UNITED NATIONS **EP**

United Nations Environment Programme

Distr. restricted

UNEP(WATER)/EAS IG.9/4 Annex I
14 February 2000

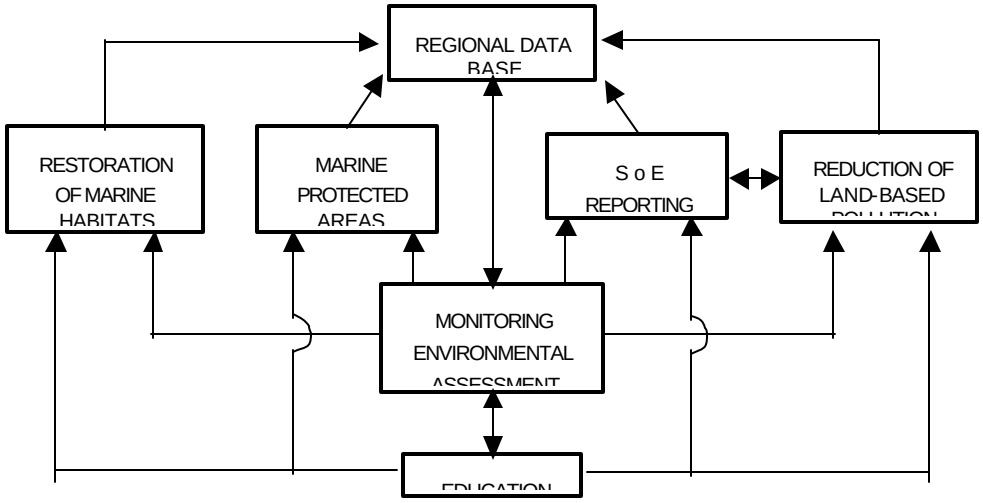
Original: ENGLISH

VISION AND PLAN - A SYSTEMATIC APPROACH

Leading the EAS Action Plan to the 21st Century

This innovative and far-reaching document is the vision and plan of the EAS/RCU to systematically and pragmatically co-ordinate the conservation, restoration and sustainable use of the marine environment in the East Asian Seas Region. Experts from the East Asian Seas Action Plan countries helped in preparing this document.

Taking into account the Regional Action Plan of GPA/LBA, and the Strategic Action Programme in the South China Sea, the planned activities will serve the purposes of these programmes, providing effective means for implementation and ensuring maximum benefits to the Member States.



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1. INTRODUCTION

The Regional Seas Programme was initiated by UNEP in 1974 and the first of the Regional Seas Programmes was developed in the Mediterranean. Based on the success of the Mediterranean Action Plan other Regional Seas Programmes were developed. The Governing Council of UNEP repeatedly endorsed a regional approach to the control of marine pollution and management of marine and coastal resources and requested the development of regional action plans.

In 1992, the Plenary of the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro adopted Chapter 17 of Agenda 21 and reaffirmed the need to strengthen and extend intergovernmental regional co-operation, citing in particular the Regional Seas Programme of UNEP. The Regional Seas Programme includes fourteen regions and nearly 140 states participate in it. It is conceived as an action-oriented programme having concerns for the consequences and causes of environmental degradation, and encompassing a comprehensive approach to combating environmental problems through the management of marine and coastal areas.

In April 1981 the Action Plan for the Protection and Development of the Marine Environment and Coastal Areas of the East Asian Region was adopted by an Intergovernmental Meeting attended by representatives of Indonesia, Malaysia, the Philippines, Singapore and Thailand. In December of that year an intergovernmental meeting established the Coordinating Body of the Seas of East Asia (COBSEA) and the necessary financial and institutional arrangements to support it.

A revised Action Plan and a Long-term Strategy for the COBSEA for the 1994-2009 period were developed in 1994 and Australia, Cambodia, China, R. Korea and Viet Nam joined the Action Plan. Unlike most of the other UNEP Regional Seas Programmes, the East Asian Seas Programme is not supported by a regional convention.

The Long-term Strategy of COBSEA (1994-2009) presented at the Fifth Meeting of the Experts on the East Asian Seas Action Plan (UNEP(OCA)/EAS WG.5/5) requires a pragmatic approach to give tangible results to achieve the objectives of the Action Plan.

A long-term (5-10 years) plan for the Regional Co-ordinating Unit is presented to the member countries, whereby pollution and destruction of habitat problems are identified and possible prevention and amelioration remedies described. This plan is dynamic and includes the problems of the Region yet it is flexible enough to adjust to changes, improvements and unplanned catastrophes. The long-term plan begins with pragmatic projects with finite ends which lead into an integrated set of projects that aim to accomplish the East Asian Seas Action Plan.

Within the overall scheme is fitted the projects and workshops that ran earlier. These projects are considered in the overall plan and are valuable milestones within the concept of the long-term plan. Worthwhile projects are identified and presented for endorsement by the member countries and can be funded by the Trust Fund or funds from donor countries or funding agencies. The role of the EAS Regional Coordinating Unit, as its name implies, is to co-ordinate activities which improve and preserve the marine environmental quality.

COBSEA's long-term strategy is to promote and support the following:

- Preparation of national strategic plans
- Integration of these plans to achieve a regionally balanced approach to the conservation of marine habitats of the EAS
- Identification of regional priorities for action, including protection of biodiversity, management of pollution and ecosystem rehabilitation
- Evaluation of progress in programme achievement through regular monitoring and assessment of the state of the marine environment of the region
- Strengthening the Governments' capability to manage coastal environments, including training, developing a database and capabilities to assess environmental risk and socio-economic impact evaluation
- Increasing awareness in decision makers and the community on socio-economic, cultural and ecological importance of marine ecosystems.

The actions described in this Long-term Plan will result from numerous sources of funding. When these actions take place cannot be predicted due to the unknown quantity and timing of available funds and the preferences of donor agencies.

Important Note:

(i) No projects or activities proposed in the document should be implemented in the disputed areas. All activities should not directly nor indirectly affect or/and prejudice the state sovereignty and the land and waters integrity of the member states of the COBSEA.

(ii) Any project or action to be carried out should be based upon consensus by all the participating states through consultations.

(iii) Further development of the projects and activities included in the document should take into account the priorities within this region: those easy to implement be preceding to the difficult ones, acting in line with all the participating state's abilities and highlighting the key points.

2. WHY WORRY ABOUT THE MARINE ENVIRONMENT?

Saving the environment for the environment's sake is not the first priority in many people's agenda. Not everyone wants to save mangrove forests or keep an unseen seagrass meadow in place. If, however, it were brought to the notice of managers, politicians and the public that these natural ecosystems are valuable long-term resources, then perhaps second thoughts about destroying them may change attitudes and actions. Coastal ecosystems are important because:

- Juveniles and adult species of commercial and recreational importance live there
- Seagrass meadows and wetlands filter the water and maintain high water quality
- Coral reefs and other marine based activities attract tourist dollars
- Animals and plants containing valuable chemicals and genes for commercial use are unique to marine habitats
- Seagrass meadows and wetlands stabilise sediments and prevent beach accretion and erosion act as buffer zones to protect coastlines and each other
- Marine ecosystems can accept limited waste and process it without unacceptable change
- Impacts from man-made disturbances and benefits from well managed ecosystems can cross borders

- There is ecological interdependency between ecosystems
- They can support local villages by providing food and habitat for fish and crustaceans

Population pressure

More than 70% of the population of South East Asia lives in the coastal zone and most of it depends upon the coastal environment for food (UNEP, 1996). The increase of population is due to migration for better living conditions, and increasing birth rate. Serious destruction of these valuable resources, such as coral reefs, mangroves and seagrass, affects their economic condition. With the population increasing in the Region, there is strong requirements for marine and coastal resources which must be protected and used in a sustainable fashion.

Pressure from Development

During the last two decades, the East Asian Seas Region (hereafter called the Region) has experienced rapid economic development. This development has not always been carried out mindful of the need to preserve marine environments. In the current economic climate this problem has worsened.

Based on discussion of the Sixth Meeting of the Experts on the East Asian Seas Action Plan (Bangkok, Thailand, 30 June –1 July 1998), the following issues were identified to be important in the Region:

(i) Problems from economic development

- Over-fishing
- Loss of marine habitats
- Sustainable use of tourism resources
- Disaster prevention

(ii) Environmental problems

- Oil pollution
- Harmful algal blooms
- Land-based Pollution (atmospheric input, river input etc.)
- Organic Pollution, e.g. PAH, PCBs,POPs

In order to properly address these problems and provide useful information for economic development and preparation of guidelines for marine and coastal environmental protection,

(i) There is a need to upgrade the capability of the Member States in the Region in implementing the projects identified, including:

- Coordinating the infrastructure on marine, coastal and associated fresh water environments
- Using scientific knowledge on marine and coastal processes
- Implementing technical skills to carry out necessary observations and monitoring.

(ii) Without an inventory of resources it is difficult to choose marine protected areas, to determine the extent of damage or recovery and to know what is available for use as aquaculture or development areas. These inventories are usually prepared from remote sensing platforms, and supplemented with *in-situ* observations.

(iii) Although complete inventories of habitats of the Region are not available it is already known where many of the areas of damage and deterioration of marine ecosystems have occurred, these "hotspots" need to be carefully monitored and compared with controls where no pollution is occurring.

(iv) Politicians, local government officials, department heads, educators and the public need to be informed about sustainable use of coastal and marine resources and why the

marine environment should be protected. This may take the form of workshops, leaflets, practical demonstrations of the worth of these ecosystems, and media coverage.

(v) There are many ecosystems already destroyed or badly damaged, reclaiming these is expensive and takes a long time. In some instances, with community participation, progress in restoration can occur, in others, highly technical solutions using heavy machinery and the latest technology are the only way.

3. WHAT ARE THE GAPS?

The demand on marine and coastal resources during development places urgency on protecting the marine and coastal environment. Although this urgency calls for immediate action, there are gaps that need to be filled:

(i) Scientific knowledge on the marine and coastal environment

- Lack of systematic knowledge on marine environmental conditions

Understanding the natural processes of marine and coastal environments requires systematic observations and monitoring, which is not the case for most seas in the Region. Although there are many marine science projects and programmes in the Region, they are either limited in specific purpose or by geographic coverage. The general description of marine and coastal environments is incomplete. A systematic approach to understanding the status of and variations in the environments is a basic requirement for the Region.

- Lack of generally agreed format on data/information management

During the past decades, there were many programmes dealing with marine and coastal environments. As a result, there are many databases in the Region. However, due to lack of co-ordination and co-operation, data can not be easily exchanged. There is no generally agreed format for data and information exchange and management in the region.

- Lack of co-ordination of programmes and projects

It is difficult to know how many marine and coastal programmes and projects have been carried out in the Region. These programmes are not well scientifically and technically co-ordinated. As a result, some funding was wasted, efforts were duplicated and the Member States did not obtain the benefits they should.

(ii) Technical measures

The rapid development of technology provides powerful tools to understand the marine and coastal environment. More benefits and effective implementation of programmes will be ensured if this technology is properly applied. There is a strong requirement on:

- Techniques on managing databases
- Technology on forming networks
- Technology on systematic observations and monitoring

4. PROPOSED PLAN

4.1 Establishment of a Regional Database Network and Information System for Marine Environmental Protection and Management

Decision-making should be based on adequate, precise data and information. At present, there are a lot of data and information relevant to marine and coastal environments held by member states of COBSEA, NGO's, regional and international organizations. However, these data and information will only be useful if they are collated and analyzed in a systematic manner so as to be used for actual scientific and management purposes. Until now, there is no integrated database and information network, either on paper or in computer files, for marine environmental protection and management in the East Asian Seas Region. Therefore, establishment of a comprehensive Regional database and information network is a necessary component in overall marine environmental protection in the Region.

Although this project is an arduous, dynamic and lengthy exercise, and needs a lot of funds and resources, it has long-term benefits to marine environmental management and lays a foundation for development and implementation of other projects. As the first step, it might be considered to establish a network which will contain already available data and information and link EAS/RCU and National Focal Points of COBSEA through internet or some other network. When funds and resources permit, this network can gradually be expanded and improved. This network will facilitate exchange of data and information and co-operation among member states and between EAS/RCU and member states, and help promote the publicity and education of marine environmental protection in the Region.

The data and information should be collected and collated in a similar format among countries in the Region, and with other countries with similar interests. The type of data and information to be compiled and managed will be defined and agreed to among COBSEA member states at an early stage of this project. However, all the data relevant to coastal and marine environments will potentially be included in its scope. For instance much of this has been done for five of the participating countries up to 1994 (ASEAN-Australia Symposium on Living Coastal Resources, 1994). The ASEAN – Australian Marine Science Project: Living Coastal Resources Phase II set out to:

- Assess the status of ASEAN Living Coastal Resources Project
- Understand how coastal ecosystems function and are connected and assess the main impacts on these systems
- Assist in developing long-term management plans for sustainable development
- Transfer scientific and technical knowledge and skills to ASEAN scientists
- Introduce new technologies, like remote sensing and computer based data analysis to the Region.

The monitoring and status reports from this review are examples of the data or metadata that should be in the database network. The data from the marine and coastal environment monitoring and assessment project (4.3) will be kept in the database network.

The information and data for river basins connected to the geographical scope and Action Plan of the East Asian Seas Action Plan will also be collected. The data and information that will be held by the database network will include:

(i) Regional (for East Asian Seas, if any) and international conventions, agreements, agendas, etc. relevant to marine environmental protection;

(ii) Directories and summaries of completed, ongoing and planned projects and activities, related to marine environmental protection in the Region, implemented by national agencies and regional and international organizations;

(iii) Marine resource exploitation and protection legislation in member states;

(iv) National marine environmental objectives, strategies and policies in the Region;

(v) Institutions in member states;

(vi) Physical, social, demographic and economic conditions and development mode (such as GDP, industry structure, etc.) as they apply to the marine environment in member states;

(vii) Marine environmental standards: quality standards, pollutant discharge standards, etc.

(viii) An inventory of ecosystem types and marine resources;

(ix) Marine environmental status: monitoring data, e.g. water quality, river input, ecosystem, biodiversity;

(x) Coastal and drainage basin environmental status: freshwater quality and quantity, land use, agriculture, etc.

(xi) Environmental problems and issues: coastal and marine pollution, habitat modification, over exploitation of resources, etc.

Some of these data are available from countries in the South China Sea in their reports of Transboundary Diagnostic Analysis. The Coastal and Marine Environment Management Information System (COMEMIS) prepared by UNEP Environment Assessment Programme for Asia and the Pacific, at Asian Institute of Technology (AIT), has much stored data and one of its long-term objectives is to "identify, assess and collate the relevant and available information on coastal and marine environments".

While the database network should be initially based on the existing facilities and achievements among the member countries, collection of items 8-11 as essential components of the dynamic and updating database network, will be accomplished through separate projects and the monitoring and assessment programme, as described below.

Why have a Regional database network?

- Countries can establish marine nature reserves and marine protected areas on a Regional basis;
- Countries can establish buffer areas for fish habitat on a Regional basis;
- Countries can learn from each other the best uses for the database and how to establish it;
- Countries can determine sources of pollution and determine if amelioration methods have worked;
- Data can be gathered in a consistent form;
- Solutions to transboundary problems can be determined; and
- Monitoring can be carried out with consistency throughout the Region and modelled on existing rigorous methods.

Short-term objectives:

(i) Establishment of an institutional framework for marine environmental data and information exchange and management systems;

(ii) Establishment of an internet-based communication network which will also be used as the main media for data and information exchange and management. In the meantime other forms of exchange are also encouraged;

(iii) Allow for discussion and design of the structure of the environmental database network;

(iv) Upgrading the capability of member states to use the network by organizing training activities.

Short-term activities:

(i) Informal experts discussion on the establishment of environmental data and information network, including, location, structure and contents of database. Design of the communication network, and other relevant technical details.

Financial requirement: *no cost*

(ii) Scoping of information on the existing databases and information exchange system, with a view to build up co-operation and co-ordination with relevant organisations.

Financial requirement: US$ 4,000 (travel costs)
US$ 5,000 (consultant 1p/m)

(iii) Preparation of a proposal on the establishment of a regional network on marine environmental data and information exchange and management in the East Asian Seas region.

Financial requirement: US$ 15,000 (consultant fee and travel)

(iv) Experts Workshop on establishment of an environmental data and information exchange and management system in the East Asian region.

Financial requirement: US$ 25,000

(v) Training course on data and information exchange and management using internet. (possibly with cooperation with currently planned training activities of NEAR-GOOS initiated by IOC/WESTPAC

Financial requirement: US$ 20,000

(vi) National focal points and technical experts meeting on the establishment of a Regional network on environmental data, information exchange and management system. – Discussion and adoption of the proposal.

Financial requirement: US$ 25,000

Mid-term objectives:

(i) Establishment of a Coordinating Group for the Network;
(ii) Preparation of necessary QA/QC procedures for data and information processing and management, and organization of a necessary workshop for preparation of the procedures to be agreed upon; and
(iii) Experimental phase of the operation of the system.

Mid-term activities:

(i) Meetings of the Coordinating Working Group

Venue to be decided
Financial requirement: US$30,000 (Coordinating Working Group meetings).
Publication of the meeting reports: US$1,000 for each of the meeting reports

(ii) Technical workshop on QA/AC and prepare a draft technical manual

In order to improve quality of the participating databases and the data exchange,

techniques of Quality Assurance and Quality Control (QA/QC) and data formats relevant to the parameters of the environmental database will be discussed. The unified and compatible pollution index/grade system will be discussed and designed in the workshop.

Financial requirement:

Workshop:	US$25,000
Prepare the manual:	US$ 8,000
Publication of the workshop report and the manual:	US$ 5,000

(iii) Experimental operation of the marine environment data and information network in the Region

Using the established internet communication network, an experimental operation of the network will be organized.

Financial requirement: No cost. The results of the operation will be gathered through the network.

Long-term objectives

(i) Provision of environmental data and products to the decision maker, scientific communities, and other users; and

(ii) Self-sustained operation of the system.

Long-term activities

The main purpose for the long-term plan of the network is to enable its operation to be self-sustainable. To achieve this purpose, necessary environmental data products need to be developed and provided in order to attract more users to the network.

The detailed activities will be proposed by the Coordinating Group.

4.2 State of the Environment Reporting (SoE)

From the database as described previously, it should be a fairly straightforward, though lengthy task, to prepare a state of the marine environment report for the Region. This report would come from the analysis and diagnosis of the data from the database network and collection of data from the sources concerned, where metadata only were in the database. The SoE report would identify “hotspots” and areas that are potential “hotspots”. The “pressure, state, response” type of reporting is one way of compiling a SoE Report. It would analyse the efforts by member States to conserve their marine environments and inform the community about the pressures on and condition of its environment. The report would contain directions for action, future research suggestions and guidelines and recommendations at the Regional level. It would be produced at regular intervals to demonstrate changes that have occurred over time and be followed by public awareness campaigns.

Although this project is tied in closely with the database project described above (4.1) it does not necessarily have to be carried out as the only outcome from that project. In other words, it is a stand alone project which can be prepared most easily from the one above. Other SoE Reports in the Region, e.g. the ESCAP five year reporting and the UNEP Global Environmental Outlook, will be taken into account when reporting for the East Asian Seas is carried out. The results and analyses from the monitoring project (4.3) would be used in the database network to describe the state of the environment.

Short-term objectives:

(i) Establishment of a mechanism for the state of the environment reporting;

(ii) Provision of environmental information to all users

Short-term activities

To form an editorial task force for the State of the Environment Reporting, and discuss the format, contents, publication and distribution of the Report. The members of the Task Force will be chosen by EAS/RCU in consultation with Member States.

(i) A circular letter will be sent to Member States for nomination of experts, together with a questionnaire to assess requirements at national level;

Financial requirement: None.

(ii) First meeting of the Task Force. The result of the questionnaire will be reported to the Task Force, indicating the requirement of the Report. The plan for the first Report and its contents, format and other technical details will be decided. The first report should be completed by the end of 2000 and should have considered the ESCAP SoE Report

Financial requirement: US$ 30,000
US$ 14,000 (Chief Editor, 2p/m)

Medium-term and Long-term Objectives:

(i) Preparation and publication of the State of Environment Report every five years;

(ii) Provision of systematic information on the environment, its state, the pressures on it and the responses to those pressures.

Medium-term and Long-term Activities:

(i) Access of information required for the Report;

(ii) Regular preparation and publication of the report,

(iii) Annual meeting of the Task force

Financial requirement: (annually)

Information assessment:	US$	4,000
Editor	US$	15,000
Publication and distribution:	US$	30,000
Meeting of the Task force	US$	20,000

4.3 Marine and Coastal Environment Monitoring and Assessment

Management decisions and choosing marine protected areas require that an inventory of marine resources is developed. This inventory usually assesses the extent, condition and status of marine ecosystems. Ecosystem assessment can assist with decisions on:

- Managing fisheries habitats;
- Choosing marine protected areas;
- Determining vulnerable areas in case of an oil spill or similar disaster;
- Choosing where to develop ports and marinas along the coast; and
- Choosing where tourist developments should take place

These uses are all relevant to management. More detailed environmental assessment can be made if the management requirements are to:

- Measure changes in areal extent of the marine resource;
- Determine species or types of resource; and
- Determine the extent of damage to a marine resource on a small (5 m) scale

A real cover of mangroves is easier to assess than the area of underwater ecosystems. Remotely sensed data can be used to assist with interpretations, and ground truth work carried out in the field is essential. Each country should be responsible for its own database but the UNEP Environment Assessment Programme for Asia and the Pacific can offer assistance in the form of image processing, storing data or metadata and assisting with GIS. Countries that do not have the technical capabilities to carry out the inventory of their marine resources while carrying out the capacity building project, can be funded to have consultants carry out the work.

Considerable amounts of pollutants from land-based human activities find their way to the seas. In many cases the effects of these pollutants on marine habitats are obvious but in some cases they are more insidious and only apparent when the habitat is destroyed. The main questions to ask before remedial action is taken are: *is there a problem and what is it?* They can be answered by monitoring, then if remedial measures are taken, monitoring can detect the effect of those measures. Monitoring should also be used to track and assess the status of management actions on fisheries and to determine the necessary actions to sustain fisheries.

Monitoring the marine environment is a long-term exercise, requiring at least five years data that have been obtained in a statistically rigorous fashion and strategically placed in space and time. Monitoring is not always popular with managers because of the expense and time involved but it is the only way to detect changes and distinguish between natural ecosystem variation and that brought about by humans.

There is an assortment of monitoring stations throughout the Region in “hotspot” and control areas. The role of the EAS/RCU is to co-ordinate the methodology, data storing and analysis of the monitoring results and encourage the collection and analyses of new data.

A suitable set of demonstration monitoring stations, including control sites, already in place could be used and the data displayed on a web site to show other member countries their use for marine environmental protection. The controls are to determine if detected changes are natural variations caused by excesses of weather or by human activities. There is, now, a global coral reef monitoring network programme known as “Reef Check” – the availability, methods and metadata of the global network is an example of what could be in the database.

The development and management of marine resources must be based on a sound and technically informative marine environment base. The COBSEA countries must, therefore have a current and dynamic database on the state of the environment (chemical, physical and biological processes, environmental tolerance to anthropogenic stress, etc.). Understanding the state of the marine environment is only possible with a series of reliable data and information compatible among the states. Baselines for the state of the marine environment must be established to monitor consequences of man made disturbances and determine if remedial actions of COBSEA countries were successful. Therefore, it is necessary to establish a collaborative, Regional monitoring programme.

Regular monitoring and surveillance of coastal and marine waters involve maintaining

a continuous record of selected environmental parameters, usually over a long period of time (at least 5-10 years). In order to achieve a Regional consistency in assessment and monitoring, it is essential that the COBSEA states agree on consistent:

- parameters to be monitored;
- monitoring methods and techniques;
- data quality; and
- analyses of the monitoring results.

International agencies (IOC, UNEP, IAEA-MESL, Wetlands International, WCMC, etc.) can ensure that the monitoring data are compatible not only within the Region but also on a global scale.

Monitoring and surveillance programmes are implemented usually over a long period of time and involve repeated measurements at fixed or randomly selected positions. The design of any monitoring programme depends mainly on the overall goal. The results of a regional monitoring programme can be used for the following purposes (UNEP, 1996):

- To assess the state of the marine, coastal, and associated freshwater environments (including land-based sources of pollution and other routes of contaminant inputs);
- Integrated coastal zone management (including associated freshwater systems);
- Pollution control of land-based and sea-based activities; and
- Management and conservation of marine and coastal biological diversity.

Short-term objectives:

(i) Identification of regional requirements for the monitoring of the marine, coastal and associated fresh water environments in the East Asian Seas region. In particular, regional environmental problems requiring long-term, systematic observation and monitoring;

(ii) Identification of sources of necessary information for assessing marine habitats, fisheries habitats and the rational use of marine and coastal resources;

(iii) Preparation of a comprehensive proposal for a collaborative monitoring network, with initial focus on certain crucial parameters which are important for understanding regional environmental problems. For instance, monitoring on the atmospheric deposition of pollutants and river inputs of pollutants to the marine and coastal environment will greatly contribute to understanding the effect of land-bases pollutants on the marine environment;

(iv) Development of common methods for environmental assessment, and applying them to a pilot project to check whether the method works for certain purposes;

(v) Establishment of a regional network for marine, coastal and freshwater monitoring; and

(vi) Upgrading the national capabilities in carrying out the necessary monitoring and environment assessment programmes in the region.

Short-term activities

(i) Regional workshop on monitoring requirements of marine, coastal and associated freshwater environments.

Considering the issues identified in the Transboundary Diagnostic Analysis for the South China Sea (TDA/SCS) and the Regional Programme of Action on GPA/LBA, a workshop should be organised to identify the regional requirements for a collaborative monitoring programme.

Budget requirement: US$ 30,000

(ii) Preparation of a comprehensive proposal on a Regional collaborative monitoring programme for the East Asian Seas region.

Based on the necessary information in the Region, TDA/SCS, Strategic Action Plan for the South China Sea and Regional Programme of Action for GPA/LBA, a comprehensive proposal on a Regional collaborative monitoring programme for the East Asian Seas Region should be prepared and submitted to a COBSEA meeting for approval.

Financial requirements: US$ 21,000 (consultant 4p/m)
US$ 10,000 (fact finding mission)

(iii) Preparation and distribution of a questionnaire to assess information on the relevant activities at both national and regional levels

A questionnaire should be prepared by EAS/RCU and distribute to all Member States and relevant organisations. Analysis will be carried out by EAS/RCU upon receipt of responses. A summary will be provided by EAS/RCU on the results of the survey.

Financial requirement: None

(iv) Collection of information from various sources concerning what has been done and data that may be used for environmental assessment

Financial requirement: none

(v) Training course on marine, coastal and associated fresh water environments monitoring (a detailed training programme will be prepared after the survey of the national and Regional requirement).

Venue to be identified.

(vi) EAS/RCU will demonstrate the usefulness of environmental assessment in preparation for a Regional workshop on identification of the scope of the Regional requirements for habitat assessment, requirement for consistent methods, tie in with MPA's, fisheries habitats, harbour and marina developments, oil spill contingency plans.

Venue to be identified
Financial requirement: US$ 25,000

(vii) Development of methods and relevant training materials for the assessment of environmental ecosystems. An expert will be invited to develop necessary training materials for environmental assessment after consultation with the Co-ordinator.

Financial requirement: US$ 7,000 (consultant 1 p/m)
US$ 1,500 (publication and distribution)

Medium-term objectives:

(i) Identification of the necessary QA/QC procedures for the monitoring programmes to ensure the quality of the monitoring results. Relevant inter-calibration should be considered in cooperation with other relevant organizations, e.g. IOC and IAEA;

(ii) Preparation of technical manuals in local languages for the collaborative monitoring programmes, preferably with identified priorities. The Strategic Plan of the Health of Ocean (HOTO) module of the Global Ocean Observing System (GOOS) will provide guidelines for the monitoring programme;

(iii) Development of monitoring products to show the results of the monitoring programmes to the decision makers, scientific communities, various users and public to ensure continued financial support and human resources are available for the programmes; and

(iv) Application of the monitoring results to address certain marine, coastal and associated fresh water environmental problems and concerns.

Medium-term activities

(i) Preparation, translation and printing of technical manuals.

Assess the existing technical manuals for the monitoring of marine, coastal and associated fresh water environments, decide if they are suitable for the monitoring activities identified in the region, and re-produce and distribute to the participating institutions. Necessary co-ordination should be ensured with TDA/SCS and GPA/LBA, as well as other relevant activities going on in other organisations.

Financial requirement: to be identified

(ii) Joint workshop on marine, coastal and fresh water environment monitoring with HOTO. The workshop will focus on the scientific, technical and management issues relevant to the marine, coastal and associated freshwater environmental monitoring. To avoid duplication of the efforts, close cooperation and coordination with HOTO, which is co-sponsored by UNEP, should occur.

(iii) Initiate a demonstration project perhaps in Cambodia, on marine and coastal resource assessment using the data and information from various sources.

Venue: Cambodia
Financial requirement: to be identified

(iv) Distribution of the results of Cambodia environmental assessment to other Member States of the region, assessment of reactions from the States and continue the environmental assessment project in other countries, if acceptable.

Financial requirement: US$ 5,000

(v) Exercise on environment impact assessment

Based on the information available from the database and monitoring programmes, procedure on environment impact assessment will be formulated, taking into account the WHO quick assessment method.

Financial requirement: US$ 14,000 (consultant 2 m/p)

(vi) Support ASEAMS in an effort to have scientific input in the monitoring network, and to assist scientists to take the initiative in government monitoring systems.

Long-term objectives

(i) Operation of regular strategic monitoring programmes at national and Regional levels;

(ii) Understanding of natural processes in the marine, coastal and associated freshwater environments, and provision of scientific and environmentally sound advise for the environmental protection and sustainable use of marine resources.

Long-term activities

(i) Annual report, assessment of use of monitoring results, assessment of acceptance by countries.

(ii) Financial requirement: US$ 10,000 /year.

4.4 Education

Probably the single most effective approach in conserving the marine environment is to have public participation and ownership. Without informed education, the public will be unaware of the devastation that is occurring both under the sea and on the coastal rim. Without education and public participation, waste dumping, sediment release and continued disturbance of marine habitats will continue. There are many ways that public awareness can be improved and all can be integrated. Projects should be initiated with the help of the UNEP Regional Office for Asia and the Pacific, and a demonstration or pilot project to determine the feasibility of extending the project to the whole Region should be introduced.

The marine, coastal and associated fresh water environment databases can be used to present examples of marine pollution and pristine marine environments, so that people know what is happening and what the marine environment should be like. The monitoring network can be assisted by the public and improvement in measured parameters can demonstrate the worthiness of protection programmes. Community efforts in restoration of marine habitats will be enhanced by people knowing more about what and why they are helping restore them. The marine protected areas project (Section 4.7) will be assisted by public participation if the community knows why these areas are being protected. Education on marine matters, such as the need for conservation and the knowledge that these marine habitats are important for the livelihood of the community, will increase awareness of damage done by development and hence raise the status of Environmental Impact Assessment. Marine law and legislation will be complied with rather than having to be enforced.

The education programme is a long-term process which will gain momentum as other programmes take shape. If a particular problem can be identified, then a programme to educate the public on how to solve the problem can be initiated. This may take the form of simple leaflets in an appropriate language that explain the reasons for and effects of the problem and what the public can do to prevent it.

To begin this project, it is suggested that mangrove forests or coral reefs be used as an example and that a leaflet on identification, value to marine and human environments, causes of destruction, restoration methods and possibly a success story from another area may be a good start. This first leaflet should be in a language of the local people of one of the member countries and then be translated to others as the time and resources permit. The success of

the leaflet should be assessed by a careful monitoring programme, before further resources are used to produce others. Much more needs to be done than produce pamphlets, and the education needs to flow through to the politicians who make the law and allow certain activities. For them to know the consequences of their decisions and resulting activities, is essential to coastal management. Department heads and their advisers need to know about the marine habitats and why they are so important.

Short-term objectives

(i) Increase pubic awareness in the state of the marine, coastal and associated fresh water environments in the region;

(ii) Identification of the needs of education and capacity building in the Member States with regard to environmental education, conservation, monitoring and protection; and

(iii) Upgrade scientific and technical understanding for marine environmental protection and sustainable use of marine and coastal resources.

Short-term activities

(i) Preparation and distribution of pamphlets, booklets or teaching aids translated into a language of the East Asian Seas Region. Design a sampling programme to determine if this teaching aid was successful.

Financial requirement: Assessment of information & materials, US$ 2,000
Design of pamphlet, booklet, US$ 3,000
Publication of education materials, US$ 8,000

(ii) Development of a home page for the East Asian Seas Action Plan, and publishing an electronic version of a newsletter.

Financial requirement: Computer software: US$ 1,500
Rent of server: US$ 600

(iii) Preparation of a questionnaire to determine the effect of the educational tool. Provision of technical assistance to monitor some ecosystem parameters that will indicate if tool is successful.

Financial requirement: none

(iv) Organization of training courses in the implementation of project activities, as identified in this document and approved by COBSEA.

Financial requirement: no separate cost required.

Medium-term objectives

(i) Identification of the evidence of usefulness of the above approach see (iii) above.
(ii) Quantifying the beneficial changes in resource use.
(iii) Preparation of recommendations for further implementation.

Medium-term activities

(i) Site visits together with other travels to the Member States and collect necessary information which is useful for educational purposes;

Financial requirements: US$ 2,000 for publication of the report.

(ii) Organization of a marine and coastal environmental tour (option)

Financial requirement: to be identified.

4.5 Restoration of Marine Habitats

Throughout the Region marine habitats have been and are being destroyed in an alarming rate. Sometimes management agencies realised the need to preserve them but often too late. Once their value was realised, NGO's, community groups and government departments attempted to restore these habitats with limited success. The objectives of this project are to bring together all groups working on restoration of marine habitats, co-ordinate their efforts and learn from these experiences. It will also tie together the successes and failures of various restoration projects so that they can learn from others' experience. This project will also research the literature to put together either a review or a database on the restoration of seagrass, saltmarsh, mangrove and coral reef habitats, e.g. Thayer, G.W. 1989. Restoring the Nation's Environment. Maryland Sea Grant Book, College Park, Maryland, USA. 716 pp.

While the attempts at restoration are being examined, the consultant for this work can continually be communicating successes to each group visited. In this way the update during the term of the project will be continuous and actual results can be recorded as the project progresses.

The choice of consultant for this work is critical. The consultant will report to the EAS/RCU regularly and must be capable of communicating and gathering information on restoration of marine habitats. This person's background must be in tropical marine ecology with experience in restoring damaged ecosystems. This project should be for two years resulting in a report on restoring one of the important ecosystems:

- Coral reefs
- Mangroves
- Saltmarshes
- Seagrass meadows

Consideration should also be given to establishing artificial reefs in some areas where fisheries habitats may be enhanced.

The first ecosystem with which to commence this project should be mangroves. Mangroves are arguably the most seriously impacted ecosystem of the four above. There is a large number of mangrove restoration projects already underway and they are not well co-ordinated. Mangrove ecosystems may be the easiest to restore.

Short-term objectives

(i) Survey all mangrove restoration projects in the Region, and prepare an inventory of the relevant information

(ii) Write a handbook on mangrove restoration methods after six months and an update at the end of the year.

Short-term activities

(i) Assessment of existing information on the mangrove restoration projects in the region, and prepare an inventory of the relevant information;

(ii) Preparation of a technical handbook on mangrove restoration methods suitable for the

region, and provision of technical advise for the member states.

Financial requirement: US$ 40,000 (consultant 1 y)
US$ 4,000 (publication of the handbook)
US$ 15,000 (travel cost)
US$ 2,000 (translation and publication in other languages)

Medium-term Objectives

(i) Provision of the updated information by continuing with the mangrove survey, revisiting sites and presenting new findings as an addendum to the handbook. Assess the usefulness of the project.

(ii) Expansion of the project to include seagrass and coral reefs if the mangrove handbook was useful.

Medium-term activities

(i) Provision of updated information by updating the handbook on the restoration of mangroves in the Region;

(ii) Assessment of information on restoration of seagrass and coral reefs in the region and preparation of handbooks on the methods for restoration of seagrass and coral reefs.

Financial requirement: US$ 21,000 (consultant 3p/m)
US$ 6,000 (publication of handbooks)

Long-term Objectives

(i) Continue with coordinating and awareness building of mangrove restoration sites.
(ii) If successful, these activities will be applied to other ecosystems.

Project outputs

- Handbook on methods to replant mangrove.
- Pilot site to demonstrate the usefulness of the handbook.
- Later, handbooks on restoration of coral reefs, and seagrass beds.

4.6 Environmentally Sound Technology and Coordination of Activities to Prevent Land-based Pollution Entering the Sea

Land-based sources of pollution account for 80% of all marine pollution. At a recent meeting of the experts on marine protection and conservation held in Bangkok (UNEP(WATER)/EAS WG.6/3), the participants decided that sewage disposal was the worst problem facing the marine environment from land-based activities. This was followed by the runoff of sediments and nutrients from the land.

Sewage dumping and excess nutrients from agricultural or urban runoff can cause algal blooms, increased epiphyte growth on mangroves, seagrasses and corals and enhance growth of benthic algae. With this excess plant growth, the light is reduced to other plants, particularly seagrass and zooxanthellae, and they die. Similarly, high levels of sediment in the water reduce light to benthic plants.

Often, monitoring in rivers is detecting the increase in sediment or nutrient loads and it is obvious from the plumes showing in aerial photographs or satellite imagery that there is a lot of sediment deposited into the sea.

This project cannot control the building of sewage treatment plants or the correct

engineering and farming practices to prevent excess run off of nutrients and sediment. It can, however, educate and help build the capacity of countries in the Region to reduce these problems. A handbook of best practises to reduce erosion from farms and engineering enterprises may assist countries to reduce sediment load in rivers and estuaries. Encouragement and a proactive effort to obtain new technology for sewage disposal may also be a way of treating the problem. Simple changes to engineering practices such as reducing the slope of road cuttings, culverts and bridge approaches will increase the life of these structures and reduce the erosion from them. The use of Geotextile-like materials and immediate planting of fast growing annuals after construction will also reduce runoff. Agricultural practices such as ploughing and leaving ground bare can be reduced to decrease runoff loads.

One section of this project will use the data and recommendations of the EAS/RCU (1997) Technical Report Series No.13 project which analysed, among others, the effects of sediments on the coastal wetlands, seagrass beds and coral reefs. Based on the impact assessment of sediments on the coastal and marine environment, actions will be proposed to reduce the sediments to the rivers from catchment areas. These actions could consist of regulating engineering, recommending economic incentive policies, improving development planning along river basins, and persuading local residents to clean up their activities, etc.

The GPA LBA office in the Hague is working closely with EAS/RCU to obtain funding for and assist with the good management of land-based activities which impact the East Asian Seas. There is a number of agencies working on similar or closely related projects, such as the Mekong River Commission and some national agencies, which will be co-ordinated with this project.

A second section of this project would be to determine the effect of excess nutrients on the marine environments and then, if this could be shown, to attempt to co-ordinate efforts at reducing sewage and farm run off entering marine ecosystems.

Short-term objectives

(i) Provision of environmentally sound information on the control of land based pollutants, including quantity and types of pollutants transferred from the land to the oceans through river inputs and atmospheric deposition;

(ii) Provision of potential technology in controlling the land based pollutants

(iii) Assistance in monitoring of land based pollutants to the marine and coastal environments through rivers and atmosphere.

Short-term activities

(i) Assessment and distribution of scientific findings on river inputs and atmospheric deposition, and translate to common understandable languages;

(ii) Preparation of technical manual on the monitoring of river inputs and atmospheric deposition of pollutants to the marine and coastal environments, taking into account the efforts of GPA/LBA, and ESCAP monitoring activities identified in the previous section, and activities carried out by other organisations, e.g. IOC.

In close co-operation with Regional GPA/LBA action Plan

Financial requirement: US$ 5,000 (information assessment and publication)
US$12,000 (co-ordinate and reprint the relevant technical manuals in local languages)

(iii) Selection of several typical demonstration sites among the member states, where one of each of the damaging erosion events are taking place and determine if

environmentally correct development will make a significant difference in conserving the marine environments.

Financial requirement: US$ 4,000 / each site

Medium-term objectives

(i) Provision of regular information on the marine and coastal water qualities for using in the control of land base pollutants;

(ii) Provision of information on the environmental technology to control pollutants to be transferred to the marine and coastal environments.

Medium-term activities

To be identified after the 1st phase of activities.

4.7 Marine Protected Areas

A principle objective in developing a regional representative system (or regional network) for marine protected areas (MPAs) is to adequately represent biogeographic, ecosystem, habitat and species diversity. The coastal zone is considered to be of highest priority. The results of a representative system can be used for the following purposes:

- Conserve biological diversity at all levels of organisation, regionally and nationally;
- Promote the sustainable use of resources;
- Maintain ecosystem integrity;
- Provide sites for research;
- Monitor and assess ecological processes, environmental changes and human impacts;
- Facilitate public education.

Intensive use of the seas and the coastal zone, the natural histories of marine species, the large-scale ecological processes that control marine ecosystems, and the structuring of coastal ecosystem by the interaction of terrestrial and oceanic processes acting over large scales, dictate the need for setting MPAs within regional contexts.

A regional representative system cannot be adequately developed without a comparative biogeographic-physiographic, related grouping of individual marine protected areas.

The 18 marine regions defined by the Commission on National Park and Protected Areas (CNPPA) are used as a framework for establishment of a global representative system of MPAs . The East Asian Seas is one of these regions, containing the following countries: Brunei Darussalam, Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam (A Global Representative System of Marine Protected Areas, Volume III, 1995). The following actions were adopted for the East Asian Seas:

- Biogeographic Classification – Outline of the biogeographic classification scheme proposed for the region.
- Assessment of existing MPAs – Overview of MPAs within the region and identification of key issues.
- 92 areas for selection as MPAs were identified from seven countries in the region (No information was available on MPAs in Cambodia). 20 areas, considered as priorities for the conservation of the region's marine biological diversity, coral reefs, mangroves and seagrass beds, were recognised as key ecosystems.
- Provision of guidelines in selection of priority areas--Determination of Priority Areas

Countries of the East Asian Seas region have collectively and individually taken steps to

conserve the marine environment through the establishment of MPAs. All countries in the region have established MPAs and most have established programs for marine biodiversity conservation. In some areas, MPAs management plans were formulated and implemented. However, there are still some major problems to be solved in the established MPAs:

(i) Deficiencies in management of the majority of the established areas. According to an assessment made by IUCN/CNPPA Working Group for East Asian Seas, of the 92 areas identified, 9 were considered to have a "high" management level (about 13 percent of areas identified for which data are available), 22 a "moderate" management level and 41 a "low" management level. No data were available for 20 areas.

(ii) There is a paucity of data on species and ecosystem dynamics; in particular the economic value of resources and activities carried out within MPAs.

(iii) Most countries have inadequate resources with which to implement MPAs effectively.

(iv) Lack of public support is a major problem.

There is clearly still much to be done to ensure that these areas achieve the aims for which they are being established and adequately represent the entire biogeographic zone in the region. Development of a regional representative system (or regional network) for MPAs will be required.

Short-term objectives:

(i) Identification of regional requirements for the MPAs.

(ii) Preparation of a comprehensive programme on the regional network for MPAs

(iii) Develop criteria in selecting MPAs to identify characteristic sites for the regional network.

Sort-term activities:

(i) A regional workshop should be organized to identify the regional requirements and prepare the comprehensive programme on a regional network for MPAs

Financial requirement: US$ 25,000

(ii) Two expert groups should be organized to develop the criteria in selecting MPAs for the East Asian Seas region and assess whether the existing MPAs adequately represent the entire biogeographic zone in the region. The development of criteria should be based on previous information in the region and IUCN.

Financial requirement: US $ 20,000

(iii) National focal points and technical experts meeting to discuss and adopt the above (1) and (2)

Financial requirement: US $ 30,000

Medium-tem objectives:

(i) Development of regional guidelines for the establishment of MPAs according to IUCN Guidelines for Establishing Marine Protected Areas.

The establishment of individual marine protected areas can be considered only a first step in the process of creating a regional network. A systematic framework is required to associate individual marine protected areas into a regional representative system,

united by the collective goals of marine or estuarine habitats, biodiversity protection and ecological sustainable use.

(ii) Development of an approach on the environmental impact assessment of MPAs

(iii) Increased management capacity

(iv) Publish a regional map for MPAs through the regional databse network (4.1).

Medium-term activities:

(i) Three regional expert groups should be organized to draw up guidelines on the establishment of MPAs and an approach for operating environmental impact assessments of MPAs.

Financial requirement:

(ii) National focal points and technical experts meeting for discussion and adoption of the above-mentioned guidelines on the establishment of MPAs and the approach for operating environmental impact assessments of MPAs.

Financial requirement: US$ 30,000

(iii) Training courses for management staff at all levels
Increasing political awareness of the need for, and advantages of marine biodiversity conservation, and translating this awareness into positive support.

Financial requirement: US$ 25,000

Long-term objectives

(i) Report of regional environmental state of MPAs prepared for decision makers, the scientific community, and other users;
(Included as a part of Section 4.2, State of the Environment Reporting)

(ii) Establish a comparative and self-sustainable MPAs database, as the essential tool to help assessment, monitoring and decision-making (Included, as a part of Section 4.3, Monitoring)

(iii) Publish “a regional representative system of marine protected areas”.

Long-term activities:

(i) Draw up a regional representative system of marine protected areas.

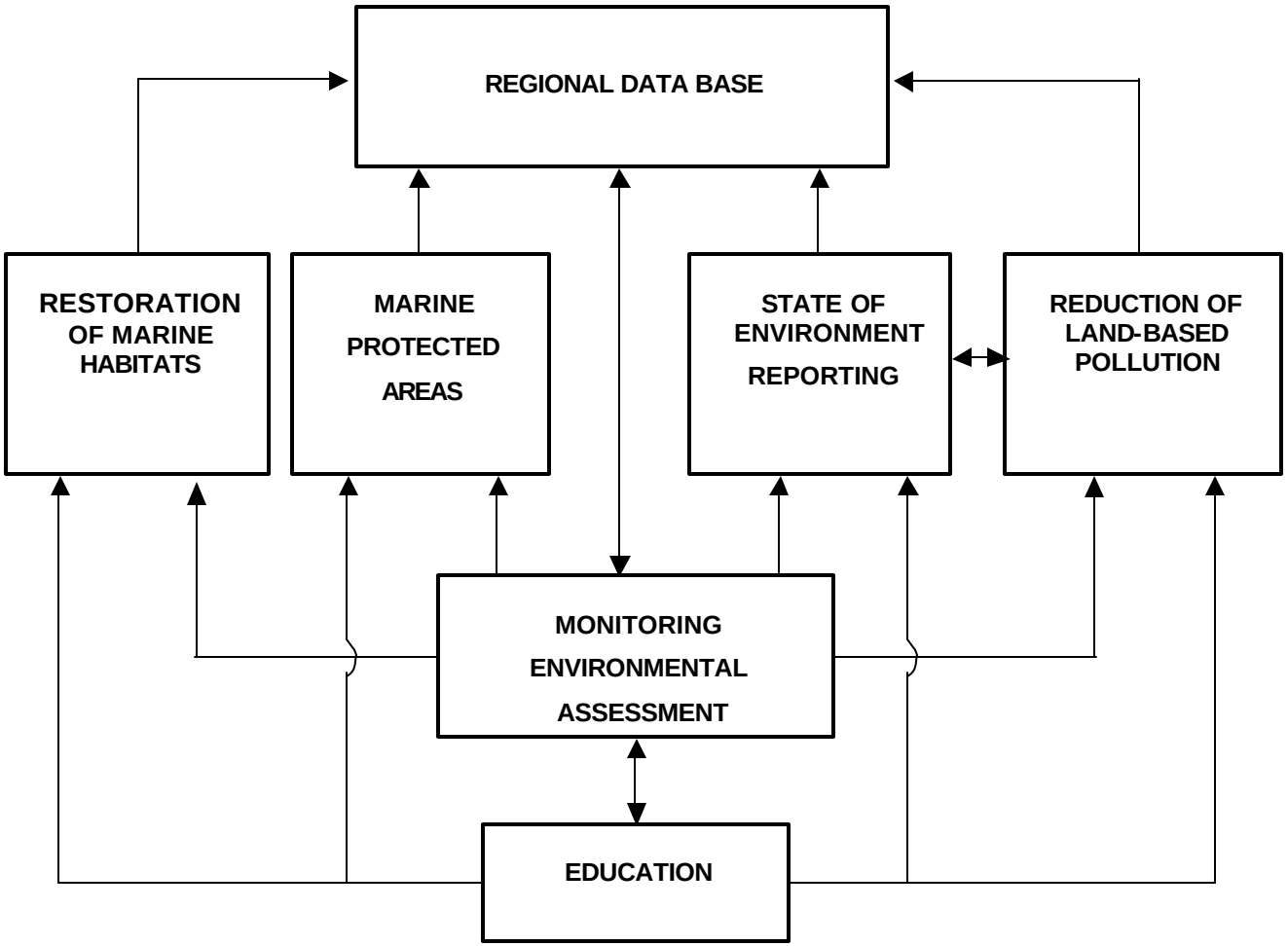
(ii) Operate and sustain a regional network for MPAs.

(iii) Prepare and publish the regional environmental state for MPAs every five years. The procedure is the same as Section 4.2, State of the Environment Reporting.

Financial requirement: US$ 10,000/year

List of Acronyms.

INTEGRATION OF SUGGESTED PROJECTS



Environmental Management

- Maintenance of a regional database
- Development and Maintenance of Monitoring and environmental assessment programmes
- Management aspects of rehabilitation of vital ecosystems and restoration of ecologically or economically important species and communities
- Establishment of a viable network of marine protected areas
- Employing appropriate technologies for the prevention and management of pollution
- Environmental impact assessment
- Capacity building

East Asia Seas Regional Coordinating Unit