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***Reversing Environmental Degradation Trends
in the
South China Sea and Gulf of Thailand***

REPORT

**Second Meeting of the Regional Working Group for
the Coral Reef Sub-component**

Sihanoukville, Cambodia, 23 – 26 October 2002

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Report of the Meeting

1. OPENING OF THE MEETING

1.1 Welcome address

1.1.1 Mr. Yihang Jiang, Senior Expert, UNEP/GEF Project Co-ordinating Unit, welcomed all participants on behalf of Dr. Klaus Topfer the Executive Director of UNEP, Dr. Ahmed Djoghlaif, Director, Division of GEF Co-ordination, and Dr. John Pernetta, Project Director. He conveyed the apologies and regret of Dr. Pernetta for not being able to attend the meeting. Mr. Jiang thanked the Ministry of Agriculture, Forestry, and Fisheries of Cambodia for their hard work in arranging the meeting. Mr. Jiang informed the meeting that, while there had been progress since the project started in January 2002, there were some improvements that will be needed. He outlined that the critical tasks to be completed by this meeting included assessment of national information according to the agreed workplan during the last meeting and prepare guidelines for the future implementation of project activities.

1.1.2 Mr. Jiang informed the meeting that according to the decision at the first meeting of the Regional Working Group for Coral Reefs (RWG-CR), the officers of the RWG serve for a calendar year in order to ensure proper representation of the RWG on the Regional Scientific and Technical Committee (RSTC). Following this decision, Mr. Kim Sour, Focal Point for Coral Reefs from Cambodia conducted the meeting as Chairperson, with the assistance of Dr. Suharsono, Focal Point for Coral Reefs from Indonesia as Vice-Chairperson, and Dr. Porfirio Aliño, Focal Point for Coral Reefs from Philippines as Rapporteur of the meeting.

1.1.3 On behalf of the Government of Cambodia, Mr. Kim Sour welcomed all participants to Cambodia.

1.2 Introduction of members

1.2.1 Members of the Regional Working Group were invited to introduce themselves to the meeting. The list of participants is attached as Annex 1 to this report. The meeting was informed that Dr. Ridzwan Abdul Rahman and Dr. Chou Loke Ming are the Regional Experts of the RWG-CR.

2. ORGANISATION OF THE MEETING

2.1 Documentation available to the Meeting

2.1.1 Dr. Annadel S. Cabanban, the designated member of the RWG-CR from the Project Co-ordinating Unit (PCU), introduced this agenda item and referred to the document UNEP/GEF/SCS/RWG-CR.2/INF.1.rev.1. She informed the meeting that draft reports on Review of Past and On-going Activities, Review of Legislation, and Identification and Characterisation of Sites have been received from Cambodia, the Philippines, and Vietnam. She also informed the meeting that Thailand would distribute their draft reports on these outputs to the meeting. The list of documents available at the meeting is attached as Annex 2 to this Report.

2.2 Organisation of work

2.2.1 Dr. Cabanban briefed participants on the administrative arrangements for the conduct of the meeting and the proposed organisation of work (document UNEP/GEF/SCS/RWG-CR.2/INF.3). She informed the meeting that the first three days of the meeting will concentrate on the review of the progress during the inter-sessional period, to provide updates on on-going activities under the workplan, and to report on the status of activities that are supposed to be initiated in accordance with the workplan. On the fourth day, there will be a field trip on coral reefs in the morning and afterwards the meeting will proceed to discuss any other business (Agenda 11) and adopt the draft report (Agenda 12).

2.2.2 The meeting proceeded in plenary and conducted in English. Sessional groups were formed as necessary.

3. ADOPTION OF THE MEETING AGENDA

3.1 The Chairperson invited Dr. Cabanban to introduce the agenda item. Dr. Cabanban went through the Provisional Agenda prepared by the Secretariat as document UNEP/GEF/SCS/RWG-CR.2/1, with outlines on the expected outcomes of the each agenda item. She explained that in the presentations, the members are invited to report on the results of the activities and to highlight the difficulties encountered in the conduct of the activities. The group, to ensure the progress of the regional project, should identify solutions to alleviate difficulties.

3.2 For the discussion and agreement of the future activities, the Regional Working Group felt that there was a need to provide clear guidelines on the implementation of the agreed activities during the next inter-sessional period. Agenda item 9 was therefore discussed and modified as follows:

9 DISCUSSION AND AGREEMENT OF FUTURE ACTIVITIES WITH FOCUS ON THE NEXT INTERSESSIONAL PERIOD

- 9.1 *Technical Consideration and Agreement on the Procedure and Format of Site Characterisation*
- 9.2 *Procedure for Preparation of Development of the Regional Criteria*
- 9.3 *Revision of Workplan and Timetable, taking into Account of the Actions Listed in the MOUs with SEAs*

3.3 The Provisional Agenda was adopted with the above modification. The adopted Agenda is attached as Annex 3 to this Report.

3.4 Dr. Suharsono asked under which agenda could the inconsistency of the activities in the Memorandum of Understanding (MoU) and agreed workplan be discussed. Dr. Cabanban clarified that the problem will be discussed in the Agenda item 9.

4. REPORT OF THE SECRETARIAT CONCERNING THE MID-YEAR REVIEWS AND REPORTS FROM PARTICIPATING COUNTRIES

4.1 Dr. Cabanban presented the document UNEP/GEF/SCS/RWG-CR.2/4 containing a summary of the findings of the PCU following receipt of the 6-monthly Progress Reports, Expenditure Statements, and Cash Advance Requests from the Specialised Executing Agencies of the participating countries. The acceptable 6 monthly progress reports from each Focal Point were also presented as contained in the document UNEP/GEF/SCS/RWG-CR.2/5.

4.2 After the presentation, Dr. Vo Si Tuan asked that though he has submitted the six monthly reports, including the Progress Report, Expenditure Statement, and the Cash Advance Request in June, the Progress Report was not included in the document UNEP/GEF/SCS/RWG-CR.2/5. Dr. Cabanban clarified that draft reports were received but that the signatory of the MoU had not signed these.

4.3 In response to the question raised by several participants on constraints in the transfer of funds from the budget lines of the subcontract with institutions to the one for consultants, Mr. Jiang stated that the reasons for signing contracts with institutions was to enhance capacity, communication and co-ordination between institutions, which is one of the overall goals of the project.

4.4 Dr. Cabanban informed the meeting that the PCU staff would make individual appointments with Focal Points from participating countries during the course of this meeting to discuss and clarify any issues that participants had with the mid-year reports. Any outstanding budget revisions should be dealt with as soon as possible if next cash advance is to proceed.

5. PRESENTATION OF NATIONAL REVIEWS OF PAST AND ON-GOING PROJECTS

5.1 During the First Meeting of the RWG-CR, it was agreed that the *“National Focal Points provide to the PCU a listing of the members of the National Committees once these were established”* (UNEP/GEF/SCS/CR.1/3, par. 6.2.3). The Focal Points for Coral Reefs from the participating countries provided reports on the composition of the national committees and/or the national working groups for coral reefs in supporting this project. The complete membership, expertise, and Institutional affiliations of the National Coral Reef Committee or National Coral Reef Working Group are in contained in Annex 4 of this report.

5.2 Mr. Kim Sour informed the meeting that there are 16 persons in the national committee for Cambodia, including two from each coastal province. The expertise in the committee includes biology, aquatic resources management, biosphere reserve, community-based management, environmental science, and fishery resource management. Most of the members are representatives of institutions and they are providing information required by the project.

5.3 Dr. Suharsono informed the meeting that in Indonesia, the Coral Reef Rehabilitation and Management Project (COREMAP), has the mandate to address management issues on coral reefs. As such, a Working Group for the South China Sea Project was created within COREMAP. The Working Group is composed of 15 persons from different agencies and local governments. The members of the national working group are experts in a variety of areas.

5.4 Mr. Abdul Khalil reported to the meeting that Malaysia had just signed in September the MoU for the implementation of activities under the coral reef sub-component. Although the MoU has just been signed, Mr. Khalil informed the meeting that he is confident that his agency will be able to provide the outputs that are required under the MoU. He reported that the National Coral Reef Committee has not been established yet, however, there does exist a National Advisory Council for Marine Parks and Marine Reserves that could now provide necessary advice for the implementation of the project activities. A national committee for coral reefs will be established soon with members from various agencies, including governmental agencies and non-governmental organisations (NGOs).

5.5 Dr. Porfirio M. Aliño referred to the report he provided to the PCU on the composition of the Philippines National Coral Reef Committee. To date around 10 members compose the national committee on coral reefs for the UNEP-SCS GEF project. He informed the meeting that the National Committee for Coral Reefs (NCCR) in the Philippines consists of experts from the Departments of Fisheries and Environment, the National Economic Development, legal experts, and representatives from provincial and local governments. He highlighted that the NCCR has members from the Palawan Council for Sustainable Development that is a special governmental body for Palawan. This is an important membership because Palawan is one of the largest islands bordering the South China Sea that has areas of coral reefs worthy of conservation and management.

5.6 Dr. Thamasak Yeemin informed the meeting that a National Working Group for the Coral Reef Sub-component of the project has been established in Thailand, with 15 members from the fields of economics, environmental law, political science, ecology, park management, and fisheries. A non-governmental organisation, Reef Check -Thailand, is in the national working group. Apart from the National Working Group, there is also an advisory board for this sub-component that assists in reviewing relevant documents that are produced during the implementation of the project activities in Thailand.

5.7 Dr. Vo Si Tuan informed the meeting that the national working group on coral reefs in Viet Nam has been approved by the national steering committee with 13 members from governmental agencies and coastal provinces, as well as NGOs. The national working group meets once every three months. Some other experts are invited to participate as required by the meeting.

5.8 According to the Workplan and Timetable (Annex 8, UNEP/GEF/SCS/CR.1/3) agreed during the first meeting of the Regional Working Group, one of the first activities was the Review of Past and On-going Projects in each of the participating countries. The Chairperson invited the Focal Points for

coral reefs from participating countries to present their report on Review of Past and On-going Activities.

5.9 The review of past and on-going activities in Cambodia found that very few activities were conducted to research or study the coral reef ecosystems. There are two main projects that are relevant to coral reefs in Cambodia. The first one is called "Environmental Management in Coastal Zone-Cambodia (CZM)", which has three phases and from 1998 and will end in 2005 or 2007. The second one is the study by National University of Singapore (NUS), which is supported by Singapore International Foundation (SIF) and Youth Expeditions Project (YEP). This study is entitled "The assessment the marine biodiversity of the reef off Koh Kong Province, Cambodia". It was thought that the Asian Development Bank and other agencies have carried out several more activities/projects in the past in the marine ecosystem. The review of activities on coral reefs is not completed yet.

5.10 Dr. Suharsono reported to the meeting that several activities have been conducted on coral reefs in Indonesia. There had been several baseline studies that were done by the Department of Forestry since 1990. The purpose of these baseline studies was to establish marine protected areas. At least 15 different areas were studied and the results of these studies led to the establishment of the Marine Park in Karimata Islands and Marine Reserves in Maya Islands. The ecosystem approach to integrated coastal zone, marine biodiversity resources management, and development planning was applied in Bareleng islands. Several studies were also conducted by the Research Center for Oceanography (LIPI) on biodiversity and stock assessments of marine resources.

5.11 Dr. Suharsono reported that there were also projects on rehabilitation and management of coral reefs that COREMAP has conducted since its was launched in 1999. This Program deals with public awareness, community-based management, monitoring, surveillance, and control in order to manage coral reefs in the Riau Province. Under the Department of Fisheries, several projects in the marine environment have been launched such as small-scale aquaculture, coastal resource management project, and coastal spatial planning. The Riau Province is now developing a coastal environmental management plan that is funded by the Asian Development Bank.

5.12 Mr. Abdul Khalil informed the meeting that even though the MoU has just been signed, there have been a number of projects carried out under various programmes by different agencies and institutions in Peninsular Malaysia and in East Malaysia. In Peninsular Malaysia, a marine park system had been established under the Fisheries Act that protects coral reefs around 40 islands. Separate assessments of present status of coral reefs at Redang Island and Tioman Island were conducted using the Reef Check method. There were also numerous research and conservation activities on coral reefs of Sabah and Sarawak. Some of the research activities are biodiversity assessment of corals, fishes, and marine mammals and the patterns of settlement of fishes on coral reefs. Coral reefs in East Sabah were digitised and the risks of these reefs from threats were analysed under the *Reefs at Risk in Southeast Asia Project*. Assessments of coral reefs using Reef Check methods and a more-focused *Reefs at Risk in Sabah* analysis are underway. North Borneo Islands Marine Managed Area is being set up as an example of integrated management of coral reefs in Sabah. In addition, there is a present activity to analyse monitoring data on coral reefs to find out specific indicators on improvement of coral reefs funded by the Ministry of Environment of Japan. All these individual projects in Peninsular and East Malaysia collectively give a holistic view of the current efforts in the conservation of coral reefs in Malaysia.

5.13 Dr. Aliño informed the meeting that a list of past and on-going studies have been recently reviewed in two volumes (Atlas of Philippine Coral Reefs, Aliño *et al.* in press and Philippine Coral Reefs through Time, PhilReefs, in press) and past coral reef reviews (Gomez *et al.*, 1994, Aliño *et al.*, in press and Uychiaoco *et al.*, in press). Some of the research and monitoring efforts have shown the continuing decline of coral reef condition despite various management efforts. Despite the numbers of investigations of the coral reefs of the Philippines, and tremendous financing of coastal management in last decade (most of which include coral reef areas around 85% of these areas) there has been less investment in research and monitoring (see Uychiaoco *et al.* 2001). On the other hand, some opportunities in relating science and management efforts (as seen by improvement and maintenance of reefs) have been demonstrated through the establishment of no-take zones (marine sanctuaries) in marine protected areas managed by local communities. The formulation of a National Marine

Sanctuary Strategy is a step towards providing convergence of local and national management efforts to link marine protection and conservation efforts into an integrated coastal management approach. In addition, the formulation of a national marine policy is now being initiated to rationalise concerns on various marine affairs in many sectors. Adaptive management has been emphasised and, based on the lessons learned, addresses the gaps in the feedback and response links to the monitoring and evaluation cycle. This has been seen in the incorporation of incentives and disincentives in performance-based monitoring and evaluation.

5.14 Dr. Thamasak presented a review of past and on-going activities on coral reefs that have been carried out over two decades in Thailand. Sources of funding were international agencies, Thai Government, private sector, and NGOs. The project objectives vary in the fields of study, locations, and approaches. The ASEAN-Australia Marine Science Project: Living Coastal Resources (Phases I and II) played a major role in providing basic data for coral reef management. The "Coral Reef Project" of the Department of Fisheries and various projects of Marine National Park Division are the main activities so far. Several projects carried out by Thai universities also provide data in particular aspects, especially in the field of coral reef biology. The research outputs have been published in various journals and proceedings and written-up in theses. He suggested that more projects should concentrate on public participation and awareness of coral reef conservation. Moreover, basic and applied scientific research should be better planned and should cover larger areas, especially for coral reef monitoring programs.

5.15 Dr. Tuan reported to the meeting the general findings of his review of past and on-going projects on coral reefs in Vietnam during 1980 – 2002. A lot of reef areas in Vietnam have not been studied in detail. There are few surveys carried out in offshore submerged reefs and remote islands. Most projects have been carried out with no specific objectives for biodiversity assessment, environmental management, or for establishing marine protected areas. In some projects, economic and social conditions have been included as components but there is still very little available information on economic valuation. There is a need to upgrade the capacities of the institutions that are involved in projects on coral reefs.

5.16 Following the presentations of the participating countries on their Review of Past and On-going Activities, the Regional Expert, Dr. Ridzwan suggested that an analysis on the national presentations is needed to answer the questions such as (i) How much work have we done? (ii) Do we know enough about the marine environment in the countries to start and think how to reverse the environmental degradation trends in the South China Sea?

5.17 Dr. Chou Loke Ming and Dr. Aliño provided information on regional assessments that can partly answer the questions raised by Dr. Ridzwan. Dr. Chou, informed the meeting that there is general information in the Coral Reef Status reports prepared under the Global Coral Reef Monitoring Program, and there are some recommendations from *Reefs at Risk in Southeast Asia*, which give updated information on the regional status of coral reefs. Dr. Aliño added that a report on gap-analysis was conducted under the East Asian Seas Action Plan and that a causal chain analysis on the problems of coral reefs and assessment of trends in degradation was conducted under the Global International Waters Assessment for the South China Sea last year. Dr. Chou reported that the Coral Reef Status Reports show evidence in improvement of coral reef status at localised scales. He suggested the implementation of this project could be linked with the demonstration sites of International Coral Reef Action Network or other regional initiatives on coral reef protection to enhance project effectiveness.

5.18 In addition to the presentation of their reviews, members were also requested to answer questions listed in Annex 5. The purpose of the survey and analysis is to provide a regional synthesis of the national reviews. The results of the survey provide a general or synoptic overview of the past and on-going projects in the region (Annex 5). The objectives of projects on coral reefs in the region encompass a wide range, from biodiversity assessment to coastal zone planning. Distribution of coral reefs is widely known but not all reefs had been surveyed in detail. However, adequate information for 50-75 % of coral reefs can now be found in Indonesia, Philippines, and Thailand. Gaps in information for management issues vary among the participating countries. The reasons for the gaps in

information for all countries are the lack of personnel, lack of funds or financial support, inadequate logistical support, inadequate monitoring, and enforcement.

6. PRESENTATION OF FIRST DRAFT REPORTS ON NATIONAL ACTIVITIES

6.1 Identification and characterisation of “sites”

6.1.1 According to the agreement of the First Meeting of the Regional Working Group, the Chairperson invited the Focal Points from participating countries to present first drafts of identification and characterisation of the sites in their respected countries.

6.1.2 In Cambodia, the identification and characterisation of coral reef sites was started late. From secondary information, about 44 coral reef sites are found along the coast of Cambodia (see Annex 6). However, each site is very small compared with other countries due to differences in categorising sites. It is hoped that after this meeting, these small coral reef sites will be aggregated into larger entities based on ecological and administrative aspects.

6.1.3 The 44 sites identified in Cambodia have very limited data and information. Among them only 7 sites have baseline biological data. Therefore, it is necessary to collect primary data to provide basic information/data on the coral reefs, such as area, location, and species composition.

6.1.4 It was also not clear which format should be used for characterisation of coral reef sites: Annex 8 of the first regional working group meeting or the GIS format. The PCU had advised, prior to the meeting, that the GIS format was to be filled-up for this meeting. Dr. Cabanban explained that the information contained in Annex 7 and the GIS format are the same; Annex 7 was translated into the GIS questionnaire to gather the data and information on the attributes listed in Annex 7.

6.1.5 The National Technical Working Group in Indonesia had decided that the area of the South China Sea Project in COREMAP is under the jurisdiction of Riau, West Kalimantan, and Bangka-Beliteng Provinces. There are more than 2,000 islands in this area and there are many coastal and marine resources that are found on these islands. Mangrove forest, muddy and sandy beaches, and rocky capes generally cover the coastline along these islands. In the intertidal area, seagrass beds, and coral reefs are found.

6.1.6 The coral communities in this area are considered to be low in diversity compared to other parts of Indonesia but the coral condition is relatively good. The coral communities flourish in the depth range of 1-12 meters. This area is naturally turbid due to the sediment inputs of many big rivers in the surrounding area. COREMAP conducted a comprehensive reef study in the Senayang and Lingga areas. The study includes the investigation of the biophysical characteristics of coral reef and the socio-economic benefits from the coral reefs. Similar to the other parts of Indonesia, the coral reefs in this area are degraded due to sand mining and the rapid growth of human population. Overfishing, land clearing and sedimentation, shipping, and urbanisation have been the main cause of decreasing quality of coastal and marine resources. The degree of the degradation is different from one island to another and depends on the state of coastal development. One of the efforts to solve the problems undertaken by government was making the community and stakeholders in the area aware of the importance of the coastal and marine resources and the need for careful management. Communities were also informed that serious negative impacts on the environment would occur without better management.

6.1.7 Mr. Abdul Khalil reported to the meeting that Malaysia has not determined any particular sites for consideration. The criteria for selection will however be closely related to the criteria detailed in the Annex 7 of the 1st meeting of RWG-CR and the GIS parameters. Sites chosen will be representative of the coral reef status of the area (see Annex 6 for location of coral reefs).

6.1.8 Dr. Aliño reported to the meeting that the Philippine National Coral Reef Report for the UNEP-GEF Project entitled “*Reversing Environmental Degradation Trends in the South China Sea and the Gulf of Thailand*” summarises the activities undertaken by the coral reef component from March – October 2002. The two main objectives for the period were to: 1) establish a national coral reef data

base for the South China Sea; and 2) establish a monitoring scheme for the demonstration sites. In order to achieve objective 1, a review of the existing coral reef information was undertaken. Updates of the current database were made and some improvements on the Philippine Coral Reef Information Network are on-going. The coral reef information, summarised in the proceedings to be published, indicates that 44% of the sites sampled are stable, 17% seem to show improvement, while 39% are degraded. The state of the coral reef fish assemblage also suggests that over 50% show some decline while only 27% show some increase and around only 20% are stable.

6.1.9 Around 10 reef sites facing the South China Sea in the Philippines have been legislated as Marine Protected Areas (MPAs) and around 6-10 sites have been considered by the National Coral Reef Committee to be demonstration sites. These sites are: a) The Batanes Province, b) Lingayen Gulf, c) Zambales Province, d) Batangas Province, e) Mindoro and f) Palawan. Some criteria have been proposed for the selection of the demonstration sites such as: a) the strategic issues addressed by the demonstration sites (DS); b) the extent of the habitat covered by the DS and its contribution to the understanding and management of transboundary concerns; c) constraints and likelihood of success; and d) accessibility, security and other amenities.

6.1.10 Dr. Thamasak reported to the meeting that the coral reefs in the Gulf of Thailand could be categorised into three distinct areas based on different oceanographic conditions. There are 7 sites based on the boundaries of coastal provinces: 1) Chonburi; 2) Rayong; 3) Chantaburi; and 4) Trad; 5) Prachuabkhirikhan; 6) Chumporn; and 7) Surathani. Site 1 is in the Inner Gulf of Thailand, Sites 2, 3, and 4 are in the eastern Gulf of Thailand, and Sites 5, 6, and 7 are in the western Gulf of Thailand.

6.1.11 Thailand has developed criteria for assigning coral reef groups to one of four management categories, *i.e.*, General Use Zone, Intensive Tourism Zone, Eco-tourism Zone and Ecosystem Reserved Zone. Most coral reefs are assigned as Eco-tourism Zones. The classification criteria include existing reef conditions, current use, dominant causes of reef damage, local context, and potential reef use and development opportunities.

6.1.12 At present, Thailand is on the process of prioritisation of coral reef sites. Several criteria have been applied, *e.g.* species diversity, source of larval supply, habitat complexity, transboundary significance, socio-economic importance, management level, *etc.*

6.1.13 Dr. Tuan reported on the draft identification and characterisation of two sites, Con Dao and Nha Trang, which he had submitted to the PCU before the meeting. Each coral reef site was documented by a text format based on the regional criteria for selection of demonstration sites and a database on available data or information. In addition to the work accomplished for these two sites, the databases for 3 other sites, Ha Long – Cat Ba, Bach Long Vi, and Hai Van – Son Cha, were also finished. Vietnam has also created a GIS databases for data and information management (see report under Agenda 8). During the preparation of these documents, they reported some problems:

- the need for appropriate format that is accepted by RWG for text of site description;
- the limited information are available to assess rate of change of reef area after a decade; from coral reef monitoring at different periods;
- the lack of data for exploited species in most sites;
- the need to clarify the concept long, medium, or short term in management plan;
- the differences between IUCN and national categories of MPA; and
- the very few data and information on economic valuation to be reviewed.

6.1.14 Dr. Cabanban informed the meeting that clarifications or questions on procedures are welcomed by the PCU and that the Focal Points need not wait for the next meeting to raise matters. With regards to the problems encountered in Cambodia and Vietnam, Dr. Cabanban explained that Focal Points can report the lack of information with remarks on the difficulty in acquiring the data. This issue was further discussed and addressed under Agenda 8.1.

6.1.15 From the presentations of the participating countries on the Identification and Characterisation of Sites, it was clear that, there was a lot of information provided at the site levels, which provided the basis for future activities. There were a total of 46 sites were identified, and among them the data and

information were provided for 24 sites (Annex 6). It was clear that substantive progress in assessing national data and information on the sites had been achieved that will provide valuable information to the future characterisation and prioritisation of the sites.

6.1.16 In the meantime, it was also clear that the data and information provided by the countries were presented in different formats and covered different scales of geographic coverage. The Focal Points for coral reefs from Vietnam, the Philippines, and Thailand have experienced some difficulties in filling the data and information in the GIS questionnaire for coral reefs, as there are some qualitative information on the coral reef sites that cannot be readily entered in the questionnaire.

6.1.17 It was agreed in the meeting that a text file will be attached with the data and information on coral reef sites. The outline of the text file is attached as Annex 7.

6.2 Review of national legislation

6.2.1 Mr. Sour reported that the first draft of review of legal and institutional frameworks in relation to coral reef management and conservation has been carried out. Responsibilities for coastal and marine resources management in Cambodia are dispersed among various national governmental agencies. There are no specific regulations that provide a legal basis for promoting an integrated management system, particular for coral reefs. Conflicts between economic interests and environmental considerations have created problems in policy implementation. Each institution tends to focus on economic interests with less focus on principles of sustainable use. Even though environmental issues are considered, implementation of most policies tends to centre on partial environmental protection. In order to maintain the principles of sustainable development, Cambodia needs to establish an integrated coastal and marine resources management system that promotes optimum sustainable use of the marine resources with environmental protection.

6.2.2 Sectoral policies are taken as applicable approaches to coastal zone management. The main constraints among legislation, policies and institutions for the protection, conservation and management of the coastal zone and resources are the lack of implementation of policies and the unclear responsibilities among local authorities on how these policies are to be implemented.

6.2.3 Dr. Suharsono asked how long it takes to pass a new law in Cambodia. In response to the question, Mr. Sour described the process from the drafting of the law by the proponent Ministry, to the discussion in the Parliament, and to the final approval of the Council of Ministers. The whole process could take about 3 years.

6.2.4 Dr. Suharsono presented the report on the primary laws and regulations pertaining to coral reef management in Indonesia. He presented a summary of a detailed review of the Acts and Clauses of the Forestry Law, Fishery Law, and Conservation Law. The summary includes the object of the law (*i.e.*, habitat and/or organisms), region in which the law is implemented, the decision-making in the protection zone, the utilisation in the protected zone, the conservation activities, the list of violations and sanctions, and the authority (ministry) in which the mandate lies.

6.2.5 He concluded that coral reef management is completely governed under the Fishery Law. Any government regulation with regards to conservation of fish, other water organisms, and water exploitation remain under the Fishery Law. However, there are also relevant articles and clauses in the Forestry Law and Conservation Law for coral reef management.

6.2.6 In the case of Malaysia, Mr. Abdul Khalil informed the meeting that legislation that pertains directly to the sea and fishery are the Fishery Act of 1985, EEZ Act of 1984, Merchant Shipping Ordinance, and Environmental Quality Act. However, there are other items of legislation that regulate activities on land that have indirect relevance to coral reefs, such as the Local Housing Legislation. Furthermore, legislation on land matters come under the States. The Parks Enactment of 1984 in Sabah, which is concerned with the conservation of coral reefs, is under review in line with the establishment of the North Borneo Islands Marine Managed Area. The regulations on Recreational Fishing are in the first-draft stage and, once passed, will be a set of regulations under the Fisheries Act of 1985.

6.2.7 Dr. Aliño summarised the legal and institutional framework in the Philippines. He introduced the poverty and resources degradation cycle, and indicated that the thematic areas include management, planning and implementation, policy and institutional responses, capability building, information, education needs, and sustainable financing.

6.2.8 He suggested that (i) Integrated Coastal Management, Marine Protected Areas and Marine Sanctuaries Strategies and Programmes should be institutionalised; (ii) law enforcement and coastal governance need to be improved; (iii) co-ordination of activities in the specialised and strategic areas should be enhanced; (iv) incentives and disincentives based on performance evaluation need to be institutionalised; and (v) sustainable financing mechanisms and capability building should be strengthened.

6.2.9 Mr. Abdul asked if the municipality has the right to pass legislations. Dr. Aliño responded that the municipality has the right to pass local legislations within 15 km of their municipal waters.

6.2.10 Dr. Thamasak introduced the national legislation in Thailand. The main laws used to protect coral reefs in Thailand are: the Fisheries law of 1947, the National Park Act of 1961, the Enhancement and Conservation of National Environment Quality Act (NEQA) of 1975, the Wildlife Protection and Conservation Act of 1992, and several Ministerial Regulations and Notifications issued pursuant to particular laws. In general, Thailand has enough laws and regulations for coral reef protection. However, there have been problems in enforcing coral reef protection laws and regulations. First, the language of the laws and the subsequent regulations are sometimes unclear or incomplete. Certain laws and regulations should be updated. Second, the area over which these laws and regulations apply is large when compared to the manpower, available equipment and funding for enforcement. Co-operation among enforcement agencies is also needed.

6.2.11 A National Coral Reef Strategy was passed by the Cabinet and Policies and Action Plans were adopted in 1992. However, there were no signs of reversing coral reef degradation trends because it has not been implemented at the local level. At present, the Policies and Action Plans in the National Coral Reef Strategy are under revision. Based on the final draft, there are 6 policies, 19 measures, and 114 projects with a required total budget of Baht 681 million for a period of 5 years.

6.2.12 He further introduced the Management Plan for Marine Resources. He informed the meeting that the policies include:

- managing coral reefs according to different ecological and economic values to maintain a balance of uses;
- reducing coral reef degradation by increasing the effectiveness of existing laws;
- establishing a management plan and application of appropriate technology;
- building and maintaining strong and broad public support;
- revising Royal Thai government legal, regulatory, and institutional framework;
- monitoring and evaluating progress; and
- supporting management through scientific research.

6.2.13 Dr. Tuan presented a report entitled Review on Legislation and Institutional Arrangements concerning Coral Reefs in Vietnam. He reviewed the legislation including the Law on Environmental Protection, the National Plan for Environmental Protection and Sustainable Development of 1991-2000, Ordinance on the Protection of Aquatic Resources, and the draft legislation for marine protected areas. He also informed the meeting that at the provincial level, there are specific regulations on the protection of coral reefs.

6.2.14 In regard to institutional arrangements, he informed the meeting of the relevant governmental agencies that have responsibilities on coral reefs. He emphasised that at the provincial level, the Provincial People's Committee plays an important role in the management of coral reefs.

6.2.15 Dr. Tuan concluded that there is some constraints that need to be removed, such as overlaps and/or conflicts among regulations, lack of scientific inputs in the preparation of regulations, and

unclear mechanism for decentralisation in management. After the review of present legislation, he assessed that even though there are a lot of regulations in Vietnam, it is still not enough to protect coral reefs.

6.2.16 In response to a question raised by Dr. Ridzwan on whether the institutional framework was strengthened through the integrated coastal area management, Dr. Tuan informed the meeting that through the ICM, the institutional framework was enhanced.

6.2.17 The meeting recognised that there are enough number of legislation dealing with protection of coral reefs in the participating countries. However, these regulations were not well co-ordinated and there is a general lack of enforcement. The main reasons for the lack of enforcement were due to: (i) lack of capability in law enforcement; (ii) lack of financial support for the enforcement; and (iii) conflicts between the regulations.

6.2.18 The meeting felt that the harmonisation of existing regulation and enforcement should be carried-out at national level. While taking necessary actions on legal approaches, the necessary actions should also be carried out in applying the best management practice to address the problem of coral reef degradation.

7. PRESENTATION OF COUNTRY REPORTS CONCERNING ON-GOING NATIONAL ACTIVITIES

7.1 Review of National Data and Information

7.1.1 In accordance with the Workplan and Timetable (Annex 8, UNEP/GEF/SCS/RWG-CR.1/3), the Focal Points were engaged in undertaking: the Review of national data and information; Creation of national meta-database; Review of national criteria; and Review of economic valuation data and information.

7.1.2 Review of national data and information has been carried out in all participating countries and relevant reports were presented under agenda 6.1.

7.2 Creation of National Meta-database

7.2.1 For a better understanding of metadatabases, the Chairperson invited Mr. Jiang to give a presentation on the regional format of metadatabase, which was planned under agenda 8.2. Mr. Jiang outlined the format of regional meta-database to be used in the project. He briefly introduced the purpose of the metadatabase, structure of the format, and necessary technical information.

7.2.2 Mr. Suharsono reported to the meeting that the metadatabase for coral reefs in Indonesia has been completed under the COREMAP project, which covers the entire Indonesian seas. He presented a printed copy of the metadatabase to the meeting that was completed before the distribution of the format of metadatabase for the South China Sea Project. In order to make the metadatabases from all participating countries comparable, Dr. Suharsono agreed to transfer relevant parts into the agreed format for the South China Sea project.

7.2.3 The meeting was informed that other countries have collected relevant information, and will complete the metadatabase as soon as possible. The meeting requested PCU to send the digital copy of the metadatabase format to the Focal Points for Coral Reefs from participating countries immediately after the meeting.

7.3 Review of National Criteria

7.3.1 The Chairperson invited Dr. Cabanban to introduce this agenda and to respond to questions on the purpose of reviewing the national criteria. Dr. Cabanban referred the Workplan that was agreed upon at the first meeting of RWG-CR (Table 2, Annex 8 of the meeting report), and informed the meeting that, there was a task to review national criteria to for the purpose of setting up national priorities.

7.3.2 Dr. Aliño presented, as an example, the prioritisation process that was carried out for biodiversity conservation in the Philippines. He informed the meeting that the elements considered in the national criteria include marine ecosystems, marine corridors, and major marine habitats. He concluded that the national criteria should meet national strategies, which are different from one country to another.

7.3.3 The meeting discussed this issue and felt that each country has its own strategy and requirements. The criteria for setting up national priorities and/or ranking the priority sites should be prepared by the countries. The main task for the RWG is to prepare a set of regional criteria.

7.4 Review of economic valuation data and information

7.4.1 Mr. Sour presented a report on the socio-economic situation in Cambodia with the main objective to provide socio-economic information in relation to coral reefs. The review included the information on migration of people and educational level of the coastal population. He reported that the coastal communities are highly dependent on coastal resources, have low income, and are generally in poor health. The low income of the coastal population contributed to the degradation of coral reefs and low diversity of fishes. He informed the meeting that coral trading and blast-fishing, although illegal, are still observed in the coastal areas.

7.4.2 Dr. Ridzwan asked if the information on tourism is available, in particular the number of hotels and number of dive and tour operators. Mr. Sour responded that the information is not available at this moment but he will try to find relevant information in the future.

7.4.3 Dr. Suharsono reported a proposed method to conduct economic valuation of coral reef resources. He informed the meeting the main objectives of the study is to provide economic value of coral reefs to decision-makers and the public for better understanding of the importance of the coastal resources. He also informed the meeting that the difficulty in these studies is to assign values to the function of the coral reefs. Such study requires additional financial support.

7.4.4 Dr. Aliño provided a report on the results on economic benefits from management of coral reefs. According to the result, coral reefs are the most important habitat in an economic sense. He also introduced a method on modelling and adaptive management. He informed the meeting that the socio-economic data and information were included in the report in the characterisation of sites that were submitted to the PCU.

7.4.5 The report on economic valuation in Thailand was provided by Dr. Thamasak. He informed the meeting that some information is available in the tourism sector. There is enough information on number of hotels and number of tourism operators and related socio-economic data. The economist in the National Working Group for Coral Reefs has been asked to use the information available to derive the economic value of coral reefs but there is some difficulty in determining the service value of coral reefs. This information is needed for decision-makers who require it particularly in coral reef rehabilitation projects.

7.4.6 Dr. Tuan presented the progress in the assessment of socio-economic value of coral reefs in Vietnam. He informed the meeting that economic valuation of coral reefs in three coral sites were attempted in Nha Trang, Ninh Thuan, and Con Dao. He found that there is limited data and information on the economic values of coral reefs. Fisheries, tourism, and coastal protection are main elements considered in the valuation. The data and information for valuation of these elements are diffused and thus presents a difficulty for valuation. For instance, the information on tourism arrival to a city is available but it is difficult to ascertain the numbers of tourists who visit coral reefs. At the second meeting of National Coral Reef Working Group, the initial results of economic valuation were presented to the meeting, but there was no agreement on the value estimated and that the preliminary results have to be reviewed.

7.4.7 Dr. Aliño stated that we should not only pay attention of economic valuation at local levels but we should also consider the transboundary values of coral reefs. Dr. Chou and Dr. Tuan suggested that the resiliency of the system be included in the consideration for the transboundary importance of

coral reefs. The meeting felt that the transboundary valuation of coral reefs is very important and decided to form a group to discuss this issue.

7.4.8 A small group was formed to describe the resiliency of coral reefs and how this can be incorporated in the valuation process. The group was composed of Dr. Aliño and Dr. Chou. Their suggestion is attached as Annex 10.

8. PRESENTATION AND REVIEW OF THE OUTCOMES OF THE GIS-WORKSHOP JOINTLY CONVENED BY THE UNEP/GEF PROJECT CO-ORDINATING UNIT AND SEA START¹ REGIONAL CENTRE IN AUGUST 2002

8.1 GIS Questionnaires relating to data and information requirements for site characterisation of coral reefs

8.1.1 Mr. Jiang introduced this agenda item by referring the document UNEP/GEF/SCS/EW.1/3 on the outcomes of the GIS-Workshop jointly convened by the Project Co-ordinating Unit and the SEA START RC in August 2002. He introduced the main outcomes of the workshop, with emphasis on the requirements of the GIS workshop on the provision and/or correction of base maps. He also informed the meeting that the questionnaire for coral reefs needs to be examined by the Regional Working Group.

8.1.2 Dr. Suharsono informed the meeting that Indonesia has prepared base maps on GIS format that has been accepted national-wide. Dr. Thamasak also informed the meeting that the Focal Points of all components in Thailand have met to discuss the technical issues in the development of the GIS database. It was decided that all components in Thailand would use the GIS base map prepared by the Department of Land Development.

8.1.3 Taking into consideration difficulties in linking the different base maps from different countries and the need to have a regional base map, the meeting agreed that the Focal Points for Coral Reefs should discuss with the GIS experts who attended the workshop and provide necessary technical information, e.g., shorelines base map, etc. to PCU. After receiving contributions from each country, PCU will discuss with SEA START RC for a possible technical solution.

8.1.4 The meeting recalled the offer made by the Project Director of Landsat images. Mr. Jiang suggested that the National Technical Focal Points in the participating countries should co-ordinate the requirements of all components in the country and send their request to PCU.

8.1.5 The meeting carefully reviewed the GIS questionnaire prepared by the SEA START RC section by section in light of the difficulties expressed in the use of this format for the characterisation of sites (Agenda 6.1). The meeting modified and revised the questionnaire that is attached as Annex 8 to this report.

8.2 Metadata format

8.2.1 Mr. Jiang outlined the format of regional meta-database to be used in the project in conjunction with the agenda 7.2. He briefly introduced the purpose of the metadatabase. The metadatabase format will be sent to the Focal points for coral reefs in the participating countries.

8.2.2 With clarification of several technical questions, the meeting accepted the format and agreed to use the format and to submit necessary metadata information to the PCU.

¹ **START** - The Global Change **SysTem** for **A**nalysis, **R**esearch and **T**raining.

9. DISCUSSION AND AGREEMENT OF FUTURE ACTIVITIES WITH FOCUS ON THE NEXT INTERSESSIONAL PERIOD

9.1 Technical Consideration and Agreement on the Procedure and Format of Site Characterisation

9.1.1 The Chairperson invited Dr. Cabanban to introduce the agenda item. Dr. Cabanban presented a draft skeletal procedure for the compilation of data and information and for qualitative and quantitative comparisons of coral reef sites. Mr. Jiang informed the meeting that the purpose to prepare a format for site characterisation is to find a better way to present the data and information of coral reef sites in a quantitative or semi-quantitative way. With this format, the National Committees or National Working Groups for Coral Reefs in the participating countries will be able to provide data and information of coral reef sites accordingly and be able to rank and prioritise the sites at a later stage in the project.

9.1.2 The meeting established a sessional working group, consisting of Dr. Aliño and Dr. Chou, Dr. Thamasak and Mr. Abdul Khalil to provide details in the draft format. Dr. Aliño presented the draft format for the compilation of site characterisation, including the attributes on biodiversity, ecological features, socio-economic valuation, and management levels. The group also introduced an evaluation process to be able to rank and prioritise reefs. The proposed format and explanation are attached as Annex 9 to this report.

9.1.3 The meeting agreed to use proposed procedure to compile data and information of coral reef sites. Each participating country will add additional attributes into the procedure. The procedure, after having been tested in each country may serve as a guide for the preparation of the regional criteria.

9.2 Procedure for Preparation of the Regional Criteria

9.2.1 Mr. Jiang informed the meeting that the preparation of regional criteria for prioritisation of coral reef sites will require extensive discussion and will take long time. It would be more effective if the RWG-CR could agree to form an intersessional working group to work on this issue, with close communication with all members of the RWG-CR by e-mail.

9.2.2 The meeting agreed to establish an intersessional working group, with participation of Dr. Thamasak, Mr. Sour, and Dr. Aliño. The group will discuss and prepare draft regional criteria and circulate this to all members of the RWG-CR. The draft regional criteria will be submitted to the next meeting of RWG-CR for consideration.

9.3 Revision of Workplan and Timetable, Taking into Account Actions Listed in the MoUs with SEAs

9.3.1 Dr. Suharsono referred to the budget of MoU for the coral reef sub-component in the participating country and reported his observations that there was inconsistency between the budget and the agreed workplans. For example, in the budget, there was an allocation to *“Prepare guidelines on testing blast fishing activities (coral)”* however the activity was not included in the agreed Workplans. Dr. Tuan also pointed out the inconsistency in the main text of MoU and the workplan attached to the MoU. In the text of MoU, it reads, *“Prepare a summary of all existing national legislation”* but, in the attached workplan, it reads, *“prepare national legislation”*. It was agreed that there was a need to keep the activities in the agreed workplan identical with the activities in the budget.

9.3.2 In response to the above observation of the absence of the preparation for “guidelines on testing blast fishing activities” in the workplan, Dr. Cabanban drew the attention of the meeting to paragraph 8.5 of the report of the 1st meeting of the RWG-CR, that *“in the light of the heavy work load currently facing the National Committees at this point in time, consideration of this activity had been deferred.”* The meeting felt that the testing of the blast-fishing device is not a priority of the project activities and agreed to prepare a proposal to use the budgetary allocation to evaluate coral reef threats with emphasis on destructive fishing activities. Dr. Cabanban informed the meeting that

amendments to the MoU are possible as written in Annex 1 of the MoU. Focal Points can propose amendments to the Project Director.

9.3.3 Mr. Jiang informed the meeting that the process by which the MoU and the budgets were approved and how the workplan was developed: i) MoUs with the budget were discussed and agreed with SEAs; (ii) the agreed budget was presented to the first meeting of the Project Steering Committee (PSC); and (iii) PSC approved the proposed budget. With the approved budget, the Regional Working Groups had the first round of meetings and prepared the workplan. Thus, if there is any request to change the activities within the approved budget, it should be discussed and agreed by PSC.

9.3.4 The meeting agreed to form a sessional working group to prepare a revision of the workplan against the MoU and the approved operational budget. The working group was composed Dr. Suharsono, Dr. Tuan, Dr. Ridzwan, and Dr. Cabanban. The revised workplan will be submitted to the Project Director and/or Project Steering Committee.

9.3.5 Dr. Tuan presented the outcomes of the sessional working group, which provided in tabular format, the workplan, based on the text in the MoU, and the Workplan agreed at the 1st meeting of RWG-CR, and the Operational Budget. He informed the meeting that the working group had (i) used the wordings of the MoU; (ii) reworded some activities following the wording of the MoU, e.g. "*prepare national legislation*" to "*prepare a summary of all existing national legislation*"; and (iii) aligned activities under each budget line. The group also incorporated in the revised workplan the proposal of the meeting to use the allocation on the "preparation of guidelines for testing blast fishing device" to review the threats at site level with emphasis on destructive fishing practices.

9.3.6 In response to a suggestion to remove the activity on root cause analysis at national level, Dr. Aliño indicated that the root cause analysis is one of necessary steps for the preparation of the national action plan and suggested not to take this action out of the workplan. The meeting agreed that the root cause analysis could be one of the tools to prepare a national action plan. Therefore, the participating countries may or may not undertake the root cause analysis.

9.3.7 The meeting agreed on the revised workplan and suggested to revise the budget according to the workplan, subject to the approval of PSC. In the meantime, the meeting requested the Chairperson of the RWG-CR to report Revised Workplan, with the request for the modification of the budget line to review threats at site level, to the Regional Scientific and Technical Committee (RSTC). The revised workplan is attached as Annex 11 to this report.

10. DATES AND PLACES OF THE THIRD AND FOURTH MEETINGS OF THE REGIONAL WORKING GROUP ON CORAL REEFS

10.1 Dr. Cabanban referred to the document UNEP/GEF/SCS/RWG-CR.2/11 prepared by the PCU, which contains the provisional meeting schedule for 2003. This provisional meeting schedule had already been considered and adopted by the Regional Working Groups for Wetlands, Mangroves, Land-based Pollution, and Fisheries. Members were invited to note that it is proposed to convene the third meeting of the coral reef and seagrass working groups concurrently in the same location in order to provide an opportunity for interaction and exchange regarding the priority sites within each of these sub-components.

10.2 Mr. Khalil kindly offered to host the next meeting in Malaysia and will communicate with the PCU on the venue of the meeting. Dr. Aliño also offered that the Fourth Meeting of RWG-CR to be organised in the Philippines. The meeting expressed its appreciation and agreed to have the Third Meeting and the Fourth Meeting of the RWG-CR in Malaysia and the Philippines.

10.3 Mr. Jiang informed the meeting of a newly adopted GEF project dealing with similar issues in the southern coast of China. The meeting agreed that it would be more beneficial for the project if the experts from China were to participate in the meetings of the Regional Working Group. The meeting requested the Project Director to take the necessary action to invite the experts from China to attend the meeting.

11. ANY OTHER BUSINESS

11.1 The meeting was informed by Dr. Cabanban of the presentation on the blast-fishing detection device at the Regional Working Group for Fisheries. The presentation of Dr. George Woodman, of the Marine Sensors and Biosensors Group, Hong Kong University of Science and Technology, was presented briefly to the RWG-CR for information only.

11.2 The members of the RWG-CR expressed their appreciation to the Government of Cambodia and to Mr. Kim Sour for hosting this meeting in Cambodia and for the generous hospitalities provided to all participants of the meeting.

12. ADOPTION OF THE REPORT OF THE MEETING

12.1 The Rapporteur presented the draft report of the meeting. The draft meeting report was discussed, amended, and adopted.

13. CLOSURE OF THE MEETING

13.1 Dr. Cabanban expressed her appreciation to the Focal Points for their active participation in the discussions during the meeting. On behalf of the PCU, she also expressed her gratitude to the Regional Experts for the time that they provided to attend the meeting and for the expertise they shared in the deliberations of scientific and administrative matters during the meeting. The Chairperson declared the meeting closed at 2:00 PM.

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ANNEX 2

List of Documents

Discussion documents

UNEP/GEF/SCS/RWG-CR.2/1	Agenda
UNEP/GEF/SCS/RWG-CR.2/2	Provisional annotated agenda
UNEP/GEF/SCS/RWG-CR.2/3	Draft report of the meeting (to be prepared during the meeting)
UNEP/GEF/SCS/RWG-CR.2/4	Report of the Project Co-ordinating Unit concerning the mid-year reviews and reports from the Specialised Executing Agencies
UNEP/GEF/SCS/RWG-CR.2/5	Six-monthly progress reports from the participating countries
UNEP/GEF/SCS/RWG-CR.2/6	Members of the National Coral Reef Committees and sub-committees in the participating countries
UNEP/GEF/SCS/RWG-CR.2/7	Draft Reports of Past and On-Going Activities
UNEP/GEF/SCS/RWG-CR.2/7.Cam	Review of Past and On-going Activities on Coral Reefs in Cambodia
UNEP/GEF/SCS/RWG-CR.2/7.Phil	Review of Past and On-going Activities on Coral Reefs in the Philippines
UNEP/GEF/SCS/RWG-CR.2/7.Thai	Review of Past and On-going Activities on Coral Reefs in the Thailand
UNEP/GEF/SCS/RWG-CR.2/8	First Drafts of the "Identification and Characterisation of Sites" and "Review of National Legislation"
UNEP/GEF/SCS/RWG-CR.2/8.Phi	Descriptions of Reef Sites in the Philippines: Bolinao, Telbang Reef, Batong Ungot, Maricaban Strait and Batangas Bay, Puerto Galera Status of Available Data and Information for Batanes Province, Batangas, Lingayen Gulf, Puerto Galera, Palawan Province (El Nido and other areas), and Zambales Synoptic Review of Policies and Legislation on Coastal Resources Management National and Local Legal framework for Coral Reef Management Coral Reef Points facing the South China Sea culled from Reefbase, from Secondary Sources, and from UP MSI COMECO Database
UNEP/GEF/SCS/RWG-CR.2/8.Thai	Review of Site Characterisation: Thailand
UNEP/GEF/SCS/RWG-CR.2/8.Vie	Identification and Characterisation of Coral Reefs in Con Dao Islands Description and Characterisation of Nha Trang Coral Reefs in Con Dao Islands Database on Condao Coral Reefs and Nha Trang Coral Reefs
UNEP/GEF/SCS/RWG-CR.2/9	Questionnaires for data and information entry into the Regional GIS database of Coral Reef sites

UNEP/GEF/SCS/RWG-CR.2/10

Meta-data formats for entries in the South China Sea Regional Meta-database

UNEP/GEF/SCS/RWG-CR.2/11

Provisional schedule of meetings for 2003

UNEP/GEF/SCS/RWG-CR.2/12

Review of Legal and Institutional (Arrangements) Concerning Coral Reef Protection in Vietnam

Information documents

UNEP/GEF/SCS/RWG-CR.2/INF.1

Provisional list of documents

UNEP/GEF/SCS/RWG-CR.2/INF.2

Provisional list of participants

UNEP/GEF/SCS/RWG-CR.2/INF.3

Draft programme

UNEP/GEF/SCS/EW.1/3

UNEP/GEF/SCS and SEA START RC, GIS Workshop in support of the UNEP/GEF Project “*Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand*”, *Report of the meeting*, UNEP/GEF/SCS/EW.1/3, Bangkok, Thailand, 7 - 9 August 2002.

UNEP/GEF/SCS/PSC.1/3

First Meeting of the Project Steering Committee for the UNEP/GEF Project “*Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand*”. *Report of the meeting*. UNEP/GEF/SCS/PSC.1/3. UNEP, Bangkok Thailand.

UNEP/GEF/SCS/RSTC.1/3

First Meeting of the Regional Scientific and Technical Committee for the UNEP/GEF Project “*Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand*”. *Report of the meeting*. UNEP/GEF/SCS/RSTC.1/3 Pattaya, Thailand, 14 - 16 March 2002.

UNEP/GEF/SCS/RWG-LbP.1/3

First Meeting of the Regional Working Group for the Land-based Pollution Component of the UNEP/GEF Project “*Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand*”. *Report of the meeting*. UNEP/GEF/SCS/RWG-LbP.1/3 Bangkok, Thailand, 3 - 5 April 2002.

UNEP/GEF/SCS/RWG-W.1/3

First Meeting of the Regional Working Group for the Wetland Sub-component of the UNEP/GEF Project “*Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand*”. *Report of the meeting*. UNEP/GEF/SCS/RWG-W.1/3 Phuket, Thailand, 24 - 26 April 2002.

UNEP/GEF/SCS/RWG-M.1/3

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UNEP/GEF/SCS/RWG-SG.1/3

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UNEP/GEF/SCS/RWG-CR.1/3

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UNEP/GEF/SCS/RWG-F.1/3

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ANNEX 3

Agenda

- 1. OPENING OF THE MEETING**
 - 1.1 Welcome address**
 - 1.2 Introduction of members**
- 2. ORGANISATION OF THE MEETING**
 - 2.1 Documentation available to the meeting**
 - 2.2 Organisation of work**
- 3. ADOPTION OF THE MEETING AGENDA**
- 4. REPORT OF THE SECRETARIAT CONCERNING THE MID-YEAR REVIEWS AND REPORTS FROM PARTICIPATING COUNTRIES**
- 5. PRESENTATION OF NATIONAL REVIEWS OF PAST AND ON-GOING PROJECTS**
- 6. PRESENTATION OF FIRST DRAFT REPORTS ON NATIONAL ACTIVITIES**
 - 6.1 Identification and characterisation of “sites”**
 - 6.2 Review of national legislation**
- 7. PRESENTATION OF COUNTRY REPORTS CONCERNING ON-GOING NATIONAL ACTIVITIES**
 - 7.1 Review of National Data and Information**
 - 7.2 Creation of National Meta-database**
 - 7.3 Review of National Criteria**
 - 7.4 Review of economic valuation data and information**
- 8. PRESENTATION AND REVIEW OF THE OUTCOMES OF THE GIS-WORKSHOP JOINTLY CONVENED BY THE UNEP/GEF PROJECT CO-ORDINATING UNIT AND SEA START REGIONAL CENTRE IN AUGUST 2002**
 - 8.1 GIS Questionnaires relating to data and information requirements for site characterisation of coral reefs**
 - 8.2 Metadata format**
- 9. DISCUSSION AND AGREEMENT OF FUTURE ACTIVITIES WITH FOCUS ON THE NEXT INTERSESSIONAL PERIOD**
 - 9.1 Technical consideration and agreement on the procedure and format of site characterisation**
 - 9.2 Procedure for preparation of the regional criteria**
 - 9.3 Revision of workplan and timetable, taking into account actions listed in the MoUs with SEAs**
- 10. DATES AND PLACES OF THE THIRD AND FOURTH MEETINGS OF THE REGIONAL WORKING GROUP ON CORAL REEFS**
- 11. ANY OTHER BUSINESS**
- 12. ADOPTION OF THE REPORT OF THE MEETING**
- 13. CLOSURE OF THE MEETING**

ANNEX 4**Members of the National Coral Reef Committees in Participating Countries²****CAMBODIA**

Name	Expertise	Office
Mr. Kim Sour	Fisheries Science Tropical Marine Ecology and Fisheries Biology	Department of Fisheries Ministry of Agriculture, Forestry and Fisheries
Mr. Sem Vyrak	Fisheries Science Aquaculture and Aquatic Resources Management	Department of Fisheries Ministry of Agriculture, Forestry and Fisheries
Mr. Meas Rithy	Forestry Science	Ministry of Environment
Mr. Suy Thea	Fisheries Science	Park Ranger, Ream National Park Ministry of Environment
Mr. Sao Sinhuon	Environmentalist	Koh Kong Department of Environment Koh Kong Province, Cambodia
Mr. Tith Sara	Fisheries Science	Kep Fisheries Office Kep Department of Agriculture, Forestry and Fisheries Kep Municipality, Cambodia
Mr. Khem Bunheng	Environmentalist	Kampot Department of Environment Kampot Province, Cambodia Mobile Phone: (855) 12 764 319
Mr. Sin Sotharath	Fisheries Science	Sihanouville Fisheries Office Sihanoukville Department of Agriculture, Forestry and Fisheries Sihanoukville, Cambodia
Mr. Ney Oi	Fisheries Science	Koh Kong Fisheries Office Koh Kong Department of Agriculture, Forestry and Fisheries Koh Kong Province, Cambodia
Mr. Chheng Touch	Fisheries Science	Marine Protected Areas Exploitation Office, Department of Fisheries 186 Preah Norodom Boulevard
Mr. Bouy Roitana	Fisheries Science - Processing and Transportation	Sihanoukville Fisheries Office Sihanoukville Department of Agriculture, Forestry and Fisheries Sihanoukville, Cambodia
Mr. Haing Leap	Fisheries Science	Aquaculture Office Department of Fisheries
Mr. Poum Sotha	Fisheries Science	Marine Fisheries Inspection Unit Sihanoukville, Cambodia
Mr. Chourb Kao	Environmentalist	Kep Department of Environment Kep Municipality, Cambodia
Mr. Prak Vong	Environmentalist	Sihanoukville Department of Environment Sihanoukville, Cambodia
Mr. Thay Saman	Fisheries Science	Kampot Fisheries Office Kampot Department of Agriculture, Forestry and Fisheries Kampot Province, Cambodia

² Lists for Indonesia and Malaysia are not available at this time.

PHILIPPINES

Name	Expertise	Office
Dr. Porfirio M. Aliño	Coral reef ecologist	Marine Science Institute University of the Philippines
Mr. Robert Jara	Project Management	Department of Environment and Natural Resources (DENR)
Mr. Florendo Barangan and/or Mr. Emiliano Ramoran	Coastal and Marine Management	Coastal and Marine Management Office Department of Environment and Natural Resources (DENR)
Ms. Sandra Arcamo/Ms. Jessica Munoz	Coastal Zone Management/Fishery Resources Management	Department of Agriculture Bureau of Fisheries and Aquatic Resources (DAF-BFAR)
Atty. Joselito Alisuag and/or Mr. John Pontillas	Legislation	Palawan Council for Sustainable Development (PCSD)
Dir. Cesar Pagdilao	Fisheries biology/Marine Resources Research Management	Philippine Council for Aquatic and Marine Research Development
Atty. Jay Batongbacal	Legislation, Marine Affairs Policy	Philippine Center for Marine Affairs
Atty. Rafael Lotilla and/or Ms. Sheila Marie Encabo	Legislation/Economic Policy	National Economic Development Authority (NEDA)
Ms. Aileen Baviera	Environmental Policy	Asian Center University of the Philippines, Diliman
Mr. Alberto A. Encomienda/ Ms. Joanne Tiquio		Department of Foreign Affairs Marine and Ocean Affairs Center (DFA-MOAC)

THAILAND

Name	Expertise	Office
Dr.Thamasak Yeemin	Coral reef ecology Environmental Management	Faculty of Science Ramkhamhaeng University
Dr. Chamnan Mongkolkasem	Economics Environmental Economics	Faculty of Economics Ramkhamhaeng University
Asst. Prof. Sanay Rojanadit	GIS Geography	Department of Geography Ramkhamhaeng University
Mr. Manoch Wongsuryrat	Environmental Management Marine ecology	Technical Forest Marine National Park Division
Mrs.Tippawan Sethapun	Management Legislation	Marine National Park Division
Mrs.Yoo-ee Kaetpet	Management Legislation Marine ecology	Fisheries Resource Management Section, Fisheries Resource Conservation Division
Mr. Sakanan Pathong	Coastal Zone Management Marine ecology	Faculty of Science, Prince of Songkha University
Mr. Somkiat Soontornpitakkool	Management Marine biology	Mu Ko Chumphon National Park
Mr. Ronawan Boonprakob	Marine biology Coral reef ecology	Eastern Marine Fisheries Development Center
Ms. Anchalee Chankong	Marine biology Coral reef ecology Fisheries	Chumphon Marine Fisheries Development Center
Mr. Suraphol Chunhabandit	Coral Reef Ecology Coastal Zone Management	Aquatic Resources Research Institute, Chulalongkorn University
Ms. Pinya Sarasas	Marine Ecology Coastal Zone Management	Reef Check Thailand
Representative from Faculty of Law	Law Environmental Law	Faculty of Law, Ramkhamhaeng University
Representative from Faculty of Political science	Sociology Political Science	Faculty of Political Science Ramkhamhaeng University
Mr. Nisit Ruangsawang	Marine Ecology Coastal Zone Management	Department of Science (Biology) Bangkok Technical Campus, Rajamankala Institute Technology

VIETNAM

Name	Expertise	Office
Dr. Vo Si Tuan	Coral Reef Ecology	Institute of Oceanography
Tran Hong Ha	Policy	National Environment Agency
Vu Huy Thu	Policy	Department of Fishery Protection Ministry of Fisheries
Le Thanh Binh	Environmental management	National Environment Agency
Tran Minh Hien	Conservation	World Wild Fund IndoChina
Bui Thu Hien	Conservation	IUCN Vietnam
Nguyeh Huy Yet	Coral taxonomy/ecology	Hai Phong Institute of Oceanography
Nguyen Thu Hue	Conservation	IMA Vietnam
Trang Vo Hung Son	Environmental economics	University of Economics
Mai Van Thang	Environmental management	Khanh Hoa Department of Environment Protection
Tran Phong	Environmental management	Ninh Thuan Department of Science and Technology
Pham Van Thom	Hydrochemistry	Institute of Oceanography
Nguyen Van Long	Coral reef fish ecology	Institute of Oceanography

ANNEX 5

Questionnaire and Results for the Regional Overview of Past and On-going Projects in the Participating Countries

COUNTRY:

1. What are the objectives of the coral reef (CR) projects in your country?
 - Biodiversity assessment ☐
 - Socio-economic evaluation ☐
 - Management / Protection ☐
 - ICZM Planning ☐
 - Others ☐ (specify:.....)
2. Do you know where the coral reefs are located (distributed) in your country?
 - Yes, for most areas ☐
 - Yes, for some areas ☐
 - No, only in very small areas ☐
3. Percentage (estimate) of the coral reefs that has already been surveyed for any of the objectives in question no.1:
 - <25% ☐
 - 25-50% ☐
 - 50-75% ☐
 - 75-100% ☐
4. Is there enough information to address CR management issues in your country?
 - Yes, for most of the CRs (>75%) ☐
 - Yes, for 50-75% of the CRs ☐
 - Yes, for 25-50% of the CRs ☐
 - Yes, for less than 25% of the CRs ☐
5. Information gaps in addressing management issues:

	Percentage of CRs				
	<25%	25-50%	50-75%	>75%	
• Biodiversity and ecology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Geo-physical parameters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Socio-economic importance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Users conflicts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Threats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Why are there gaps in the above information?
 - Lack of trained personnel to collect information ☐
 - Lack of fund or financial support ☐
 - Remote areas with inadequate logistical support ☐
 - ☐
 - ☐
 - ☐

7. What are the outputs & outcomes of the CR projects in your country so far?

- Increase in number of reports and publications ☐
- Create public awareness of the status of the CR resources ☐
- Knowledge of threats to the CRs ☐
- Establishment of new MPAs ☐
- Identification of new dive sites for the tourism industry ☐
- Increase number of tourists visiting your CRs ☐
- Introduction of new legislations to protect CRs ☐
- Better fishery management ☐
- Improve the socio-economic condition of the community ☐
- Attract more scientists to conduct CR research ☐
- Public and community involvement in CR management ☐

Regional Overview of the Past and On-Going Projects in Participating Countries

	CAMBODIA	INDONESIA	MALAYSIA	PHILIPPINES	THAILAND	VIETNAM
1. The objectives of country's coral reef projects:						
• Biodiversity assessment						
• Socio-economic assessment						
• Management/protection/conservation						
• ICZM planning						
• Others (research, education, awareness)						
2. Knowledge of the distribution of coral reefs						
• Yes, for most areas						
• Yes, for some areas						
• No, only in very small areas						
3. Estimate of CRs already surveyed						
• <25%						
• 25-50%						
• 50-75%						
• >75%						
4. Adequacy of info. to address mgmt. issues						
• Yes, for >75% of the CRs						
• Yes, for 50-75% of the CRs						
• Yes, for 25-50% of the CRs						
• Yes, for <25% of the CRs						
5. Info. gaps in addressing mgmt. issues						
• Biodiversity and ecology	>75%	25-50%	25-50%	25-50%	25-50%	50-75%
• Physico-chemical parameters	>75%	25-50%	25-50%	>75%	25-50%	>75%
• Socio-economic benefits	>75%	>75%	50-75%	50-75%	>75%	>75%
• User conflict	50-75%	>75%	25-50%	>75%	25-50%	>75%
• Threats	50-75%	25-50%	25-50%	25-50%	25-50%	50-75%

	CAMBODIA	INDONESIA	MALAYSIA	PHILIPPINES	THAILAND	VIETNAM
6. Why are there information gaps?						
• Lack of trained personnel to collect info.						
• Lack of fund or financial support						
• Inadequate logistical support						
• Inadequate monitoring, enforcement, surveillance						
7. Outputs & outcomes of the CR projects						
• Increase in number of reports and publication						
• Create public awareness of the CR resources						
• Knowledge of threats to CRs						
• Establishment of new MPAs						
• Identification of new dive sites						
• Introduction of new legislations to protect CRs						
• Better fishery management						
• Improvement of socio-economic condition of community						
• Attraction of scientists to conduct CR research						
• Community involvement in CR mgmt.						
• Integration of CR science into mgmt.						

ANNEX 6

Summary of Coral Reef Sites Identified and Characterised in the Participating Countries

Country	Location	Coordinates	Characterisation		Remarks
Cambodia			Annex 7	GIS form	<ul style="list-style-type: none"> - 44 reef locations listed below will be grouped together into 3-4 sites; - Sites in Sihanoukville and Kampot Province have minimal information on species composition of corals. - A first draft text file on these sites has been prepared and submitted.
Koh Kong Province	1. Koh Menah (Trah Island) 2. Koh Krosa 3. Koh Andeak 4. Koh Chhan 5. Koh Sameth 6. Koh Torteng 7. Koh Sdach 8. Koh Khmoch 9. Koh Ampel Toch 10. Koh Ampel Kandal 11. Koh Ampel Thom 12. Koh Smach 13. Koh Damlong 14. Koh Manas 15. Koh Tateam 16. Koh Chnong 17. Kohn Chlam				The Singapore International Foundation has conducted two coral reef surveys in this province with the Ministry of Environment. The results of the two surveys will be input in the appropriate forms.
Sihanoukville	1. <i>Koh Pos (Pos Island)</i>				
	2. Koh Tres				
	3. Koh Chanlus				
	4. Koh Krobey				
	5. Koh Rusey				
	6. Koh Takiev				
	7. Koh Sromouch				

Country	Location	Coordinates	Characterisation		Remarks
	8. Koh Thas				
	9. Rangs of Koh Rong				
	10. Rangs of Koh Rong Sanlem				
	11. Koh Pring				
	12. Koh Trang				
	13. Koh Thmey				
	14. Koh Daung				
	15. Koh Veal				
	16. Koh Polouvay				
	17. Koh Khundor				
	18. Koh Trongoul				
	19. Poy Machov				
	20. Poy Tamoung				
	21. Poy Kampeth				
	22. Poy Koh Po				
Kampot	1. Koh Trognol				
	2. Prek Ampel				
	3. Koh Tonsay				
	4. Koh Mtes				
	5. Koh Angkrong				
	6. Koh Sot				
Indonesia					
	Senayang Linga, Riau Province				
	Bintang Islands				
	Natuna Islands				The formats for the characterisation of the sites have been presented to the National Committee for Seagrass.

Country	Location	Coordinates	Characterisation		Remarks
Malaysia					
	Peninsula Malaysia				Data and information on these sites in Peninsular Malaysia are available from governmental reports and research articles. These will be gathered and presented in the appropriate forms.
	<i>40 islands with fringing reefs</i>				The reefs surrounding these islands are managed as Marine Parks under the Department of Fisheries.
	East Malaysia				Data and information on these sites in East Sabah are available from governmental reports and research articles. These will be gathered and presented in the appropriate forms.
	<i>Derawan Island and others (off Kinarut, Sabah)</i>				
	<i>Tunku Abdul Rahman Park</i>				
	Mantanani Islands				
	North Borneo Islands				
	Sarawak				
Philippines					
	Batanes Province	20°0'- 21°24.3'N, 121°32.4'- 121°16.2'E			
	Bolinao	16°22'- 16°27'N, 119°52'- 120°00'E			
	Telbang Reef	16°10'40"- 16°10'50"N, 120°04'08"- 120°02'04"E			

Country	Location	Coordinates	Characterisation		Remarks
	Lingayen Gulf	15o24.3'- 16o37.26'N, 199o36.45'- 120o32.4'E			
	Batong Ungot	15o10'34''- 15°10'33''N, 120°01'10''- 120°01'49''E			
	Maricaban Strait and Batangas Bay				
	Batangas Bay				
	Puerto Galera	13°28.35'- 13o34.02'N, 120o54.27'- 120o59.13'E			
	Palawan Province:				
	El Nido				
	Puerto Princesa				
	Ulugan Bay	9o51'-10°20'N, 118°35.64'- 118°51'E			
	Balabac Island				
	Bacuit Bay, El Nido	11.00o- 11.30oN, 119.15°- 119.45°E			
	Zambales-Batangas	13o36.45'- 15°0'N; 120°0'- 120°58.32'E			

Thailand					Coral reefs have been grouped together based on similarity of ecological attributes. Characterisation of sites and digitising of reefs have begun. Digitising of reefs will be finished by next month.
	Suratthani				
	Chumporn				
	Prachuabkirikahn 1				
	Prachuabkirikahn 2				
	Chonburi				
	Rayong				
	Chantaburi				
	Trad				
Vietnam					
	Con Dao Islands	8°37'-8°48'N, 106°32'- 106°45'E			
	Nha Trang Bay	12°00'- 12°45'N, 109°15'- 109°30'E			

ANNEX 7

Outline for Text Description of Coral Reef Sites³

- 1 GEOGRAPHIC LOCATION⁴
- 2 TRANSECT SITES
- 3 PHYSICAL FEATURES
- 4 NOTEWORTHY FAUNA AND FLORA
- 5 SCIENTIFIC IMPORTANCE AND RESEARCH⁵
- 6 TRANSBOUNDARY SIGNIFICANCE⁶
- 7 ECONOMIC VALUE AND SOCIAL BENEFITS⁷
- 8 DISTURBANCE AND DEFICIENCIES
- 9 LEGAL PROTECTION
- 10 MANAGEMENT
- 11 RECOMMENDATIONS
- 12 REFERENCES

³ This text file will accompany the compilation of the survey on data and information for each coral reef site. This text file is proposed to accommodate any other data and information, especially qualitative information, which cannot be entered in the questionnaire prepared by SEA-START RC.

⁴ Coordinates, areal extent of site.

⁵ e.g., species richness, presence of endemic, threatened, or endangered species.

⁶ site of spawning aggregations, nursery; resiliency of coral reef site (see Annex 10)

⁷ e.g., data and information on algae, fishes, and invertebrates exploited by coastal villages; presence of subsistence fishery; presence of tourism; this implies no economic evaluation.

ANNEX 8

Revised Questionnaire⁸ to Survey of Data and Information on Coral Reef Sites⁹C2. *Environmental data of each coral reefs in the South China Sea part of (country)*

Coral reef site name:

The geographical coordinates (latitude and longitude) of the **approximate centre OR range** of the coral reef site, expressed in degrees and minutes.

Latitude:

Longitude:

Table C2.1	Category	Unit	Data	Remarks*
Physical Environment				
<input type="checkbox"/> 1. Reef Type	Fringing (mainland & island)	Sq. km or Ha		Estimated by method?
<input type="checkbox"/>	Barrier			No data
<input type="checkbox"/>	Atoll	Number or area		
<input type="checkbox"/>	Patch			No info/No data
	Other			
	(1).....			
	Other			
	(2).....			
<input type="checkbox"/>	Maximum	m		
<input type="checkbox"/>	Minimum	m		
2. Average Cross Sectional Slope	Category of slope (1-gentle, 2- moderate, 3-steep)		1 or/and 2, 3	
3. Change of Reef Area		Ha or sq. km (%)		Time period

⁸ Corrections in fields and additional explanations are in italics and in bold letters.

⁹ A text file (Annex 7) will accompany this survey form to accommodate qualitative data and information that cannot be entered in the fields of this questionnaire.

Table C2.2	Category	Unit	Data	Remarks*
<u>Present Environmental State</u>				
1. Coral				Investigation date
1.1 Number of Hard Coral Genera/Species		number /number		
1.2 Number of Soft Coral Genera/Species		Number /number		
1.3 Live Coral Cover (All Species)		percent		
1.4 Change in Live Coral Cover Area/Time Over Last Decade (All Species)		percent/decade (+/-)		
2. Algae				
2.1 Number of Algae Genera/Species		number /number		Indicate season
2.2 Present Algae Cover		percent		
2.3 Change Algae Cover Area Over Time		percent/decade (+/-)		
3. Molluscs				
3.1 Number of Molluscs Genera/Species		number /number		
3.2 Molluscs Density		number/m ²		

Table C2.3	Category	Unit	Data	Remarks*
4. Crustacean				Investigation date
4.1 Number of Crustacean Genera/Species		number/ number		
4.2 Crustacean Density		number/m ²		
5. Echinoderm				
5.1 Number of Echinoderm Genera/Species		number/ number		
5.2 Echinoderm Density		number/m ²		
6. Polychaete¹⁰				
6.1 Number of Polychaete Genera/Species		number /number		
7. Coral Reef Fish				
7.1 Number of Coral Reef Fish Genera/Species		number /number		
7.2 Coral Reef Fish Density		number/m ²		
8. Transient Fish				
8.1 Number of Transient Fish Genera/Species		number/ number		
9. Target Species				
9.1 Number Per Genera				
9.2 Density of Target Species		number/area		
10. Indicator Species		number		
10.1 Number Per Genera		number/ number		
10.2 Density of Indicator Species		number/area		

¹⁰ Particularly those that are indicator species.

Table C2.4	Category	Unit	Data	Remarks*
9. Mammal				Investigation date
9.1 Number of Mammal Species		number		
9.3 Mammal Abundance		<i>number</i>		
10. Larvae				
10.1 Number of Larvae Families		number		
10.3 Larvae Density		Number/m ³		
11. Exploitation				
11.1 Major Exploited Species Group and Level of Exploitation	Grouper	<i>Over or moderately exploited</i>		
	Giant Clam	kg./year		
	Sea Cucumber	kg./year		
	Snapper	kg./year		
	Lobster	kg./year		
	Others (identify).....	kg./year		
		kg./year		
		kg./year		
		kg./year		
		kg./year		
		kg./year		
12 Ecosystem Function				
12.1 Number Of Other Ecosystems ¹¹ Interact With This Coral Reef		number		
12.2 Spawning Ground Of Important Species			Yes or no	Specify species

¹¹ Specify ecosystems, e.g., seagrass and/or mangroves, in the Remarks column of this field; indicate also the distance of the coral reef site from the habitats/ecosystems that they interact with.

Table C2.5	Category	Unit	Data	Remarks*
<u>Regional And/Or Global Significance</u>				Investigation date and species name
Number Of Endemic Species		number		
Number Of Indigenous Species		number		
Number Of Rare Species		number		
Number Of Endangered And Threatened Species (IUCN Red List Categories)	Critically Endangered (CR)	number		
	Endangered (EN)	number		
	Vulnerable (VU)	number		
Existing International Recognition	National Park	Year Established		

Table C2.6	Category	Unit	Data	Remarks*
National Significance				
Existing Management Plans (Provide Short Detail)	Long-term (>10year)			
	Medium-term (5-10)			Details:
	Short-term (<5)			Details:
Existing Status MPA/MA (IUCN Category And Others) Www.Iucn.Org/Themes/Marine/Pdf/Mpaguid.Pdf	National Park Category II	Year Proposed		
Management Or Preservation Activities On Site				
Existing Level And Quality Of Site Management ¹²				
Existing Support To Institutional Management				
Long-Term Sustainability Including Prospects For Revenue Generation (Identify Activities)				
Potential Aspects That Can Be Developed Wisely In The Site (Identify Activities)				
Average Level Of Direct Stakeholder ¹³ Involvement In Management				
Long Term Environmental Perspective				

¹² Consider Reefs at Risk Analysis in Southeast Asia and other analyses.

¹³ e.g., local authorities and communities, national organisations.

Table C2.7	Category	Unit	Data	Remarks*
Threats To This Area				
1. Present Threats				
1.1 Destructive Harvesting	Bombing	number/year	No data	
	Poisoning	number/year		
	Bottom trawl			
	Plant/animal removal			
	Other (1).....			
	Other (2).....			
1.2 Pollution	Value	unit	Data	Investigation date
1.3 Sedimentation	Turbidity	NTU	No data	
	TSS	(mg/l)		
	Other ...			
1.4 Oil	Oil	(mg/l)		
1.5 Heavy Metals	Fe	(µg/l)		
	Mn	(µg/l)		
	Zn	(µg/l)		
	Cu	(µg/l)		
	Pb	(µg/l)		
	As	(µg/l)		
	Cd	(µg/l)		
	Cr	(µg/l)		
	Ni	(µg/l)		
	Hg	(µg/l)		
1.6 Organic Pollutants	P org	(µg/l)		
	N org	(µg/l)		
	C org	(µg/l)		
	BOD	(mg/l)		
	COD	(mg/l)		
	DO	(mg/l)		

1.7 Eutrophication (Nutrient)	NO3-N	(µg/l)		
	NO2-N	(µg/l)		
	NH3-N	(µg/l)		
	PO4 – P	(µg/l)		
	SiO3 – Si	(µg/l)		
1.8 Pesticides	Total pesticides	(µg/l)		
1.9 Salinity Change	Salinity	(‰)		Long term
1.10 Thermal Change	Temperature	(° C)		
1.11 Other of Types of Pollution	Other (1).....			
	Other (2).....			
2.0 Coastal Development	Dredging			
	Tourism			
	Construction		Medium	

Table C2.8	Category	Unit	Data	Remarks*
3.0 Natural Disaster	Storm			
	Volcano			
	Land subsidence			
	Sea level rise			
	Other (1).....			
	Other (2).....			
4.0 Others	Starfish Crown of Thorn	Number /m ²		
	Bleaching event	Number /decade		

Table C2.9	Category	Unit	Data	Remarks*
2. Future Threats				
	Development plan (add details of activities)			
	Distance to the Coral Reef Area	km		
3.0 Stress-Pressure Information				
Social And Economic Drivers Of Change In Environmental State	Population growth	Percent/year		
	Resident human population	Number		
	Migration	Percent/year		
	Average GDP growth during the last decade	Percent/year		
	Others			

Table C2.10	Category	Unit	Data	Remarks*
4.0 Management				
4.1 Ownership	Federal			
	State			
	Community			
	Private			
	Common property			
	Other (1).....			
	Other (2).....			
4.2 Management regime	Land-use planning			
	Coastal zoning			
	Institutional framework			
	Stakeholder co-ordination			
	Restoration			
	Stakeholder investment			
	Fishery practices			
	Other (1).....			
	Other (2).....			

Table C2.11	Category	Unit	Data	Remarks*
5.0 Current use	Commercial			<i>Explanation on economic and social benefit</i>
	Subsistence			
	Fishing ground		Yes	
	Tourism		Yes	
	MPA		Yes	
	Other			
	(1).....			
6.0 Traditional use	Other			
	(2).....			
7.0 Potential use	Fishing ground			
	Tourism		Yes	
	MPA		Yes	

Table C2.12	Category	Unit	Data	Remarks*
8.0 Uses and Services				
8.1 Extractive use	Reef related fish landing	currency/year		Explanation on economic and social benefit
	Subsistence fishery	VND/year		
	Coral mining			
	Other (1).....	VND/year		
	Other (2).....	VND/year		
8.2 Non-extractive use - e.g., Tourism	Number of visitors	number/year		
	Number of people involved in industry	number		
	Number of chalets/hotels operators	number		
	Number of ferry/boats operators	number		
	Number of guide/agents	number		
	Other (1).....			
	Other (2).....			
8.3 Other non-extractive use (year 2000)	Specify (1).....			
	Specify (2).....			
9.0 Environmental services	Coastal protection	currency/year		
	Sediment stabilisation	currency/year		
	Water quality enhancement	currency/year		
	Contaminant sink	currency/year		
	Reduction of wave energy & erosion,	currency/year		
	Other (1).....	currency/year		
	Other (2).....	currency/year		

ANNEX 9

Proposed Procedure for Site Characterisation and Evaluation for National Prioritisation

This compilation summary matrix and proposed evaluation process are discussed in relation to the site characterisation and review of the national criteria.

Objective

This national prioritisation process was conducted to learn how this can be used as inputs (e.g. summary compilation format) for the regional criteria prioritisation process.

Evaluation can be done based on the scores for the subtotals and totals and eventually cross check based on the raw scores or frequency for the categories. The scores can be validated based on the general consensus and expert opinion of the evaluator (e.g., national committee, national working group, or technical experts).

Site Categories ¹ and attributes	Site 1	Site 2	Site 3	Site n	Remarks
BIODIVERSITY					
<i>Species richness</i>					
<i>Relative diversity score</i>					
<i>Others</i>					
<i>Subtotal</i>					
ECOLOGICAL IMPORTANCE					
<i>Habitat complexity</i>					
<i>Reef heterogeneity</i>					
<i>Spawning grounds</i>					
<i>Migratory species pathway</i>					
<i>Endangered species feeding/nursery ground</i>					
<i>Others</i>					
<i>Subtotal</i>					
SOCIO-ECONOMIC IMPORTANCE					
<i>Fisheries</i>					
<i>Tourism</i>					
<i>Education</i>					
<i>Cultural</i>					
<i>Others</i>					
<i>Subtotal</i>					
MANAGEMENT LEVEL/NEEDS					

¹ Scores = are taken from the GIS database and text description and translation to the H, M, L equivalent scores are suggested in the text.

SITE CHARACTERISTIC ATTRIBUTES

BIODIVERSITY VALUES

1. SPECIES RICHNESS – of at least a benthic organism (e.g. coral) and reef fish; (consider also diversity index or other ways to gauge quantitatively species diversity).

Evaluation process

Get the average or decide the most important species attribute (e.g. either coral or fish etc. to score a high, medium or low value based on best judgement (i.e. expert opinion).

2. RELATIVE DIVERSITY – Proportion of species and representativeness of the site.

Evaluation process

Compare the species richness for the site relative to the average proportion of the national average.

2.1 When available, consider constructing a species area curve and see the sample size in relation to the potential number you get for the site (see attach process figure for construction of the curve).

2.2 Alternatively, you can just have a number of taxa scored in relation to their importance and sum up their total scores.

Evaluation process

The H, M, and L categories can be given a corresponding score or scale (e.g., H = 3, M = 2, L = 1 or H = 5, M = 3, L = 1, or score that that is considered appropriate). The categories can be derived by looking at the range of species divided by three (e.g., percent of species or total numbers per area) or depending on the classes (range) you will decide and thus score (H, M, L) the species diversity value based on which category they are in. Use a number of taxa (at least two like hard coral and fish) to evaluate the categorisation and to decide the eventual categorisation. This evaluation can be done by adding or averaging the scores or by the frequency for this and document this accordingly.

ECOLOGICAL IMPORTANCE

1. HABITAT COMPLEXITY AND HETEROGENEITY

ECOSYSTEM COMPLEXITY – The ecosystem complexity refers to the number of habitats (e.g., number of habitats referred to in GIS database) or the reef heterogeneity of the topography in the reef (e.g., spur and groove, zones like reef flat and slope features like spur groove, lagoons, etc.) in a site. Based on the quantity of these attributes, translate this into semi-quantitative scores (H, M, L). Derive the categories by looking at the range of distribution of the attribute scores.

Evaluation process

For ecosystem complexity scores are derived by evaluating the number of interacting habitats (e.g., seagrass, mangroves and patch reefs nearby, etc.) with the more habitats, e.g., three or more = High, like seagrass, mangrove and patch reef scored as three and moderate would be 2 habitats and 1 or less habitats would be low.

2. REEF HETEROGENEITY – refers to topographic relief (e.g. spur and groove and slope) and zones (like reef flat, crest and reef slope and lagoon); reef heterogeneity can be scored as High = with 3 or more relief/zones, Moderate score = with 2 relief/zones, Low = 1 and < 1 relief/zones.

3. SPAWNING OR NESTING GROUND – description of the function (refer to text description); Put Yes or No in the matrix; Provide score a higher score for the important species (e.g., indigenous or endangered species).

4. MIGRATORY SPECIES PATHWAY – just describe function put mark yes (x) or no (no score)

5. ENDANGERED SPECIES FEEDING AND NURSERY AREA – describe species and score for each known function (marked x in the matrix) and put higher score (xx) for important species.

SOCIO-ECONOMIC CONSIDERATIONS

1. FISHERIES PRODUCTION – put value (kg/year in the specific area and equivalent monetary value) and translate this value into a high, medium and low category.

2. TOURISM – gauge the value of the amount of tourism revenues and entries and translate this value into a high, medium and low category based on the range of values in the area.

3. EDUCATIONAL – gauge the importance of the area based on the number of researches and associated facilities and describe and translate into a high, medium and low category.

4. CULTURAL IMPORTANCE (include traditional use) – same as above

5. OTHERS

Evaluation process

Evaluate all the attribute categories and gauge the integrated or additive scores.

MANAGEMENT LEVELS

Some questions to consider in the assessment of management levels:

1. Is there a management plan?
2. Is this legislated?
3. Is there stakeholder participation in management planning?
4. Is implementation of management defined in detail, e.g., with zone and (level)?
5. Is the level of management supported by stakeholders (e.g., with technical assistance, government funds, and others)?
6. Is the management effective?

Fill in the matrix the management level the site has.

ANNEX 10

Recovery Index for Ecosystem Valuation and Reproductive Output/Spill-over Value for Transboundary Value or Significance

Prepared by Dr. Porfirio M. Aliño and Dr. Chou Loke Ming

Recovery Index

Valuation based on ecological significance has not been intensively investigated and remains as a gap in attaching a monetary value to coral reef ecosystems. Ecosystem resilience could be used to provide a basis to such an evaluation. It is based on the fact that mature ecosystems with high biodiversity have greater resilience to impacts and a higher potential for recovery.

This project can make a comparative review of the different reefs to investigate and attempt some correlation between biodiversity richness and ecosystem recovery. The correlation will facilitate the development of a recovery index based on biodiversity richness or ecosystem maturity. The index can then be used as a basis of ecosystem valuation.

Reproductive Output/Spill-over Value

A sensitivity analysis of simulations of different disturbances (both with the interaction of human and natural impacts) in relation to the role of the habitat (ecosystem) can be undertaken. Its "reproductive output/spill-over" value in the connectivity of habitats can be utilised as another index for its transboundary value or significance.

ANNEX 11

Workplan and Timetable of Agreed Activities for the RWG-Coral Reefs and Schedule of Meetings for 2003

Year	2002												2003											
Quarter	1st			2nd			3 rd			4 th			1st			2nd			3rd			4th		
Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
National Committee meetings	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
NTWG Meetings						x				x														
Review National Reports																								
Review of Regional Database and Respond																								
NATIONAL ACTIVITIES																								
<i>Prepare national inventory of coral reefs & develop national data in GIS/map format (coral)</i> ¹⁴																								
Review of past and on-going Projects						1					2													
Assemble data /info in national metadatabase ¹⁵																								
Review economic valuation data & information ¹⁶																								
Review criteria at national level ¹⁷																								
Identification & characterisation of "sites" and assemble GIS database ¹⁸										3	4	5												
<i>Review national legislation and develop action plans on coral reefs</i>																								
<i>National prioritisation</i> ¹⁹																								
Prepare objective criteria for future use ²⁰																								

¹⁴ **Budget line 2205** in the Operational Budget; reworded to harmonise with the clauses in the MoU and the agreed activities in the Workplan and Timetable by the Regional Working Group (see Table 2, Annex 8 - UNEP/GEF/SCS/RWG-CR.2/1).

¹⁵ based on review of national data and information; Clause viii of the MoU.

¹⁶ This activity is in the agreed workplan at the first meeting of the Regional Working Group.

¹⁷ Clause x of the MoU.

¹⁸ These activities are not in the Memorandum of Understanding but the meeting agreed to conduct this activity in order to gather data and information on coral reef sites, to develop a national metadatabase, and to be able to have the information needed for regional prioritisation.

¹⁹ **Budget line 2206** in the Operational Budget; reworded to harmonise with the clauses in the MoU and the agreed activities in the Workplan and Timetable by the Regional Working Group (see Table 2, Annex 8 - UNEP/GEF/SCS/RWG-CR.2/1).

²⁰ Clause xi of MoU.

²¹ Clause xi of MoU.
²² Clause vii in the MoU.
²³ in the Workplan agreed at the First Meeting of the RWG-CR.
²⁴ in the Workplan agreed at the First Meeting of the RWG-CR.
²⁵ in the Workplan agreed at the First Meeting of the RWG-CR.
²⁶ Clause 16 of the MoU; in the Workplan attached to the signed MoU, this activity reads: “Application of the criteria to prioritise areas and select demonstration sites on coral reefs”
²⁷ Not all countries have existing National Action Plans for Coral Reefs. Thus, this activity is either for development or revision, if necessary, of National Action Plans.
²⁸ **Budget line 2207** in the Operational Budget attached to the MoU. The RWG-CR decided not to use the funds for this purpose. Instead, the RWG-CR would like to use the budget line to review threats with emphasis on the impacts of destructive fishing practices such as fishbombing and cyanide fishing. This change in the object of expenditure is a proposal to the Project Coordinating Unit.
²⁹ Please refer to Annex 10 of the Report of the GIS Workshop.

Notes on the Numbered Cells in the Revised Workplan and Timetable for the Regional Working Group for Coral Reefs

Number	Notes
1	First draft
2	Final draft to be submitted to PCU
3	First Draft
4	15 November - New deadline for submission of First Draft
5	31 December 2002 - Final Draft
6	First Draft
7	15 November - New deadline for submission of First Draft
8	31 December 2002 - Final Draft
9	Development of Regional Criteria by electronic discussion
10	First Draft of Regional Criteria to be circulated to all members
11	28-31 October 2002, 2 nd Meeting of the RWG-CR
12	25-28 March 2003, Third Meeting of the RWG-CR, Malaysia
13	29 September to 2 October 2003, Fourth Meeting of the RWG, Philippines

Provisional Schedule of Meetings for 2003

M		T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M							
January			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
February						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28			
					Chinese N.Y.																									RWG-LbP-3						
March						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
							RWG-M-3																							RWG-SG-3						
							RWG-W-3																							RWG-CR-3						
April		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30					
		RWG-F-3										Thai N.Y.							Easter																	
May					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
							RSTC-3																													
June							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
July		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
August					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
																													RWG-LbP-4							
September		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30					
							RWG-F-4															RWG-SG-4						RWG-CR-4								
October			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
		Cont.						RWG-W-4							RWG-M-4															Ramadan						
November						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
				Ramadan																																
December		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
				Regional Sci. Mtg.				RSTC-4								PSC-3								Xmas												

