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Facility

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

REPORT

**Fourth Meeting of the Regional Working Group for
the Mangroves Sub-component**

Beihai, China, 14th – 17th October 2003



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Cover Photo: Dr. John Pernetta; Mangrove propagules ready for replanting, Trad Province, Thailand.

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Report of the Meeting

1. OPENING OF THE MEETING

1.1 Welcome address

1.1.1 The Project Director, Dr. John Pernetta, welcomed participants to the fourth meeting of the Regional Working Group on mangroves, on behalf of Dr. Klaus Töpfer, the Executive Director of UNEP and Dr. Ahmed Djoghlaif, Assistant Executive Director and Director, Division of Global Environment Facility (GEF) Co-ordination.

1.1.2 He noted that this is an important meeting, which occurs at a critical point in the development of the project, where decisions are to be made regarding recommendations to the Project Steering Committee on the choice of demonstration sites that are to be funded from GEF grant funds. He noted that, the agenda was extensive in relation to the time allotted and that, therefore, the participants would have to work hard to complete all the items before them for consideration.

1.1.3 He welcomed the National Focal Point from China, Mr. Chen Mingjian and the National Technical Focal Point, Professor Huang Zhengguang and informed the meeting that due to their busy schedules they would not participate in the entire meeting.

1.1.4 The Chairperson of the Regional Working Group on Mangroves (RWG-M), Dr. Sonjai Havanond, welcomed the members and observers to the meeting. He noted with regret that one of the Regional Expert Members Dr. Sanit Aksornkoae, and one of the Focal Points, Mr. Ke Vongwattana, from Cambodia were unable to be present in this meeting. He welcomed Mr. Sok Vong, Focal Point for wetlands in Cambodia as the alternate representative for Mr. Ke Vongwattana. The list of participants is contained in Annex 1 of this report.

2. ORGANISATION OF THE MEETING

2.1 Documents available to the meeting

2.1.1 Dr. Pernetta introduced the documentation available to the meeting noting the individual discussion and information documents and their relationship to the various agenda items. The full list of documents available to the meeting is contained in Annex 2 of this report.

2.1.2 Dr. Pernetta noted that one of the tasks for this meeting was to discuss the finalisation of the National Reports and in this context he noted that the reports had not been reproduced since they had been distributed to the members during the last meeting, and were available on the CD-ROMs included in the document package for all participants. He noted that independent reviews of these reports were available and that the meeting needed to finalise agreements regarding the completion of the reports.

2.1.3 He further noted that the reports of the third meetings of the regional working groups and the Regional Scientific and Technical Committee were available in electronic versions on the CD, in hard copy and that, they had been distributed via e-mail and via the project website in advance of the meeting. He drew the attention of participants to the reports of the Regional Task Forces on Economic Valuation (RTF-E) and on Legal Matters (RTF-L) that contained specific advice, regarding the finalisation of the national reports on legal and institutional frameworks and economic valuation.

2.2 Organisation of work

2.2.1 The Project Director briefed participants on the administrative arrangements for the conduct of the meeting, noting the proposed organisation of work contained in document, UNEP/GEF/SCS/RWG-M.4/Inf.3. He noted that the meeting would be conducted in English and in plenary as far as possible, although he noted that; due to the volume of work some evening sessions and/or preparatory work by members might be necessary if the full business of the session was to be completed in a satisfactory manner.

2.2.2 He noted that Dr. Fan had kindly made arrangements for a field trip to the potential demonstration site of Fangchenggang on the 17th and that this would necessitate expeditious processing of the report if it was to be adopted by the members prior to the closure of the formal sessions of the meeting.

3. ADOPTION OF THE MEETING AGENDA

3.1 The Chairperson invited members to consider the provisional agenda prepared by the Secretariat as document UNEP/GEF/SCS/RWG-M.4/1, and to propose any amendments or additional items for consideration. There were no objections, or amendments, and the agenda was adopted as contained in Annex 3 of this report.

4. REPORTS FROM THE PROJECT CO-ORDINATING UNIT REGARDING OVERALL PROGRESS TO DATE

4.1 Status of mid-year progress reports, expenditure reports, and budgets

4.1.1 The Project Director introduced this agenda item and document UNEP/GEF/SCS/RWG-M.4/4, "*Current status of budgets and reports from the Specialised Executing Agencies in the participating countries*" that contains a summary of the current status of budgets and administrative reports, including audit reports, received by the Project Co-ordinating Unit (PCU) from the Specialised Executing Agencies (SEAs) of the participating countries.

4.1.2 Dr. Pernetta drew the attention of the participants to the fact that to date, no funds for the last 6 months had yet been disbursed, due to the late receipt and finalisation of the financial reports. As the Memoranda of Understanding (MoU) terminate at the end of this year, it would be irresponsible for the PCU to distribute significant cash advances when many of the SEAs have substantial funds still in hand. What was now required was a detailed cost estimate from each SEA for the actions required to complete the activities outlined in the MoUs, in particular the substantive reports.

4.1.3 Dr. Pernetta went on to explain that the funds allocated by the Project Steering Committee (PSC) in the budget were the maximum available to each SEA, and that this allocation did not necessarily mean that the funds would be transferred in their entirety to the SEAs by the end of the first two years. He referred the participants to Table 2 of document UNEP/GEF/SCS/RWG-M.4/4, which showed the total expenditures and cash advances to date.

4.1.4 He noted that it had been anticipated that the SEAs would continue to be involved in the second phase of the project particularly in the development of the Strategic Action Plan (SAP). He proposed and the meeting accepted that, the current MoUs be extended to June 30th 2004, in order to complete the agreed activities of the first phase, and that new and different MoUs would be prepared for each of the SEAs for the continuation of the project beyond June 2004. These new MoUs would reflect the new tasks including the execution of demonstration activities, and would be different for each SEA, reflecting the activities that are agreed as the most appropriate for each country. He noted for example, that in the case of Cambodia, where available data has been found to be minimal, the MoU might support capacity building for collection of information, rather than implementation of a demonstration site.

4.1.5 In response to a question from the Chairperson, Dr. Pernetta stated that each demonstration site would have an individual budget that would be part of the new MoUs.

4.1.6 Mr. Barangan asked whether the unspent funds needed to be returned to the PCU for reallocation. Dr. Pernetta pointed out that, at the end of the first 18 months of the project, the SEAs currently held \$385,000 of unaccounted funds, and that a further \$436,482 had not yet been advanced. Dr. Pernetta noted that expenditures for the first half of the year had not yet been reported and that the cash balances held by the SEAs were likely to be considerably less than the total indicated in this document.

4.1.7 The Chairman asked the participants to briefly provide information on the situation in each country.

4.1.8 Mr. Barangan noted that only \$3,727.28 is in hand, and that it was his understating that the audit reports have been sent to the PCU. He noted that there was still some clarification that had to be undertaken with the relevant department holding the funds. Dr. Pernetta confirmed that the audit report had been received by the PCU on the 8th October, but the expenditure report was still outstanding.

4.1.9 Mr. Santoso informed the meeting of the overall activities, some of which had utilised GEF funds and some of which had been supported by government co-financing, noting that this had delayed submission of his report.

4.1.10 Mr. Vong said that the audit report has been delayed due to ongoing discussions with the audit firm. The expenditure report has been drafted but not finalised, due to the illness of Mr. Vongwattana.

4.1.11 Dr. Do Dinh Sam noted that his reports had been filed with the PCU and that the cash in-hand was not substantial.

4.1.12 Dr. Fan noted that they have completed the reports, but delays in financial transfers between Beijing and Beihai had meant that his centre had advanced the cash in advance of receipt of the GEF funds. Reconciliation of the finances was now complete and the reports had been submitted in September.

4.1.13 Dr. Sonjai noted that the transfer of the project to the new Ministry of Natural Resources and Environment had delayed the utilisation of funds, but that the work had been completed in advance of payments which were now being effected. Government funds had been used for many of the activities and the reports have now been finalised and submitted.

4.1.14 In relation to the unspent balance of funds originally allocated to Malaysia, Dr. Gong asked whether the non-participation of Malaysia would affect the development of the SAP. Dr. Pernetta noted that Malaysia had endorsed the draft framework for the SAP, but that their non-participation in the mangrove component could result in some reluctance on the part of Malaysia to commit to the targets established in the SAP.

4.1.15 Dr. Gong noted that there were several issues, resulting from the non-participation of Malaysia including the lack of information from Malaysia for inclusion in the regional database and the potential difficulties in the future relating to the SAP. She noted that there are groups of scientists in Malaysia that have information on South China Sea mangroves that could be incorporated into any regional database.

4.1.16 Dr. Pernetta stated that a contract could be used to gather information, but that Malaysia might not accept this approach. Dr. Tri noted that it was important to include information from Malaysia, and that he believed any approach that might produce results was worth pursuing. Dr. Gong agreed to contact officials and colleagues to help gain the needed support to facilitate the participation of Malaysia in the mangrove component.

4.2 Status of planned substantive outputs from the national level activities

4.2.1 The Project Director introduced document UNEP/GEF/SCS/RWG-M.4/5, *“Current status of substantive reports on mangroves from the Specialised Executing Agencies in the Participating Countries”* that, contained a summary of the current status of the substantive reports received to date, by the PCU, and noted that documentation received from the Focal Points up to the end of September, 2003 has been circulated by e-mail.

4.2.2 Dr. Pernetta noted that the agreed deadlines for these documents are well past, and that finalisation and publication were a priority. He noted that unless these reports were finalised there could be no further advance of funds.

4.2.3 In reference to the report on legislation he noted that the Regional Task Force on Legal matters had reviewed the reports and agreed upon the minimal contents expected of the reviews. He noted further that the individual members of the RTF-L had agreed to work with the focal points on the finalisation of these drafts. He also noted that the Regional Task Force on Economic valuation had reviewed the economic valuation information presented in the national reports and had developed a conceptual framework for the compilation of such data on a regional basis. He highlighted the responsibility of the RTF-E to develop regionally accepted valuations that can be used in the SAP and further noted that the individual members would be contacting the SEAs regarding the finalisation of such data and information.

4.2.4 The Project Director drew the attention of the meeting to the independent reviews of the reports on past and ongoing activities and the reviews of national data. He noted that draft reviews from three regional experts, together with the review of the PCU have been consolidated in document UNEP/GEF/SCS/RWG-M.4/6 and proposed that the meeting go through this document, and discuss the reports, country by country.

4.2.5 Mr. Santoso accepted the comments in the review of the Indonesian reports, along with the shortcomings of the reports. He noted that the reports had been originally written in Bahasa Indonesia, and that translation was not completed. Dr. Pernetta said that there needed to be some agreement on how to get the documentation translated into English and Mr. Santoso agreed that the information from 13 provinces, contained in separate documents in Bahasa Indonesia, would be translated in full. He agreed to have the translations completed and to finalise the reports based on the comments contained in document UNEP/GEF/SCS/RWG-M.4/6, by December 1st 2003.

4.2.6 Dr. Tri noted that in order to produce a regional overview, it was important for the reviews to be completed in the agreed format, so that comparisons can be easily made. Dr. Sam noted that everyone had agreed to the format for the reports at the previous meetings, and these should be followed.

4.2.7 Other focal points then considered the contents of the reviews of their country reports, and agreed on deadlines for finalisation of the amendments and submission to the PCU. Mr. Barangan apologised for his lack of progress on these reports, and said that he had some reports for submission to this meeting. He agreed to finalise the reports in draft by the end of December, 2003 and it was agreed that a finalisation date of March 31st 2004 was practical, and that the report would follow the format of the Thai report. A detailed work plan with costed activities for the finalisation of these reports would need to be formulated and agreed prior to the closure of this meeting and Mr. Barangan agreed to this suggestion.

4.2.8 Dr. Tri commented that there is a very comprehensive report containing extensive information on mangroves compiled under an EU project on mangroves and seagrass in Ulugan Bay. This information should be included in the national review, which should not be limited to selected sites.

4.2.9 Dr. Sam accepted the comments of the reviewers, and said he would check the data and add information as suggested. Some further examples of economic valuation could be included. He also informed the meeting that the priority site for Vietnam as a demonstration site was Ca Mau in the south. He agreed to finalise the reports by 31st December 2003.

4.2.10 Dr. Pernetta suggested that, for all countries, the table on past and ongoing activities be appended to the Review of National Data. In addition, SEA-START RC could be approached to put this into a database, which would be posted on the project web site and to which additional information could be added as it became available. Dr. Tri suggested further that, an analysis of the tables of past and ongoing activities would be useful as an indicator of the extent of government and external support for sustainable use of mangroves. These suggestions were discussed and agreed by the participants.

4.2.11 Mr. Vong noted that the projects listed under past and ongoing activities in Cambodia are primarily directed towards development activities rather than mangrove management. He said the comments of the reviewers were most useful and noted that all the references provided on page 7 had already been used in preparing the review. Regarding the economic valuation he noted that Cambodia does not have data on economic values, except for one small study, which could be used as an example. He noted that they would improve the reports, as much as possible, by the end of December.

4.2.12 Dr. Pernetta noted that the references should be properly cited in the text and that data, information and text should not be cut from other documents without proper referencing in the reports. Dr. Gong thought that given the comments of the reviewers, and the need for extensive revision finalisation by 31st December was perhaps too ambitious. Taking these comments into account, Mr. Vong agreed that 31st March 2004 would be the final deadline, with 31st December 2003 being the date for submission of the revised draft to the PCU for review.

4.2.13 Dr. Fan appreciated the comments of the reviewers and noted that detailed maps were available, but could not be reproduced clearly on A-4 size paper. Regarding economic valuation, he noted that there are only 3 papers for the whole of China, and that the intention was to do more work on this at the Fangchenggang site. Regarding the information from Hong Kong, although it is a part of China, there are some political issues preventing access to data for inclusion in the reports. He agreed to finalise the reports by December 1st 2003.

4.2.14 Dr. Pernetta drew the attention of the meeting to the innovative way that the economic valuation of mangrove services with respect to improving water quality had been made in China based on productivity of pearl farms and noted that the RTF-E had expressed interest in this approach.

4.2.15 Dr. Sonjai also stated that he found the comments of the reviewers most helpful, and agreed to address the issues they had raised, where possible, and amend the report. More detailed maps can be provided, and additional data can easily be collected to fill in the identified gaps. The final reports from Thailand will be sent to the PCU by December 1st, 2003.

4.3 Status of planned substantive outputs from the regional level

4.3.1 The Project Director reminded members of their agreement that a regional over-view of the status of mangroves in the South China Sea was to have been produced by the PCU and officers of the committee prior to this meeting, for review during the meeting. Regrettably delays in submission of national inputs including submission of GIS based data and metadata, combined with the staffing situation in the PCU during the first half of 2003, had delayed the preparation of this overview, which must be printed in time for the Regional Scientific Conference in February 2004.

4.3.2 The Project Director presented Document UNEP/GEF/SCS/RWG-M.4/7, "*Proposed timetable, contents and responsibilities for the production of the regional overview of mangroves bordering the South China Sea*", which showed the possible modalities through which such an overview could be produced, and a suggested framework for its contents. This publication would provide an overview of the mangroves of the South China Sea, and show the donors attending the Regional Scientific Conference, that the proposed demonstration sites have been selected through a defined and balanced process.

4.3.3 Dr. Pernetta then invited the members to consider, amend and agree on the contents of the booklet. It was agreed that Dr. Sanit Aksornkoae be approached to write the foreword for the booklet. He also asked that members provide relevant photographs for inclusion in the overview. Members agreed that by 25th October, 2003 they would send photos that could be used, with captions and the name of the photographer. After some discussion, during which various amendments and additions were made, the contents were agreed and are attached to this report as Annex 4.

4.3.4 Dr. Pernetta then asked for volunteers to draft some sections of the report. Dr. Gong and Dr. Tri agreed to draft the section on Mangrove Distribution and Diversity. Dr. Pernetta agreed to draft the section on the demonstration sites. Dr. Pernetta suggested that, each of the six members draft, by this Friday morning, 17th October, 100 words each on current threats in their country, and 100 words on the use and value of mangroves, and pass these to him. Dr. Pernetta would then use these to compile the first draft of the required sections of the booklet.

4.3.5 Dr. Pernetta reminded the participants that the PCU needs an electronic copy of their institutional logos, for inclusion on the front cover of the report. Members agreed that they would ensure the PCU received these by Friday morning, 24th October 2003.

4.3.6 Dr. Pernetta referred the members to page 2 of document UNEP/GEF/SCS/RWG-M.4/7, containing the timetable for production of the report. He informed the meeting that the deadline for a camera-ready copy is the end of November, and draft text would therefore need to be ready by the end of October. Strict attention needed to be paid to the length of the text, which needed to be around 1000 words per page, and less where pictures were to be included.

5. REVIEW OF THE SITE RELATED DOCUMENTS

5.1 Site characterisation; cluster analysis; environmental and socio-economic ranking; and available supporting documentation

5.1.1 Dr. Pernetta informed the members that the clustering and ranking of sites based on the agreed data and information would only be accepted internationally if the numbers used were substantiated by lists of species. He referred members to document UNEP/GEF/SCS/RWG-M.4/8, "*Cluster analysis and environmental and socio-economic ranking, of potential mangrove demonstration sites bordering the South China Sea*", which showed the situation to date with respect to the agreed clusters and ranks.

5.1.2 Dr. Pernetta referred members to Tables 1 to 5 of the document, where Table 5 listed, by country, the top six sites identified in each cluster and noted that these selections were based on the information contained in Table 1. An important task for this meeting was to verify these data and he noted that Table 2 contained a frequency analysis of the individual data sets that highlighted some anomalous data points.

5.1.3 Dr. Pernetta pointed out that some of the scores accorded to numbers in some categories of the ranking needed to be reassessed, based on the empirical data now available. In some instances the divisions were obviously inappropriate. He then referred members to page 13 of document UNEP/GEF/SCS/RWG-M.4/9, and noted that members had been asked to bring species lists with them to this meeting to clarify any discrepancies and fill any gaps.

5.1.4 Dr. Sonjai noted some problems and in clarification Dr. Pernetta pointed out that the cluster and ranking did not use the same parameters. Associate mangrove species and number of trophic levels were used in the ranking but not in the cluster analysis. Dr. Sam noted that they had consulted national experts regarding the occurrence of species but that even these experts did not always agree on the number of species in some categories.

5.1.5 Dr. Gong asked whether there are lists of species associated with each site for Thailand, to which Dr. Sonjai replied these had been provided with the site characterisations. Dr. Gong asked whether these lists were available with the site characterisations for some of the other sites, for example in Vietnam. Dr. Sam said that he had lists for the top 3 sites for Vietnam, but not species lists for all individual sites.

5.1.6 Dr. Gong noted that the information available for Thailand and Indonesia appeared to be in order, and that apparently information from China had some problems with grouped data for birds. Dr. Fan said that for one site they had some problems with numbers of species of birds and fish, where they do not know which are definitely associated with mangroves, and therefore estimates were used. Philippines had supporting data for 2 of the sites.

5.1.7 Mr. Vong said that they are trying to get the data, as they have some groups like Birdlife International and Wildlife Conservation Society, who are identifying birds and animals, and the Ministry of Environment and CZM-DANIDA project identifying plants, for some sites, but that in general Cambodia had many gaps in the data.

5.1.8 Dr. Gong suggested that cluster analysis be conducted only on those sites, around 26 in total, that have species lists. Dr. Pernetta expressed disappointment that some countries had not brought the lists to the meeting since this resulted in a collective problem for the RWG-M regarding how to proceed.

5.1.9 Dr. Fan noted that each list should be accompanied by the scientific reference for the data, and/or information regarding its collection, when this had been specifically collected for the purposes of the project.

5.1.10 The members then considered the lists of species prepared by each member in support of the characterisation of the sites and finalised the table of data for cluster analysis. In total, data for twenty six sites compared with the original forty four were considered to have sufficient supporting documentation to merit their inclusion in the final analysis. Sites with insufficient supporting data were not considered further.

5.1.11 The final set of data covering a total of twelve parameters for twenty-six sites accepted by the participants for inclusion in the cluster analysis is presented in Table 1 of Annex 5. The results of the analysis are included in Annex 5 of this report.

5.1.12 The meeting noted that in order to finalise the ranking of sites based on environmental criteria and indicators it was necessary to revise the originally agreed rank scores to reflect the empirical data relating to the sites. Some of the original ranges for numbers of species greatly exceeded the observed values whilst in other instances the rank scores failed to adequately separate the sites due to the similarity in observed values. A detailed discussion ensued during which it was agreed to lower the upper limits for the numbers of true mangrove species, and fish species, and to raise the upper limits for the numbers of crustacean and bird species.

5.1.13 Following a detailed discussion of the merits or otherwise of including the indicator "number of trophic levels below the top carnivore in the terrestrial food chain" and in recognition of the fact that this indicator was fairly consistent across sites, it was agreed to delete this class of indicator and to reassign the points across other elements of the indicators of biological diversity. The finally agreed ranking scheme is included as Table 1 of Annex 6.

5.1.14 In accordance with the agreed three-step process for ranking sites and recommending the choice of demonstration sites to the Project Steering Committee the meeting proceeded to assign and discuss rank scores for those potential sites which were supported by detailed proposals submitted in advance of the meeting and for which species listings had been provided. A total of fourteen such proposals were before the meeting and on the basis of information contained in the supporting documents a discussion of rank scores to be assigned for the socio-economic indicators ensued.

5.1.15 Some discussion occurred regarding the indicator of "population stress" as to whether human population density should be related to the area around the mangroves, or to a larger area such as the whole province. It was agreed that where possible the smaller scale should be used. Other socio-economic indicators were also extensively discussed during the process of scoring the demonstration sites. This resulted in a socio-economic ranking table agreed by all members, which is included in Annex 6 of this report.

5.1.16 Dr. Pernetta questioned the very high scores accorded the stakeholder support categories, by all members. He suggested that on the basis of the apparently high level of central government, local government, civil society and private sector support for these demonstration sites, it would appear that in fact GEF and or external donor support was not required. He suggested that these scores should be reviewed and there followed an extensive discussion and review of the scores assigned.

5.1.17 During discussion it was agreed that the ranking table contained in Annex 6 should be further amended to include a column highlighting the key purpose of the activities at each of the demonstration sites. Table 4 of Annex 6 presents the final rank scores for the individual socio-economic indicators together with the total for the environmental indicators and the grand total representing the summation of these two values.

5.2 Critical review of proposals for demonstration sites

5.2.1 Dr. Pernetta introduced document UNEP/GEF/SCS/RWG-M.4/9, "*Reviews of the proposed mangrove demonstration site proposals bordering the South China Sea*" containing the reviews of the demonstration site proposals prepared by the PCU and highlighted some of the problems with these, in particular those relating to sections 14 "Threats", and 15, "Budgets".

5.2.2 In relation to the section on budgets, Dr. Pernetta presented an example of how to construct a budget by activity, and also the same budget broken down by object of expenditure. He noted that the budgets for the demonstration site proposals would need to be re-constructed, as demonstrated.

5.2.3 Dr. Sam asked whether research and monitoring activities could be supported with GEF funds and Dr. Pernetta responded that monitoring was in the view of the GEF a baseline activity that should be funded by the government. Research activities were fundable only where the research was vital to the achievement of the goals of the primary activities.

5.2.4 There followed an extensive discussion of the individual proposals during which it was noted that there was money in the core budget for training, and it was not necessary to include these costs in the demonstration site budgets.

5.2.5 Dr. Pernetta then discussed at some length the method by which a budget could be constructed based, on activity and object of expenditure using examples from the proposals presented to the meeting. He noted that budgets containing a high proportion of funds in the sub-contracts component would not be considered favourably since this implied that the Executing Agency was not the appropriate body to execute the activity.

5.2.6 Dr. Tri commented on the Indonesian causal chain analysis, and noted that it was important to link the activities of the proposal to the problems identified in the causal chain analysis.

6. REVISION OF THE WORKPLAN AND ACTIVITIES FOR THE REGIONAL WORKING GROUP ON MANGROVES WITH EMPHASIS ON THE PERIOD OCTOBER 2003 TO JUNE 2004

6.1 The participants noted that during the first and second meetings of the Regional Working Group a flow chart of activities and work plan and timetable had been developed and agreed. The meeting noted that as a consequence of the sequential delays in production of national level outputs it was necessary to revise the work plan and timetable.

6.2 In the light of the discussion and agreements reached under prior agenda items, the meeting discussed and reviewed the contents of document UNEP/GEF/SCS/RWG-M.4/10 "*Proposals for a revised work plan and timetable for the RWG-M with details of outputs and milestones between October 2003 and June 2004*" and agreed upon the final timetable for production of the required outputs. The agreed work plan and timetable are attached as Annex 7 of this report.

7. DATE AND PLACE OF THE FIFTH MEETING OF THE REGIONAL WORKING GROUP ON MANGROVES

7.1 In discussion of this matter, members noted the proposed dates of the Regional Scientific Conference in February 2004 and agreed on the proposed dates for the next meeting of the RWG-M, September 27th to 30th 2004.

7.2 It was noted that the PSC had decided that future meetings could only be convened at demonstration sites and that on the basis of the recommendations from this meeting regarding the ranking of potential demonstration sites the next meeting should be held in Trad Province, Thailand. In the event that Trad was not selected by the PSC as a demonstration site, it was agreed that the location of the next meeting would be discussed and agreed via e-mail.

8. ANY OTHER BUSINESS

8.1 Under this agenda item the situation regarding Cambodia was extensively discussed. Dr. Sonjai asked whether, if Thailand were fortunate enough to gain a demonstration site in Trad, it would be possible to include an arrangement with Cambodia to include activities in mangroves on the Cambodian side of the border that could enhance the demonstration site outcomes and benefit both countries. In response the Project Director noted that this was indeed possible and that a letter from Cambodia would assist in facilitating this sort of co-operation. He further noted that Thailand should include mention of the intention of involving Cambodia in their demonstration site proposal.

8.2 In addition it was agreed that Cambodia should develop a proposal for extending their information base and developing capacity with respect to the sustainable management of mangroves that should be financially supported by the project outside the budget line for demonstration activities.

9. ADOPTION OF THE REPORT OF THE MEETING

9.1 The Rapporteur presented the draft report of the meeting prepared by the PCU, which was considered, amended and adopted as it appears in this document.

10. CLOSURE OF THE MEETING

10.1 In closing the meeting the Chairperson thanked the PCU for their support in the preparation and conduct of the meeting, the members for their support and constructive discussions and Dr. Fan for his excellent support to the local organisation and arrangements.

10.2 The formal session of the meeting was closed at 18:45 on 16th October, noting that participants would visit the Fanchangang potential demonstration site on the following day.

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ANNEX 2

List of Documents

Discussion documents

UNEP/GEF/SCS/RWG-M.4/1	Provisional agenda
UNEP/GEF/SCS/RWG-M.4/2	Provisional annotated agenda
UNEP/GEF/SCS/RWG-M.4/3	Report of the meeting
UNEP/GEF/SCS/RWG-M.4/4.Amend.1	Current status of budgets and reports from the Specialised Executing Agencies in the participating countries.
UNEP/GEF/SCS/RWG-M.4/5	Current status of substantive reports on mangroves from the Specialised Executing Agencies in the Participating Countries.
UNEP/GEF/SCS/RWG-M.4/6	Reviews from three regional experts, and the PCU of the drafts of the substantive reports produced by the Specialised Executing Agencies in the participating countries. <i>[Individual reports for each country have been produced with the same document number together with the first letters of the country name appended.]</i>
UNEP/GEF/SCS/RWG-M.4/7	Proposed timetable, contents and responsibilities for the production of the regional overview of mangroves bordering the South China Sea.
UNEP/GEF/SCS/RWG-M.4/8	Cluster analysis; and environmental and socio-economic ranking; of potential mangrove demonstration sites conducted following the third Regional Scientific and Technical Committee meeting.
UNEP/GEF/SCS/RWG-M.4/9	Critical reviews of the proposed mangrove demonstration sites bordering the South China Sea.
UNEP/GEF/SCS/RWG-M.4/10	Proposals for a revised, work plan and timetable for the RWG-M with details of outputs and milestones between October 2003 and June 2004.
UNEP/GEF/SCS/RWG-M.4/11	Demonstration site proposals from the participating countries. <i>[These twelve documents are not individually numbered, rather they are printed as received with minimal formatting. They have been distributed by e-mail and are contained on the CD-ROM together with all other meeting documents.]</i>

Information documents

UNEP/GEF/SCS/RWG-M.4/Inf.1	List of participants
UNEP/GEF/SCS/RWG-M.4/Inf.2	List of documents
UNEP/GEF/SCS/RWG-M.4/Inf.3	Draft programme
UNEP/GEF/SCS/RWG-M.3/6	Guidelines for the preparation of demonstration site proposals and format for use in their presentation.

The following documents are supplied on CD-ROM and in published form.

UNEP/GEF/SCS/RWG-M.3/3	Third Meeting of the Regional Working Group on the Mangroves Sub-component for the UNEP/GEF Project "Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand". Report of the meeting. Bali, Indonesia, 3 rd – 6 th March 2003 UNEP/GEF/SCS/RWG-M.3/3.
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- UNEP/GEF/SCS/RWG-W.3/3 Third Meeting of the Regional Working Group on the Wetlands Sub-component for the UNEP/GEF Project *“Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand”*. Report of the meeting. Bali, Indonesia, 4th – 7th March 2003 UNEP/GEF/SCS/RWG-W.3/3.
- UNEP/GEF/SCS/RWG-LbP.3/3 Third Meeting of the Regional Working Group on the Land-based Pollution Component for the UNEP/GEF Project *“Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand”*. Report of the meeting. Phuket, Thailand, 7th- 10th July 2003 UNEP/GEF/SCS/RWG-LbP.3/3.
- UNEP/GEF/SCS/RWG-F.3/3 Third Meeting of the Regional Working Group on the Fisheries Component for the UNEP/GEF Project *“Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand”*. Report of the meeting. Siem Reap, Cambodia, 29th April – 2nd May 2003 UNEP/GEF/SCS/RWG-F.3/3.
- UNEP/GEF/SCS/RWG-CR.3/3 Third Meeting of the Regional Working Group on the Coral Reefs Sub-component for the UNEP/GEF Project *“Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand”*. Report of the meeting. Kota Kinabalu, Malaysia, 24th – 27th March 2003 UNEP/GEF/SCS/RWG-CR.3/3.
- UNEP/GEF/SCS/RWG-SG.3/3 Third Meeting of the Regional Working Group on the Seagrass Sub-component for the UNEP/GEF Project *“Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand”*. Report of the meeting. Kota Kinabalu, Malaysia, 25th– 28th March 2003 UNEP/GEF/SCS/RWG-SG.3/3.
- UNEP/GEF/SCS/RSTC.3/3 Third 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. Phuket, Thailand, 16th – 18th June 2003 UNEP/GEF/SCS/RSTC.3/3.
- UNEP/GEF/SCS/RTF-E.1/3 First Meeting of the Regional Task Force on Economic Valuation for the UNEP/GEF Project *“Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand”*. Report of the meeting. Phuket, Thailand, 11th – 13th September 2003 UNEP/GEF/SCS/RTF-E.1/3.
- UNEP/GEF/SCS/RTF-L.1/3 First Meeting of the Regional Task Force on Legal Matters for the UNEP/GEF Project *“Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand”*. Report of the meeting. Phuket, Thailand, 15th– 17th September 2003 UNEP/GEF/SCS/RTF-L.1/3.

ANNEX 3

Agenda

- 1. OPENING OF THE MEETING**
 - 1.1 Welcome address**
- 2. ORGANISATION OF THE MEETING**
 - 2.1 Documents available to the meeting**
 - 2.2 Organisation of work**
- 3. ADOPTION OF THE MEETING AGENDA**
- 4. REPORTS FROM THE PROJECT CO-ORDINATING UNIT REGARDING OVERALL PROGRESS TO DATE**
 - 4.1 Status of mid-year progress reports, expenditure reports, and budgets**
 - 4.2 Status of planned substantive outputs from the national level activities**
 - 4.3 Status of planned substantive outputs from the regional level**
- 5. REVIEW OF THE SITE RELATED DOCUMENTS**
 - 5.1 Site characterisation; cluster analysis; environmental and socio-economic ranking; and available supporting documentation**
 - 5.2 Critical review of proposals for demonstration sites**
- 6. REVISION OF THE WORKPLAN AND ACTIVITIES FOR THE REGIONAL WORKING GROUP ON MANGROVES WITH EMPHASIS ON THE PERIOD OCTOBER 2003 TO JUNE 2004**
- 7. DATE AND PLACE OF THE FIFTH MEETING OF THE REGIONAL WORKING GROUP ON MANGROVES**
- 8. ANY OTHER BUSINESS**
- 9. ADOPTION OF THE REPORT OF THE MEETING**
- 10. CLOSURE OF THE MEETING**

ANNEX 4

Agreed Preliminary Draft Contents for the Regional Overview on Mangroves

Foreword - 1 page - Dr. Sanit Aksornkoae to be approached.

Introduction - 1 spread, 2 pages Broad introduction at global to regional scales

Text covering:

- Global distribution of mangroves,
- Biological diversity of Atlantic Province and sub-regions of the Indo-West Pacific,
- Rates of loss in area over the 20th Century, globally and regionally,
- Global importance of SCS mangrove.

Box bottom left covering the purpose and objectives of the South China Sea Project.

Box top right GIS map of mangrove distribution bordering the South China Sea.

Mangrove distribution & diversity in SCS - 2 spreads, 4 pages

Text covering:

- Ecology of mangroves,
- Geographic and abiotic limits to mangrove habitats,
- True mangrove spp, community structure,
- Production, density, and ecosystem functions,
- Services provided (carbon sequestration) water quality, coastal protection, nursery areas,
- Environmental impacts/consequences of habitat loss,
- Social & economic consequences of habitat loss.

Box giving details of past and present areas of mangrove in SCS countries cf. global totals

2 photos from countries illustrating typical undisturbed mangrove habitats. (Indonesia & China/Viet Nam?)

State of mangroves & present threats - 1 spread 2 pages

Text covering:

- Socio-economic context of SCS countries GDP growth development, population,
- Country based reviews of status, threats and actions to protect mangrove,
- Shrimp farming economic benefits of environmental impacts on water quality and habitat loss/degradation.

Use & value of mangrove systems bordering the South China Sea - 1 spread 2 pages

Text covering:

- Range of present direct uses,
- Indirect uses,
- Economic valuation.

Photo, mangrove molluscs in market, (column width)

Mud crabs,

Photo, mangrove fishing, (column width)

Box on value of mangroves for pearl production in China.

Purpose of the demonstration sites - 1 spread 2 pages

Text covering:

- Types of demonstration sites illustrating sustainable use,
- Demonstrating what?
- And for whom?
- Value of regional co-ordination and networking,
- Anticipated outcomes.

Process of selecting sites - 2 spreads 4 pages

Text covering:

- Data and information; criteria and indicators, selection and agreement,
- Cluster analysis and the purpose of the clustering procedures,
- Ranking, environmental and socio-economic indicators,
- Priority listing and proposals.

End page 1 page - Photo and details of the Regional Working Group on mangroves

Total No of pages 18

ANNEX 5

Final Cluster Analysis and Ranking of Potential Mangrove Demonstration Sites

Background

During the third meeting of the Regional Working Group on Mangroves a preliminary cluster analysis was undertaken on available data for forty-four sites bordering the South China Sea. Subsequently, these data were checked, evaluated and corrected and a semi-final analysis prepared by the Project Co-ordinating Unit and dispatched via e-mail to all members of the working group in July. This data set still contained some anomalous points requiring clarification and/or justification and focal points were requested to compile and bring with them lists of species from each site, for verification during the fourth meeting of the working group.

Available data and results

During the fourth meeting members reviewed the data available in support of each site and accepted that of the original forty-four sites considered during the preliminary analysis, twenty-six were sufficiently well documented to merit inclusion in the final analysis. These data are presented in Table 1, where it can be seen that a total of seventeen cells (5.4%) lack entries.

The data were transformed to z scores (Table 2) and a cluster analysis performed using the Clustan Graphic6 software programme. The resulting cluster diagram is presented in Figure 1, whilst the proximity matrix based on dissimilarity is presented in Table 3.

It can be seen from Figure 1 that the sites fall into three clusters two of which are comparatively small (four sites each). These two small clusters encompass sites in China, Thailand and Viet Nam representing the northern and north-western margins of the South China Sea. The larger central cluster of 18 sites, is more heterogenous, encompassing both insular and mainland sites generally lying in the Southern and Eastern portions of the region.

Figure 1 Cluster diagram of twenty-six mangrove sites bordering the South China Sea based on Euclidean distance and mean proximity.



Table 1 Final agreed data set for mangrove potential demonstration sites.

Site	Present area	Zones spp assoc	% Change in area	True mangrove spp.	Density >1.5m high /ha	% Cover	No. crustacean. spp.	No. bivalve	No. gastropod spp.	No. fish spp.	No. bird spp.	No. migratory bird spp.
Trad Province	7,031	5	2	33	1,100	90	32	M	M	55	98	24
Thung Kha Bay - Savi Bay	3,543	4	34	23	1,628	90	58	M	M	36	13	8
Pak Phanang Bay	8,832	3	2	25	1,282	56	36	M	M	85	72	45
Kung Kraben Bay	640	2	0	27	6,100	80	19	M	M	35	75	16
Welu River Estuary	5,478	3	31	33	1,400	60	25	M	M	52	69	15
Tien Yen	2,537	2	-25	13	7,000	60	51	M	M	79	M	M
Xuan Thuy	1,775	3	98	11	9,500	75	61	25	30	90	31	62
Can Gio	8,958	3	100	32	6,000	80	28	17	32	103	96	34
Ca Mau	5,239	3	60	30	7,500	85	12	6	15	36	18	53
Shangkou	812	4	11	9	11,980	90	65	40	33	95	28	76
Quinglangang	1,189	6	-56	25	10,183	80	60	50	62	90	39	32
DongXhaiGang	1,513	5	-14	16	8,433	80	32	24	27	84	43	35
Futien	82	3	-26	7	10,233	80	29	16	21	11	58	99
Fangchenggang	1,415	4	-10	10	12,300	90	67	62	40	71	42	145
Busuanga	1,298	5	-5	24	7,550	90	6	15	36	9	45	27
Coron	1,296	5	-50	26	7,080	M	7	15	37	13	42	34
San Vicente	133	5	-15	14	3,780	80	6	15	36	13	36	40
Ulugan	790	4	-10	16	5,100	85	8	15	36	13	42	39
San Jose	483	4	-80	25	3,180	60	7	13	34	7	48	37
Subic	148	3	-20	23	1,420	90	8	14	35	16	44	57
Quezon	1,939	5	-40	32	4,000	80	5	14	37	11	44	37
Belitung Island	22,457	5	0	8	467	100	5	26	43	71	M	M
Angke Kaput	328	9	-2	12	569	70	29	21	4	22	40	4
Batu Ampar	65,585	5	0	21	2,391	100	11	15	17	51	19	27
Ngurah Rai	1,374	6	27	25	660	100	38	10	32	34	38	42
Bengkalis	42,459	7	-15	18	490	99	12	8	9	3	16	15

Table 2 Data transformed to z scores for cluster analysis.

	Present area	Zones spp. associations	% Change in area	Spp. true mangrove	Density	% Cover	No. spp. crustacea	No. spp. bivalve	No. spp. gast	No. spp. fish	No. spp. bird	No. migratory spp.
Trad Province	-0.012	0.416	0.050	1.478	-1.027	0.619	0.209	Missing	Missing	0.285	2.314	-0.580
Thung Kha Bay - Savi Bay	-0.246	-0.220	0.827	0.277	-0.890	0.619	1.436	Missing	Missing	-0.289	-1.445	-1.102
Pak Phanang Bay	0.109	-0.856	0.050	0.517	-0.980	-2.005	0.398	Missing	Missing	1.192	1.165	0.105
Kung Kraben Bay	-0.440	-1.491	0.002	0.757	0.273	-0.155	-0.405	Missing	Missing	-0.320	1.297	-0.841
Welu River Estuary	-0.116	-0.856	0.754	1.478	-0.949	-1.703	-0.122	Missing	Missing	0.194	1.032	-0.874
Tien Yen	-0.313	-1.491	-0.605	-0.924	0.507	-1.703	1.105	Missing	Missing	1.010	Missing	Missing
Xuan Thuy	-0.364	-0.856	2.380	-1.164	1.157	-0.542	1.577	0.278	-0.062	1.343	-0.649	0.659
Can Gio	0.118	-0.856	2.429	1.358	0.247	-0.155	0.020	-0.285	0.093	1.736	2.226	-0.254
Ca Mau	-0.132	-0.856	1.458	1.118	0.637	0.232	-0.735	-1.060	-1.228	-0.289	-1.223	0.366
Shangkou	-0.429	-0.220	0.275	-1.404	1.802	0.619	1.766	1.335	0.171	1.494	-0.781	1.116
Quinglangang	-0.403	1.051	-1.365	0.517	1.335	-0.155	1.530	2.039	2.425	1.343	-0.295	-0.319
DongXhaiGang	-0.382	0.416	-0.339	-0.563	0.880	-0.155	0.209	0.208	-0.295	1.161	-0.118	-0.222
Futien	-0.478	-0.856	-0.632	-1.644	1.348	-0.155	0.067	-0.356	-0.762	-1.045	0.545	1.866
Fangchenggang	-0.388	-0.220	-0.233	-1.284	1.885	0.619	1.861	2.884	0.715	0.768	-0.162	3.367
Busuanga	-0.396	0.416	-0.119	0.397	0.650	0.619	-1.018	-0.426	0.404	-1.106	-0.029	-0.482
Coron	-0.396	0.416	-1.212	0.637	0.528	Missing	-0.971	-0.426	0.482	-0.985	-0.162	-0.254
San Vicente	-0.474	0.416	-0.362	-0.804	-0.331	-0.155	-1.018	-0.426	0.404	-0.985	-0.427	-0.058
Ulugan	-0.430	-0.220	-0.241	-0.563	0.013	0.232	-0.924	-0.426	0.404	-0.985	-0.162	-0.091
San Jose	-0.451	-0.220	-1.940	0.517	-0.487	-1.703	-0.971	-0.567	0.249	-1.166	0.103	-0.156
Subic	-0.473	-0.856	-0.483	0.277	-0.944	0.619	-0.924	-0.496	0.326	-0.894	-0.074	0.496
Quezon	-0.353	0.416	-0.969	1.358	-0.273	-0.155	-1.066	-0.496	0.482	-1.045	-0.074	-0.156
Belitung Island	1.022	0.416	0.002	-1.524	-1.192	1.393	-1.066	0.349	0.948	0.768	Missing	Missing
Angke Kaput	-0.461	2.958	-0.047	-1.044	-1.166	-0.929	0.067	-0.004	-2.083	-0.713	-0.251	-1.233
Batu Ampar	3.914	0.416	0.011	0.037	-0.692	1.393	-0.782	-0.426	-1.073	0.164	-1.179	-0.482
Ngurah Rai	-0.391	1.051	0.664	0.517	-1.142	1.393	0.492	-0.778	0.093	-0.350	-0.339	0.007
Bengkalis	2.363	1.687	-0.356	-0.323	-1.186	1.315	-0.735	-0.919	-1.694	-1.287	-1.312	-0.874

Table 3 Proximity matrix for twenty-six potential mangrove demonstration sites bordering the South China Sea and included in the cluster analysis presented in Figure 1.

Case Province	Trad Kha Bay	Thung Phanang	Pak Kraben	Kung River	Welu Yen	Tien Thuy	Xuan	Can Gio	Ca Mau	Shangkou langang	Quin Khaigang	Dong	Futien ggang	Fanchen	Busuang	Coron Vicente	San	Ulugan Jose	San	Subic	Quezon	Belitung Kaput	Angke Ampar	Batu Rai	Ngurah Bengalis	
Trad Province	0.0000																									
Thung Kha Bay	0.4331	0.0000																								
Pak Phanang Bay	0.3477	0.4429	0.0000																							
Kung Kraben Bay	0.2911	0.3936	0.3098	0.0000																						
Welu River Estuary	0.3061	0.4013	0.1950	0.2429	0.0000																					
Tien Yen	0.5449	0.4719	0.3043	0.3895	0.4393	0.0000																				
Xuan Thuy	0.5794	0.4107	0.4494	0.4839	0.4985	0.4235	0.0000																			
Can Gio	0.3432	0.5144	0.3603	0.3547	0.3303	0.5473	0.3688	0.0000																		
Ca Mau	0.4614	0.3305	0.4389	0.3309	0.3757	0.5259	0.3590	0.3788	0.0000																	
Shangkou	0.5770	0.4366	0.5083	0.5045	0.5874	0.4026	0.2374	0.4761	0.4381	0.0000																
Quinglangang	0.4405	0.4082	0.4278	0.4340	0.4781	0.4419	0.4643	0.5259	0.5575	0.3413	0.0000															
DongXhaiGang	0.3938	0.3517	0.3442	0.3290	0.3948	0.3355	0.2961	0.3715	0.3226	0.2527	0.3271	0.0000														
Futien	0.5403	0.5206	0.4788	0.4047	0.5366	0.3824	0.3843	0.4982	0.3734	0.3484	0.5141	0.3041	0.0000													
Fangchenggang	0.6435	0.5848	0.5813	0.5932	0.6795	0.3915	0.4124	0.5985	0.5781	0.2495	0.4144	0.4289	0.4042	0.0000												
Busuanga	0.3619	0.3575	0.4529	0.2721	0.3918	0.5593	0.4333	0.4122	0.2739	0.4242	0.4232	0.2533	0.3284	0.5430	0.0000											
Coron	0.4173	0.4355	0.4194	0.3225	0.3908	0.5485	0.5137	0.4978	0.3453	0.4767	0.4326	0.2777	0.3575	0.5899	0.1059	0.0000										
San Vicente	0.4193	0.3547	0.4125	0.3313	0.3996	0.4893	0.4173	0.4597	0.3148	0.4156	0.4417	0.2452	0.2935	0.5296	0.1541	0.1739	0.0000									
Ulugan	0.3915	0.3401	0.4027	0.2654	0.3795	0.4673	0.3973	0.4238	0.2828	0.3970	0.4379	0.2374	0.2680	0.5138	0.1206	0.1598	0.0758	0.0000								
San Jose	0.4442	0.4813	0.3693	0.3369	0.3586	0.4926	0.5322	0.5101	0.3970	0.5258	0.4708	0.3350	0.3632	0.6098	0.2712	0.1338	0.2271	0.2387	0.0000							
Subic	0.3619	0.3542	0.3918	0.2687	0.3663	0.5173	0.4443	0.4231	0.2852	0.4453	0.4775	0.3026	0.3122	0.5353	0.1925	0.2045	0.1715	0.1346	0.2462	0.0000						
Quezon	0.3408	0.3923	0.4030	0.2925	0.3417	0.5717	0.4998	0.4414	0.3130	0.4897	0.4296	0.3007	0.3792	0.5830	0.1496	0.1019	0.1902	0.1847	0.1791	0.1783	0.0000					
Belitung Island	0.4432	0.4678	0.5664	0.5176	0.6041	0.6045	0.5189	0.4934	0.4969	0.4720	0.5418	0.3611	0.4596	0.5255	0.3758	0.4306	0.3163	0.3207	0.5067	0.3446	0.4313	0.0000				
Angke Kaput	0.4844	0.4315	0.5102	0.5351	0.4994	0.6565	0.5297	0.5730	0.4740	0.5398	0.5674	0.3669	0.4886	0.6700	0.3957	0.4302	0.3430	0.3894	0.4208	0.4488	0.4073	0.5204	0.0000			
Batu Ampar	0.5604	0.4964	0.6020	0.5751	0.5968	0.7716	0.5540	0.5467	0.4226	0.5518	0.6097	0.4408	0.5366	0.6734	0.4273	0.4704	0.4324	0.4269	0.5166	0.4339	0.4470	0.4022	0.5035	0.0000		
Ngurah Rai	0.3214	0.2394	0.4526	0.3945	0.4194	0.6210	0.4095	0.4040	0.3056	0.4220	0.4570	0.2964	0.4116	0.5507	0.2393	0.2823	0.2525	0.2494	0.3865	0.2415	0.2657	0.3562	0.3648	0.4092	0.0000	
Bengkalis	0.5270	0.4307	0.6164	0.5603	0.5858	0.7739	0.5904	0.6039	0.4194	0.5845	0.6314	0.4378	0.5122	0.7100	0.3747	0.4132	0.3638	0.3803	0.4629	0.4022	0.3937	0.4233	0.3581	0.2273	0.3442	0.0000

ANNEX 6

Final Ranking of Potential Mangrove Demonstration Sites Based on Environmental and Socio-Economic Indicators

Background

During the third meeting of the Regional Working Group on Mangroves (RWG-M) a preliminary ranking of sites using both environmental and socio-economic indicators was undertaken for forty-four sites bordering the South China Sea. At that time it was recognised that the scores for the socio-economic indicators, particularly those relating to stakeholder involvement and co-financing support, could not be adequately gauged until such time as full demonstration site proposals had been prepared. Subsequently, following amendment and correction of the data a revised ranking based on the environmental and biological diversity indicators was prepared by the Project Co-ordinating Unit and circulated to the RWG-M by e-mail, together with the revised cluster analysis.

Given the questions and uncertainties regarding some of the data, and the need to further verify the information, a final cluster analysis was conducted during the fourth meeting, using only information for those sites where all parties agreed that, adequate data and supporting documentation were available (Annex 5).

Finalisation of the Rank scores and indicators

In reviewing the empirical data the Regional Working Group noted that the ranges of values for a number of the environmental indicators were inappropriate given the actual observed numbers and ranges.

Table 1 Revised indicators and weight for mangrove systems of biological diversity, transboundary, regional and global significance.

Class of Indicator	Indicator scale				
	Score				
1. Area maximum 35 points					
1.1 Total existing natural mangrove area (ha)	< 500	500-1,000	1,001-5,000	5,001-15,000	>15,000
Score	7	14	21	28	35
2. Biological diversity 50 points					
2.1 Species diversity Score maximum 38 points					
2.1.1 True mangrove species	< 12	13-18	19-24	25-30	>30
Score Maximum 15 points	3	6	9	12	15
2.1.2 Associate mangrove species	<10	11-20	>20		
Score Maximum 5 points	1	3	5		
2.1.3 Total fish species	<50	51-100	>100		
Score Maximum 6 points	2	4	6		
2.1.4 Crustacean	<30	31-60	>60		
Score Maximum 6 points	2	4	6		
2.1.5 Resident bird species	< 45	46-90	>90		
Score Maximum 6 points	2	4	6		
2.2 Community diversity 12 points					
2.2.1 Number of zones or associations	1-2	3-4	>4		
Score Maximum 12 points	4	8	12		
3. Transboundary significance 10 points					
3.2 No migratory bird species include seasonal migratory spp. and long distance migrators	<15	16-40	41-65	66-90	>90
Score Maximum 10 points	2	4	6	8	10
4. Regional/Global significance 5 points					
4.1 Number of associate and true mangrove species found only in the South China Sea	0.5 points for each endemic to a maximum of 2.5				
Score Maximum 2.5 points					
4.2 Number of endangered & threatened species	0.5 points for each endangered species to a maximum of 2.5				
Score Maximum 2.5 points					

Some of the original ranges for numbers of species greatly exceeded the observed values, whilst in other instances the rank scores failed to adequately separate the sites due to the similarity in observed values. Following a detailed discussion it was agreed to lower the upper limits for the number of true mangrove and fish species, and to raise the upper limits for the numbers of crustacean and bird species.

The indicator “number of trophic levels below the top carnivore in the terrestrial food chain” was discussed at length. In recognition of the fact that, this indicator was fairly consistent across sites, (i.e. it did not discriminate between sites) it was agreed to delete this class of indicator and to reassign the points across other elements of the indicators of biological diversity. The finally agreed ranking scheme is presented in Table 1.

Table 2 Indicators for socio-economic considerations to be used in the ranking of mangrove sites bordering the South China Sea.

Class of Indicator	Indicator scale			
	Score			
1. Reversibility of Threats				
1. Change of area (% Lost over ten years)	<5	6-10	11-25	>25
Score – max 20	20	15	10	5
2. Human population stress (population density, people/Km ²) in the site 10	<40	40-199	200-400	>400
Score – max 10	10	6	4	2
2. National significance/priority-Government support				
1. National priority	Low	Medium	High	
Score – max 20	2	10	20	
3. Financial considerations /co-financing				
1. Project cost (\$US)	<150,000	150,000	>150,000	
Score – max 10	10	5	0	
2. Co-financing commitment 10	<1/1	1/1	>1/1	
Score – max 10	0	5	10	
4. Stakeholders involvement 30				
Local government (in cash/in-kind)	Low	Medium	High	
Score – max 8	2	5	8	
Central government (in cash/in-kind)	Low	Medium	High	
Score – max 8	2	5	8	
NGOs/Civil Society (in cash/in-kind)	Low	Medium	High	
Score – max 8	2	5	8	
Private Sector (in cash/in-kind)	Low	Medium	High	
Score – max 6	1	3	6	

Ranking of the mangrove potential demonstration sites

Following revision and finalisation of the environmental and biodiversity indicators, and agreement on the rank scoring system, rank scores were determined in respect of each of the twenty-six potential demonstration sites for which agreed data and supporting documentation were available. The outcome of this exercise is presented in Table 3, which also presents the results in descending order of priority. The top six ranked sites are highlighted in bold typeface. It should be noted that of the top twelve priority sites in this listing, demonstration site proposals had been prepared for eleven, since they were also ranked highly on the basis of environmental and biodiversity indices in the previous cluster and ranking exercises.

The RWG-M reiterated its previous decision that determination of rank with respect to the socio-economic indicators should be confined to the fourteen demonstration site proposals, since the validity of measures of support in-kind and in-cash can only be estimated in broad terms without a defined set of actions such as those contained in the proposals. Table 4 presents the outcome of the rank scoring of the socio-economic indicators for these fourteen sites. Again, sites have been ranked in this table in descending order of priority.

Table 3 Values of agreed environmental parameters and rank score for twenty-six, potential mangrove demonstration sites. M = missing values.

	Present area		True mangrove spp.		Associate mangrove spp.		No. resident fish spp.		No. crustacean. spp.		Resident bird spp.		Zones – spp. associations		Migratory bird spp.		Endangered & threatened spp.		Total score	Rank
	Ha	score	no.	score	no.	score	no.	score	no.	score	no.	score	no.	score	no.	score	no.	score		
Trad Province	7,031	28	33	15	36	5	55	4	32	4	98	6	5	12	24	4.0	0	0.0	78.0	1
Can Gio	8,958	28	32	15	42	5	103	6	28	2	96	6	3	8	34	4	0	0.0	74.0	2
Pak Phanang Bay	8,832	28	25	12	13	3	85	4	36	4	72	4	3	8	45	6	0	0.0	69.0	3
Batu Ampar	65,585	35	21	9	5	1	51	4	11	2	19	2	5	12	27	4	M	0.0	69.0	3
Ca Mau	5,239	28	30	15	40	5	36	2	12	2	18	2	3	8	53	6	2	1.0	68.5	5
Quinglangang	1,189	21	25	12	5	1	90	4	60	4	39	2	6	12	32	12	2	1.0	68.5	5
Welu River Estuary	5,478	28	33	15	28	5	52	4	25	2	69	4	3	8	15	2	0	0.0	68.0	7
Quezon	1,939	21	32	15	7	1	11	2	5	2	81	4	5	12	43	4	3	1.5	62.5	8
DongXhaiGang	1,513	21	16	6	6	1	84	4	32	4	43	2	5	12	35	12	0	0.0	62.0	9
Bengkalis	42,459	35	18	6	7	1	3	2	12	2	16	2	7	12	15	2	M	0.0	62.0	9
Ngurah Rai	1,374	21	25	12	6	1	34	2	38	4	38	2	6	12	42	6	M	0.0	60.0	11
Coron	1,296	21	26	12	1	1	13	2	7	2	42	4	5	12	34	4	1	0.5	58.5	12
Belitung Island	22,457	35	8	3	5	1	71	4	5	2	M	0	5	12	M	0	M	0.0	57.0	13
Xuan Thuy	1,775	21	11	3	30	5	90	4	61	6	31	2	3	8	62	6	2	1.0	56.0	14
Fangchenggang	1,415	21	10	3	8	1	71	4	67	6	42	2	4	8	145	8	5	2.5	55.5	15
Busuanga	1,298	21	24	9	4	1	9	2	6	2	72	4	5	12	32	4	1	0.5	55.5	15
Thung Kha Bay - Savi Bay	3,543	21	23	9	15	3	36	2	58	4	13	2	4	8	8	2	0	0.0	51.0	17
San Vicente	133	21	14	6	1	1	13	2	6	2	36	2	5	12	40	2	0	0.0	48.0	18
Shangkou	812	14	9	3	7	1	95	4	65	6	28	2	4	8	76	8	0	0.0	46.0	19
Kung Kraben Bay	640	14	27	12	15	3	35	2	19	2	75	4	2	4	16	4.0	2	1.0	45.5	20
Tien Yen	2,537	21	13	6	31	5	79	4	51	4	M	0	2	4	M	0	0	0.0	44.0	21
Subic	148	7	23	9	3	1	16	2	8	2	44	6	3	8	57	6	2	0.5	41.5	22
Ulugan	790	14	16	6	1	1	13	2	8	2	42	4	4	8	39	4	1	0.0	41.0	23
San Jose	483	7	25	12	3	1	7	2	7	2	48	4	4	8	37	4	1	0.5	40.5	24
Futien	82	7	7	3	4	1	11	2	29	2	58	4	3	8	99	8	0	0.0	35.0	25
Angke Kaput	328	7	12	3	7	1	22	2	29	2	40	2	7	12	4	2	M	0.0	31.0	26

Table 4 Rank score for agreed socio-economic parameters in respect of fourteen potential, mangrove demonstration sites, bordering the South China Sea.

	Change in area	Pop'n stress	National priority	Project cost	Co-financing commitment	Local gov. support	Central gov. support	NGOs civil society	Private sector support	Total	Rank
Trad Province	20	10	20	0	10	5	8	8	3	84	1
Batu Ampar	20	10	20	0	5	5	8	8	6	82	2
Fangchenggang	15	6	20	0	10	8	8	8	6	81	3
Busuanga	20	10	20	0	10	5	5	8	1	79	4
Welu River Estuary	20	6	10	0	10	5	8	5	1	65	5
Ca Mau	20	2	20	0	0	5	8	2	3	60	6
Angke Kaput	20	2	2	0	5	8	5	8	6	56	7
Xuan Thuy	20	2	10	0	0	2	8	8	3	53	8
Quinglangang	5	4	10	0	10	5	8	5	3	50	9
Can Gio	20	6	2	0	0	8	2	5	6	49	10
Bengkalis	10	6	10	0	5	8	2	5	3	49	10
Ngurah Rai	20	2	2	0	5	8	8	2	1	48	12
Quezon	5	6	10	10	0	5	5	5	1	47	13
Pak Phanang Bay	20	2	2	0	10	2	5	2	3	46	14

Table 5 presents the combined outcome of the ranking of the fourteen sites, using both environmental and socio-economic indicators. It should be noted that this combination involves equal weighting to both classes of indicator, a weighting which was not discussed and which requires agreement prior to finalisation of the recommended priority listing for intervention.

Table 5 Priority ranking of the fourteen potential demonstration site proposals based on the environmental and socio-economic indicators individually and collectively.

	Environmental Indicators		Socio-economic Indicators		Overall	
	Total score	Rank ¹	Total score	Rank ²	Grand total score	Overall rank
Trad Province	78	1	84	1	162	1
Batu Ampar	69	3	82	2	151	2
Fangchenggang	56	11	81	3	137	3
Busuanga	56	11	79	4	135	4
Welu River Estuary	68	7	65	5	133	5
Ca Mau	69	3	60	6	129	6
Can Gio	74	2	49	10	123	7
Quinglangang	69	3	50	9	119	8
Pak Phanang Bay	69	3	46	14	115	9
Bengkalis	62	8	49	10	111	10
Xuan Thuy	56	14	53	8	109	11
Quezon	61	9	47	13	108	12
Ngurah Rai	60	10	48	12	108	12
Angke Kaput	31	14	56	7	87	14

Table 6 presents a comparison of the rank scores for each of the fourteen sites with respect to the environmental and socio-economic indicators individually and combined. Sites are ranked in descending order in this table within each of the three clusters identified in Figure 1. Table 6 also provides information regarding the primary purpose of the proposed activities at each demonstration site.

¹ Based on the twenty-six sites ranked in table 3.

² Based on the fourteen sites ranked in table 4.

Table 6 Rank scores for agreed parameters for mangrove, potential demonstration sites, arranged according to the clusters illustrated in Figure 1 of Annex 5.

	Total score socio-economic	Total score environmental	Grand total	Overall rank	Demonstration purpose
Cluster 1					
Trad Province	84	78	162	1	Community based- management for restoration
Welu River Estuary	65	68	133	5	Reversing degradation
Can Gio	46	74	120	7	Management for eco-tourism
Pak Phanang Bay	46	69	115	9	Management for coastline protection
Cluster 2					
Batu Ampar	82	69	151	2	Management for multiple uses
Busuanga	79	56	135	4	Multiple management through tenurial instruments
Ca Mau	63	69	132	6	Management for ecological services
Quinglangang	48	69	117	8	Protection of endangered species
Bengkalis	49	62	111	10	Management for charcoal production and restoration
Quezon	47	61	108	12	Participatory management for aqua-silviculture
Ngurah Rai	48	60	108	12	Management for training and public awareness
Angke Kaput	56	31	87	14	Management for environmental education
Cluster 3					
Fangchenggang	81	56	137	3	Cross-sectoral management
Xuan Thuy	53	56	109	11	Management for biodiversity conservation

Table 1 continued **Agreed work plan for delivery of the required substantive outputs of the preparatory phase from the mangrove SEAs; administrative and financial reports; and for amendment of the Memoranda of Understanding.**

Year	2003												2004																																
Month	October			November				December					January				February			March			April			May			June																
Week starting	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	2	9	16	23	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14									
National Rpts																																													
Nat'l meta-database	SEAs to submit entries to SEA START RC no later than 31 st December																																												
Nat'l Legislation	SEAs to liaise with National legal expert and finalise drafts no later than 30 th Jan. 2004																																												
National reviews	China, Thailand, Indonesia, and Vietnam to finalise by 1 st December							China, Philippines finalise major revisions																																					
PCU edits										X	X																																		
SEA clearance												X		X																															
Camera ready													X			X																													
Publication																					X	X																							
Regional Overview																																													
Inputs from SEA		24 th																																											
PCU compile & dispatch			31 st																																										
SEA review				7 th																																									
PCU camera ready					X																																								
Publication												X																																	
MoU revision must be signed by 30/11/2003												Regional Scientific Conference																																	

