waste management system.
- The SME private sector is quite active in the port environment in Africa and Asia, but seems to be marginal in Latin America.
- SMEs are often not authorized to operate in the port environment, but are tolerated as long as it does not hinder crucial port operations.
- Not many port authorities and hardly any of the SMEs have established environmentally sustainable waste management practices, the absence of which results in the deterioration of the coastal zone environment.
- SMEs are seldom considered serious partners in the establishment of an environmentally sound waste management system in the ports.
- There is a clear link between the informal waste recovery activities in the port area and the recycling sector outside the port area. However, the link between the port waste management system and the adjacent city waste management system is often vague.

The case studies showed that SMEs operate in three areas. Firstly, the entrepreneurs who collect waste oil and oily bilge water using tank trucks. The waste oil is recovered and sold at considerable profits as lubricating oil or fuel oil, or it is refined into a higher grade oil. However, separation of oil and water is seldom done in a responsible way, resulting in large amounts of oil disposed into water and land bodies.

Secondly, SMEs are engaged in the collection of recyclable solid waste fractions. These are mainly individuals, often laborers taking residuals like packing materials with them when leaving the port area. While this is not permitted formally, it is often tolerated by port officials. Subsequently,

Recovered recyclables at the port of Cristobal, Panama.

the recyclables enter the resource recovery sector when sold to intermediate buyers.

Thirdly, in a number of instances the collection of solid waste is contracted out to small-scale cleaning services that employ laborers and simple equipment for the operation of the service.

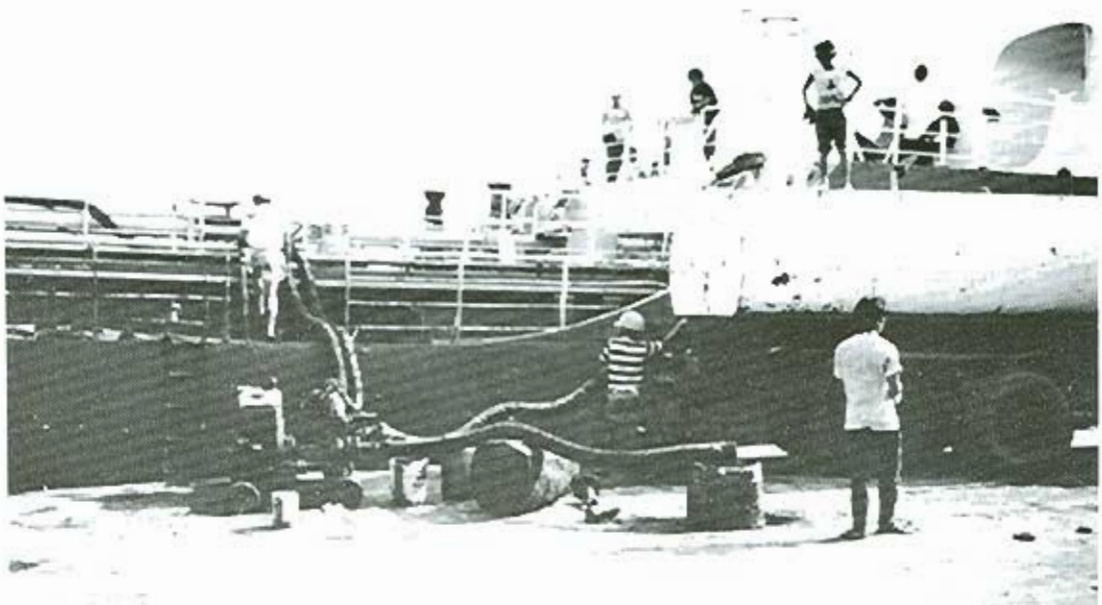
Small and Medium Enterprises: A Forgotten Partner?

As mentioned above, one of the most important challenges that ports in developing countries face nowadays is the protection of the marine environment. In many countries, the responsible authorities are preparing themselves for the establishment of an environmentally sound ship and port waste management system, as required by MARPOL. More and more, the private sector is regarded and approached as a partner to participate in this. The UWEP research has revealed that SMEs are very active in the port environment. However, they are often not acknowledged as a serious partner when it comes to the establishment of public-private partnerships in waste management. The tendency is to approach large enterprises to manage the ship and port waste, in some cases even to introduce foreign companies.

UWEP has the opinion that the participation of SMEs in the port and ship waste management system is an opportunity which the port authorities should seriously consider. The main contribution of SMEs stems from the fact that they are well-established in the market for recycled products, simply because they are part and parcel of the resource recovery sector and maintain close links with others in this network. The port authorities could take advantage of that, since capturing the value of recyclable waste materials could lead to a reduction in the port waste management cost. In an urban economy perspective, the participation of SMEs means the generation of income and employment, inside as well as outside the port.

Policies and Strategies

At present, the survival of SME activities in ports in developing countries is at stake. There is an imminent threat that SMEs will be ousted from port areas and will be overwhelmed by large private companies. This would result in depriving small entrepreneurs and their staff of their current business, whilst there is an international recognition that the SME sector is often the motor and the main employment generator in urban economies in developing coun-



Oily bilge water collection in Belawan, Port of Medan, Indonesia.

tries. Moreover, neglecting SMEs will forego the opportunity of an optimal resource recovery and thus a reduction of system cost.

What is needed are policies and strategies that promote and facilitate SME participation in the ship and port waste management system. It should be stressed, however, that the involvement of SMEs should not be pursued at the expense of the environment. Therefore, investment and capacity building programs are required aiming at improving the environmental performance of SMEs.

Waste collection by push cart, Belauan, Port of Medan, Indonesia.

UWEP's thrust will be to further advocate the case of SMEs in ship and port waste management and to support activities that consider SME participation. To that end, UWEP would like to come into contact with organizations, preferably based in developing countries, that share UWEP's view.

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THE INVESTORS' ROUND TABLE ON PUBLIC-PRIVATE PARTNERSHIPS: INVESTMENT OPPORTUNITIES IN COASTAL AND MARINE SECTORS

An Investors' Round Table on Public-Private Partnerships, the first of its kind within the region, attracted more than 80 participants to Manila on 10 and 11 November 1998. Although few of the participants had previously experienced this type of event, the theme of the meeting created sufficient interest to entice the attendance of representatives from commercial and intergovernmental financial institutions, private companies, trade departments and donor agencies from Australia, Canada, Germany, Japan, New Zealand, the Philippines, Singapore, Sweden, Switzerland and the United States. In addition, more than 50 representatives from participating countries of the GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas attended. The purpose of the Round Table was to enable the international business and investment community to assess opportunities for environmental investment in the East Asian Seas region through the development and implementation of public-private sector partnerships.

Invitees to the Round Table were informed that two levels of investment opportunities would be examined over the two days. The first was identified as 'near-to-market', meaning those projects for which baseline research and preliminary technical and economic feasibility studies had been completed. From the preliminary effort, the local public partners had developed mature proposals, with clearly stated investment requirements and expectations. Local prospective partners would be present to introduce the investment packages, and to promote and discuss the opportunities with investors and potential partners in the private sector.

The second tier of projects to be presented at the Round Table were those representing 'emerging market' opportunities. With the emerging market opportunities, the investment risk was still undefined but the need and potential

size of the market were identified through research and previous technical assistance projects in the region. The purpose of discussions was to establish linkages with the private sector on these issues, to determine the existing concerns and constraints to investment from the private sector's perspective and to examine ways and means of moving these ideas forward.

Near-to-Market Opportunities

Six opportunity briefs were presented on near-to-market projects. The opportunities were identified and developed as part of the Regional Programme's integrated coastal management (ICM) demonstration projects at two sites in the region. Included were four projects from the Province of Batangas, Philippines:

Near-to-Market Opportunities in Batangas

- ***Animal Waste Management and By-product Marketing*** in partnership with the Limcoma Multipurpose Cooperative, Philippine Bio-Sciences and Engineering Co., Ltd., a central processing unit consisting of animal waste anaerobic digester waste management system and electric power generation system.
- ***Regional Municipal Solid Waste Management Facility*** in partnership with the Province of Batangas, the City of Batangas, the City of Lipa and the 32 Municipalities of Batangas consisting of the development, construction and operation of a Provincial processing, treatment and disposal system for municipal solid waste.
- ***Hazardous Waste Management System*** in partnership with local industry, central and local government agencies and institutions consisting of: (1) A waste oil recycling center; (2) Waste exchange and recycling of industrial hazardous wastes; (3) A centralized treatment-disposal facility for small and medium enterprises (SMEs); (4) A medical waste collection treatment-disposal facility.
- ***Shore Reception Facility and Used Oil Recovery/Recycling for the Ports of Batangas and Manila, Philippines*** in partnership with the Philippine Ports Authority consisting of shore reception facilities and related services for ship and port waste for the Batangas-Manila port/region.
- Regional Municipal Solid Waste Management Facility
- Hazardous Waste Management System
- Animal Waste Management and By-Product Marketing
- Shore Reception and Used Oil Recovery/Recycling for the Ports of Batangas and Manila

In addition, opportunities were identified for investment in Xiamen Municipality, China. The Xiamen opportunities were wide ranging, from the construction of infrastructure aimed at the cleanup of a major bay to coastal reclamation projects.

Near-to-Market Opportunities in Xiamen

- ***Integrated Development and Management Project*** in partnership with the Government of Xiamen. Opportunities for: (1) Relocation of aquaculture from the West Sea; (2) Stabilization of deep water navigation channels and improvement of environmental quality and water circulation; (3) Defining the optimal size of coastal reclamation.
- ***Engineering and Development Aspects for the Cleanup of Maluan Bay*** in partnership with the Government of Xiamen. Opportunities for: (1) Construction of two sluice gates, one at each end of the causeway; (2) Renovation and restructuring of the causeway; (3) Construction of shore protection structures or retention walls around the Maluan Bay. Completion of these development projects will result in a newly reclaimed land of around 2 km^2 which may be used for development within a joint venture or public-private partnership arrangement.

A number of exchanges occurred following the presentations, and clarifications were sought in several key areas:

1. PPP Process Versus the Public Tendering Process

The question was raised over the assurance that a company, having been selected as a partner, would have exclusive rights to the project. It was acknowledged that, in the Philippines for example, the Build-Operate-Transfer (BOT) law is well advanced, and serves as a modified procurement service used by central and local governments. Under the Philippines' BOT law, unsolicited bids are open to challenge and, as a result, proponents can lose innovative proposals and ideas to the 'lowest bidder'. On the other hand, under the Local Government Code of the Philippines, it is within the mandate of local governments to enter into PPP arrangements. From the beginning of the PPP process

the local government unit selects the partner, and the terms of the partnership are declared. The partnership ends only if one party decides not to carry through with the implementation due to lack of feasibility. Laws in other countries, and their interpretation of the PPP process, will need to be determined as part of the procedure for expanding public-private partnerships.

The meeting also learned that the 'near-to-market' opportunities presented by representatives of Xiamen Municipality had already been selected and approved by the government. Chinese government policy welcomes foreign investment in environmental priority areas, and the PPP offerings represented the first such demonstration of a new financing mechanism in the country. The Xiamen experience would serve as a model for other regions of the country.

2. Political Regimes Changing During a Project

When political regimes change in mid-project, the reality has been that an ongoing project is put at risk due to a different political agenda or the lack of stimulus to carry forward a program that has been initiated by a previous administration. The guiding principle for avoiding this situation is that the partnership must be formed as a joint venture or operating company, with a contractual arrangement that is legally binding and protected from interference. Reference was also made to the newly formed Local Government Unit Guarantee Corporation established in the Philippines, which is designed to guarantee borrowings. This type of mechanism further reduces the 'political risk' by establishing a call on guarantees in case of default.

It was also emphasized that PPP is a dynamic process. Procedures for selecting partners, establishing equity shares, addressing future problems and making decisions in a partnership environment must be transparent and clearly described for all parties, meaning that the partners need to engage in frank discussions and negotiations on a variety of issues.

3. Ownership Relationship when Governments Change

The operating company needs to be established by legal instrument. The roles and relationships between the parties must be clearly stated in these agreements to avoid disruption in operation, as a consequence of change in government. Conditions precedent to and procedures for termination of the partnership will be clearly stated in the contract. In addition, at the working level, there needs to be transparency and commitment so that key government players, i.e., senior bureaucrats, understand and support the arrangement. They normally have the longer term view of the project, and can bridge the gaps from government to government.

4. Public Sector Equity in the Operating Company

In most cases to date, which are outside of the East Asian region, the private sector has held the majority interest in terms of equity. A local government does not normally want to invest, or is incapable of investing, in a large equity purchase of the company. More often, the investment is in land, or in in-kind services. On issues such as pricing or user charges, the public sector wants to have influence in the company decisions, however the dialogue is far less adversarial if both parties are inside the company.

Emerging Market Opportunities

Emerging market opportunities presented during the Round Table had the following characteristics:

- The goal is to improve or establish environmental management within a developing economic sector
- The necessary institutional framework or management mechanism is under development
- The opportunity and related constraints are described in general terms
- Uncertainties and information gaps are evident
- Further effort is required to develop the opportunity into a near-to-market situation.

Various opportunities were described and discussed during the program, in relation to both hardware and software applications under public-private partnership arrangements. The emerging opportunities involved:

- Ecotourism and investments in preserving the natural capital of an area
- Technical assistance projects in China, including development of national nature reserves and wetlands, port development and expansion of the aquaculture industry
- Environmental hardware for marine and coastal development and pollution prevention
- Environmental software such as training and public awareness programs, ISO certification and technical assistance
- Information management, packaging and networking

In discussing the emerging opportunities, the Round Table conceded that 'best practices' needed to be developed in concert with each opportunity, taking into account: the supportive policy environment; an efficient process for partnership formation; effective and transparent communication between all stakeholders; financing and risk mitigation measures; and established criteria for cultivating contracts

Chua (1997)

and operating modalities. It was concluded that, when developing emerging opportunities, the best practices should focus on economic efficiency, adequate risk adjusted returns, transparency and equity.

Commentary on the Round Table

At the concluding session, representatives from the private sector expressed appreciation and support for the PPP process, including the Round Table. Four items were highlighted by the group: the prefeasibility work for each near-to-market opportunity; the design and conduct of the Investors' Round Table; the advances made in the PPP process that were appropriate for the East Asian region; and the fostering of interest and participation of the public sector in environmental management projects. It was recognized that through application of the ICM working model, problems were identified, political stakeholder processes were initiated, technical and economic prefeasibility undertaken and the level of political will determined. These outputs are relatively impossible for a foreign private sector to achieve, and as a result many environmental investment 'opportunities' remain untouched. It was stated that the response mechanisms developed in Batangas and Xiamen as part of the Regional Programme have few equals, and that efforts are needed to accelerate the application of such mechanisms elsewhere.

The private sector investors identified that they spend considerable time and money in the region trying to develop projects. Martin O'Neill of Parsons Brinkerhoff Power iterated that, generally, 10% of the opportunities are doable and only 1% are winnable. The general feeling was that the opportunities presented at the Round Table were both well screened and mature. The hurdles would have been too high for any private sector company to reach such a stage.

Overall, the Round Table served as a forum where competitors and colleagues alike could sit and discuss project opportunities—recognizing that they too may be partners one day. Perhaps the most significant show of support was the conclusion by the private sector participants that the Round Table approach and format should continue to be part of the ongoing effort of the PPP development process in the region.

Recommendations from the Round Table

The Round Table issued the following recommendations at the close of the two-day event:

1. Development and demonstration of the PPP working model should be continued and applied in other countries of the East Asian region.

2. The Regional Programme should continue its efforts to build capacity at the local and national levels to facilitate private sector participation and investment in coastal and marine environmental management programs.

3. Identification and development of investment opportunities in coastal and marine environmental management program should be expanded in the Regional Programme's follow-on phase, Building Partnerships for Environmental Protection and Management of the East Asian Seas, 1999-2004.

4. A global network of private sector investors should be established with the coordination of the Regional Programme, to interact in developing and implementing bankable environmental projects in the East Asian region.

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MONTEGO BAY, JAMAICA: A CASE STUDY IN PUBLIC-PRIVATE PARTNERSHIPS FOR POLLUTION PREVENTION AND MANAGEMENT OF A VALUABLE CORAL REEF ECOSYSTEM

The coral reefs, mangroves, seagrass beds and other ecosystems of coastal zones in tropical areas are a source of diverse, unique and useful economic and ecological goods and services. These ecosystems serve as the backbone of local and regional economies providing ecosystem services such as filtering organic waste and mitigating coastal erosion, potentially yielding medicines and tools for biomedical research, and form an irreplaceable source of biodiversity, educational and scientific knowledge, and aesthetic pleasure.

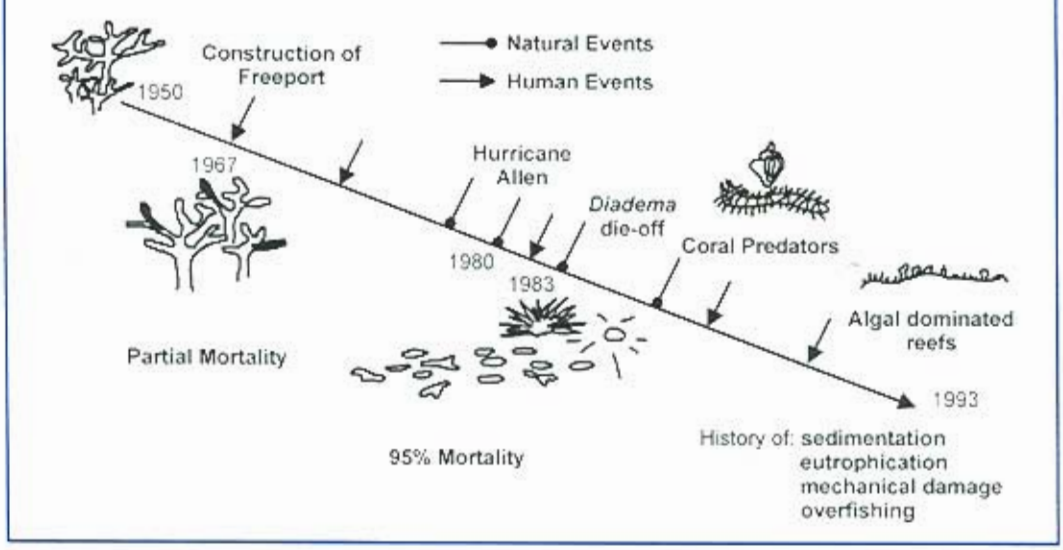
Montego Bay is one of Jamaica's leading tourist centers and is considered by most experts (Jameson et al., 1995) as one of the most threatened nearshore coral reef ecosystems. However, coral communities further offshore are in better condition as they benefit from flushing oceanic currents. Natural and anthropogenic forces over many years have combined to inflict this deadly blow (***Figure 1***). Water pollution, in the form of nutrient enrichment, from municipal raw sewage discharges, household waste, associated leaching and sedimentation has been especially devastating to the nearshore coral reef ecosystem (Hitchman, 1997; Jameson,1997; LaPointe et al., 1997). Oil pollution and runoff of agricultural fertilizers and pesticides continually add to the problems. Once luxuriant nearshore coral reefs are now smothered by macrophytic algae and struggling for survival (Sullivan and Chiappone, 1994).

The purpose of this paper is to characterize the recent public-private partnerships that are ongoing or planned by the Montego Bay Marine Park Trust (MBMPT) in Montego Bay, Jamaica to prevent and manage water pollution in this valuable coral reef ecosystem. This paper also highlights the World Bank integrated coastal zone management decision support model being prepared for Montego Bay Jamaica and finally discusses some of the poverty related issues that hamper water quality improvement and make resource protection difficult.

The Montego Bay Marine Park

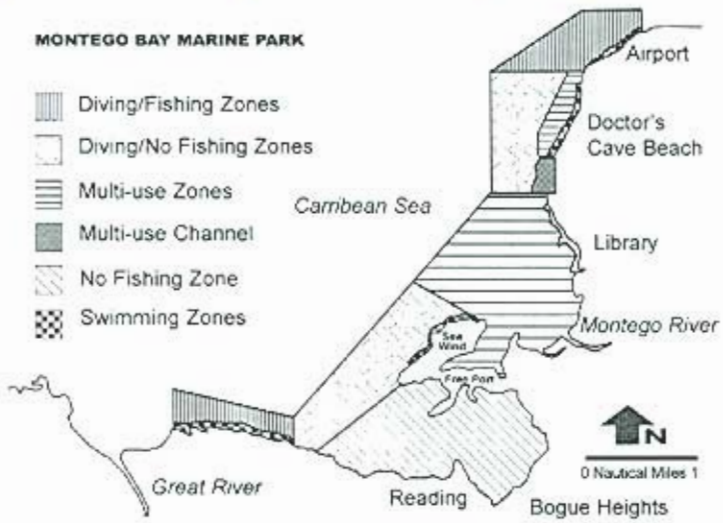
The Montego Bay Marine Park (park) is a 15.3 km² marine area located adjacent to the city of Montego Bay. The Park runs for 9 km of coastline from the Sangster

Figure 1. Natural and Anthropogenic Impacts to the Coral Reef Ecosystem in Montego Bay, Jamaica.



Adapted from Sullivan and Chiappone (1994).

Figure 2. New Zoning Plan for the Montego Bay Marine Park.



International Airport to a point east of the Great River. The Park extends from the high water mark seaward beyond the reefs and contains some of Jamaica's best coral reefs (*Figure 2*).

Montego Bay Marine Park is a mosaic of marine communities that includes coral reefs, seagrass beds, mangrove islands and beaches. The land is joined to the ocean through rivers, wetlands and coastal watersheds. Jamaicans have benefited in the past from this ecosystem in the form of fishes, conch and lobster. Montego Bay can be recalled as a scenic coastline with beautiful beaches, nearshore reefs, freshwater wetlands and mangrove islands. The park is the focal point of the economic and social health of Montego Bay and its environs.

Two watersheds drain into the park—Great River and Montego River. These carry the inland pollutants to the park waters. Coastal mangroves, other wetland areas and seagrass beds which provide breeding, feeding and nursery grounds for fish and shrimp are being destroyed. Harbors and nearshore water bodies are becoming more polluted. Impacts from wind blown dust and illegal sand removal are causing loss of aesthetic value and failure in rehabilitating coastal areas. The Montego Bay Marine Park, charged with conserving this valuable national resource, is now faced with a long-term and expensive restoration project.

Originally under government jurisdiction, a bold experiment was undertaken when the park was transferred to NGO management (private) in 1996. A group of concerned citizens, who had earlier formed the Montego Bay Marine Park Trust in 1992, obtained responsibility from the Government of Jamaica (public) to manage the park under the authority of the Natural Resources Conservation Authority (NRCA). This nationwide experiment in public-private management of national marine and terrestrial parks is starting to show fruitful signs in Montego Bay.

Public-Private Partnerships

The Montego Bay Marine Park Trust in partnership with various public entities is in the process of implementing a variety of low cost and effective programs (soft interventions) to mitigate water pollution impacts to the coral reef ecosystem (***Table 1***).

The CORAL Model

The World Bank-MBMP partnership in developing a least-cost integrated coastal zone management decision support model will assist national and local government officials, planners and park officials to determine the most efficient and effective interventions for water quality management.

The primary question the model asks is: What is the most cost-effective means for achieving a given level of coral reef quality as expressed by percent coral cover?

The technology: *CORAL* runs on a PC laptop computer and is being developed to have a user-friendly interface.

The science: The decision support model exhibits two key features. First, it represents existing knowledge of reef ecology at a detail and within the bounds of accuracy sufficient for project evaluation. To achieve this aim, the model has the ability to show the effects of cumulative nonlinear relationships among pollutants, coral reefs and the reefs' larger marine environment. Second, the model is operable and provides useful results with the information available at the location of potential application. Below are just a few examples of the many ecological test-case scenarios that have been simulated with the model:

- Algae abundance as a function of the interaction of reef fish grazing pressure and effective nutrient concentration;
- The influence of algae and relief on coral cover;
- The influence of algae and suspended sediment on coral cover;
- The influence of suspended sediment and sediment deposition on coral cover.

Table 1. Public-Private Partnerships in Water Pollution Prevention amd Management in Montego Bay, Jamaica.

Public-Private Partnership	Pesticides and Oil	Sediments	Nutrient Enrichment	Program Status
CORAL modeling WB-MBMPT		Provides least-cost solutions	Provides least-cost solutions	Model operational in 1999
ReefFix restoration program WB-MBMPT	Watershed management component	Watershed management component	Watershed management component	ReefFix proposal submitted for GEF approval
Sewage treatment and effluent disposal NWC-MBMPT			Ideas for design of new plant and disposal methods submitted	Periodic interactions during new plant construction
Artificial wetlands program NRCA-MBMPT		Critical for removing sediments from sewage effluent	Critical for removing nutrients from sewage effluent	Under consideration by NWC and NRCA
Water quality enforcement NRCA, NWC, JDFCG-MBMPT	Oil spills--Park rangers, coast guard and marine police operations		Ships and hotels--Park rangers, coast guard and marine police joint operations	Ongoing
Mangrove reseeding program NRCA-MBMPT		River bank and shore stabilization, filter sediment	Helps remove nutrients from polluted runoffs	Ongoing, with school participation
Green certification			Hotels must meet sewage treatment and disposal standards	Under development
Hydrology assessment NRCA, NWC-MBMPT		Examines effects of structural modifications	Clarifies role and inflows from land-based sources	Historical hydrological assessment needs funding
Circulation studies NRCA, NWC-MBMPT	Estimates long-term and episodic transport	Estimates long-term net and episodic transport in the park	Estimates long-term net and episodic transport in the park	Needs funding
Water quality standards NRCA, NWC-MBMPT	Pesticide and oil standards created	Sediment loading standards created	Nitrogen and phosphorous standards and biocriteria created	Under development
Interpark laboratory NRCA, NWC-MBMPT	Processes monitoring samples	Processes monitoring samples	Processes monitoring samples	Needs funding

Note: MBMPT (Montego Bay Marine Part Trust), WB (World Bank), NRCA (Natural Resources Conservation Authority), NWC (National Water Commission), UWA (Underground Water Authority), JDFCG (Jamaica Defense Forces - Coast Guard), SJPC (St. James Parish Council).

The logic: Coral reef data deficiencies, coupled with marked limitations on resources for reef research and management in the developing tropics, led to the adoption of a fuzzy-logic (or fuzzy-sets, fuzzy-systems) approach. Fuzzy methods possess a number of features making them particularly applicable to the prediction and management of ecological systems (Ruitenbeek et al., 1996).

First, they enable rigorous, quantitative system modeling even though the variables and their interrelationships are described initially (i.e., as inputs to the model) in qualitative terms. This is especially appropriate when human knowledge about the behavior of systems, such as coral reef ecosystems, to human induced environmental changes such as increased sedimentation, nutrient

enrichment and increased fishing effort, is approximate and imprecise at best, rendering adequate parametrization all but impossible. The ability to accommodate qualitative data about reef systems means that more information about them, from more and different kinds of sources, is likely to be available. Since fuzzy logic allows systems to be described as sets of if-then, linguistically-specified rules relating inputs to outputs, it thus offers great potential to utilize human judgment and experiential knowledge, rather than being dependent upon mathematized theory or quantitative databases. Finally, relative to conventional control systems, those using fuzzy methodologies have proven easier and quicker to develop and more robust in operation.

...methods for deriving estimates of coral reef benefits, which are used in conjunction with the model's cost function, are being developed...

The economics: Improved methods for deriving estimates of coral reef benefits, which are used in conjunction with the model's cost function, are being developed. This work adapts and refines existing valuation methods so they take account of the key characteristics of coral reefs, and derive more accurate estimates of coral reef benefits for selected sites. To keep the analysis tractable, the model focuses on three methods for valuing the benefits:

- Direct use valuation—estimating the lost productivity or value in the absence of proper protection or conservation;
- Contingent valuation—estimating the benefits derived from "public goods";
- Marine system biodiversity valuation (lower relative importance to the above)—assessing marine biodiversity values using bioprospecting as the primary technical basis for valuation.

The modeling research applies each of these valuation methods, and then develops a synthesized benefits function based on the data collected during site-specific economic surveys (Huber et al., 1994).

The sociology: The sociocultural impact assessment facet of the modeling program (i.e., encounter sessions with fisherfolk) examines the sociocultural framework of the reef user groups and determines the sociocultural costs and benefits of management alternatives and changes in reef quality. The outputs are an assessment of user group activities related to coral reefs and recommendations for management alternatives based on the sociocultural costs and benefits of alternatives. These results are then incorporated into the larger economic valuation of the costs and benefits of coral reef management and protection for the model.

Caught in the Poverty Cycle

Implementing the necessary water quality management measures to ensure a healthy coral reef ecosystem will not be quick or easy. In about five years, 60% of the population in Jamaica will reside in urban areas, such as Montego Bay, and a third will be located in squatter communities unserved by adequate household waste disposal. Only 25% of the country's households are connected to sewer systems, and even where such connections exist, wastewater treatment is inadequate. The lack of a comprehensive waste management policy and clear lines of government responsibility delays implementation of effective waste management.

Taking all factors together, tourism is the largest economic engine in Jamaica today. In 1992, Jamaica received US$1,009.1 million in foreign exchange earnings. Government direct revenues from tourism for 1992 were US$89.87 million against expenditures of US$58.57 million. Tourism depends on the natural environment and at the same time can support protection of the environment.

However, in Montego Bay, tourism impacts itself and residents and has a direct correlation to water quality. The tourism industry makes many demands on the marine environment, such as pressure on the beaches, use of precious resources for craft items, use of wetlands and outfalls in the sea for waste disposal, removal of seagrass for swimming beaches and blocking of visual and public access to the coast. Other negative environmental externalities, which have all been slowly working together to reduce the charm and quality of Montego Bay as a tourist destination, include: upland sources of pollutants and soils are washing down into coastal ecosystems including wetlands from squatter settlements originating from increased tourist-based employment; overpumping and contamination of aquifers and aquifer recharge areas; disappearing beaches due to encroachment of structures and groynes; foreclosed public access and recreational opportunities in the coastal zone; threatened artisanal and small-scale commercial fisheries from overharvesting and degraded marine ecosystems. The result is reduced water quality, beach erosion, flooding and coral reef die-back which threatens the sustainability of the tourist industry—an industry which is the most important foreign exchange earner in Jamaica.

While Montego Bay has the potential to create vast wealth and has had a measurable degree of success to date, little of this wealth has filtered down to the residents. All-inclusive hotels generate the largest amount of revenue but their impact on the economy is smaller per dollar of revenue than other accommodation subsectors (OAS, 1994). For 1997 in Jamaica, Johnson (1998) estimates that the all-inclusive hotels attracted about 40% of all stop-over visitors and captured about 60% of the total accommodation revenues. Unfortunately, only about 23% of this revenue (Johnson, 1998) stays in Jamaica. The trend towards the all-inclusive concept is increasing. Guests are discouraged from leaving the all-inclusive hotel property because of harassment and crime. Over recent years, this has led to poor earnings by local restaurants, sidewalk vendors and shops. The non-all-inclusive accommodations import less and employ more people per dollar of revenue than the all-inclusives (OAS, 1994). For the entire tourism industry in 1997, the percentage of revenue remaining in Jamaica is about 43% (Johnson, 1998).

> ...tourism industry makes many demands on the marine environment, such as pressure on the beaches, use of precious resources for craft items, use of wetlands and outfalls in the sea for waste disposal, removal of seagrass for swimming beaches and blocking of visual and public access to the coast.

The hotel industry should be a sector where linkages between economic development and environmental protection can enhance the well-being of the local community and maintain options for present and future generations. Unfortunately this is not the case, and living conditions in Montego Bay are eroding. Over one-third of Jamaicans live below the poverty line and many survive on remittances from 4.8 million Jamaicans living abroad. Women's unemployment rate was more than twice as high as men's but this has changed. Female unemployment is still lower but decreasing faster, and more young men are unemployed. People flock to the tourist centers for jobs. However, upon arrival, they find there is no affordable housing provided at these locations and therefore, squatter communities are expanding. Visitor harassment is increasing as more people move from the countryside to tourism centers without jobs. The adult and juvenile crime rate is high and illegal spearfishing (mainly for subsistence) has helped to remove all breeding size fish from snorkel depth waters in the park. Funding from the Government of Jamaica is totally inadequate to restore marine life. Gustavson (1998) estimates that the marine park is worth US$489 million per annum to the economy (US$420 million for tourism, US$4.75 million for fisheries and US$65 million for waterfront land storm protection) but government only contributed US$52,000 in 1997 (and less in 1998) to the marine park budget. Government funds are scarce when 56% of GNP goes to pay off IMF and other foreign debts incurred as a result of the 1973 OPEC crisis. Therefore, unless the tourism sector becomes more proactive and puts money into the environment, the Montego Bay Marine Park Trust will have to go overseas or directly to the 1.2 million annual visitors for help. Population growth, without providing adequate housing and water, waste management, roads, schools and other services is resulting in a vicious cycle of poverty related environmental degradation. It is likely that human impacts will continue to prolong the recovery period of coral reef communities.

In recent months, the economic environment has worsened. Inflation is down and interest rates are falling but bankruptcies are up, so is emigration. Banks are repossessing small hotels and other businesses. Two of the five independent dive shops closed recently.

Breaking the Cycle

The local communities are the principal force behind the need for reef conservation, standing to benefit considerably but also being the principal cause of reef loss. Notwithstanding these threats, the natural areas in Montego Bay remain in good enough condition that, if properly managed and rehabilitated, they will provide substantial opportunities for: (i) economic growth; (ii) poverty alleviation and (iii) the maintenance of globally important biodiversity.

However, given the economic trade-offs and local awareness of environmental issues, coral reef ecosystem preservation and associated water quality is presently seen as a luxury. Until public relations and education efforts take root and informed government policies and programs dealing with pollution and poverty issues are enacted, coral reef managers are caught in a downward spiral of poverty that will defeat them. In any case, resource managers must demonstrate short-term economic benefits from conservation. Long-term payoffs mean nothing in an economy where subsistence is of primordial concern.

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Websites on Public-Private Partnerships in Pollution Prevention and Management and Related Issues

Below are some sites on the Internet about institutions, programs, publications and meetings relating to public-private partnerships in pollution prevention and management.

http://www.undp.org/undp/ppp/

UNDP: PPP-UE—The central objective of the Public Private Partnerships for the Urban Environment Programme is to promote partnerships/joint ventures between the private sector and governments to address key urban environmental problems in developing countries in the areas of water, waste management and energy. The program promotes these partnerships/joint ventures by providing resources to convert environmental problems into viable business opportunities. UNDP believes that the formation of such partnerships is one of the most promising forms of cooperation now emerging for sustainable development.

http://www.inforamp.net/~partners/

Established in 1993, the Canadian Council for Public-Private Partnerships is an organization founded on the belief that there are many benefits to be gained when the spheres of government and business intersect. The Council conducts research, publishes research findings, facilitates forums for discussion and sponsors conferences on PPP.

http://www/clar.net/pub/ip3/

The Institute for Public-Private Partnerships (IP3), a nonprofit corporation, is an international training and technical assistance firm dedicated solely to fostering public-partnerships in infrastructure development, municipal and public services, and business development.

http://www.ip3.org/haz.htm

The training workshop on Public-Private Partnerships in Solid Collection, Transfer and Disposal: Project Appraisal, Analysis, and Financing Techniques, held on 3-14 August 1998, in Washington, DC is specially designed for those officials responsible for designing, developing and implementing effective public-private partnerships in the solid waste sector.

http://www.globenet.org/preceup/angl/index.html

PRECEUP—The Urban Popular Environmental Economy Programme which began in 1994, is funded by the European Union and is designed to support local initiatives in the South dealing with the urban environment, and initiate debates and information exchanges on the theme of urban environment.

http://www.sustainabledevelopment.org/blp/

The Best Practices & Local Leadership Programme is a global network of capacity-building organizations dedicated to sharing lessons learned from innovative practices in support of sustainable urban and community development and of the implementation of the Habitat Agenda and Agenda 21.

http://www.iclei.org/

The International Council for Local Environmental Initiatives (ICLEI) is an association of local governments dedicated to the prevention and solution of local, regional and global environmental problems through local action. It was launched in 1990 as the international environmental agency for local governments under the sponsorship of the United Nations Environment Programme, the International Union of Local Authorities, and the Center for Innovative Diplomacy.

http://www.worldwatercouncil.org/SEED/region/siocam.htm

The Strategic Initiative for Ocean and Coastal Management (SIOCAM) is a global initiative which seeks to harness the knowledge and skills of UNDP headquarters, UN agencies, donors and other external support agents and projects themselves, to enhance the effectiveness of ocean and coastal management projects in promoting sustainable human development, particularly of the poor, in developing countries.

http://www.unchs.org/unon/unchs/uef/oldhome.htm

The Urban Environment Forum is a global coalition through which cities and international support programs and exchange experiences, learn from each other and collaborate in addressing urban environmental issues worldwide.

http://clu-in.com/pubipart.htm

Publications on Public-Private Partnerships, Consortia and Roundtables. Some files are downloadable on Word Perfect and Adobe Acrobat formats.

http://www.ncppp.org/index.html

The National Council for Public-Private Partnerships, founded in 1985, is a nonprofit, nonpartisan association whose primary purpose is to explore the ways in which the private and public sectors can work together in providing public services and developing, financing and implementing infrastructure and community facilities.

http://www.amazon.com/exec/obidos/ASIN/9992802383/qid=915502011/sr=1-28/002-5780764-6591406

Public-Private Partnerships in Environmental Protection. Published in 1991.

http://www.amazon.com/exec/obidos/ASIN/0821333194/qid=915502011/sr=1-4/002-5780764-6591406

The Business of Sustainable Cities: Public-Private Partnerships for Creative Technical and Institutional Solutions (Environmentally Sustainable Development). Edited by Ismail Serageldin, Richard Barrett and Joan Martin-Brown. Published in June 1995 by the World Bank.

Newsbriefs

The Global Environment Facility (GEF)/ United Nations Development Programme (UNDP)/ International Maritime Organization (IMO) Regional Programme for Marine Pollution Prevention and Management in the East Asian Seas (MPP-EAS) is now in its fifth year of implementation. The Programme is participated in by Brunei Darussalam, Cambodia, China, DPR Korea, Indonesia, Malaysia, Philippines, Republic of Korea, Singapore, Thailand and Vietnam. This section highlights recent activities of the Programme from August 1998 to June 1999.

REGIONAL PROGRAMME

Final Project Evaluation of the Regional Programme

On 3-16 August 1998, a three-man evaluation team commissioned by UNDP composed of Dr. Angel Alcala, Dr. Olof Linden and Dr. F. Brian Davy, conducted an intensive evaluation of the Regional Programme's progress, achievements and outputs. The team concluded that the Programme has made substantial accomplishments towards meeting its goals.

Fifth and Sixth Programme Steering Committee (PSC) Meetings

The Fifth PSC meeting, held on 2-5 December 1998, in Bali, Indonesia, was attended by representatives from the 11 participating countries, the United Nations Development Programme (UNDP) Manila, International Maritime Organization (IMO) London and the Programme Development and Management Office as well as 19 observers from various international agencies and local institutions. It was noted that the Programme had achieved the projected milestones and objectives and completed its major activities and basically achieved its set objectives.

The Sixth PSC Meeting was held on 25 March 1999 in Manila Diamond Hotel, Philippines. This one-day meeting, with 70 participants, was both a technical session and a tripartite review session. Undersecretary Ramon Paje of the Philippine Department of Environment and Natural Resources underscored the importance of the meeting to extend the experience gained from the Regional Programme. Mr. Jean Claude Sainlos, Senior Deputy Director of the Marine Environment Division of IMO London and Mr. Shun-ichi Murata, Deputy Resident Representative of UNDP Manila, both stressed the success of the Programme in developing innovative management approaches to marine pollution problems, the public- and private-sector partnership, training and technical assistance projects for the participating countries and the new initiative on Marine Electronic Highway in the Malacca Straits.

International Conference on Challenges and Opportunities in Managing Pollution in the East Asian Seas

The Regional Programme, in collaboration with the Coastal Management Center and the Department of Environment and Natural Resources, organized the conference entitled, "Challenges and Opportunities in Managing Pollution in the East Asian Seas". The conference was held on 22-24 March 1999 at the Manila Diamond Hotel, Philippines. About 150 experts, policy-makers, environmental managers and private sector individuals from 21 countries participated in the conference.

About 150 participants attended the International Conference on Challenges and Opportunities held in Manila on 22-24 March 1999.

The experiences and lessons learned as well as the achievements of the Regional Programme in the abatement and management of marine pollution in the East Asian Seas were presented. Working models and innovative management mechanisms, such as integrated coastal management (ICM) and risk assessment/ risk management, developed by the Regional Programme to address the various aspects of land- and sea-based pollution were discussed.

'Building Partnerships' Approved

On 14 October 1998, the GEF Council approved a project brief entitled, "Building Partnerships for Environmental Protection and Management in the East Asian Seas". The brief was prepared by the Regional Programme on behalf of the 11 participating countries of the East Asian Seas, and in collaboration with UNDP. The primary purpose of the proposed project is to build upon and extend the integrated management working model developed under the current project. The follow-on phase will use the base of experience and knowledge, and replicate and extend the practice to more than 18 sites across the region. A detailed document is currently being reviewed by GEF Council. It is expected that the follow-on phase will start in October 1999.

BATANGAS BAY DEMONSTRATION PROJECT

Batangas Bay Multimedia CD-ROM

The Environmental Management Spatial Database of the Batangas Bay Region (CD-ROM format) has been published. It is an output of the application of the geographic information systems (GIS) subproject of the Batangas Bay Demonstration Project in support of the integrated coastal management (ICM) system being applied in the Bay Region with emphasis on marine pollution abatement and management. Although it was prepared for the Bay Region, it can be used as a model or training tool in the preparation of a similar multimedia CD-ROM for a selected planning area.

The CD-ROM has several unique features: (1) three types of maps: basic, digital and maps generated from modeling activities; (2) each map has corresponding text describing the contents of the theme map, its relevance, source and quality, technical information about the contents obtained from the reports, map analysis and modeling in the GIS; (3) maps can be saved to a PCX format to the local drives of the computer where it is running, it can be edited and printed to any popular imaging software; (4) it comes with an operating manual and tutorial.

MALACCA STRAITS DEMONSTRATION PROJECT

Workshop for Subregional Cooperation in Oil Spill Modeling in the Malacca Straits

This workshop, held on 25-27 August in Jakarta, Indonesia, was organized by the Regional Programme in collaboration with the Environmental Impact Management Agency (BAPEDAL), the Indonesian State Oil and Gas Company (PERTAMINA) and the Canadian funded Collaborative Environmental Project in Indonesia (CEPI).

Sixty participants attended the workshop. An action plan was adopted for subregional collaboration in the application of a common oil spill model in the Malacca Straits as an effective tool for the prevention and reduction of oil spill pollution in the Straits.

Malacca Straits Environmental Information System

The information system, which has been completed, is a Windows-based software that provides a basic framework for the operation of an environmental and marine and coastal resource database and computer mapping, as well as different physical models. In designing the system the objective was to provide an environmental management and decision support system for the Malacca Straits.

The system is menu driven, with seven submodules: five for databases and two for modeling. Base maps include bathymetry, topography, rivers, state, district, town, demography, land use and shipping lanes. Database and/or map overlays are available on marine and coastal resources, socioeconomic activities, environmental pollution, pollution control options and oil spill contingency. The modeling submodules include oil spill trajectory and pollutant dispersion.

The two models are linked to the database to provide a rapid assessment of resources that are at risk in the coastal area, as well as an estimate of the potential economic impact on the area threatened by pollution.

Training Workshop on Environmental Risk Assessment and Natural Resources Damage Appraisal for Tropical Ecosystems

The training workshop, held on 21-29 October 1998 in Singapore, combined environmental risk assessment (RA) and natural resources damage appraisal (NRDA). The workshop focused on systematic processes used in describing and quantifying the risks and damages to the environment and human health as a consequence of an action, event or activity.

Regional Workshop on the Marine Electronic Highway

The Regional Programme, in collaboration with the Maritime and Port Authority of Singapore, organized the workshop, held on 29-30 October 1998, in Singapore. Its aim was to facilitate the transfer of technical information on the development, planning and construction of a marine electronic information network. Outputs included: consensus of opinion on the utility of the marine electronic highway; roles and responsibilities of the public and private sectors in littoral and user States, and appropriate international/ intergovernmental agencies, in developing and operationalizing the highway; and a plan of action for stakeholders to build a highway in a portion of the Straits as a demonstration project.

International Conference on the Straits of Malacca

Dr. Chua Thia-Eng, Regional Programme Manager and Prof. Syed Jalaludin Syed Salim, Vice Chancellor of Universiti Putra Malaysia (UPM) signed a Memorandum of Agreement on 8 December 1998 concerning the International Conference on the Straits of Malacca entitled, "Towards Sustainable Management of the Straits of Malacca: Scientific Basis, Policy, Technical and Financial Options".

The conference, held on 19-22 April 1999, in Malacca, Malaysia, was attended by 120 participants. The meeting was jointly organized by the Malacca Straits Research and Development Center, Faculty of Science and Environmental Studies of UPM, the Regional Programme and the Malaysian Fisheries Society to deal with the advancement of knowledge on technology, policy, information as well as financial measures and mechanisms in the Straits of Malacca. The conference assessed the lessons learned and the technological gaps to be filled with respect to the management of the Malacca Straits.

Prof. Syed Jalaludin Syed Salim (left) of UPM and Dr. Chua Thia-Eng, Regional Programme Manager, sign the Memorandum of Agreement on the International Conference on the Straits of Malacca.

INTERNATIONAL CONVENTIONS

Training Workshop on the Strategies, Tools and Techniques for the Implementation of International Conventions on Marine Pollution in the East Asian Seas

The training workshop was held on 21-24 September 1998 in Bangkok, Thailand. Thirty-five trainees from 10 countries and 16 resource persons from the region and IMO London participated. The training focused on the legal, administrative and financial aspects of ratification and implementation of international conventions,

primarily founded on the experience and lessons learned during the past five years of the Regional Programme.

SUSTAINABLE FINANCING

Letters of Intent for Waste Management

Three Letters of Intent (LOI) were negotiated which call for the implementation of the Public-Private Partnership process for the establishment of a waste management system for Batangas Province.

One was signed with the Limcoma Multipurpose Cooperative, Philippine Bio-Sciences and Engineering Co., Ltd., for a central processing unit consisting of an animal waste anaerobic digester waste management system and electric power generation system. A second one was between the Province of Batangas, the Regional Programme Office, the League of Mayors for Batangas and the Sustainable Project Management (SPM) to proceed with the development of a regional municipal solid waste facility. Another LOI was signed with the Philippine Ports Authority for the development and operation of a shore reception facility and waste oil recycling center for the ports of Batangas and Manila.

CAPACITY BUILDING

Fourth Regional Training Course on the Application of Integrated Coastal Management System in Marine Pollution Prevention and Management

The course was conducted on 7-25 September 1998 in Batangas (Philippines), Xiamen (China) and Singapore. There were 24 participants from Cambodia, Indonesia, Malaysia, PR China, Philippines, Republic of Korea, Thailand, Vietnam, Kenya, South Africa and Tanzania. The sponsors were the Regional Programme, the Swedish International Development Cooperation Agency (Sida) and Coastal Management Center. About 15 institutions in the three countries were involved in the local conduct of the course.

Study Tour to ICM Demonstration Sites

Nine senior government officials and scientists from Indonesia (3), Cambodia (2), Vietnam (2) and Democratic People's Republic of Korea (2) participated in a study tour to Batangas (Philippines) and Xiamen (China) on 14-22 October 1998.

The tour brought about a perception change among participants towards an integrated coastal management (ICM) program and made them confident that ICM is the tool for sustainable environmental and economic development of the coastal areas.

Second and Third Training Workshops on Integrated Environmental Impact Assessment (IEIA) for Coastal and Marine Areas

The IEIA workshops were jointly sponsored and organized by the Swedish International Development Cooperation Agency, Coastal Management Center and the Regional Programme. The second workshop was conducted on 16-21 November 1998 in Singapore. There were 20 participants from Cambodia, China, Indonesia, Kenya, Malaysia, Philippines, Republic of Korea, Thailand and Vietnam. The Department of Biological Sciences and Tropical Marine Science Institute of the National University of Singapore hosted the second workshop.

For the second workshop, officials and administrators handling environmental impact assessment (EIA), coastal planners, academicians and others were trained on the concept, scope, methodology, multidisciplinary approach, implementation and benefits of integrated EIA so that they can sway integration of EIA in the development of planning schemes in their countries.

The third workshop, held on 25 March 1999, was attended by 10 participants from the Philippines, Singapore, Norway, Malaysia and Hong Kong from government agencies, the academe and nongovernment organizations.

Announcements

INTERNATIONAL OIL POLLUTION CONFERENCE AND EXHIBITION '99

The Maritime and Port Authority (MPA) of Singapore, in co-operation with a number of international organizations, will hold the International Oil Pollution Conference and Exhibition (IOPCE'99) on 1-3 September 1999 at the Orchard Hotel in Singapore. IOPCE 99 is the meeting point for the oil and marine industry to find out the total approach to oil pollution planning, prevention and response.

A major focus of the international conference is damage claims arising from accidental oil spills and the requirements that need to be followed in order to obtain speedy compensation. The conference will also discuss a case study of a hypothetical, major oil spill incident.

The conference will feature a distinguished panel of experts from the: Marine Environment Protection Committee, IMO; International Oil Pollution Compensation Fund, International Tanker Owners Pollution Federation Limited, Oil Companies International Marine Forum; Mobil Shipping and Transportation Company, Det Norske Veritas, OSG Ship Management, Inc., Ince and Co., Thomas Miller P&I Ltd., Maritime and Coastguard Agency, United States Coast Guard, The Japan Association of Marine Safety; Marine Department Malaysia; Maritime and Port Authority of Singapore, International Petroleum Industry Environmental Conservation Association; East Asia Response Ltd.; BMT Marine Information Systems, Exxon Research and Engineering Company; Exxon Company International and Mobil Business Resources Corporation. The conference will also showcase the latest oil spill response equipment and services.

Oil company executives, business development managers, oil spill services managers, claims and liabilities managers, oil spill technology managers, port authorities, maritime specialists, marine managers and others are invited to attend the above event. For enquiries and registration, please contact:

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REGIONAL CONSULTATIVE WORKSHOP—RECOVERY OF OIL SPILL CLEAN-UP COSTS AND POLLUTION DAMAGE CLAIMS

During the 6th Programme Steering Committee (PSC) meeting of the Regional Programme, representatives from participating governments expressed concern over difficulties encountered by claimant countries with respect to financial compensation under the Civil Liability and Fund Conventions.

In line with this, the Maritime and Port Authority of Singapore (MPA) and the Regional Programme are sponsoring and co-organizing the Regional Consultative Workshop on the Recovery of Oil Spill Clean-up Costs and Pollution Damage Claims. The workshop will be held on 3 September 1999, at the Orchard Parade Hotel, in Singapore. It will be conducted as a follow-on event to the International Oil Pollution Conference and Exhibition '99 on 1-2 September organized by the Marine and Port Authority of Singapore.

The purpose of the workshop is to discuss pertinent issues concerning damage claims in the East Asian Seas region and to examine means of strengthening regional cooperation with respect to damage claims from transboundary oil spills. The workshop shall take advantage of the experience and knowledge of experts in attendance at IOPCE '99 as resource persons. The workshop is being designed for senior government officials from the Regional Programme's participating governments. For further information, please contact the:

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OPRC REGIONAL TRAINING COURSE

A train-the-trainor course on Oil Pollution Preparedness, Response and Cooperation (OPRC) will be held in Singapore on 25-29 October 1999 as part of the International Maritime Organization's (IMO's) long-term objective of combating oil spills through accession and implementation of the OPRC Convention 1990. It is being organized by the Regional Programme and is co-financed by IMO and the Government of Singapore through the IMO-Singapore Third Country Training Programme.

Competent On-Scene Commanders (OSCs), experienced staff from the government and instructors from maritime training institutes are invited to attend the training. For more details, please contact the:

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Forthcoming Publications

CONFERENCE PROCEEDINGS

Proceedings of the International Conference on Challenges and Opportunities in Managing Pollution in the East Asian Seas. MPP-EAS Conference Proceedings 12

Proceedings of the International Conference on Challenges and Opportunities in Managing Pollution in the East Asian Seas, held on 22-24 March 1999 in Manila Diamond Hotel, Philippines. Presents the experiences, lessons learned and achievements of the Regional Programme and those of other national/regional/international initiatives in the abatement and management of marine pollution with special reference to the East Asian Seas region. Discusses the working models and innovative management mechanism developed for wider replication and extension. Contains around 50 papers presented in five sessions including Integrated Management of Marine Pollution, Environmental Investments, International Conventions, Application of Science and Technology, and Stakeholders Participation.

TECHNICAL REPORTS

Benefit-Cost Analysis of Tourism Development and Sustainability in the Malacca Straits. MPP-EAS Technical Report 17

This study focuses on the economic analysis of benefits and costs of management actions for resource preservation and pollution prevention, particularly those affecting tourism in the Malacca Straits. As a first exercise towards valuation of recreational benefits provided by the coastal and marine resources in the Straits, the benefits transfer method (BTM) is adopted. The benefit and cost estimates of the management options considered in this study are, likewise, adopted from other studies. The results of this study, therefore, present broad orders of magnitude of potential net benefits, which may be sufficient to make an opinion about the advisability of a project or a program. The values can then be used as inputs to policy-making.

Benefit-Cost Analysis of Habitat Conservation in the Malacca Straits. MPP-EAS Technical Report 18

This study evaluates the benefits and costs with respect to management options in terms of conservation of and sustainable use of three habitats—mangroves, coral reefs and beaches. It discusses the resource profile of the three littoral States of Indonesia, Malaysia and Singapore including related studies conducted. It provides a methodology and framework in benefit-cost analysis, and results using the developed methodology and framework.

Manual on Economic Instruments for Coastal and Marine Resource Management. MPP-EAS Technical Report 19

This manual presents a background on the current problems besetting the coastal and marine environments and the prevailing policies. It provides a discussion on the economic instruments (EIs) to help countries develop their own implementation strategies. It focuses on the different economic policy instruments utilized by the government such as the command-and-control (CAC) approach, market-based instruments (MBIs) and EIs.

The manual is organized in two parts: Part One provides a general discussion on current pressures on coastal resources and environment, and various public policy strategies. Part Two describes the theoretical foundation of economic instruments and the key design issues. Examples of EIs and actual country experiences are illustrated.

Environmental Risk Assessment Manual: A Practical Guide for Tropical Ecosystems: MPP-EAS Technical Report 21

The manual provides policy-makers, regulators and technical personnel with an understanding of the key principles and practices of ecological risk assessment. The emphasis throughout is on information and guidance that are relevant for subregional seas and tropical ecosystems. It focuses on marine ecosystems and their components as targets, and human health implications arising from them. As far as the agents of risk go, chemical contaminants are the main focus of the manual.

Natural Resource Damage Assessment Manual. MPP-EAS Technical Report 22

This manual reviews the concepts and methods for appraising damages from transboundary marine oil spill and discharges of priority pollutants. Also stressed are practical applications, procedures that could be used to implement NRDA methods, and examples and exercises to illustrate these methods. Problems and issues that can arise in conducting NRDA, and addressing these problems are discussed. This manual is built upon the results of studies conducted for the Malacca Straits. It was tested during the Regional Workshop in Environmental Risk Assessment and Natural Resource Damage Appraisal in October 1998 in Singapore.

Malacca Straits: Refined Risk Assessment. MPP-EAS Technical Report 23

This document focuses on two priority activities and contaminants in the Malacca Straits, as identified in the publication Malacca

Straits. Initial Risk Assessment (1997), namely: (1) human health effects by exploring fish/seafood consumption and contamination of fish/seafood by metals, pesticides and hydrocarbons and (2) ecological effects by exploring measured environmental concentrations for hydrocarbons and hydrocarbon composition and their impact on the ecosystem.

Marine and Coastal Resource Valuation for the Malacca Straits. MPP-EAS Technical Report 24

This report describes the procedures and results of the study on total economic valuation of the Malacca Straits. Estimates are made of the total marine resources, market resources and non-market resources.

Water Use Zoning for the Sustainable Development of Batangas Bay, Philippines. MPP-EAS Technical Report 25

This study deals with the creation of a water use zonation scheme for Batangas Bay, an area rife with multi-layer claims and multi-use conflicts among its surrounding coastal municipalities. The proposed zonation scheme aims to address these issues and avert their possible escalation. The study includes ideas on how to improve the quality of existing land use plans with regard to the use of waterfront areas and also explores the innovative institutional arrangements for implementing the water use zonation scheme in its adherence to the principles of local autonomy and people empowerment.

INFORMATION SERIES

Natural Resource Damage Assessment and the Malacca Straits. MPP-EAS/Info/99/191

This report focuses on economics and explores the feasibility of a Straits-wide approach for assessing natural resource damages in the Straits of Malacca. Emphasis is given to damages due to harm to publicly controlled natural resources, rather than to private losses, since the latter are relatively easy to assess compared to natural resource damages, and the incentive and legal means usually exist to pursue such claims.

Sustainable Financing for Ship-based Pollution Prevention and Management of Malacca Straits. MPP-EAS/Info/99/192

This report examines sustainable financing mechanisms for measures to prevent and manage ship-based, transboundary pollution in the Straits of Malacca. Ship-based pollution includes not only oil spills but also garbage, plastics, oil, grease, sludge and other wastes. The Straits of Malacca are among the world's busiest waterways, operating conditions for vessels are very difficult and accidents are common. Further, many important ecosystems/natural resources in the Straits are vulnerable to pollution, such as mangroves, corals, fish and beaches, and resource-dependent activities such as fishing and coastal tourism and recreation.

Marine Pollution Prevention and Management in the East Asian Seas: A Benefit-Cost Framework. MPP-EAS/Info/99/193

This document provides a framework and guidelines for benefit-cost analyses of marine pollution prevention and management in the East Asian Seas. The framework adopts concepts and methods from the fields of environmental and natural resource economics and applied benefit-cost analysis, focusing on problems central to marine and coastal resources. Special emphasis is given to resource valuation and its potential role in improving benefit-cost analysis to address management of pollution issues in the East Asian Seas.

Malacca Straits: Special Area? MPP-EAS/Info/99/194

This study examines the need, feasibility and implications of designating the Malacca Straits as a Special Area under MARPOL 73/78, and provides recommendations on the considerations and procedures for advancing the special area designation in the Malacca Straits, and/or elsewhere within the East Asian Seas.

This report is based on a literature study, including an extensive review of IMO documents regarding the designation of those Special Areas that are already part of MARPOL 73/78 (i.e., documents of the 1973 Diplomatic Conference and of subsequent MEPC sessions). In addition, an effort was made to identify publications (articles, etc.) with respect to Special Areas.

Marine Pollution Management in the Malacca/Singapore Straits: Lessons Learned. MPP-EAS/Info/99/195

This paper focuses on the lessons learned regarding navigational safety and marine pollution management issues in the Malacca/Singapore Straits as well as the cooperation and collaboration among the littoral States—Indonesia, Malaysia and Singapore—in dealing with such issues. The paper is intended to support the enhancement of environmental management programs in the Straits and to assist with the transfer of good practices and experience from the Malacca/Singapore Straits to other subregional sea areas in the East Asian region.

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FACTS AND FIGURES

Common Constraints to Waste Management Programs in the East Asian Seas Region*

Top Ten Constraints

1. Inappropriate technologies/processes
2. Enforcement ineffective/non-existent; illegal dumping
3. Lack of financing
4. Lack of training/human resources
5. Lack of political support
6. Lack of legislation
7. Policy conflicts among levels of government; overlapping responsibilities
8. Rapid increase in waste generation; limited data
9. Lack of awareness among public
10. Limited land area; land tenure issue

* 1997 National Profiles for Brunei Darussalam, Cambodia, China, Indonesia, Japan, Malaysia, Philippines, Singapore, Thailand and Vietnam, compiled by the GEF/UNDP/IMO Regional Programme.

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

The Executive Editor

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"There is nothing more difficult to plan, more doubtful of success, nor more dangerous to manage than the creation of a new system. For the initiator has the enmity of all who would profit by preservation of the old system and merely lukewarm defenders in those who would gain by the new one."

Machiavelli

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