Proceedings of the Consultative Meeting on the Malacca Straits Demonstration Project

12-13 March 1997
Cebu, Philippines

PROCEEDINGS OF THE MALACCA STRAITS CONSULTATIVE MEETING

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

PROCEEDINGS OF THE MALACCA STRAITS CONSULTATIVE MEETING

Cebu, Philippines, 12-13 March 1997

A. INTRODUCTION

1. The Malacca Straits Consultative Meeting was held at the Tambuli Beach Villa, Cebu, Philippines, from 12 to 13 March 1997. The Meeting was organized by the GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas.

2. The Meeting was attended by representatives from Indonesia, Malaysia and Singapore, and an observer from the Government of Japan.

3. Also represented at the Meeting were the International Maritime Organization (IMO), London, the IMO Programme Development and Management Office, Manila, and two resource persons, respectively, from the University of Sheffield, United Kingdom and the University of Rhode Island, USA.

4. A full list of participants is provided in Annex 1.

5. Mr. S. Adrian Ross, Senior Programme Officer of the Regional Programme, was Chairman for the Meeting. Ms. Lee Mui Ngah of Singapore was Rapporteur.

6. The Meeting adopted the Agenda, as provided in Annex 2.

B. MEETING SUMMARY

1.0 Opening Remarks

Mr. S. Adrian Ross welcomed the participants to the Consultative Meeting.

2.0 Objectives of the Consultative Meeting

2.1 The Chairman recalled that the objective of the Meeting, as stated during the Third Programme Steering Committee was to review the risk assessment report and then to determine the 1997 Work Plan follow-on activities for the Malacca Straits Demonstration Project.

3.0 Malacca Straits Demonstration Site Work Program

3.1 The objectives and status of the demonstration site work program were reviewed, including the outputs achieved to date and how they contributed to the overall objectives of the demonstration site activity.

3.2 The following conclusions were made by the Meeting regarding the outputs achieved thus far in the project, namely:

3.2.1 Malacca Straits Environmental Profile

- the Profile is a snapshot of the Malacca Straits, and serves as an information base for the initial risk assessment. While there are some data gaps, the Profile has insights for further data collection and analysis within the risk assessment framework.

3.2.2 Initial Risk Assessment

- the initiative should present a perspective on the Malacca Straits in general and not on individual countries.

- the initial risk assessment should be regarded as a screening mechanism, to help prioritize contaminants and their effects.

3.2.3 Special Area Study

- although the report is comprehensive, further study on information gaps, such as oceanographic conditions, the ecological effects of oil and garbage, existing enforcement capabilities and other issues, were noted.

- the designation of special area status is one possible measure for improving marine pollution risk management.

- the implications of special area designation on littoral States in terms of their obligations and the benefits they stand to gain would need to be studied. A similar study on the implications for user States is also required.

3.2.4 Oil Spill Modelling

- the Meeting noted that the proceedings of the Pusan Workshop will be published by June 1997.

4.0 Overview of Regional Risk Assessment/Risk Management: Approaches and Applications

4.1 The concept and methodological framework proposed for risk assessment, and economic analysis under the Demonstration Project were introduced.

4.2 Professor Peter Calow emphasized the importance of distinguishing between the risk-based approach and the adherence to the precautionary principle, particularly with respect to policy implications. Professor Thomas Grigalunas discussed the various economic principles and techniques that can be used in risk management, such as cost-effectiveness, cost-benefit analysis and resource valuation.

5.0 Initial Risk Assessment of the Malacca Straits: Review of the Draft Report

5.1 Professor Calow discussed the contents of the Initial Risk Assessment Report and made recommendations for a more refined risk assessment in the Malacca Straits.

5.2 The Meeting noted that:

- risk assessment should address changes in coastal habitats and other natural resources within a subregional context.
- data gaps in the Profile were identified, such as human health indicators and food consumption, which need to be collected for a more refined risk assessment.
- reliability of the data should be assessed to ensure a high level of confidence in risk assessment results.
- hydrodynamic models of some local areas within the Straits are available, and collectively may provide information on the hydrodynamic characteristics of the Straits area. More emphasis needs to be placed in hydrodynamic modelling of the Straits.
- a surveillance system on operational discharges by vessels is one option that should be considered as a means of improving risk management in the Straits.
- refinement of the risk assessment analysis includes both short-term and longer-term activities. Short-term activities involve identifying available secondary data, refining the risk analysis on certain contaminants, and prioritizing possible actions. Longer-term options include developing a coordinated monitoring program to address identified data gaps and, implementing ecotoxicological research activities to establish critical threshold criteria and standards for tropical ecosystems.

6.0 Malacca Straits Demonstration Site Work Plan for 1997/1998.

A series of project proposals describing follow-on work activities for the Malacca Straits Demonstration Site were reviewed by the Meeting. The revised proposals are attached (Annex 3).

6.1 *Refinement of Risk Assessment Analysis*

6.1.1 Given the timeframe to implement the project, the risk assessment refinement will focus on 2 of the 5 areas identified in the initial risk assessment report, namely:

a) human health effects, particularly fish/seafood consumption and contamination of fish/seafood; and
b) ecological effects, especially the impact of hydrocarbons on the ecosystem.

6.1.2 The Meeting noted the importance of utilizing the results of the initial risk assessment to raise awareness concerning information gaps and the need for further work on the assessment of other contaminants and habitats in the Straits.

6.1.3 The representative from Malaysia informed the Meeting that an ASEAN-Canada initiative on water quality standards was completed in 1996 which may be of use for addressing critical threshold limits.

6.2 *Resource Valuation*

6.2.1 The Meeting noted that the resource valuation activity will be a paper study, aimed at pulling together secondary data on living and non-living resources, and the different services provided to users and beneficiaries of those resources. The data will be used to provide littoral States with an estimate of the total value of the identified services.

6.3 *Effective Marine Pollution Preventive Measures*

6.3.1 The Meeting acknowledged that the activity will build upon the information available in the Profile, and will focus on priority areas identified in the risk assessment analysis.

6.3.2 The Meeting agreed that the activity will be undertaken within a regional context, examining options which will strengthen existing programs and measures being undertaken by the three littoral States. The Meeting noted that the initial risk assessment identified the following contaminants as a priority concern in the Straits of Malacca, namely: metals; pesticides; oil; TBT; coliforms; and nutrients. The Meeting agreed that a macro-quality approach should be taken to address all the priority contaminants.

6.3.3 The Meeting noted that the study of marine pollution preventive measures will include institutional and regulatory aspects. The Meeting agreed that the study will also highlight the positive efforts already undertaken by the three littoral States.

6.4 *Benefit and Cost Appraisal of Marine Pollution Prevention and Management*

6.4.1 The Meeting noted that a framework for cost-benefit analysis will be developed as part of the activity. It was further acknowledged that cost-benefit analysis may not be practical for some activities, depending on the information available and the objectives of the implementing government. In these cases, cost-effectiveness may be more appropriate to use in assessing options available. It is also evident that some operations are multi-functional in nature and therefore cost-benefit analysis of one aspect of the operation may not adequately represent the overall benefit derived.

6.5 *Oil Spill Modelling*

6.5.1 The Meeting was informed of the recommendations of the Pusan Workshop and follow-on activities concerning development of a common operational oil spill model for application on a subregional basis, with the Malacca Straits as a testing ground. The proposal which was presented at the Third Programme Steering Committee Meeting has been refined, based on the inputs of National Focal Points. A consultative workshop is being planned.

6.5.2 The representative from Indonesia informed the Meeting that his government is considering hosting the consultative workshop in June or July 1997 pending official approval. As to the project implementation, in his opinion, attention should be given to intellectual property rights in transferring technology.

6.6 *Environmental Management Atlas and Information Base*

6.6.1 The Meeting noted that the environmental information system (EIS) will be developed based upon information in the Profile and the risk assessment report. The Meeting suggested that the major output of the system be called an Environmental Atlas, which will be available in hardcopy and CD-ROM.

6.6.2 The EIS will be developed in close collaboration with the National Focal Points. Mechanism and protocols for updating the system on a regular basis, as well as on future linkages with other systems, such as the Marine Electronic Highway and the Internet, will be explored.

6.7 *Marine Electronic Highway*

6.7.1 The Meeting was informed of the ongoing GEF activity, concerning the Regional Marine Electronic Highway Demonstration Project and noted that the Programme Office will be cooperating and collaborating with GEF, World Bank and the project proponent in the completion of the pre-feasibility study and follow-on activities.

6.8 *Risk Assessment Workshop and Technical Conference*

The proposal was discussed in combination with the proposal under Item 6.9.

6.9 *Risk Assessment/Risk Management Training Program*

6.9.1 The Meeting recognized the linkage between the two proposals and endorsed the tasks envisaged in these proposals. However, the Meeting called for further refinement of proposals in terms of expected outputs, the target groups, and implementation schedules for the proposed training, the workshop and the technical conference.

6.10 *Sustainable Financing Mechanisms for Prevention and Management of Marine Pollution in the Malacca Straits*

6.10.1 The Meeting noted the need for further work on viable financial mechanisms to support navigational safety and marine pollution prevention and management programs in the Straits, as proposed under this activity.

6.10.2 It was emphasized that the advantages and disadvantages of proposed financial mechanisms and public sector-private sector partnerships need to be examined.

6.10.3 It was further acknowledged by the Meeting that case studies envisaged under this activity would focus on the lessons learned within the Straits' region with respect to financial mechanisms and public sector-private sector partnerships.

7.0 International Conference on Sustainable Financing Mechanisms for the Prevention and Management of Marine Pollution in the Straits of Malacca and Singapore

7.1 The Meeting noted the importance of the proposed international conference on the development of equitable sustainable financing schemes among littoral States, user States and other stakeholders in the Malacca Straits.

7.2 The Meeting acknowledged the momentum that had been created on this issue as a result of the Institute of Policy Studies (IPS)/International Maritime Organization (IMO) International Conference on Navigational Safety and Control of Pollution in the Straits of Malacca and Singapore: Modalities of International Cooperation, which was held in Singapore in September 1996. The Singapore representatives stated that Prof Tommy Koh (IPS) had broached the possibility of a follow-up conference with IMO.

7.3 The Meeting endorsed the proposal for the international conference. The Chairman summarized the discussion, indicating that:

7.3.1 IMO would be the most appropriate forum for convening an international conference of littoral States, user States and other stakeholders to address the issue; and

7.3.2 The proposal for IMO to host such a conference needs to be highlighted at future MEPC and MSC meetings, to raise awareness among the littoral States, user States and other stakeholders.

8.0 Other Business

8.1 The Meeting agreed that all draft technical reports on the Malacca Straits Demonstration Project, would be distributed to the National Focal Points in each of the three participating countries for review and comment prior to finalization and public dissemination.

9.0 Closure of the Meeting

In closing, the Chairman expressed appreciation for the contribution of the participants and the support given to the Regional Programme. The Meeting was officially concluded at 15:30, 13 March 1997.

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MALACCA STRAITS CONSULTATIVE MEETING
Cebu, Philippines
March 12-13, 1997

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ANNEX 2

MALACCA STRAITS CONSULTATIVE MEETING

12-13 March 1997
Cebu, Philippines

AGENDA

1. Opening Remarks
2. Objectives of the Consultative Meeting
3. Malacca Straits Demonstration Site Work Program
4. Overview of Regional Risk Assessment/Risk Management: Approaches and Applications
5. Initial Risk Assessment of the Malacca Straits: Review of the Draft Report
6. Perspectives on Marine Pollution Risk and Management in the Malacca Straits: Littoral and User States
7. Malacca Straits Demonstration Site Work Plan for 1997/1998
8. International Conference on Sustainable Financing Mechanisms for the Prevention and Management of Marine Pollution in the Straits of Malacca and Singapore (1998)
9. Other Business
10. Closure of Meeting

ANNEX 3

MALACCA STRAITS CONSULTATIVE MEETING

12-13 March 1997
Cebu, Philippines

MALACCA STRAITS DEMONSTRATION WORK PLAN
1997-1998

Project Descriptions:

1. Refinement of the Risk Assessment Analysis for the Malacca Straits (MSCM/REV4/97)

2. Resource Valuation for Marine Pollution Prevention and Management in the Malacca Straits (MSCM/REV14/97)

3. Effective Marine Pollution Preventative Measures in the Malacca Straits (MSCM/REV9/97)

4. Benefit-Cost Appraisal of Marine Pollution Prevention and Management in the Malacca Straits (MSCM/REV5/97)

5. Application of Common Oil Spill Models for Pollution Risk Management in the Malacca Straits (MSCM/REV13/97)

6. Development of an Information System/Environmental Management Atlas for the Malacca Straits (MSCM/REV11/97)

7. Risk Assessment Workshop (MSCM/REV6A/97)

8. Malacca Straits Technical Conference (MSCM/REV6B/97)

9. Risk Assessment/Risk Management Training Program (MSCM/REV7/97)

10. Sustainable Financing Mechanisms for Marine Pollution Prevention and Management Programs in the Malacca Straits (MSCM/REV8/97)

Malacca Straits Consultative Meeting
Revised: 13 March 1997

CONSULTATIVE MEETING ON THE MALACCA STRAITS

12 - 13 March 1997
Cebu, Philippines

PROPOSAL: Refinement of the Risk Assessment Analysis for the Malacca Straits

1.0 Background

The Programme Work Plan (as revised at PSC2, December 1995) refers to the completion of a risk assessment of land-based and sea-based sources of marine pollution in the Malacca Straits (Activities 1.11.1 to 1.11.4). An initial risk assessment of the Malacca Straits was completed using the Malacca Straits Environmental Profile as the principal resource document (February 1997). That assessment revealed a number of information gaps in the environmental profile, relating to vessel traffic, cargo, living and non-living resources in the Straits, physical/chemical data, human health, etc. In addition, the initial risk assessment provided an indication of the relative risk among contaminants and their impact on resources in, and people along, the Straits, and pointed the way for a more refined risk assessment of chemicals, routes and endpoints.

The initial risk assessment recommended further research in the following areas:

.1 a detailed risk assessment of metals in water;
.2 the determination of sources and critical effect levels of suspended solids;
.3 the assessment of composition, effects levels and likely impacts of oil and hydrocarbon contamination;
.4 a more refined risk assessment of pesticides in sediments;
.5 the determination of human health effects from marine contaminants;
.6 ecological risks from nutrients;
.7 a risk-based strategy for avoiding ecological impacts from oil spills;
.8 the assessment of causes of decline in commercial fisheries;
.9 the development of exposure models;
.10 the harmonization of critical effect concentrations;
.11 a coordinated monitoring program for chemical contaminants;
.12 the development of exposure models;
.13 a cost-benefit analysis.

The proposed project is designed to provide further insight into priority contaminants and their effects on resources and users of the Malacca Straits, by exploring and evaluating existing information sources and programs in the three littoral States. Ultimately, the project will produce a refined risk assessment report on marine pollution in the Malacca Straits, and specific recommendations regarding the application of risk assessment/risk management

as a coordinating instrument in other subregional sea areas, based upon the Malacca Straits model.

2.0 Project Objectives

2.1 To complete a refined risk analysis of land- and sea-based sources of pollution and their effects on living and non-living resources in the Straits;

2.2 To identify ongoing programs and activities in the littoral States of the Malacca Straits which can contribute to the refinement and implementation of a risk assessment/risk management program in the Malacca Straits subregion.

3.0 Methodology

To fulfill the objectives of the Programme Work Plan, and in consideration of the limited time available, the project will focus on two priority activities and contaminants in the Malacca Straits, as identified in the initial risk assessment, namely:

a) Human health effects, by exploring further:

- fish/seafood consumption
- contamination of fish/seafood by metals, pesticides and hydrocarbons

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

The project will be implemented in collaboration with institutions, agencies and individual experts in the three littoral States. Only available secondary data will be input to the project. There will be no primary data collection.

4.0 Work Program

The work program will consist of the following steps:

4.1 Identification of institutions, agencies and individuals in the three littoral States with ongoing programs, studies, experience and/or historical information in the two identified areas;

4.2 Consultation and subcontracting of project components to selected institutions, agencies and individuals in each country;

4.3 Preparation of consolidated reports in each of the identified areas; and

4.4 Utilization of the consolidated reports to complete a refined risk assessment report.

5.0 Project Implementation

The project will be managed and coordinated by the Regional Programme Office. National focal points in the three littoral states will be requested to identify and assist in arranging initial meetings with institutions, agencies and individuals in their respective countries with information, experience and/or ongoing programs and activities in the identified areas. Project outputs, including the refined risk assessment will be reviewed by the National Focal Points prior to distribution.

6.0 Project Outputs

Project outputs will include:

6.1 A Refined Risk Assessment on Marine Pollution in the Malacca Straits;

6.2 A network of institutions, agencies and programs in the subregion with the potential to work on and contribute to a subregional risk assessment/risk management program.

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CONSULTATIVE MEETING ON THE MALACCA STRAITS

12 - 13 March 1997
Cebu, Philippines

PROPOSAL: Resource Valuation for Marine Pollution Prevention and Management in the Malacca Straits

1.0 Background

1.1 The initial risk assessment for the Malacca Straits, based on information in the Malacca Straits Environmental Profile, observed that the quantity and quality of major ecosystems in the Straits had declined and reviewed the likely causes and consequences of these declines. The initial risk assessment also provided an indication of the relative risk among contaminants from land- and sea-based sources and their impact on resources in, and people along, the Straits.

1.2 Assessments of ongoing and proposed actions for land- and sea-based sources of marine pollution requires an understanding of important linkages between the resource base of the Malacca Straits and the economic welfare of those who directly or indirectly benefit from the Straits. These linkages include consideration of (1) the important natural resources of the Straits, (2) the services provided to people by these natural resources, (3) the value of these services and, ultimately, (4) the tradeoffs inherent in management actions.

1.3 This proposal focusses on items (1) - (3). Important resources of the Straits will be identified, and the services they provide will be summarized, based on information in the Malacca Straits Environmental Profile, the Initial Risk Assessment, and in the available regional literature. Then, the economic value of these services will be examined. To do this, the proposed work will draw upon standard concepts from the field of environmental and natural resource economics, use information on resources and their services given in the Profile, and adopt or adapt results from prior work on resource valuation done in the region.

1.4 The services and economic values to be considered will be inclusive, based on information in the Malacca Straits Environmental Profile and results available in the literature. Services will include, for example, the use of sea lanes for transportation, the productivity value of mangroves and peat marshes in contributing to support of marine life and wood products, as well as the role they play in protecting the coastline from flooding, storms, and erosion. A major issue in understanding the value of natural resources is that many of the services these resources provide (e.g., contributions to commercial fisheries, storm and erosion protection) are not directly considered in the market place. Hence, the examination of economic value to be

done in this proposal will include both the market and non-market value of the services provided by Malacca Strait resources, based on information available in the literature.

1.5 The scope of the proposed work is broad and is intended to summarize and synthesize available information on Malacca Straight resources and their value in a way that will facilitate its later use for management purposes. For this reason, the important issues of tradeoffs inherent in actions to prevent and manage pollution--item (4) above--are not addressed in work to be done under this proposal. Consideration of the tradeoffs arising from specific actions essentially involves benefit-cost analyses, which raises many action-specific and related issues that are outside of the scope of this proposal. A separate proposal (see Benefit-Cost Analysis of Marine Pollution Prevention and Management in the Malacca Straits) addresses the benefits and costs of specific ongoing and proposed actions, and will use the resource valuation information from this proposal.

2.0 Project Objectives

2.1 To present key concepts for resource valuation useful for later benefit-cost analyses dealing with land- and sea-based sources of pollution in the Malacca Straits.

2.2 To summarize available information concerning key natural resources of the Straits and the services they provide.

2.3 To provide the littoral States with an estimate of the total value of identified services in the Straits.

3.0 Methodology

3.1 Standard concepts from environmental and natural resource economics will be used. First key concepts will be presented. The notion of natural resources as Natural Assets capable of providing valuable services ("dividends") over time, if maintained, will be introduced. Then, key sources of market failure (externalities, public goods, ill defined property rights) leading to unsustainable use of natural resources will be described, and examples will be given.

3.2 For each important resource, the important services it provides will be identified and estimates of their value presented, using results in the available literature. Annual values of service flows over time will be discounted to illustrate the asset value of resources.

3.3 The values to be considered include on site and offsite values, as well as market and non-market values. Examples of market-values services are the commercial value of fish or wood harvests. Non-market valued services include the value of mangroves and corals for storm and flood protection and shoreline erosion control. On site value refers to the net benefits from uses of the resources *in situ*, for example, fishing or harvesting of wood in mangroves. Examples of off site value are

the positive effects on the productivity of sea grasses and corals due to the presence of mangroves that reduce sedimentation or pollution from land-based sources, or the benefits received by those who harvest marine species many kilometers from a particular habitat critical for "producing" the species.

3.4 For each resource, the descriptions will indicate the services provided, the nature of the value (benefit) provided--market/non-market and on site/offsite-- and the apparent beneficiaries, for example, littoral States, Asia and other areas (in the case of transportation). When information is available, ranges of values will be shown and uncertainties will be recognized.

3.5 Several issues complicating attempts to establish resource values should be recognized. One is the inherent difficulties in quantifying resource services and their monetary value, although considerable progress has been made on these issues in recent years. Beyond that, the quality of studies done at different points in time may differ, some studies are more inclusive than others, and resources in similar categories may not be homogeneous. Hence, due care must be exercised in using the results of studies, and caution is called for in transferring the results from one area to another. Potential double counting is another concern and arises, for example, if one counts both the value of fish harvested by fishers in the littoral States and the estimated value of corals or mangroves in "producing" fish. Also, important differences may exist between the value associated with a marginal (small) change in a resource and the value associated with a large change. These and other issues will be noted and, when appropriate, taken into account. For example, in some cases, the value of particular resources may have to be described qualitatively.

3.6 Work done under this proposal will build upon the Malacca Straits Environmental Profile and the Initial Risk Assessment for the Straits. Data concerning the economic values associated with important Malacca Straits resources, including mangroves and corals and the value of sea lanes for transportation, will be adopted and/or adapted from the literature from the region..

3.7 Consideration will be given to the services and economic value associated with key resources, as identified in the Malacca Straits Environmental Profile and Initial Risk Assessment for the Malacca Straits:

- mangroves
- peat swamps
- coral reefs
- sea grass beds
- soft bottoms
- sea lanes
- fisheries
- beaches/resorts

3.8 Based on the above analyses, the value of each resource will be assessed. When possible, estimates of the economic value of each service will be given. In addition, the apparent distribution of the benefits will be described (littoral States, region, others). Particular values that cannot be quantified in monetary terms will be noted

and described qualitatively, with an assessment of the likely importance of the missing information and challenges faced in filling the gap.

4.0 Work Program

4.1 Identify national and/or regional agencies and organization, other institutions (e.g., universities, international banks or consulting firms) or individuals, in the three littoral States with completed or ongoing studies, reports or information in the area of resource valuation relevant to this proposal;

4.2 Consult or subcontract project activities to selected companies, agencies, and individuals who are working in the identified areas;

4.3 Prepare report summarizing the concepts, methodology, data sources and assumptions, results, qualifications, and further research needs.

5.0 Project Implementation

The project will be coordinated and managed by the Regional Programme Office. National Focal points in the three littoral states will be requested to identify and assist in arranging initial meetings with institutions with institutions, agencies, and individuals in their respective countries with information, experience and/or ongoing programs and activities in the identified areas.

6.0 Project Outputs

6.1 A technical report on the concepts underlying resource valuation, resources, the services they provide, the estimated economic value of these resource services and their apparent distribution in the Malacca Straits subregion.

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Malacca Straits Consultative Meeting
Revised: 13 March 1997

CONSULTATIVE MEETING ON THE MALACCA STRAITS

12 - 13 March 1997
Cebu, Philippines

Proposal: Effective Marine Pollution Preventative Measures in the Malacca Straits

1.0 Background

The Programme Budget and Work Plan (as revised at PSC2, December 1995) calls for an activity aimed at identifying and evaluating existing and proposed marine pollution preventative measures in the Malacca Straits (Activity 1.12.1), based upon the outcome of the pollution risk assessment initiative.

The initial risk assessment identified the following priority contaminants in the Straits:

- metals
- pesticides
- oil
- TBT
- coliforms
- nutrients

The project will focus on the priority contaminants identified in the initial risk assessment. The project will review existing mechanisms and practices for preventing and managing these pollutants, from land- and sea-based activities, identify possible new measures, and assess the technical and financial implications of each within a regional context. The output will be a package of viable mechanisms to improve pollution management in the Straits and for possible application in other subregional sea areas in the East Asian Seas region.

2.0 Project Objectives

2.1 To review current measures and capacities for managing identified contaminants in the Straits of Malacca, including the development and operation of facilities and measures to avoid shipping accidents;

2.2 To identify possible facilities, measures and institutional and regulatory arrangements which can be implemented in support of existing pollution management programs;

2.3 To evaluate the technical and financial implications of identified facilities and measures;

2.4 To prepare a package of measures, mechanisms, institutional arrangements and regulatory controls for strengthening marine pollution management, within a regional context in the Straits, and for transfer to other subregional sea areas.

3.0 Methodology

The project will build upon the environmental profile and the initial risk assessment for the Straits.

3.1 The principal sources of the identified contaminants will be verified and the positive efforts already undertaken by the three littoral States to prevent and control contaminant discharges and emissions will be examined. Consideration will be given to:

- land- and sea-based, point and/or non-point sources
- deliberate/accidental discharges and spills
- facilities and measures in place/proposed to avoid, reduce and control contaminants
- vessel traffic separation schemes
- oil spill response and coordination
- airborne surveillance
- usage/enforcement of existing facilities, measures and controls.

3.2 Potential measures for strengthening existing pollution management programs related to the identified contaminants will be identified. The measures proposed will focus on the principal sources of the contaminants and will include land- and sea-based measures, such as:

- metals contamination avoidance, reduction and treatment
- pesticide use avoidance and control
- agricultural runoff control
- domestic wastewater management
- Special Area designation
- port State control
- marine electronic highway

3.3 The technical, financial, regulatory and institutional implications of the proposed measures will be determined The assessment will involve a review of:

- regulatory and control requirements, including international conventions and agreements
- institutional requirements
- approaches to integrating proposed measures into existing programs
- whether the technologies and expertise are available locally or will need to be foreign-sourced
- human resource requirements, including training needs
- potential for phasing in the development using transitional measures

- administrative, monitoring and compliance considerations, including coordination of responsibilities among government agencies, levels of government and the private sector.

In completing the financial analysis of the alternatives, the following aspects will be considered:

- the capital investment
- the operation and maintenance of the measures and support services
- indirect costs, such as administration, monitoring and compliance training, etc.
- anticipated/potential revenues, such as sale of services, user fees, permit/license fees, monitoring/inspection fees and administrative charges
- potential investors from sources outside the region.

3.4 On the basis of the above analysis, the feasibility of a package of marine pollution measures and mechanisms will be determined. Indirect effects, such as: a) employment; b) net income; c) technological advancement and d) region-wide environmental and resource management will be identified and evaluated, quantitatively and/or qualitatively, in terms of net benefit to the subregion.

4.0 Work Program

The work program will consist of the following steps:

4.1 Identification of national and/or regional agencies and organizations in the three littoral States with ongoing studies, reports and/or historical information in the identified areas;

4.2 Consultation with and/or subcontracting of project activities to selected companies, agencies and individuals who are currently working in the identified areas;

4.3 Preparation of consolidated reports;

4.4 Extrapolation of indirect benefits of the proposed package to the Straits.

4.5 Packaging of information into an overall report on measures and mechanisms for managing marine pollution in the Straits;

5.0 Project Implementation

The project will be managed and coordinated by the Regional Programme Office. National focal points in the three littoral states will be requested to identify and assist in arranging initial meetings with institutions, agencies and individuals in their respective

countries with information, experience and/or ongoing programs and activities in the identified areas.

6.0 Project Outputs

Project outputs will include:

6.1 A series of technical and financial reports on managing the identified contaminants in the Straits;

6.2 An overview report on integration of proposed measures and mechanisms into the existing programs in the littoral States and the subregion, including possible institutional and regulatory arrangements.

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Malacca Straits Consultative Meeting
Revised: 13 March 1997

CONSULTATIVE MEETING ON THE MALACCA STRAITS

12 - 13 March 1997
Cebu, Philippines

PROPOSAL: **Benefit-Cost Analysis of Marine Pollution Prevention and Management in the Malacca Straits**

1.0 Background

Completion of a risk assessment of land- and sea-based sources of marine pollution in the Malacca Straits was identified in the Programme Work Plan (as revised at PSC2, December 1995). The initial risk assessment for the Malacca Straits, based on information in the Malacca Straits Environmental Profile, observed that the quantity and quality of major ecosystems in the Straits had declined and reviewed the likely causes and consequences of these declines. The initial risk assessment also provided an indication of the relative risk among contaminants from land- and sea-based sources and their impact on resources in, and people along, the Straits.

Among the areas recommended for further research was the cost-benefit analysis to contribute to risk management in the Straits. This recommendation reflected the recognition that decisions to undertake pollution management actions are not just technical decisions that can be made in isolation. Rather, management actions can entail substantial costs, as well as benefits, and decisions about whether, how, and to what extent a management action will be implemented must take into account all associated benefits and costs and their distribution, if the full societal consequences of management actions are to be considered.

This proposed project will present a framework for assessing benefits and costs and apply this framework to ongoing and proposed actions for managing land- and sea-based pollution in the Malacca Straits. Standard concepts and methods from environmental and resource economics will be employed, using priorities identified in the initial risk assessment as well as research results and other information synthesized from work within the region. The results of prior work in the region on resource valuation, for example, of mangroves and corals, will be a particularly important part of this work (see Proposal on Resource Valuation). Ultimately, a goal is to use the experience gained with the use of benefit-cost analysis for managing land- and sea-based pollution in the Malacca Straits as a model for other sub-regional seas.

2.0 Project Objectives

2.1 To develop and apply a benefit-cost framework for managing land- and sea-based sources of pollution for the Malacca Straits.

2.2 To identify related ongoing and planned work in the three littoral States that can support and contribute to the development and implementation of the benefit-cost framework for the Malacca Straits.

2.3 To apply the benefit-cost framework on selected activities and programs in the Straits, existing and proposed, in order to demonstrate the potential application of the process.

3.0 Methodology

3.1 To carry out the proposed work, standard concepts from environmental and natural resource economics and applied cost-benefit analysis will be used. For each management action, all important benefits and costs will be identified, including both market- and non-market-valued effects. Examples of market-valued costs would include the costs of implementation, as well as changes in the commercial value of fish, aquaculture, or wood harvests due to an action. Illustrations of non-market effects would include the value of mangroves and corals for bio-diversity and offsite services, including erosion control.

3.2 All analyses will focus on the incremental effects of a proposed management action, i.e., the effects with vs. without the action. An appropriate rate of discount will be used to discount benefits and costs that occur over time, and sensitivity analyses and other methods will be employed to address important sources of uncertainty.

3.3 The work proposed herein will build upon the environmental profile and initial risk assessment for the Straits, in addition to work being done under other proposals. For example, acquisition of information on capital and operating costs for management actions will be facilitated by work to be done in the proposal, Effective Marine Pollution Preventive Measures in the Melacca Straits. Data concerning the economic values associated with important Malacca Straits ecosystems, including mangroves and corals, will draw upon the results of the proposal on Resource Valuation.

3.4 Pollution management programs that are in place in the Straits to prevent and control contaminant discharges will be considered for their costs and benefits. These programs include:

- land and sea-based point and non-point sources
- deliberate/accidental discharges and spills
- facilities and measures in place/proposed to avoid, reduce, control contaminants
- vessel traffic control separation schemes
- oil spill response and coordination

- airborne surveillance
- usage/enforcement of existing facilities, measures and controls.

3.5 Consideration also will be given to the benefits and costs of potential measures to strengthen existing pollution management programs for controlling land- and sea-based pollution in the Malacca Straits, such as:

- metals contamination avoidance, reduction and treatment marine
- domestic wastewater management
- pesticide use, avoidance and control
- marine electronic highway
- Special Area designation
- port State control

3.6 Based on the above analyses, the net present value of each action studied (i.e., the discounted benefits less the discounted costs) will be assessed. In addition, the apparent distribution of the benefits and costs among affected parties will be described. Particular costs or benefits that cannot be quantified in monetary terms will be noted with an assessment of the likely importance of the missing information and how the data gap might be filled.

4.0 Work Program

4.1 Identify national and/or regional agencies and organization in the three littoral States with completed or ongoing studies, reports or information on subjects relevant to this proposal;

4.2 Consult or subcontract project activities to selected companies, agencies, and individuals who are working in the identified areas;

4.3 Prepare report(s) summarizing the methodology, data and assumptions, results, qualifications, and further research needs.

5.0 Project Implementation

The project will be coordinated and managed by the Regional Programme Office. National Focal points in the three littoral states will be requested to identify and assist in arranging initial meetings with institutions with institutions, agencies, and individuals in their respective countries with information, experience and/or ongoing programs and activities in the identified areas.

6.0 Project Outputs

6.1 A series of technical reports on the benefits and costs (and their distribution) of ongoing or proposed actions for managing land- and sea-based pollution in the Malacca Straits.

6.2 A synthesis report that (1) reviews the use of benefit-cost analysis as a tool for enhancing the management of land- and sea-based pollution in the Malacca Straits, and (2) summarizes lessons learned that might be applied to other sub-regional seas.

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Malacca Straits Consultative Meeting
Revised: 13 March 1997

CONSULTATIVE MEETING ON THE MALACCA STRAITS

12-13 March 1997
Cebu, Philippines

PROPOSAL: Application Of Common Oil Spill Models For Pollution Risk Management In The Malacca Straits

1.0 Background

Indonesia, Malaysia and Singapore have adopted Standard Operating Procedure for Joint Oil Spill Combat in the Malacca Straits (SOP) under which the participating countries may take prompt measures, either individually or jointly, against oil spills from ships. The three countries have also developed their respective capabilities in coastal environmental monitoring and hydrodynamic/oil spill models. While principles for hydrodynamic and oil spill modeling are similar, methodology used and capabilities for model validation vary with countries. Thus simulation results can be very different. Individual data gathering and modeling efforts failed to generate the data that are comprehensive enough for developing and testing operational models for oil spills across jurisdictional boundaries, and the information that are comparable, consistent and reliable for the decision making with regard to joint actions in contingency planning and response.

The Regional Workshop on Operational Oil Spill Modelling, Pusan, R. Korea, 31 May - 3 June 1996, with participants from the littoral countries of the Malacca Straits, recommended that the Malacca Straits be a testing ground for subregional collaboration in the development and application of common models to assist the implementation of any cooperative arrangements in contingency planning and response. The experience gained should be packaged for extension in other subregions. The project is proposed in response to the said recommendation. The Third Meeting of the Programme Steering Committee, 10-12 December 1996, Kuala Lumpur, Malaysia, adopted in principle the draft project proposal. Following the meeting, the draft is being further refined for implementation, based on the comments received from the national focal points concerned.

2.0 Objectives

.1 Identify and select operational hydrodynamic and oil-spill models for common application in the Malacca Straits by the littoral countries;

.2 Exchange data and information about Malacca Straits including those of bathymetry, hydrometeorology and oil properties that are needed for oil spill modeling, particularly for the application of the common models;

.3 Calibrate and validate the common models, including joint experiments and studies among the participants from the littoral countries

.4 Determine strategies and measures for the improvement and further development of the models for fate processes of the spilt oil and damage assessment, including valuation of resultant economic losses; and

.5 Develop a subregional cooperative mechanism for the application of the common models in oil spill contingency planning and response in the Malacca Straits

3.0 Proposed Actions

3.1. Review and Adoption of Joint Action Plan for the Project

,1 National Review and Approval

.2 Subregionl Review and Adoption

3.2 Exchange of Data/Information

.1 Identification of Data Requirements

.2 Determining Modalities of the Exchange

3.3. Identification and Testing of Models for Common Application

3.4 Application of the Common Models

.1 Preparation of Guidelines

.2 Technical Extension

.3 Improvement of Monitoring

.4 Training

3.5. Extension of Project Results

4.0 Measures For Implementation

4.1 Project Management: the PDMO in consultation of national focal points

4.2 Joint Group of Experts from the littoral countries: advice and evaluation on scientific aspects of the project.

4.3 Duration: one years

4.4 Budgetary Requirements: about US$424,000, covering cost of subregional workshop, validation of the common models selected, technical extension, and demonstration of project results for other subregions. The PDMO will assist in leveraging the funding required.

Malacca Straits Consultative Meeting
Revised: 13 March 1997

CONSULTATIVE MEETING ON THE MALACCA STRAITS

12-13 March 1997
Cebu, Philippines

PROPOSAL: **Development of an Information System/Environmental Management Atlas for the Malacca Straits**

1.0 Background

Under the Revised Programme Activities and Budget on the Malacca Straits Demonstration Project, Activity 1.10.3 on the development of a database system and Activity 1.10.4 on the preparation of an environmental atlas are to be implemented starting 1997. These two activities form the basis of the project proposal entitled, *Development of an Information System/Environmental Management Atlas on the Malacca Straits*. The purpose of an information system for the Malacca Straits is to provide reliable data and information on-line or through electronic data exchange which can be utilized by the user and littoral States in the assessment and management of risks due to marine pollution associated with land- and sea-based activities. In the future, the Malacca Straits Information System may be linked to various information systems, such as the electronic highway (ECDIS) and the Internet. Appropriate mechanisms and protocols can be developed on sharing and access of data among the systems with the Malacca Straits Information System. Table 1 shows the overall substantive contents of the Malacca Straits Information System which is based on the *Environmental Profile of Malacca Straits* and the initial risk assessment report.

The purpose of the environmental management atlas, on the other hand, is to serve as a reference document on the Malacca Straits for the user and littoral States. It will be a collection of maps focusing on risk assessment and risk management, with textual and graphical explanation of the relevance of each map. These maps will be segmented from the Malacca Straits Information System and at various scales - subregional (whole of the Straits), national (whole country) or local (specific site) that will show for example, areas at risk by type of contaminants or areas with specific resource that is at risk by type of contaminants. Other contents of the atlas will be the natural resources in the Straits, economic activities and pollution. The atlas will also show critical areas (based on risk assessment) for risk management and other forms of interventions. Figure 1 shows the contents of the atlas. The atlas will be produced in two forms - hardcopy and in CD-ROM. In the CD-ROM, each map will contain relevant information in the form of text, graphs, pictures and tables which can be accessed or viewed by the use of cursor with possible animation where time series data are available. The CD-ROM will be produced in Windows 3.1 and Windows '95.

2.0 Project Objectives

2.1 To develop an information system on the Malacca Straits, including the implementation of cost effective mechanisms for data acquisition and updating on a regular basis using existing technologies and expertise available in institutions and agencies in the three littoral States.

2.2 To produce a Malacca Straits Environmental Management Atlas with emphasis on risk assessment and risk management in hardcopy form and in CD-ROM.

3.0 Methodology

3.1 Contents of the Malacca Straits Information System. The initial information in the spatial database will be taken from the *Malacca Straits Environmental Profile*.

3.1.1 During the course of implementing the project, additional data relevant to risk assessment/management, resource valuation and economic impact assessment will be collected, processed and stored into the Malacca Straits Information System.

3.1.2 The data will consist of two types: geographical data and attribute data. As much as possible, data with absolute location (coordinates) will be preferred. Attribute data with relative location will also be collected, provided these are area specific (e.g., census count of a district or state). Maps and remotely sensed data are relevant data that need to be secured and incorporated into the database. Temporal data of a given location will be collected to enable the assessment of spatial changes over time, especially of resources such as mangroves and coral reefs.

3.1.3 Data will be stored in electronic or digital form using a suitable computer software known as geographic information systems (GIS) which will be linked to a relational database management system. The output, namely environmental management atlas will include maps, graphics, tabulated data and textual information in a hardcopy and in CD-ROM.

4.0 Work Programme

4.1 The design of the system will not require extensive technological and computer programming inputs but will rely on existing information systems resident in selected institutions and agencies in the three littoral States. Interface programs may be required, especially for data exchange but this will depend on the type of system each of the selected institutions and agencies uses which may have more than adequate import/export and conversion functionalities. An overall design framework is shown in Figure 2. Specific steps in the work programme include:

4.1.1 Consultation with relevant institutions and agencies in the three littoral States. This process will be made in close cooperation with the National Focal Points who will provide a list of institutions and agencies in the three littoral States that can participate in the project. The consultation will discuss collaborative efforts with the selected institutions in operationalizing the system, mechanisms and protocol of data acquisition and data exchange, among others.

4.1.2 System design. A proto-type Malacca Straits Information System will be developed based on the contents of the Malacca Straits Environment Profile but focusing on risk assessment and risk management. The design of the system will take into consideration the existing information technologies in the selected organizations in the three littoral States. The design will have components on data capture, storage and display as well as an analytical function to compute certain output, for example, spatial changes, areal extent and risk quotients.

3.1.3 All new data generated by the participating institutions will be encoded into the system at PDMO. Once completed, the system will then be field tested by the participating institutions for system use and effectiveness including data accuracy and precision.

4.1.4 The system will be designed to enable the inputs of data from various participating organizations relatively simple including data sharing procedure through email or by transfer of data via diskettes to PDMO. The PDMO will make regular contacts and visits to these institutions to review the progress of work (in data acquisition and encoding).

4.1.4 Initial information for the system will come from the Environmental Profile of the Malacca Straits including some of the data from the initial risk assessment report. It is anticipated that the system will have bugs during the initial encoding process so that modifications may be necessary. Once this step is shown to be working well, the next step is to input additional data.

4.1.5 The additional data for the system will be secured from the participating institutions. A format for data extraction and encoding will be developed to enable easy capture of data by the system. Such data will be secured from relevant government, research and academic institutions within the three littoral States including remotely sensed data, from existing database (local and international) and other pertinent sources. Other sources may come from ongoing activities of the Malacca Straits Demonstration Project including existing national and international efforts on the Malacca Straits (ASEAN-Canada, ASEAN- Australia, UNEP, FAO, Japan, etc.).

4.1.6 Refinement of the system will be made based on feedback from the field testing. The system will then be presented at a technical conference to interest active stakeholders of the Malacca Straits of the potential relevance of the system in risk assessment and risk management. The presentation will also include the Environmental Management Atlas.

4.1.7 A major output of the Malacca Straits Information System is the Environmental Management Atlas. A presentation module will be integrated into the system to produce quality maps that will be used in the atlas. The module will incorporate thematic information such as for example, risk quotients for certain areas by type of contaminants or water quality indices of coastal waters.

5.0 System Maintenance and Operation.

5.1 The Malacca Straits Information System will be installed in selected institutions or agencies in Indonesia, Malaysia and Singapore during the field testing period besides PDMO. These organizations will serve as Data Custodians. An agreed upon mechanism (to include manpower, funding and mode of data exchange/transfer) will be developed to enable system updating on a regular basis. Similar protocols (including proprietary, cost recovery and revenue generation) will be developed for disseminating the database contents and its access (on-line or through correspondence) by users.

6.0 Project Implementation

6.1 The PDMO will be responsible in developing the Malacca Straits Information System and the Environmental Management Atlas in close cooperation and collaboration with the National Focal Points. National Focal Points will be responsible for identifying institutions and agencies in their respective countries with appropriate programs, experience and technology for input in the system and the atlas.

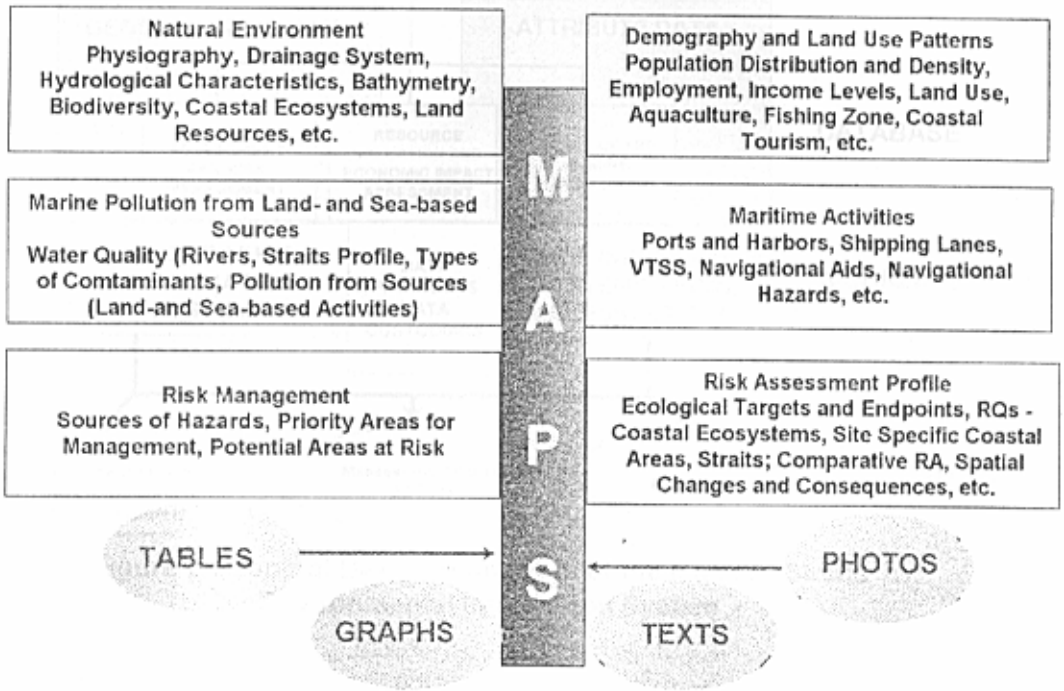
7.0 Expected Outputs

7.1 Publication of the Environmental Management Atlas of the Malacca Straits.

7.2 Production of the Environmental Management Atlas of the Malacca Straits in CD-ROM.

7.3 Establishment of a Malacca Straits Environmental Information System.

Figure 1. Contents of the Environmental Management Atlas of the Malacca Straits



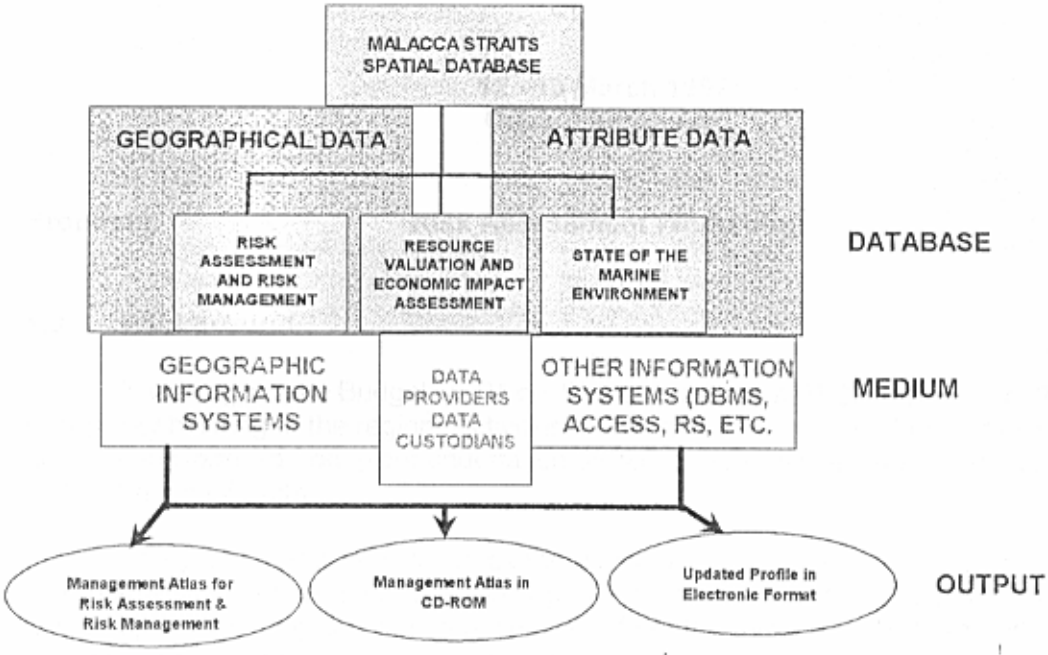


Figure 2. General Design framework of the Malacca Straits Environmental Information System

CONSULTATIVE MEETING ON THE MALACCA STRAITS

12 - 13 March 1997
Cebu, Philippines

Proposal: **Risk Assessment Workshop**

1.0 Background

The Programme Budget and Work Plan (as revised at PSC2, December 1995) refers to capacity building in the region (Activities 1.16.1 and 1.16.3), based upon the experience and lessons learned from work undertaken on pollution risk assessment and management in the Malacca Straits.

The proposed project includes the development of a risk assessment manual and field-testing of the manual at a workshop in the Malacca Straits subregion. The two-day workshop will be targeted to representatives from the three littoral States with technical, scientific and/or management experience in various programs contributing to pollution prevention and management in the Straits of Malacca. Workshop participants will include resource and environmental managers and maritime authorities from the public sector, representatives from the private sector, including the shipping, petroleum and tourism industries, as well as representatives from NGOs, academe and scientific/technical institutions.

The purpose of the workshop is to build capacity and awareness in risk assessment/risk management among agencies and institutions working in the Straits area.

2.0 Project Objectives

2.1 To develop a manual on the application of risk assessment in the management of marine pollution programs in subregional sea areas;

2.2 To build awareness of, and capacity to implement, risk assessment in pollution prevention and management programs in the East Asian Seas;

2.3 To field test and refine the manual at a workshop in the Malacca Straits subregion.

3.0 Methodology

3.1 The training course will be developed as an introduction to regional risk assessment of marine pollution, considering both land- and sea-based activities. The course will focus on the use of best available science to make judgements on the likelihood of environmental conditions emanating from human activities and having adverse effects on ecological systems and/or human health.

3.2 The risk assessment/risk management framework which has been developed as part of the Malacca Straits demonstration project will be used as the reference point for development of the manual. The manual will explain the general approaches used for completing a regional risk assessment, and will relate the actual experience in the Malacca Straits region to identify the practical application of the framework. The preparation of appropriate descriptions of the region (environmental profile), identification of sources, pathways, endpoints and temporal and spatial scales and the effects of multiple stresses will presented, along with specific examples of how these issues and others were addressed during the Malacca Straits demonstration. The economic dimensions of the risk assessment/risk management framework will be introduced, exploring the linkage between contaminants, land and water use, effects and management decisions.

3.3 Invitations to the workshop will be extended to senior and middle managers in the public and private sectors within the Straits.

4.0 Work Program

The work program will include activities such as:

4.1 Identification of institutions, agencies and individuals within the three littoral States with programs, projects and/or research in: ecological and/or human health assessment; resource management; marine pollution monitoring; damage assessment; GIS; sensitivity mapping; etc.;

4.2 Forward invitations to the workshop;

4.3 Development of manual outline;

4.4 Subcontract manual preparation to (various) selected institutions, agencies or individuals;

4.5 Completion of draft manual and workshop program;

4.6 Implementation of workshop;

4.7 Refine risk assessment manual;

4.8 Publish and disseminate subregional seas risk assessment manual to all participating countries.

5.0 Project Implementation

The project will be managed and coordinated by the Regional Programme Office. National focal points in the three littoral States will be requested to identify and assist in arranging initial meetings with institutions, agencies and individuals in their respective countries with information, experience and/or ongoing programs and activities in the identified areas.

The workshop will be held in November 1997, at a venue to be determined.

6.0 Project Outputs

Project outputs will include:

6.1 A manual on risk assessment application in the management of marine pollution programs in subregional sea areas;

6.2 Twenty to thirty managers, scientists and technicians from the region with awareness and capacity to contribute to risk assessment/risk management in pollution prevention and management programs the East Asian Seas.

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Malacca Straits Consultative Meeting
Revised: 13 March 1997

CONSULTATIVE MEETING ON THE MALACCA STRAITS

12 - 13 March 1997
Cebu, Philippines

Proposal: **Malacca Straits Technical Conference**

1.0 Background

The Programme Budget and Work Plan (as revised at PSC2, December 1995) refers to capacity building in the region (Activities 1.16.1 and 1.16.3), based upon the experience and lessons learned from work undertaken on pollution risk assessment and management in the Malacca Straits.

The proposed project includes a two-day technical conference on risk assessment/risk management in the Malacca Straits, at which time the outputs and lessons learned from the project will be presented and reviewed. The targeted audience for the technical conference include representatives from the public sector, such as policy makers, resource and environmental managers and maritime authorities, as well as representatives from the private sector, including the shipping, petroleum and tourism industries.

The conference will be an opportunity to demonstrate the results of the Malacca Straits Demonstration Project. The achievements of the demonstration project will be presented for review, discussion and dissemination. Application of the risk assessment/risk management framework which has been developed as part of the demonstration project will be reviewed, and promoted for use in other subregional sea areas in the region.

The technical conference will be open to regional and international participants.

2.0 Project Objectives

2.1 To prepare and implement a technical conference entitled, ***Marine Pollution Risk Assessment/Risk Management: The Malacca Straits Demonstration***.

2.2 To disseminate technical and scientific information on the Malacca Straits Demonstration Project;

2.3 To build awareness and capacity in marine pollution risk assessment/risk management of subregional sea areas throughout the East Asian Seas.

3.0 Methodology

3.1 Presentations to the technical conference will be provided by agencies, institutions and individuals who have contributed input and worked with the Regional Programme during the demonstration project. In addition, lessons learned from other programs (e.g.,
monitoring experience; economic analyses) will also be considered for presentation.
The proposed technical conference will consist of various related sessions, for example:

- habitats
- human health
- contaminants and their fate
- standards and criteria
- resource valuation
- management options
- benefit and cost appraisal
- monitoring and information management
- financing the investment

3.2 In order to attract major stakeholders from within and outside the region, the conference sessions will be carefully developed, supported and promoted in various forums.

4.0 Work Program

The work program will include activities such as:

4.1 Identification of institutions, agencies and individuals within the three littoral States, and from outside the subregion, with ongoing programs, studies, experience and/or historical information on: ecological and/or human health risk assessment; resource valuation; benefit and cost appraisals for marine pollution; marine pollution monitoring; damage assessment; GIS; sensitivity mapping; resource/environmental database; etc.;

4.2 Identification of the date and venue for the technical conference.

4.3 Invitations to presenters of technical papers for the conference;

4.4 Review of technical papers and finalization of conference program.

5.0 Project Implementation

The project will be managed and coordinated by the Regional Programme Office. National focal points in the three littoral States will be requested to identify and assist in arranging initial meetings with institutions, agencies and individuals in their respective countries with information, experience and/or ongoing programs and activities in the

identified areas.

The technical conference will be held in the first quarter of 1998. The date and venue will be determined in consultation with the three littoral States.

6.0 **Project Outputs**

Project outputs will include:

6.1 A report on the proceedings of the technical conference;

6.2 An assessment of the work program and achievements of the demonstration project in the Malacca Straits, as determined from discussions at the technical conference; and

6.3 An internationally accepted risk assessment/risk management framework for marine pollution management of subregional sea areas.

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Malacca Straits Consultative Meeting
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CONSULTATIVE MEETING ON THE MALACCA STRAITS

12 - 13 March 1997
Cebu, Philippines

Proposal: Risk Assessment/Risk Management Training Program

1.0 Background

The Programme Budget and Work Plan (as revised at PSC2, December 1995) refers to development of training materials, staff exchanges and awareness programs for participating countries interested in pollution risk assessment and management (Activities 1.16.3, 1.16.4 and 1.16.5).

The proposed project includes the development of training modules on risk assessment/risk management and field-testing of the modules in 1998. The target audience for the training program are individuals, agencies, institutions and organizations in the East Asian Seas region who are working in/managing marine-related activities and operations in the public and private sectors dealing with: resource management and development; pollution prevention and management; maritime transport and safety; resource valuation; policy development; monitoring and enforcement; industry and commerce; etc. The purpose of the project is to develop expertise in the use of risk assessment/risk management among managers, professionals, scientists and technicians as a tool for managing subregional sea areas in the East Asian Seas region on a long-term and self-reliant basis.

2.0 Project Objectives

2.1 To develop a series of training modules on the use and refinement of the risk assessment/risk management framework for managing marine pollution in subregional sea areas;

2.2 To field-test the training program in the East Asian Seas region;

2.3 To institutionalize the training program among national and regional agencies and organizations in the region.

3.0 Methodology

3.1 The training modules will build on the experience of the manual on risk assessment (MSCM/REV6A/97), expanding upon management, scientific/technical and economic issues related to risk analysis, including:

- preparing an environmental profile
- screening economic and human activities and their impacts
- identification of pertinent physical, chemical, biological and socio-economic endpoints
- retrospective and prospective risk assessment
- benefit and cost appraisal
- decision-making within the risk assessment/risk management framework
- designing monitoring programs to support risk assessment

3.2 The modules will be developed and targeted principally for managers dealing with marine resources, marine and coastal development, maritime transportation, tourism and fisheries. However, each module will be a "stand alone" package, and therefore other groups and entities will also benefit from individual training modules, including policy-makers, researchers and scientists, academe, economists and NGOs.

3.3 In addition to training material for trainees, support modules will be developed for trainers. This will ensure that anyone who wishes to incorporate the concept of risk assessment/risk management into a training or education program will have the necessary preparatory information.

3.4 The training program will be field-tested at two locations in 1998 prior to finalization. The training course, with all modules included, will be a 10-day program. The emphasis in the course will be the practical application of risk assessment/risk management in managing marine pollution in a subregional sea area, utilizing the experience of the Malacca Straits Demonstration Project as the working model.

4.0 Work Program

The work program will consist of the following steps:

4.1 Completion of the manual on risk assessment (1997);

4.2 Assessment of interest and further training requirements on management, technical/scientific and economic issues from participants at the workshop;

4.3 Development of training objectives, target groups and modules outline;

4.4 Consultation and subcontracting of module components to selected institutions. agencies and individuals;

4.5 Implementation of preparatory workshop to review and finalize the training modules;

4.6 Field-testing of the training program at two locations in the region in the third quarter of 1998;

4.7 Evaluation of the workshops and finalization of the training modules;

4.8 Distribution of the training modules to selected institutions and organizations in the region for inclusion in self-sustaining training and education programs.

5.0 Project Implementation

The project will be managed and coordinated by the Regional Programme Office. The project will be initiated in the third quarter of 1997 and extend to the third quarter of 1998.

6.0 Project Outputs

Project outputs will include:

6.1 A training program on ***Risk Assessment/Risk Management as a Mechanism for Managing Marine Pollution in Subregional Sea Areas***;

6.2 Twenty-five to fifty managers, scientists and policy-makers from the region with the capacity to implement the risk assessment/risk management framework for pollution prevention and management programs the East Asian Seas;

6.3 Institutionalization of the training program at selected institutions and organizations within the region.

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Malacca Straits Consultative Meeting
Revised: 13 March 1997

CONSULTATIVE MEETING ON THE MALACCA STRAITS .

12 - 13 March 1997
Cebu, Philippines

Proposal: Sustainable Financing of Marine Pollution Prevention and Management Programs in the Malacca Straits

1.0 Background

The Programme Budget and Work Plan (as revised at PSC2, December 1995) refers to reviewing and evaluating existing airborne detection/surveillance systems for deterring illegal discharge of oil and other contaminants and for monitoring oil movement in the event of spills, including safety of navigation (Activity 1.12.2). The decision taken by the Second Programme Steering Committee to broaden the focus of risk assessment and management in the Malacca Straits, to include both land- and sea-based sources of pollution, signifies that airborne surveillance is only one of several options for preventing and deterring pollution of the Straits, including the deliberate discharge of oily wastes by ships.

The proposed project will identify the various pollution prevention and management programs (including maritime safety and aids to navigation) that are in place or proposed for the Straits. This will be followed by a review and assessment of the financial mechanisms and institutional arrangements that are available to coordinate and finance such activities. In general, the assessment will include identification and evaluation of:

- the users and beneficiaries of the Straits
- the benefits derived
- the services provided, their cost and how they are supported
- cooperative activities/programs with user States
- institutional/financing arrangements among littoral States
- economic/market-based instruments
- the revolving fund
- environmental management fund
- public sector-private sector partnership opportunities

2.0 Project Objectives

2.1 To identify users and beneficiaries of the Malacca Straits and determine the direct and indirect benefits being derived;

2.2 To determine the extent of existing and proposed pollution prevention and management services provided in the Straits, and the costs associated with such services;

2.3 To assess the benefits derived from marine pollution prevention and management services in the Straits;

2.4 To review various financial mechanisms, including economic and market-based instruments, revolving funds and public sector-private sector partnerships, and to examine the advantages and disadvantages of such mechanisms in the context of programs within the Malacca Straits.

3.0 Methodology

3.1 The identification of users and beneficiaries of the Straits, and the benefits derived, will require analysis of:

- shipping data, including vessel types, cargo routing and volume at different times of the year
- port and harbour traffic, cargo handled and revenue generated
- shipping industry and related commercial activities in the littoral States
- oil refineries/chemical industries (existing and proposed)
- fisheries industry
- tourism industry
- mariculture
- forestry/agriculture
- other (potential) users and beneficiaries

3.2 The identification of services provided, and the related costs and exisitng cost recovery mechanisms will require a series of case studies, focusing on lessons learned within the Straits with respect to:

- maritime safety/navigational aids
- oil spill and emergency response
- monitoring and surveillance
- resource/environmental management programs

- cooperative initiatives among the littoral States
- cooperative initiatives and programs with user States

3.3 A benefit and cost appraisal will be conducted on marine pollution prevention and management services and programs (past, present and proposed) and the relative consequences for littoral and user States, industry, other sectors of the economy and the coastal populations along the Straits;

3.4 The identification of potential financial mechanisms for enhancing and sustaining programs in each of the littoral States, as well as cooperative programs among the States will be completed with due consideration of existing mechanisms, established institutional arrangements and the confines of existing international agreements. Possible technical and economic options will be explored, their potential viability and their advantages and disadvantages will be determined for input to future discussions among the littoral States and user States.

4.0 Work Program

The work program will consist of the following steps:

4.1 Identification of companies, agencies and individuals in the three littoral States with ongoing studies and/or historical information in the identified areas;

4.2 Consultation and subcontracting of project activities to selected companies, agencies and individuals in each country;

4.3 Preparation of consolidated reports in each of the identified areas; and

4.4 Utilization of the consolidated reports to complete a benefit and cost appraisal of users, beneficiaries and programs in the Straits;

4.5 Extrapolation of benefit and cost appraisal to proposed programs for the Straits;

4.6 Exploration of various financial mechanisms for sustaining existing and proposed programs and the calculated contributions (share) from users and beneficiaries;

5.0 Project Implementation

The project will be managed and coordinated by the Regional Programme Office. National focal points in the three littoral states will be requested to identify and assist in arranging intitial meetings with institutions, agencies and individuals in their respective countries with information, experience and/or ongoing programs and activities in the identified areas.

The project will be implemented in 1998.

6.0 Project Outputs

Project outputs will include:

6.1 A technical report delineating the users and beneficiaries of the Straits and their relative contributions to marine pollution prevention and management programs;

6.2 An appraisal of the benefit and cost of existing and proposed marine pollution prevention and management programs in the Straits;

6.3 A report on potential financial mechanisms for sustaining marine pollution prevention and management programs in the Straits.

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