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**Global Environment
Facility**

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

REPORT

**Seventh Meeting of the Regional Working Group for
the Mangrove Sub-component**

Pontianak, West Kalimantan Province, Indonesia, 4th – 8th September 2006



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Cover Photo: Mud Lobster (*Thalassina anomala*) mounds in mangrove forest, Batu Ampar, West Kalimantan Province, Indonesia, by Dr. John C. Pernetta, 8th September 2006.

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Report of the Meeting

1. OPENING OF THE MEETING

1.1 Welcome addresses on behalf of UNEP and the West Kalimantan Provincial Government

1.1.1 The Chief of the Environmental Office of West Kalimantan Province, Ir. Tri Budiarto welcomed participants to West Kalimantan and noted that the Seventh Meeting of the Regional Working Group on Mangroves of the UNEP/GEF South China Sea Project was an important occasion for the Province since the Memorandum of Understanding regarding the execution of the demonstration site activities at Batu Ampar would be signed during the opening session.

1.1.2 The Project Director, Dr. Pernetta; welcomed participants and observers on behalf of UNEP and expressed his personal pleasure at being present for the signing of the MoU regarding the Batu Ampar demonstration site. He noted that an important feature of the South China Sea project was the exchange and sharing of experiences between the various demonstration sites and the importance given to sustainable use of the mangrove resources for the benefit of all stakeholders, rather than simply environmental protection. He noted in this regard that the planned activities included the development of alternative livelihoods for local people and the development of sources of revenue to ensure longer-term sustainable management of the mangrove eco-system.

1.1.3 The Vice-Governor of West Kalimantan Province, Drs. H.L. Kadir welcomed participants and observers to the meeting and to West Kalimantan and expressed appreciation on behalf of the Provincial Government for the fact that the mangrove area of Batu Ampar in Pontianak Regency, West Kalimantan had been selected as one of the demonstration sites within the framework of the South China Sea Project. He noted that the area of mangrove was more than 150,000 hectares of which some 65 thousand hectares represented the demonstration site within the Batu Ampar district. The Vice-Governor noted that the growth of the coastal population in the area was resulting in an increase in stress on the mangrove habitat and that the project was therefore timely in providing an opportunity to develop more sustainable ways of utilising the mangrove resources for the benefit of the local people.

1.1.4 Following these opening statements a short signing ceremony was held, during which the Project Director, Dr. John C. Pernetta, and Mr. Nyoto Santoso, Indonesian Focal Point for Mangroves and Director of the Indonesian Institute of Mangrove Research and Development, co-signed the addendum to the MoU covering the operational plan for activities at the Batu Ampar site. The signatures were witnessed by the Vice-Governor of West Kalimantan Province, Drs. H.L. Kadir.

1.1.5 Following the signing and the commencement of the business of the meeting Dr. Pernetta, noted that regrettably the Philippines Focal Point, Mr. Florendo Barangan was unable to attend the meeting due to health problems that prevented him from flying and noted that, he would convey the best wishes of the group to Mr. Barangan for a speedy recovery. The Project Director took the opportunity to warmly welcome Mr. Koh Hock Lye, Director of Silviculture and Forest Protection of the Forestry Department of Peninsular Malaysia to the Seventh Meeting, of the Regional Working Group on Mangroves and noted that this was the First meeting at which Malaysia was represented. He noted that he was looking forward to working with Mr. Koh in the future.

1.1.6 Dr. Pernetta noted that the main item of business before the group was a consideration of the mangrove elements to be included in the Strategic Action Programme and in particular, elaboration of the actions and their associated costs. He noted further in this regard that the working group had the advantage of being the last one to meet during 2006 and it could therefore take advantage of the experiences of the others in formulating actions for inclusion in the SAP.

1.2 Introduction of Participants

1.2.1 The Project Director noted that there were a number of observers from the local university and government of West Kalimantan Province and invited all participants to introduce themselves to the meeting. This was followed by a *tour de table*, during which participants introduced themselves and indicated their respective roles in the project. The list of participants is attached as Annex 1 to this report.

2. ORGANISATION OF THE MEETING

2.1 Election of Officers

2.1.1 Members recalled that during the fifth meeting Mr. Nyoto Santoso, Focal Point for Indonesia, Dr. Gong Wooi Khoo, expert member from Malaysia and Dr. Nguyen Hoang Tri, expert member from Viet Nam, had been elected as Chairperson, Vice-Chairperson, and Rapporteur respectively. During the sixth meeting Mr. Santoso was re-elected as Chairperson, and Mr. Florendo Barangan and Mr. Ke Vongwattana were elected as Vice-Chairperson and Rapporteur respectively.

2.1.2 Dr. Pernetta reminded participants that the Rules of Procedure state that the Regional Working Group shall elect from amongst the members a Chairperson, Vice-Chairperson and Rapporteur and that, members may be re-elected no more than once. Since Mr. Santoso has served as Chairperson for two years he was no longer eligible for re-election.

2.1.3 The Project Director called for nominations of individuals as officers of the Regional Working Group on Mangroves. Dr. Sonjai Havanond, the Mangrove Focal Point for Thailand nominated Dr. Hangqing Fan, the Focal Point for Mangroves in China, as Chairperson, and Dr. Do Dinh Sam, the Focal Point for Mangroves in Viet Nam, seconded this nomination. Dr. Gong and Dr. Tri nominated Dr. Sonjai as Vice-chairperson and Dr. Sam volunteered to serve as Rapporteur for the meeting. There being no further nominations; Dr. Fan, Dr. Sonjai, and Dr. Sam were elected as Chairperson, Vice-Chairperson and Rapporteur respectively by acclamation.

2.2 Documentation and Administrative Arrangements

2.2.1 The Chairperson invited Dr. Pernetta, to introduce the documents available to the meeting, a list of which was contained in document UNEP/GEF/SCS/RWG-M.7/Inf.2. Dr. Pernetta briefly introduced the documents and highlighted the main substantive items for consideration and decision by the Working Group, which included consideration of progress in execution of the demonstration sites; inputs from the mangrove Sub-component to the Strategic Action Programme; the administrative reports; national substantive reports; finalisation, adoption and implementation of the National Action Plans; the project website and databases; the training activities; economic valuation of mangrove goods and services; and revision of the work plan and activities of the Working Group. The list of documents is contained in Annex 2 of this report.

2.2.2 Dr. Pernetta briefed participants on the administrative arrangements and the proposed organisation of work as contained in document UNEP/GEF/SCS/ RWG-M.7/Inf.3.

3. ADOPTION OF THE MEETING AGENDA

3.1 The Chairperson introduced the Provisional Agenda prepared by the Project Co-ordinating Unit (PCU) as document UNEP/GEF/SCS/RWG-M.7/1, and the amended Annotated Provisional Agenda document UNEP/GEF/SCS/RWG-M.7/2.Amend.2; and invited members to propose any amendments or additional items for consideration prior to the adoption of the agenda. There being no proposals for amendment or addition the agenda was adopted as it appears in Annex 3 of this report.

4. STATUS OF THE ADMINISTRATIVE REPORTS FOR 2005 AND 1ST HALF 2006: PROGRESS REPORTS; EXPENDITURE REPORTS; AND AUDIT REPORTS

4.1 The Chairperson invited the Project Director to introduce document UNEP/GEF/SCS/RWG-M.7/4, "*Current status of budgets and reports from the Specialised Executing Agencies in the participating countries*"; which outlined the current status of the administrative reports, including the six-month progress reports, expenditure reports, audit reports, and MoU amendments.

4.2 Dr. Pernetta drew the attention of members to the current situation with respect to the receipt of routine six-month progress and expenditure reports and the annual audit reports for expenditures during 2005. He noted that progress and expenditure reports for the period 1st January – 30th June 2006, had been received by the Project Co-ordinating Unit only from Cambodia, resulting in the RWG-M having the worst record of all the working groups for this reporting period. He noted further that no reports had been received from the Philippines since the first half of 2005 and that the reports for the second half of 2005 from China had not yet been finalised.

4.3 Regarding the audit reports for 2005 expenditures, the Project Director noted that none had been received to date although these were due by 31st March 2006. He noted further that, no further cash advances could be made until these were received. Dr. Pernetta noted that currently Thailand held a considerable unaccounted cash balance and had done so for an extended period that would undoubtedly result in questions being asked regarding the fate of the interest earned.

4.4 The Chairperson invited the focal points to brief the meeting on the situation with respect to the outstanding reports and problems, and expressed the hope that any problems could be resolved during the meeting.

4.5 Mr. Santoso noted that the administrative reports for the Indonesian Mangrove Sub-component were currently being finalised and would be submitted by the end of September.

4.6 Mr. Vongwattana informed the meeting that the progress and expenditure reports for Cambodia were up to date and that the auditors were currently finalising the audit report for 2005, which would be available during September.

4.7 Dr. Fan informed the meeting that there had been some minor difficulties in the implementation of the Fangchenggang demonstration site, which had delayed the finalisation of the reports and there had been delays in the transfer of funds from the central government in Beijing to the Specialised Executing Agency. He noted that the Chinese reports for 2006 would be finalised during this month and noted that the outstanding reports for 2005 would be signed during this meeting.

4.8 Dr. Sonjai noted that the reason for the delays in implementation of the Trat demonstration site activities was the difficulty encountered in developing a sub-contract, which required approval from the Department of Comptroller General, Ministry of Finance as the budget exceeds two million baht. This had now been received and a sub-contract between the DCMR and the Thailand Environment Foundation was currently under negotiation. Dr. Sonjai noted further that the audit report for 2005 was finalised and would be sent to the PCU in the immediate future.

4.9 Dr. Sam informed the meeting that the Balat/Xuan Thuy Estuary demonstration site has not yet been approved. With regard to the administrative reports of the Viet Nam Mangrove Sub-component, he informed the meeting that his secretary had prepared the reports, which he would check and send to the PCU following his return to Viet Nam.

4.10 Dr. Pernetta noted that the Project Steering Committee had instructed the SEAs to report within 15 days of the end of each financial period, whilst the MoU stated that such reports should be provided within one month, i.e., no later than 31st January and 31st July each year. Where an SEA encountered problems they should inform the PCU immediately otherwise the assumption was that the budget was being misused. He noted that in the case of Thailand it was quite unacceptable that not one single report regarding the Trat demonstration site had been received following the transfer of the first tranche of funds in March 2005.

4.11 Dr. Sonjai noted that expenditures had to be in line with the financial rules and regulations of the government to which Dr. Pernetta responded that originally Dr. Sonjai had signed the MoU addendum in a form that did not involve the drafting of a Sub-contract and that the absence of reports for in excess of 18 months was unacceptable to UNEP. Dr. Sonjai noted that work had been on going in Trat using budget allocations from the government, and Thailand Environment Foundation and that draft reports for July to December 2005 had been delivered during this meeting.

5. STATUS OF SUBSTANTIVE NATIONAL REPORTS

5.1 Dr. Pernetta reminded participants of their prior agreements as documented under agenda item 4 on pages 2 and 3 of the report of the fifth meeting of the RWG-M regarding the preparatory phase outputs. During the sixth meeting of the RWG-M held in Busuanga, Philippines from 1st – 5th August 2005 it was noted that Indonesia, China and Viet Nam had published their national reports and that the PCU had copies. Members recalled that national reports were to have been published originally by the focal points in national languages for distribution in each country by June 30th 2004 and that following this UNEP would publish the English versions for regional distribution.

5.2 Dr. Pernetta noted that Cambodia was to have published their national report in Khmer by August 2005 and that Thailand and Philippines were to have published their reports by the end of 2005. The PCU had received copies of the published national report from Cambodia following the sixth meeting. The Project Director wished to draw to the attention of members that copies of the national reports from Thailand and the Philippines had not been received to date, and that consequently publication of the entire set in English has been delayed. The status of these reports was presented in document UNEP/GEF/SCS/RWG-M.7/5.

5.3 The Chairperson invited each focal point to provide the meeting with a brief report on the status of all national level publications including the national reports. Each member was requested to bring 20 copies of any new publications to the meeting for the information of members and the records of the PCU; and to discuss and agree on the final timetable for publication of these reports in English.

5.4 Dr. Sonjai tabled the Thai mangrove report, which had recently been published and Mr. Vongwattana provided Cambodia's report, which had been published in August 2005. Dr. Sonjai noted that the delays in publishing the Thai report resulted from the desire to include recently acquired data regarding mangrove areas derived from remote sensing. The programme to acquire such data had resulted from questions being raised in the country regarding the increase in mangrove area.

5.5 Dr. Tri queried the figures provided in the Thai report and Dr. Gong noted that this represented a significant increase in the mangrove area compared with previous estimates. Dr. Sonjai noted that previous figures had not included mangrove areas on private land and therefore much of the apparent increase was due to the manner in which the figures had been derived. The current estimates provided in the Thai language version of the national report were derived from interpretation of remotely sensed images with ground truthing. Dr. Sonjai noted that of the total 1.5 million rai¹, only 0.4 million rai were found along the South China Sea coast of Thailand, he noted further that in some areas of private land, selective cutting for charcoal production had been carried on for around 100 years, and could therefore be considered sustainable.

5.6 In response to a query from Dr. Tri, regarding the use of Satellite imagery Dr. Sonjai noted that not only could the mangrove habitat be identified but also in some instances individual species associations could be recognised. Dr. Sonjai noted further that where shrimp farms were abandoned on government land and reserved areas they would be replanted with mangrove but this was not necessarily the case with private land.

5.7 Dr. Pernetta noted that as a consequence of the changes to the figures contained in the Thai version of the report the figures in the English version were incorrect. Dr. Sonjai promised to provide a translation of the new tables by the end of the meeting.

5.8 The Project Director requested guidance from the Working Group regarding what they wished the PCU to do regarding the regional publications in the absence of the Philippines report. During discussion it was noted by Dr. Sam that the English and local language versions should contain the same data since if different data were used it would be confusing for future analyses. It was noted that for Cambodia, China, Indonesia and Viet Nam the data were the same in both versions.

5.9 In response to a query regarding whether or not a Malaysian report could be produced Mr. Koh noted that at the present he had no mandate to make such a commitment and that he would be recommending to the Director General an appropriate course of action following the meeting.

5.10 Dr. Gong sought clarification from Dr. Pernetta regarding publication of the reports from the other groups and Dr. Pernetta stated that the reports from three groups were ready for publication. Dr. Gong had no strong feelings but felt that if the Philippines report was not available then the PCU should proceed with publication of the other reports. The meeting agreed with this recommendation.

5.11 Dr. Gong requested information regarding whether or not there were funds to support Malaysia's participation in the Mangrove Sub-component and Dr. Pernetta indicated that the Project

¹ 6.25 Rai is equivalent to 1 hectare.

Steering Committee had approved the retention of an allocation for this purpose, however there was little point in signing the original Memorandum developed in 2002 since circumstances were no longer the same and should Malaysia decide to participate then a specific MoU would be drafted encompassing those tasks which it would be appropriate for Malaysia to undertake in the time remaining.

5.12 In response to a question regarding the benefits to a country of participating in the Project, Dr. Fan and Dr. Pernetta pointed out that participation, had certainly resulted in better co-ordination at the national level between the sectors involved in coastal resource use and between central, provincial and local government agencies in China as evidenced by the additional cash and in-kind co-financing that had been provided from diverse sources beyond that originally estimated and committed by the central Government of China.

5.13 Dr. Sonjai noted that one benefit for Thailand had been the production of new and improved data regarding the mangroves of the Gulf of Thailand and that the project had promoted international activities and exchange which were of benefit to the countries. He noted that in the case of the demonstration sites the local and provincial governments were also pleased that their areas had been selected and looked forward to exchange and replication of activities in other areas. Dr. Pernetta noted that the development of the demonstration sites had involved the exchange of experiences between local government officials, managers and scientists, which had broadened the perspectives of each group with respect to the problems faced by the others.

5.14 Mr. Santoso noted that the project had influenced the policy position and commitment of the Indonesian government towards sustainable use of mangrove resources and the National Action Plan had been influential in drawing together various sectoral interests in the country and strengthening their interactions. Mr. Vongwattana noted that the SCS project had been valuable in sensitising and influencing high-ranking officials to the value and functions of mangroves and in involving local communities. Dr. Sam noted that as a consequence of the project the Ministry of Agriculture and the Ministry of Environment and Natural Resources had enhanced their co-operation in Viet Nam, in terms of the development and sustainable use of mangroves including co-operation in maintaining mangroves as a protection against storm surges and typhoon damage.

6. PROGRESS IN THE IMPLEMENTATION OF THE DEMONSTRATION SITE ACTIVITIES

6.1 The Chairperson invited the relevant focal points to make presentations regarding the status of activities at the mangrove demonstration sites and copies of the presentations were provided to the PCU for lodging on the project website. Focal points were requested to highlight any lessons learned to date during their presentations.

6.2 In the case of the Fangchenggang demonstration site in China, Dr. Fan's presentation focussed on progress to date in the areas of:

- GIS development;
- Organisation of the management framework, including: establishment of the Management Board; recruitment of the site manager; letting of the sub-contract for GIS development; conduct of periodic self-evaluation meetings; establishment of the Mangrove Friendship Association; publication of 5 editions of the newsletter; and organisation of volunteers in mangrove planting);
- Training with a significant number of workshops, training courses, and field trips organised;
- Survey and planning activities including investigation of traditional uses; identification of the distribution and abundance of endangered species; and some work on migratory birds;
- Major outputs to date include: 12 notice boards; construction of the learning centre at the Beilun Reserve; reports on the biodiversity of marine animals and vegetation; establishment of a mangrove website; GIS information on the distribution of *Heritiera littoralis*; production of the first DVD for mangrove education; two posters, two brochures, highlighting biodiversity conservation and two scientific papers published;
- Several postgraduate students were now working at the Fangchenggang site and the first Msc. Student had now graduated;

- Dr. Fan noted that the Provincial and Central Governments were more aware and concerned about mangrove as a result of SCS Project, and this had resulted in further financial support from the provincial government, under the marine 908 project.

6.3 Dr. Tri commented that the Fangchenggang site was a very good example of the linking of central and lower levels of government with the private sector and civil society and noted that this was generally less effective in most other countries.

6.4 Dr. Sam asked whether the co-financing would have been invested in the absence of the South China Sea Project. Dr. Fan responded that the visitor centre for example would probably have been constructed even if the SCS project had not been involved but that it would probably not have been constructed for another five to ten years. He felt that the SCS project had been influential in mobilising government support for sustainable use of mangroves that would have been significantly less without the project.

6.5 Mr. Koh sought clarification regarding the co-financing and Dr. Pernetta noted that the GEF did not provide grant financing without a co-financing commitment on the part of the government. He noted that in the case of the South China Sea Project a detailed evaluation of the co-financing in cash and in kind that would be provided by the governments was made prior to the commencement of the project. The first meeting of the Project Steering Committee had approved the co-financing estimates, and it was perhaps significant to note that these original estimates had been greatly exceeded to date. It had also been agreed prior to the approval of the demonstration sites that, the local and central governments would provide cash co-financing in a ratio of 1:1.

6.6 Dr. Fan noted that China had benefited from the project not merely in terms of experience in mangrove management from outside but in other areas such as project management and methods of organising and running complex projects and activities. Dr. Pernetta noted that he had been informed by the National Focal Point of China that the project served as a model for managing other projects within the State Environment Protection Administration and Dr. Fan noted that after 3 years of participation in the SCS project, the government, local communities and scientists had all gained new ideas and experiences.

6.7 Mr. Koh asked about the size of the Fangchenggang demonstration site and Dr. Fan responded that it was only 1,400 ha, which was small in comparison with many mangrove areas in Indonesia but very significant for China since many Mangrove areas had been lost in the past and the mangrove was far less extensive than further South. Dr. Tri suggested that it would be beneficial to Viet Nam if the activities in Fangchenggang could be linked to those in the Red River delta area of northern Viet Nam, particularly in the light of the fact that sipunculid worms were now being harvested in Viet Nam and exported to China. Dr. Fan noted that this was a very good suggestion since many of the mangrove and seagrass resources were shared in the sense that the populations were distributed on both sides of the border.

6.8 Dr. Pernetta noted that there were already two transboundary demonstration sites in the South China Sea project, one between Cambodia and Viet Nam, and the second between Cambodia and Thailand. He noted that a joint meeting held in May between the Phu Quoc and Kampot management teams had identified a large number of transboundary resource issues, which they agreed to work towards resolving through joint management of resources. He noted that one intention of approving the Tun Mustapha Park in Sabah had been that it would encourage the Philippines and Malaysia to expand their co-operation in joint resource management.

6.9 Dr. Pernetta noted that sipunculid worms were not exploited in most areas bordering the South China Sea and that potentially these could serve as a source of alternative income for local communities in Batu Ampar for example, particularly if there were good air connections.

6.10 Mr. Vongwattana made a presentation of the activities at the Peam Krasop Wildlife Sanctuary demonstration site. The presentation encompassed information regarding:

- The background to the site, vegetation types, land use and population demography;
- Problems including illegal charcoal production, illegal fishing, land encroachment, over-fishing, and management related challenges;

- Goal, purpose, rationale, objectives, expected outputs, activities of the demonstration site;
- Progress to date, which included the organisation and conduct of: national and local meetings; office establishment; survey of socio-economic issues; agreement on mangrove research methods; development of posters; a joint meeting between Peam Krasop Wildlife Sanctuary and Trat demonstration sites; public awareness activities on environment; mangrove planting; workshop on mangrove resources; field survey on mangrove species and distribution; and basic training for project staff and local communities.

6.11 Mr. Vongwattana noted that activities had commenced only in March 2006 and in response to a question regarding problems with monkeys and the success rate of propagules planted in mud-flat areas he noted that monkeys had not been a problem to date and that since the mud-flat areas had previously been mangrove the success rate of planted propagules was high. Dr. Fan asked how many propagules were planted per square meter and Mr. Vongwattana noted that were planted at a density of 1 per square meter.

6.12 In response to a question regarding the level of poverty in the area Mr. Vongwattana noted that 85% of the local population depended on fishing and therefore indirectly at least on mangrove resources. Dr. Tri noted that this would make it difficult to improve the mangrove condition.

6.13 Dr. Sonjai made a presentation regarding the activities and progress in the Trat demonstration site, noting that some areas were state owned and some privately owned. He noted that mangroves had been progressively removed up to 1996 and that substantial areas of abandoned shrimp farms were to be re-planted with mangrove as part of the demonstration site activities. He noted that the focus of the demonstration activities was on community based restoration and management centred on the existing activities of Pred Nai village. Regarding ongoing activities he noted the following:

- Development of a business plan was commencing with economic resource surveys;
- Replanting had been undertaken involving the public, local people and volunteers and was financially supported by the government;
- Training, Education, and Awareness activities had involved school children and local villagers;
- The Thai Environment Foundation was to be sub-contracted to conduct the bulk of the work;
- The Green Power project had been initiated by the Thai Environment Foundation relating to mangrove.

6.14 Mr. Koh asked for clarification regarding the budget from GEF and Dr. Sonjai noted that the GEF funds and co-financing were complementary but the work plan was integrated with the funds being used in parallel for joint activities.

6.15 In response to a question from Dr. Tri regarding how the activity would reverse degradation trends Dr. Sonjai noted that the focus was on community-based management, that built upon the activities of the chief of Pred Nai village, some 15 years ago, who proposed to the Provincial Governor that the spread of shrimp farming in mangrove areas be halted and who organised a campaign based on the slogan for mangrove conservation "*If you keep one crab now, it will be one million in the future*". The activities focussed on building an understanding of the functions and values of mangrove ecosystems.

6.16 Dr. Sonjai noted that in Southern Thailand, where mangrove was planted low down in the inter-tidal zone *Sonneratia* was attacked by a small crustacean (*Sphaeroma terebrans*) that burrowed into the trunk weakening it and resulting in breakage and death. Dr. Fan noted that many species planted low in the inter-tidal zone failed to grow well, hence it was not a good idea to plant mangrove in the mud-flat areas in front of existing mangrove. He noted however that in China the possibilities of replanting on the landward side were small due to alternative land uses, hence most replanting took place on the seaward edge with the result that substantial areas failed to establish themselves.

6.17 Dr. Fan asked about the release of animals in new mangrove plantations and Dr. Sonjai responded that crabs purchased in the local markets were released in mangrove plantations to enhance production of these areas. Dr. Fan queried whether or not there was any scientific evidence

to suggest that such activities resulted in increased population levels. Dr. Sonjai responded that although hard scientific data were not available local peoples' experience regarding the levels of subsequent crab catches suggested that such activities were in fact beneficial to the local community.

6.18 Both Dr. Fan and Mr. Santoso noted that in some areas, insect attack could result in defoliation of mangroves particularly *Avicennia marina* but Dr. Tri noted that often following such events the trees recovered and appeared to grow more vigorously. Dr. Fan noted that apparently the occurrence of such events had only been noticed over the last forty years and wondered whether this was correlated with increasing surface temperatures.

6.19 Dr. Pernetta noted that one aspect of the Trat demonstration project was that it would undertake multi-species planting rather than simply replanting *Rhizophora* and asked what other species had been planted to date. Dr. Sonjai responded that at present no other species had been planted but that the Department of Coastal and Marine Resources had now agreed to focus on replanting of 5 species to enhance the biodiversity of replanted mangrove stands. Dr. Tri noted that it was possible to leave patches of un-planted land to allow natural regeneration of other species and hence increase biodiversity, provided that a source of propagules was available.

6.20 Dr. Pernetta, noted that clearly the investment of the government of Thailand in the Trat mangroves meant that the GEF involvement was not necessary to ensure action and asked Dr. Sonjai why, in this case they were interested in serving as a demonstration site for the South China Sea Project? Dr. Sonjai noted that the primary purpose of proposing the Trat Province as a demonstration site was to provide an opportunity to share experiences in community based mangrove restoration with the other countries in the region.

6.21 For the Batu Ampar demonstration site in Indonesia, Mr. Ahmad Faisal Siregar presented information regarding the Batu Ampar mangrove area including:

- Mangrove status, species distribution, noting the presence of 21 true mangrove species, and 17 associate species in four types of association;
- Objectives and activities which included enhancing local incomes and improving the efficiency of mangrove resource use and building a strong management framework involving the local communities, which was new for Indonesia;
- Some activities involve the collection of basic data and information, and the publication of information for the local community, school children and the general public. He noted that the programme involved central and local government, private sector, local people, and NGOs.

6.22 Mr. Santoso noted that the mangrove was essentially divided into two areas, one of primary forest, which contained the protection forest areas and the other of secondary forest, which contained the production forest areas. There followed a discussion of what constituted conversion forest and it was noted that this was mangrove land that had been designated by the central government for use for another purpose other than mangrove production, including infrastructure development, land reclamation etc.

6.23 Mr. Koh, requested information regarding the forest concession and Mr. Santoso noted that in Indonesia any concession greater than 5,000 ha, required an Environmental Impact Assessment prior to cutting and that in the Batu Ampar there were two concessionaires.

6.24 In response to a question from Dr. Tri, Mr. Santoso noted that the project intended to develop a full management plan for the area that would include different use zones and involve discussion with all stakeholders in an attempt to reduce the stakeholder conflicts.

6.25 Dr. Pernetta queried the age of the secondary regrowth and Mr. Santoso noted that this had been logged since 1985; the primary forest area had never been logged. Dr. Tri asked whether or not there was any protected area and Mr. Santoso noted that there was at present no formally declared Park or Protected area but that part of the primary forest areas had been designated as a forest reserve.

6.26 There followed a discussion regarding the certification of timber and other mangrove products during which the members felt that a certification scheme for shrimps produced without impacts on the mangrove systems would be of benefit to mangrove conservation in the region.

6.27 In the case of the Balat/Xuan Thuy Estuary joint mangrove and wetland demonstration site in Viet Nam, Dr. Sam noted that the proposal had been developed by the Viet Nam's Wetland Sub-component and commented upon by the mangrove committee. At present this had been approved by UNEP and submitted to the GEF Secretariat for funding but a decision had not yet been made.

6.28 Dr. Pernetta noted that he had received in the last fortnight the final draft of the proposal for Busuanga from Mr. Barangan that he would review prior to its dispatch to Nairobi. He noted however that at the present time the new CEO had called a moratorium on the funding of new projects until such time as the situation with regard to the funding of GEF phase 4 was clarified.

6.29 Finally Dr. Pernetta requested members of the Regional Working Group on Mangroves to note that, not only do the Focal Points have responsibility for periodically reporting on the status of these sites to the RWG-M, but also, the RWG-M has a collective responsibility to ensure successful implementation through the provision of oversight and guidance. Dr. Pernetta suggested that although interesting the presentations were not adequate for this purpose and suggested that in future full written reports should be provided on the activities and outcomes six weeks in advance of the meeting of the Working Group.

6.30 Dr. Gong supported this suggestion noting that it was difficult to hold all the information in one's head during a presentation and that a written report would make evaluation of the performance considerably easier. Dr. Tri noted the importance to the project of seeing the outputs and making these as widely available as possible, not just in terms of routine progress reports but more detailed reports of lessons learned regarding what has and has not worked.

7. STATUS OF THE NATIONAL ACTION PLANS

7.1 Members recalled that during the fifth meeting of the Regional Working Group on Mangroves it was agreed that, second drafts of the National Action Plans (NAPs) would be produced no later than January 2005, and that final drafts were to have been produced no later than June 30th 2005, i.e., in advance of the sixth meeting.

7.2 The Project Director reminded members that prior to the sixth meeting in August 2005 revised NAPs had been received only from Cambodia, China and Viet Nam. The revised Indonesian NAP was tabled in hard copy during the meeting, however no revisions of the Thai and Philippines Action Plans were provided. It was agreed that second revisions of the National Action Plans of Thailand and the Philippines would be circulated by December 2005. Regrettably, second revisions of these NAPs have not yet been received by the PCU.

7.3 Dr. Pernetta noted that the meeting had been informed by the respective focal points that the NAPs would be approved according to the following timetable: China, December 2005; Cambodia and Indonesia, January 2006; Philippines and Thailand July 2006; Viet Nam, May 2006.

7.4 The Chairperson invited the focal points to present any further revisions completed to date and to report in detail concerning the situation with regard to publication and formal approval of these plans.

7.5 Dr. Sam tabled the published NAP for Viet Nam noting that although the approval process had not yet been completed the plan was before the Ministry of Environment and Natural Resources and was being used as the basis for further actions.

7.6 In the case of Indonesia Mr. Santoso reported that as a result of a meeting between the concerned Ministries requests for some modification had been made but these were not major and it was anticipated that final approval for signature by presidential decree would be granted in the near future.

7.7 Mr. Vongwattana noted that the content of the Cambodian NAP had been extensively reviewed and accepted by the National Coastal Zone Committee, and that since this was initially drafted in English it had been translated into Khmer, for use in public consultations at the national and local level. The final Khmer version will be available at the end of September following these consultations and subsequently the English version will be revised.

7.8 Dr. Fan noted that the NAP in China had been considered by an Inter-ministry Committee meeting but was to be adopted at the Provincial rather than the National Level since adoption of a National Action Plan in China was a lengthy and complicated process.

7.9 Dr. Sonjai tabled the draft NAP of Thailand, prepared in 2004 noting that this focussed on the Gulf of Thailand and noting further that discussions were ongoing regarding the inclusion of actions to limit shrimp farming to closed systems. He noted that unfortunately due to the political situation in Thailand it had not been possible to approve the NAP this year but it was anticipated that a large national meeting would be convened in 2007 to consider and recommend the NAP to the government for approval.

7.10 Mr. Koh queried whether or not the development of the National Action Plan was a requirement under the MoU and whether there was an agreed format and content for such a plan. Dr. Pernetta noted that at the outset of the project it had been agreed that NAPs would be developed as an integral basis for developing the regional Strategic Action Programme it was therefore an agreed output but not a requirement in the sense that a penalty clause would be invoked if a NAP were not developed. The optimum contents of the NAP had been agreed but the format was not defined since this should reflect the different requirements and procedures of the countries concerned.

7.11 Mr. Koh asked whether these were National Action Plans or plans that related only to the South China Sea coastline of countries that had coasts in more than one sea, and what was the timeline for such plans? Dr. Pernetta noted that for countries such as Thailand, Malaysia, Indonesia Philippines and China, which had coastlines outside the South China Sea the action plan covered only those states or provinces bordering the South China Sea. With respect to the time frame Dr. Pernetta noted that there was an agreement that five and ten year time frames would be adopted both for the NAPs and for the SAP and that assuming the SAP was approved in 2007 the milestone dates would be 2012 and 2017.

7.12 Dr. Gong added that since the national Government of Malaysia is a member of the Project Steering Committee the SAP, if approved, would represent a regional consensus regarding action. Dr. Pernetta noted that the actual status of the SAP was yet to be decided by the PSC but it was unlikely that this would take the form of a legally binding agreement.

7.13 Finally Mr. Koh requested clarification regarding the relationship between the national report and the National Action Plan and Dr. Pernetta noted that the national reports had been intended to be a review of the status of mangroves in each country prepared as the basis for developing the national action plan.

8. FINALISATION OF INPUTS FROM THE MANGROVE SUB-COMPONENT TO THE REGIONAL STRATEGIC ACTION PROGRAMME

8.1 Elaboration of the substantive mangrove related inputs

8.1.1 The Chairperson invited the Project Director to introduce document UNEP/GEF/SCS/RWG-M.7/6 "*Inputs from the Mangrove Sub-component for Updating the Regional Strategic Action Programme*". Dr. Pernetta reviewed the contents of the document and the Annex containing the inputs drafted to date, and summarised the major elements related to the Mangrove Sub-component that needed to be discussed during the meeting.

8.1.2 The Project Director reminded members that the goal and targets had been initially discussed during the fifth meeting and draft targets prepared, which had been reviewed by the Regional Scientific and Technical Committee. The RSTC had recommended that the group clarify what was meant by the term "protection" since this was subject to widely differing interpretations in different

disciplines. Subsequently the group had, at its sixth meeting refined the targets and identified four types of mangrove forest: production forest, used for the production of timber and or wood chips; conversion forest (a category confined to Indonesia, representing mangrove land identified in land use plans for conversion to other purposes); Parks and Protected Areas; and areas not subject to use for mangrove timber but subject to extractive use of other non-timber resources such as crabs and fish. Three categories of targets were identified: areas to be added to National Parks and Protected Areas; areas for which the land use designation of conversion was to be changed to either production or non-extractive use; and increase in the areas under sustainable management.

8.1.3 In addition to reviewing the targets and ensuring consistency in the figures for areas used in the various tables the group was invited to consider in greater detail the proposed activities and their associated costs. It was noted in this regard that the group had spent little time in drafting these during the sixth meeting since considerable effort had been expended in developing rational targets. The activities in the various components required further elaboration and clarification such that it was clear to the reader exactly what was to be undertaken, how it was to be done, and the time frame for completion.

8.1.4 The group took note of the redefined goal of the Strategic Action Plan as proposed by the Regional Working Group on Coral Reefs and considered that this adequately reflected the overall intent and direction of the mangrove sub-component.

8.1.5 The group then proceeded to discuss the figures for the areas of mangrove in each category and those contained in Table 1 of the document showing the rates of decline. The figures were carefully reviewed and an extensive discussion took place during which members noted that: the latest FAO estimates were based on national data that had been collected in different years, and in different ways; the figures represent national totals and not merely the area bordering the South China Sea; and the South China Sea figures were those contained in the national reports prepared under this project and represented areas of mangrove forest, not mangrove land.

8.1.6 Dr. Fan expressed the view that the FAO figures for China were likely an over-estimate that included areas of replanted land where the survival rate was very low. Members noted that the FAO figures for most countries included estimates of areas of "mangrove land" regardless of whether or not the area currently contained mangroves, for example areas of shrimp ponds in mangrove could still be classified as mangrove land and might have been included in some estimates. The group noted that the FAO definition of forested land was land where 10% was covered by trees.

8.1.7 Mr. Santoso noted that forest lands in Indonesia were classified as being "good", medium or poor and the area of mangrove provided in Table 1 was for the categories good and medium only. Mr. Koh noted that the FAO figure in 2003 for Malaysia was correct and Dr. Gong noted that in Malaysia the areas of mangrove outside the South China Sea were somewhat limited totalling approximately 50,000 hectares hence it was possible to derive a rough estimate for the mangrove area bordering the South China Sea coastline of Malaysia.

8.1.8 Dr. Sonjai provided new figures for the area of mangrove in Thailand that had been revised in accordance with the latest figures available from the recently completed programme of satellite image interpretation. It was noted that previous figures for mangrove land in Thailand had not included privately owned mangrove land whereas the present figure included 10,000 hectares of privately owned mangrove lands, around 1,600 hectares of which had been sustainably harvested for charcoal production for over 100 years. It was further noted that the amendments to the figures for the Philippines had not been provided following the sixth meeting of the group.

8.1.9 There followed a consideration of the targets outlined in Table 4 of document UNEP/GEF/SCS/RWG-M.7/7. It was noted that two increasingly important types of activity being undertaken in the region had not been adequately reflected in the targets, namely replanting of deforested mangrove land, and enrichment planting. There followed a discussion of possible targets for areas to be replanted and those to be subject to enrichment planting to increase the mangrove species biodiversity. In this context it was noted that in Thailand there was now agreement that rather than planting single species stands of *Rhizophora* multi-species stands of up to five species should be re-planted in future. These two categories of target were added to the table and the finally agreed figures are presented in Table 1.

Table 1 Areas of Mangrove currently under different forms of land-use designation and management and potential targets for future mangrove management to be included in the SAP.

	Cambodia	China	Indonesia	Philippines	Thailand	Viet Nam	Total	%
PRESENT SITUATION								
Total area (ha)	72,350	23,446	934,000	27,251	62,618	156,608	1,276,273	100
Production	0	0	610,800	0	1,600	18,000	650,800	49.39
Conversion	0	0	165,000	500 ²	0	0	166,500	12.97
Parks & Protected Areas (Conservation) non-extractive use	13,558	15,772	158,200	[4,776] ³	11,520	20,000	223,826	17.54
Non-use of mangrove but extractive resource use (fish, crabs etc.)	58,792	7,674	0	26,751	39,496	118,608	251,323	19.69
Private land, unregulated use	0	0	0	0	10,000	0	10,000	0.78
Area currently under management Regulated in laws/regulations	13,558	15,772	768,800	23,143	11,520	155,000	987,793	77.40
Areas estimated as currently under sustainable management ⁴	13,558 8,820	15,772 +1,000 ⁵	158,200 100,000	[MPAs?] 15,000 ⁶	11,520 1,600	20,000 18,000 46,608	432,078	32.6
TARGETS 2012								
<i>[Proposed areas to be subject to changes in designation and management regime.]</i>								
Area to be transferred to National Parks and Protected Area status	0	5,330	20,000	0	1,400	30,000	56,730	4.44
Non-conversion of mangrove but sustainable use	0	0	165,000 ⁷	0	1,600	0	166,600	13.05
Improved management relating to sustainable use	49,972	0	490,800 ⁸	11,751 ⁹	10,000	50,000	602,523	47.21
Replanting of deforested mangrove land	2,500	500	0	?	8,000	8,000	19,000	1.49
Enrichment planting to increase mangrove biodiversity	0	5,000	0	?	3,200	2,000	10,200	0.80

8.1.10 Having revised the targets the group proceeded to consider what was meant by sustainable use of mangrove areas, and in this context reviewed the indicators of sustainability that had been developed by the coral reef group to assess whether or not a management regime was likely to result in sustainable harvests.

8.1.11 Members agreed that the management indicators were reasonable for mangrove areas and that one would anticipate a greater degree of sustainability in the management when all conditions in each category were met. For example if an area has only a formal management framework it is less likely to be sustainably managed than one which has a framework, trained manpower, necessary facilities and a sustainable source of financing.

8.1.12 The ecological indicators proposed by the coral reef working group were not considered suitable for application to mangrove areas and the working group discussed and agreed five indicators covering the mangroves themselves and mud-crabs as an indicator of secondary production.

8.1.13 In the case of the socio-economic indicators the group felt that tourism was a less important source of income in mangrove areas compared with coral reefs and that indicators for the forest sector should be included. The group replaced the category of "other alternative income" used by the coral reef group and included a more generic indicator namely the numbers of people, (and their *per capita* income) involved in activities other than fishing, tourism and forestry, in order to reflect the

² Conversion for Infrastructure development and other uses.

³ Area is for the entire Philippines, area for South China Sea to be supplied later.

⁴ Areas considered as being sustainably managed at the present time include all lands designated as production forest since it is a legal requirement that these be replanted; all mangrove lands contained within National Parks and Protected Areas; and a proportion of the mangrove area subject to extractive use of non-timber resources.

⁵ Area outside the protected area for which some form of management plans exist – estimated.

⁶ Estimate of total area with local government or community based management plans.

⁷ Represents re-classification of conversion forest to other forms of use.

⁸ This represents areas that are used both for forest production and non-timber uses.

⁹ By 2010.

diversity of alternative sources of income generated by mangrove habitats. The agreed set of indicators of sustainability is presented in Table 2 below.

Table 2 Sustainable Management Indicator Matrix.

Management Indicators	Ecological/Environmental Indicators	Socio-Economic Indicators
Management Capacity: <ul style="list-style-type: none"> Formal Management framework Trained Man-power (No./levels) Facilities and equipment Sustainable Financing 	<ul style="list-style-type: none"> Forest Cover Population structure of the dominant mangrove species Tree density (tree of over 1.5 meters high) Number of True Mangrove species <i>Scylla serrata</i> (size and abundance) 	Fisheries: <ul style="list-style-type: none"> Catch per unit effort Total landing Income
		Tourism: <ul style="list-style-type: none"> Number of visitors Number of tourism operators Income
Management Approach: <ul style="list-style-type: none"> Sectoral Integrated Community-based Multiple-use 		Forestry: <ul style="list-style-type: none"> Volume of timber Weight of charcoal product Income
Management Tools: <ul style="list-style-type: none"> Licensing and permits Seasonal closure Zoning 		Activities Other than Fisheries, Tourism and Forestry: <ul style="list-style-type: none"> Numbers of people involved Per capita income
		Overall Living Standard: <ul style="list-style-type: none"> Level of education Health of the community

8.1.14 The members agreed to complete the details of the management status of the mangrove areas that had been considered as potential demonstration sites overnight as a check on the contents of Table 1 above. These entries were consolidated and are presented in Table 6 of Annex 4 of this report.

8.1.15 Following agreement regarding the revised and expanded targets and the indicators for sustainable management the group proceeded to reconsider the threats as outlined in Table 2 of Annex 1 of document UNEP/GEF/SCS/RWG-M.7/7. The group was of the opinion that the threat of mangrove conversion to shrimp ponds was no longer significant in the region and that perhaps the most significant threat for the future would be the continued conversion of mangrove lands due to increasing infrastructure development along the coast and associated land reclamation. It was noted that, in general, the economic values of mangroves were considered by planners and economists as being so low that, any form of development resulted in an increase in the economic value of the area.

8.1.16 Dr. Fan expressed the view that one of the most serious threats to the survival of mangroves in China was sea level rise, which along the Southern coast of China had reached approximately 6 to 8 centimetres over the last 40 years. The development of land behind the mangroves restricted the extent to which mangroves could respond to rising sea level by colonising areas further inland. A similar problem was noted in Viet Nam where the construction of dykes along the coast restricted mangroves to areas on the seaward side.

8.1.17 Mr. Santoso noted that sea level rise was not only a problem in areas where the back mangroves had been developed but also in areas such as small islands where inputs of sediment were extremely low. Dr. Pernetta noted that he had published a paper contrasting the potential response of mangroves in tidal estuaries in the Kikori area of the Gulf of Papua with those occurring in river dominated systems such as the Purari delta. The former lack sediment inputs whereas the suspended sediment load of the Purari was extremely high.

8.1.18 Dr. Fan voiced concerns about future threats from changes in temperature resulting in increased frequency of defoliation. Dr. Tri suggested that in Viet Nam at least, defoliation appeared to be a cyclic event occurring every 4 to 5 years. Dr. Sonjai noted that the introduction of *Penaeus*

vannamei shrimps to China and their subsequent introduction to Thailand and Indonesia posed a threat to native shrimp species since this species was fast growing and reproduced rapidly.

8.1.19 Dr. Gong concluded that regional threats could be divided into two main categories natural or environmental such as defoliation and sea level rise, and human threats such as conversion, and that these should be clearly separated in the table.

8.1.20 Mr. Santoso was of the opinion that some of the threats could be addressed through a regionally agreed certification procedure, which certified mangrove products as having been produced in a sustainable manner without, impact on mangrove eco-systems.

8.1.21 The group then turned to a consideration of Table 5 of the document concerning challenges to sustainable mangrove management in the region. Dr Fan was of the opinion that the lack of permanent mechanisms for fostering regional and international co-operation remained a major constraint, which Dr. Tri felt was mirrored at the national level with a lack of co-ordination between sectoral interests and stakeholder groups. Dr. Pernetta noted in this regard that each focal point was supposed to chair a national committee or sub-committee of stakeholders with involvement in mangroves to address exactly this problem whilst in theory at least the South China Sea's Regional Working Group on Mangroves provided a forum for regional co-operation.

8.1.22 It was agreed that in general governments needed to modify their management perspectives with respect to mangrove areas and to consider mangrove services such as coastal protection when deciding on the development of mangroves in coastal areas. An ecosystem approach to management should be more widely adopted. Dr. Pernetta noted that whilst the international system was increasingly using the term "ecosystem management" this was in fact impossible since ecosystems themselves could not be managed, the only thing that could be managed was human activities.

8.1.23 There followed a lengthy discussion in plenary of the contents of Table 7. It was agreed that the meeting would break into small groups to consider firstly the elaboration of the activities and secondly the approximate costings. Initial results from these small working groups were then projected and considered in plenary. The outcome of these discussions is presented in Table 7 of Annex 4 of this report.

8.2 Economic valuation of mangrove goods and services

8.2.1 The Chairperson invited the Project Director to introduce document UNEP/GEF/SCS/RWG-M.7/10 "*Economic Valuation of Mangrove Goods and Services*". The Project Director noted the previous agreement of the group that various data regarding the economic valuation of mangrove goods and services would be provided from the demonstration sites since this information was required to develop the business plans and explore alternative livelihoods as outlined in the operational plans for each site. Members recalled that they had agreed during the sixth meeting of the Regional Working Group to provide data in the agreed format, relating to the economic values of mangrove goods and services at the demonstration sites according to the following schedule: Batu Ampar, Peam Krasop, Busuanga, and Fangchenggang by December 2005; Trat Province by January 2006 and the Balat Xuan Thuy estuary within three months of commencement of work.

8.2.2 The Project Director noted with regret that none of these data had been supplied in advance of the fourth and fifth meetings of the Regional Task Force on Economic Valuation (March and August 2006 respectively). He noted further that the fifth meeting of the RTF-E had taken place before the RWG-M hence the document contained the outcome of their deliberations and the data they had assembled and presented during the meeting (UNEP/GEF/SCS/RTF-E.5/3).

8.2.3 The Chairperson invited members of the RWG-M to: present any economic valuation data that had become available from the demonstration sites; consider the data assembled by the RTF-E; and, to make any suggestions and/or recommendations regarding the need for further values prior to calculation of regional values.

8.2.4 A question was raised regarding the meaning of the abbreviation CPI and Dr. Pernetta responded that this was the Consumer Price Index a standard economic measure used in national accounting. The CPI was to be used by the RTF-E in standardising values in US\$ between countries

thus permitting comparisons and statistical treatment of the data. Dr. Pernetta noted that the data for each good or service would be standardised within countries by determining a weighted market price that reflected the volume of supply. The weighted national values would then be weighted a second time according to the areas of habitat in each country and a regional weighted market price determined from which the economic value of each item would be determined. By summing the values per hectare for all goods and services a total economic value for mangrove habitat could be determined and used in evaluating the costs and benefits of action and non-action.

8.2.5 During discussion various anomalies were discussed and Dr. Fan noted that what had been valued as timber in Fangchenggang was not the standing stock, but the annual production and that he would examine the data and provide the PCU and Dr. Li Kaiming with corrections and amendments as soon as possible.

8.2.6 Mr. Vongwattana noted that in the case of the Peam Krasop Wildlife Sanctuary old, and in some cases inappropriate data were presented in the table, and that new work on economic values through field research would result in data being provided in a standardised format by 15th October 2006. Dr. Pernetta requested that these data be provided both to the PCU and to Mr. Sy Ramony the member of the RTF-E from Cambodia.

8.2.7 Mr. Santoso noted that the economic data from Batu Ampar had been compiled and sent to the Indonesian RTF-E member. He noted further that these values were not based on the entire area of the site rather on a sub-set of some 10,000 hectares and that a more accurate set of values would be provided once the demonstration site became fully operational.

8.2.8 Dr. Sonjai noted that work on the economic valuation of mangrove goods and services in Trat Province, had not yet commenced, although it was pointed out that these activities were included in the operational plan for the site.

9. UPDATING OF THE REGIONAL GIS-DATABASE AND META-DATABASE AND EFFICIENT USE OF THE PROJECT WEBSITE

9.1 The Chairperson invited the Project Director to introduce document UNEP/GEF/SCS/RWG-M.7/7, "*Status of the UNEP/GEF South China Sea Project Website, Online Tools, and Activities to Promote the Mangrove Sub-component of the Project*". Dr. Pernetta noted that there are currently in excess of one hundred institutions directly involved in the project, and more than four hundred institutions indirectly involved through individual participation in National Committees, Sub-committees and Regional Working Groups. It is anticipated that this network will continue to grow as the demonstration sites and pilot activities become fully operational and as more outputs are produced at both the national and regional levels.

9.2 Dr. Pernetta noted that the project had developed a wide range of outputs, including: knowledge documents; national reports; over sixty meeting reports; an online Geographical Information System (GIS) and meta-database; a nutrient carrying capacity model for the South China Sea; National Action Plans for key marine habitats; and regional guidelines on the use of fisheries *refugia* for capture fisheries management.

9.3 The Focal Points were reminded that it was their responsibility under the Memoranda of Understanding to ensure that any new mangrove related GIS and meta-data sets were made available to the Project Co-ordinating Unit for inclusion in the regional databases as they became available at the national level. Dr. Pernetta reminded them further of their prior agreements during the sixth meeting regarding revision and up dating of national data for inclusion in the regional databases.

9.4 The Project Director noted that to date meta-data entries had been provided by Cambodia, Philippines and Viet Nam and included in the regional meta-database. He noted that Mr. Santoso had supplied the Indonesian entries in "PDF" format, which prevented them from being uploaded to the database, and that the CD supplied by Dr. Sonjai was so heavily infected with viruses as to be unreadable. Mr. Santoso supplied the database entries in word format during the meeting and Dr. Fan noted that the Chinese meta-data entries had been provided to the PCU on Friday last. Dr. Sonjai agreed to provide clean sets of the data from Thailand upon his return to Bangkok.

9.5 Dr. Pernetta noted that the PCU has conducted an evaluation of each meta-data entry and has prepared guidance for the focal points concerning how the existing meta-data entries could be revised to make them more, user-friendly. The results of this evaluation were attached as Annex 2 to document UNEP/GEF/SCS/RWG-M.7/7 it was agreed that the focal points would correct these entries according to the dates agreed in the work plan (Annex 5). Dr. Pernetta noted that it was now possible for members to log onto the site and to amend the entries directly, without having to submit data to the PCU.

9.6 A customised CD-ROM was provided to each member having the user names and passwords attached, and a full user manual for the website, which was also supplied in hard copy. Members may now log on to the website and enter information on the demonstration site pages, participate in any e-fora, and amend the pages relating to the RWG-M, and their own meta-data entries.

9.7 The Chairperson noted that the document also contained details of proposed initiatives developed by the PCU to support the substantive work of the regional working groups in using the website for exchange of information and experiences through new functions including the use of e-fora. He invited members to discuss and agree on how the project website could be used to improve communication between members of the RWG-M between meetings.

9.8 There followed a discussion regarding the use of the website for enhancing communication and exchange of information between meetings. Dr. Tri noted that in his experience e-fora discussion groups only worked when people were motivated and when they agreed in advance to contribute to the discussion. It was suggested that each member would undertake to post something in the discussion forum once a week. Various topics were proposed for discussion including sustainable charcoal production, timber production, and mangrove foods.

9.9 It was agreed that each member of the RWG-M would take sequential responsibility for stimulating the discussion for one month, starting with Dr. Tri, in October, followed by Mr. Santoso, November, and then proceeding in reverse alphabetical order starting with Viet Nam. Each member would, as the moderator for the month, post no more than two topics and initiate and encourage discussion. Dr. Pernetta noted that the e-fora were established in such a way that each time a posting was made an e-mail was automatically distributed to all members of the group.

10. CONSIDERATION OF PROPOSED SOUTH CHINA SEA PROJECT TRAINING ACTIVITIES REGARDING THE MANGROVE SUB-COMPONENT

10.1 The Chairperson invited the Project Director to introduce document UNEP/GEF/SCS/RWG-M.7/8, *"The South China Sea Project Training Programme"*. The Project Director outlined: the background to the development of this programme; the aim and *modus operandi* of the training programme; the procedures proposed for the selection of Implementing Entities; and the procedures for the conduct of training courses.

10.2 Dr. Pernetta drew members' attention to Table 1 of the document, which listed the major topics identified by the Sub-Committee of the RSTC that should be included in a course on mechanisms for sustainable production/use of mangroves and other coastal wetlands. He reviewed the proposed elements that had been identified for inclusion by the RWG-W and were presented in the annex to the document.

10.3 The Chairperson invited members of the Regional Working Group on Mangroves to: discuss the contents of this document; provide comment on appropriate participants for the training courses; consider suitable training topics for inclusion in each course; provide advice on possible implementing entities, and how materials developed for regional training could be utilised in national level training activities.

10.4 Dr. Fan noted that the requirement for English would limit participation from China and Dr. Pernetta responded that participants in the regional training courses need to know sufficient English to be able to translate key materials for delivery during the national echo seminars, He noted that the level of education of participants would generally be high, probably at least first degree level.

10.5 Dr. Gong sought further information regarding the trainees' responsibilities and Dr. Pernetta indicated that they would be expected to organise and run the echo seminars, probably in collaboration with the Specialised Executing Agencies and that participants could be nominated by

the focal points but the final selection would be the responsibility of the National Technical Focal Points. Given that each course was expected to cater for up to 25 participants and there were seven countries involved each country could expect to secure at least three places in the course.

10.6 The Chairperson asked for comments on the proposed contents of the course as outlined by the Sub-Committee and presented in Table 1. Dr. Gong noted that this content was in her opinion suitable but that the inclusion of the contents elaborated by the wetland group might result in a considerable dilution of the substance making it not worthwhile for mangrove managers to participate. She sought clarification regarding which wetlands were to be the subject of this course and Dr. Pernetta indicated that the wetlands other than mangroves were, coastal lagoons, estuaries, intertidal mudflats, peat swamp and non-peat swamp coastal forests.

10.7 Dr. Pernetta responded that the Wetlands and Mangrove Sub-components were combined in a joint course for financial and time related reasons and it was really up to the group to indicate what was the course content that they felt was needed by mangrove practitioners. He noted that many of the topics proposed by the wetlands group for inclusion could be dealt with in a short period of time depending upon how the timetable and curriculum were arranged. The group agreed that the content as laid out in Table 1 was more appropriate than that listed by the wetlands working group.

10.8 Dr. Pernetta noted further that whichever institution expressed an interest in running the course would be responsible for determining the course content and developing the materials but clearly the members of the regional working group could provide inputs to the curriculum and materials, and/or participate as resource persons. Dr. Gong expressed an interest in participating as a resource person for the section on carbon storage and Dr. Tri indicated his interest in presenting aspects of the economic valuation.

10.9 During discussion it was agreed that whoever had materials that could be used or translated for use in such a course would provide details of these, together with copies to the Project Co-ordinating Unit who would pass them to the Institution selected as the Implementing Agency. Dr. Gong noted that some years ago UNESCO/Universiti Sains Malaysia had run a mangrove training course and that some of the materials might be suitable for use in this course and Mr. Santoso noted that materials were available from the JICA centre in Bali that he would try to obtain copies for use in this course. It was noted that some of the materials from the RWG-M such as the national reports would be suitable as reference materials for trainees and that once completed the training materials developed for the course should be made widely available through the project website.

10.10 Dr. Gong noted that possibly the Universiti Sains Malaysia might be interested in running such a course and undertook to discuss this with the appropriate persons upon her return to Penang.

11. REVISION OF THE WORK PLAN AND ACTIVITIES FOR THE REGIONAL WORKING GROUP ON MANGROVES 2006 – 2008

11.1 Mr. Sour, Secretary to the working group presented document UNEP/GEF/SCS/RWG-M.7/9 "*Draft Work Plan and Timetable for the Regional Working Group on Mangroves 2006 to 2008*". The draft work plan was projected and amended by the members in the light of decisions made under earlier agenda items and to reflect the commitments of individual members with respect to overdue outputs from the national level.

11.2 The amended work plan was finalised and approved as it appears in Annex 5 of this report.

12. DATE AND PLACE OF THE EIGHTH MEETING OF THE REGIONAL WORKING GROUP ON MANGROVES

12.1 The Project Director reminded members that previous meetings of the working group had been convened in China, Indonesia, Philippines, Thailand, and Viet Nam and noted that to date no meeting had been convened in Cambodia.

12.2 Members of the Regional Working Group were also reminded that, in accordance with the decision of the Project Steering Committee, all Regional Working Group meetings are to be convened

at the demonstration sites. The Project Director noted in this context that the Peam Krasop demonstration site in Koh Kong Province, Cambodia, was reputed to be one of the best remaining stands of mangrove in the Gulf of Thailand.

12.3 Mr. Vongwattana invited the group to convene the Eighth Meeting at Peam Krasop in Cambodia and there followed a discussion of suitable dates with respect to the wet season since the road from Phnom Penh was not an all weather road. It was agreed that the meeting would be convened from 19th to 22nd April inclusive, since this was the end of the dry season in the area.

13. ANY OTHER BUSINESS

13.1 Members recalled that during the sixth meeting, the working group had held a preliminary discussion regarding the production of a mangrove cook-book, and Mr. Santoso had provided copies to the members during this meeting. Mr. Santoso suggested that members should attempt to complete this cook-book during the inter-sessional period.

13.2 It was agreed that individual members would provide recipes, including lists of ingredients for dishes containing mangrove products, and that photographs would be lodged on the project website to avoid overloading e-mail inboxes.

13.3 The Chairperson then invited members of the Regional Working Group to raise any further matters needing consideration at this time. No additional items were raised by members for consideration of the meeting.

14. ADOPTION OF THE REPORT OF THE MEETING

14.1 The Chairperson invited, Dr. Sam, the Rapporteur to present the draft report of the meeting, prepared by the secretariat during the meeting, for consideration and adoption by the members.

14.2 Dr. Sam presented the report, which was discussed, amended, and approved as it appears in this document. Hard copies of the text of Annex 4 of the report were provided to members who agreed to provide the Project Director with any amendments or corrections prior to their departure from Pontianak.

15. CLOSURE OF THE MEETING

15.1 The Chairperson thanked participants for their very hard work, the PCU staff for their support to the running of the meeting and Mr. Santoso for his assistance in organising the logistics of the meeting.

15.2 The Project Director thanked participants for their hard work during the course of the meeting and the Indonesian hosts for assistance with the administrative arrangement and for organising the field visit to Batu Ampar.

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ANNEX 2

List of Documents

Discussion documents

UNEP/GEF/SCS/RWG-M.7/1	Agenda.
UNEP/GEF/SCS/RWG-M.7/2	Annotated Agenda.
UNEP/GEF/SCS/RWG-M.7/3	Report of the Meeting.
UNEP/GEF/SCS/RWG-M.7/4	Current Status of Budgets and Reports from the Specialised Executing Agencies in the Participating Countries.
UNEP/GEF/SCS/RWG-M.7/5	Status of Substantive Reports from the Specialised Executing Agencies for the Mangrove Sub-component of the UNEP/GEF South China Sea Project.
UNEP/GEF/SCS/RWG-M.7/6	Inputs from the Mangrove Sub-component for Updating the Regional Strategic Action Programme.
UNEP/GEF/SCS/RWG-M.7/7	Status of the UNEP/GEF South China Sea Project Website, Online Tools, and Activities to Promote the Mangrove Sub-component of the Project.
UNEP/GEF/SCS/RWG-M.7/8	The South China Sea Project Training Programme.
UNEP/GEF/SCS/RWG-M.7/9	Draft Work Plan and Timetable for the Regional Working Group on Mangroves 2006 to 2008.
UNEP/GEF/SCS/RWG-M.7/10	Economic Valuation of Mangrove Goods and Services [Data Relating to the Economic Value of Mangrove Goods and Services Extracted from the Report of the fifth meeting of the RTF-E].

Information documents

UNEP/GEF/SCS/RWG-M.7/Inf.1	List of Participants.
UNEP/GEF/SCS/RWG-M.7/Inf.2	List of Documents.
UNEP/GEF/SCS/RWG-M.7/Inf.3	Programme.
UNEP/GEF/SCS/RSTC.6/Sub-Comm	First Meeting of the Sub-committee of the Sixth Meeting of the Regional Scientific and Technical Committee for the UNEP/GEF Project " <i>Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand</i> ". Report of the Meeting. Bangkok, Thailand, 6 th – 10 th February 2006 UNEP/GEF/SCS/RSTC.6/Sub-Comm.

Published Reports supplied in hard copy (available on the Project Website www.unepscs.org)

UNEP/GEF/SCS/PSC.5/3	Fifth Meeting of the Project Steering Committee for the UNEP/GEF Project " <i>Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand</i> ". Report of the Meeting. Batam, Indonesia, 12 th – 14 th December 2005 UNEP/GEF/SCS/PSC.5/3.
UNEP/GEF/SCS/RSTC.6/3	Sixth Meeting of the Regional Scientific and Technical Committee for the UNEP/GEF Project " <i>Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand</i> ". Report of the Meeting. Batam, Indonesia, 8 th – 10 th December 2005 UNEP/GEF/SCS/RSTC.6/3.
UNEP/GEF/SCS/RWG-SG.6/3	Sixth Meeting of the Regional Working Group on the Seagrass Sub-component for the UNEP/GEF Project " <i>Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand</i> ". Report of the Meeting. Bolinao, Philippines, 27 th – 30 th September 2005 UNEP/GEF/SCS/RWG-SG.6/3.

- UNEP/GEF/SCS/RWG-W.6/3 Sixth 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. Sihanoukville, Cambodia, 12th – 15th September 2005 UNEP/GEF/SCS/RWG-W.6/3.
- UNEP/GEF/SCS/RWG-F.6/3 Sixth 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. Kudat, Sabah, Malaysia, 5th – 8th September 2005 UNEP/GEF/SCS/RWG-F.6/3.
- UNEP/GEF/SCS/RWG-CR.6/3 Sixth 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. Masinloc, Philippines, 22nd – 25th August 2005 UNEP/GEF/SCS/RWG-CR.6/3.
- UNEP/GEF/SCS/RWG-M.6/3 Sixth 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. Busuanga Island, Palawan, Philippines, 1st – 5th August 2005 UNEP/GEF/SCS/RWG-M.6/3.
- UNEP/GEF/SCS/RWG-LbP.6/3 Sixth 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. Ninh Hai, Ninh Thuan, Viet Nam, 18th – 21st July 2005 UNEP/GEF/SCS/RWG-LbP.6/3.
- UNEP/GEF/SCS/RTF-E.4/3 Fourth 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. Xuan Thuy, Nam Dinh Province, Viet Nam, 27th – 30th March 2006 UNEP/GEF/SCS/RTF-E.4/3.
- UNEP/GEF/SCS/RTF-L.4/3 Fourth 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. Shantou, China, 24th – 27th April 2006 UNEP/GEF/SCS/RTF-L.4/3.

Document received during the RWG-M-7 meeting in Pontianak, West Kalimantan Province, Indonesia, 4-8 September 2006.

- Cambodia:** Cash Advance Request period ending in year 2006.
Six Monthly Project Expenditure from January – June 2006.
Six Monthly Progress Report period July – December 2005.
National Report of Mangrove, Phnom Penh, August 2005, 186 pps. Publish in Cambodian Language, 2 copies.
- China:** Newsletter, GEF FCG Mangrove Demo Site Project, Issue 5, May 2006, Chinese Language, 1 copy.
Education Mangrove Book, Chinese Language, 4 copies.
Poster Mangrove different photos in Chinese Language.
2 different leaflets in Chinese Language, 10 copies each
1 DVD about Mangrove 1 CD

Indonesia: CD Metadata and GIS Database of Indonesia Mangrove Ecosystem in the South China Sea, Bogor, 2005.

Thailand: Mangrove Sub-component, Final Report, July 2004, 126 pps. English Language, 1 copy.

Document part 3 Book 1/6 – Mangrove, 60 pps., in Thai Language, 2 copies.

Mangrove Strategic Action Plan in the Gulf of Thailand, print document, 49 pps. In Thai Language, 1 copy.

Future Mangrove Management in the Gulf of Thailand, print document, 7 pps. English Language, 1 copy.

Viet Nam: National Action Plan for Protection and Development of Vietnam's Mangrove Forests Until 2015, Hanoi – 2005 publish in Viet Nam and English Language, 3 copies.

ANNEX 3

Agenda

- 1. OPENING OF THE MEETING**
 - 1.1 Welcome Addresses on behalf of UNEP and the West Kalimantan Provincial Government
 - 1.2 Introduction of Participants
- 2. ORGANISATION OF THE MEETING**
 - 2.1 Election of Officers
 - 2.2 Documentation and Administrative Arrangements
- 3. ADOPTION OF THE MEETING AGENDA**
- 4. STATUS OF THE ADMINISTRATIVE REPORTS FOR 2005 AND 1ST HALF 2006: PROGRESS REPORTS; EXPENDITURE REPORTS; AND AUDIT REPORTS**
- 5. STATUS OF SUBSTANTIVE NATIONAL REPORTS**
- 6. PROGRESS IN THE IMPLEMENTATION OF THE DEMONSTRATION SITE ACTIVITIES**
- 7. STATUS OF THE NATIONAL ACTION PLANS**
- 8. FINALISATION OF INPUTS FROM THE MANGROVE SUB-COMPONENT TO THE REGIONAL STRATEGIC ACTION PROGRAMME**
 - 8.1 Elaboration of the Substantive Mangrove Related Inputs
 - 8.2 Economic Valuation of Mangrove Goods and Services
- 9. UPDATING OF THE REGIONAL GIS-DATABASE AND META-DATABASE AND EFFICIENT USE OF THE PROJECT WEBSITE**
- 10. CONSIDERATION OF PROPOSED SOUTH CHINA SEA PROJECT TRAINING ACTIVITIES REGARDING THE MANGROVE SUB-COMPONENT**
- 11. REVISION OF THE WORK PLAN AND ACTIVITIES FOR THE REGIONAL WORKING GROUP ON MANGROVES 2006 - 2008**
- 12. DATE AND PLACE OF THE EIGHTH MEETING OF THE REGIONAL WORKING GROUP ON MANGROVES**
- 13. ANY OTHER BUSINESS**
- 14. ADOPTION OF THE REPORT OF THE MEETING**
- 15. CLOSURE OF THE MEETING**

ANNEX 4

Draft Inputs to the revised SAP from the RWG-M

THREATS TO MANGROVES AND PRIORITIES IN THE SOUTH CHINA SEA

Around 30% of the world's remaining mangrove is found in the countries participating in this project and 8% of the World's total is found along the margins of the South China Sea marine basin. Rates of loss are generally higher along the South China Sea coastlines than elsewhere in the seven countries participating in the UNEP GEF project. For example around 80% of the mangrove bordering the Gulf of Thailand has been lost compared with only around 20% on the Andaman coast of Thailand. The annual rates of loss in the seven countries, between 1990 and 2000, were greater than the world average (Table 1¹⁰). Such losses represent a loss of global biological diversity that must be a matter of global concern (UNEP, 2004). The total area of mangrove lost in the participating countries over different time spans (70 years for the Philippines) was estimated in 1998 at 4.2 million ha suggesting that over half of the original mangrove bordering the South China Sea had been lost during the last century.

Table 1 Estimates of area (Ha) and rates of loss of mangrove habitat in seven countries bordering the South China Sea, compared with the world totals. [Most recent data from FAO, 2003]

	Most recent estimate FAO	Date of FAO estimate	National Estimates of total mangrove area			Current South China Sea area	% Rates of loss per year	
			1980	1990	2000		1980 - 1990	1990-2000
Cambodia	72,835	1997	83,000	74,600	63,700	72,350	-1.01	-1.46
China	36,882	1994	65,900	44,800	23,700	23,446	-3.20	-4.71
Indonesia	3,493,110	1988	4,254,000	3,530,700	2,930,000	934,000	-1.70	-1.70
Malaysia	587,269	1995	669,000	620,500	572,100	532,100	-0.72	-0.78
Philippines	127,610	1990	206,500	123,400	109,700	27,251	-4.02	-1.11
Thailand	244,085	2000	285,500	262,000	244,000	62,618	-0.82	-0.69
Viet Nam	252,500	1983	227,000	165,000	156,608	156,608	-2.73	-0.51
Total	4,814,291		5,790,900	4,821,000	4,099,808	1,798,373	-1.67	-1.61
World	15,763,000	1992	19,809,000	16,361,000	14,653,000	15,763,000	-1.74	-1.04
% world total	30.54		29.23	29.47	27.62	11.41		

The causes of mangrove destruction identified in the TDA (UNEP, 1998) along the coastlines bordering the South China Sea, included conversion to pond aquaculture, particularly for shrimp, clear felling of timber for woodchip production, land clearance for urban and port development and human settlements; and harvest of timber products for domestic use (UNEP, 2004). Present causes of loss of mangrove habitat are no longer dominated by shrimp culture although this remains one cause of conversion in China, Indonesia and Viet Nam (Table 2). Conversion of mangrove to land for industrial purposes (including harbour construction) has grown over the last ten years, and is now significant in China, but of low importance in Indonesia, the Philippines and Viet Nam, and not important in Thailand and Cambodia. Degradation of mangrove habitats as a consequence of chronic pollution from shrimp farming operations is now more prevalent in China, Indonesia and Thailand, whilst charcoal production continues to degrade mangrove in Cambodia, Indonesia and the Philippines despite legislation banning all harvesting of mangroves in Cambodia and the Philippines.

Transboundary influences are seen through the operation of the world markets and global trade for example, in shrimp. The high global level of demand for shrimp is itself driven by demand in Japan, North America and Europe which sets the world price such that, economic incentives for the conversion of "non-productive" mangrove habitats operate at both the individual and national levels in producing countries. Hard currency income and economic development fuel the motives at the national level whilst individual producers, at least in the short-term, derive considerable cash income from cutting mangrove and converting to shrimp ponds.

¹⁰ This table is based on that contained in UNEP, 2004. *Mangroves in the South China Sea*. UNEP/GEF/SCS Technical Publication No. 1.

Table 2 Threats to Mangroves Outlined in Each of the National Action Plans and at the Regional Level.

Cambodia	China	Indonesia	Philippines	Thailand	Viet Nam	Regional
<p>1. Fast population growth since after the civil war, and associated issues: poverty, settlement and urgent survival needs of local people;</p> <p>2. Increased demands in mangrove charcoals and shrimp culture leading to the degradation and destruction of mangrove forests/unsustainable uses of mangroves (P);</p> <p>3. Growing needs for National Economic Development/foreign investments (P).</p>	<p>1. Coastal reclamation for rice farming(P);</p> <p>2. Coastal aquaculture, mangrove areas converted for fishponds and shrimp farming;</p> <p>3. Mangroves converted for port, urban expansion and industry;</p> <p>4. Mangrove biodiversity are threatened by animal collecting, hunting, exotic species, pest and diseases.</p>	<p>1. Domestic exploitation;</p> <p>2. Salt production(P);</p> <p>3. Rice cultivation(P);</p> <p>4. Aquaculture;</p> <p>5. Oil pollution;</p> <p>6. Industrialization, settlement and urbanization;</p> <p>7. Agriculture pesticides etc.;</p> <p>8. Coastal erosion; and</p> <p>9. Perception of the public.</p>	<p>1. The conversion of mangroves into fishponds or shrimp farms(P);</p> <p>2. Unregulated and destructive tanbark tapping;</p> <p>3. Indiscriminate cutting for fuel and charcoal production;</p> <p>4. Conversion into harbours/ports and settlement areas;</p> <p>5. Certain past policies and regulations tended to encourage the destruction of the rich mangrove resources (P).</p>	<p>1. Culture of marine animals, in particular the farming of black tiger shrimp;</p> <p>2. Increase in population and development has resulted in mangrove areas being converted (P);</p> <p>3. Agricultural production and salt pans(P);</p> <p>4. Mining in mangrove areas(P);</p> <p>5. Tree felling exceeding mangrove productivity (P);</p> <p>6. Land-based pollution-garbage industry;</p> <p>7. Coastal erosion (small).</p>	<p>1. Extensive application of chemicals (ecocide) by Americans in 10 years 1962 – 1972(P);</p> <p>2. So called “Reclaiming marginalized lands” that converted large segments of mangrove into arable lands in 1980 – 1985 (P);</p> <p>3. Repeated clearing mangrove for aquaculture, particularly for shrimp rearing, was extremely extensive during 1988 –1995;</p> <p>4. Seaward embankment and expansion of urban areas conducted in the North has led to the reduction of mangrove cover.</p>	<p>1. Reclamation and infrastructure development*;</p> <p>2. Shrimp farming-Pollution-Th, Ch, In;</p> <p>3. Industrial conversion-Ch-High; Ph, In, VN-Small; Th, Ca-NI¹¹;</p> <p>4. Charcoal production-In, Ph, Ca;</p> <p>5. Conversion-to shrimp culture potential long term threat in Viet Nam.</p> <p>Natural Threats:</p> <ul style="list-style-type: none"> • Sea level rise. • Episodic events – tsunami, typhoon.

*Note for abbreviations: Ca-Cambodia, Ch-China, In-Indonesia, Ph-Philippines, Th-Thailand, VN-Viet Nam.

¹¹ Not important.

On a smaller scale, trade in charcoal derived from mangrove in Cambodia to Thailand was a major cause of mangrove loss in the areas of Cambodia close to the Thai border, in the recent past. This market appears to have declined somewhat over the last five years under the influence of more widespread use of cheap and convenient, liquid gas in Thailand.

When mangrove forests are destroyed and replaced by alternative forms of land use, not only are the species of plants and animals lost but also many services provided by mangrove systems are lost as well. This is well known in Viet Nam where the function of coastal vegetation, particularly mangroves is considered a vital service with measurable economic benefits as a protection against hurricane damage and marine based flooding. Mangrove degradation causes losses in direct and indirect economic values that support socio-economic development at both local and national scales.

GOAL¹²

During the fifth meeting of the Regional Working Group on Coral Reefs (RWG-CR), there was a discussion regarding the wording of the overall goal of the SAP, and the group recommended amendment to the original wording as follows:

“The goal of the Strategic Action Programme is to foster regional cooperation and collaboration in order to halt or slow the current rate of environmental degradation and assist participating states in taking actions within their respective policies, priorities and resources, thereby contributing to human well-being; promotion of the sustainable use of marine living resources; and contributing to the maintenance of globally significant biological diversity, for the benefit of present and future generations.” UNEP/GEF/SCS/RWG-CR.5/3 para 7.2.10

PROPOSED TARGETS¹³

Table 3 presents information relating to the management of mangrove areas in six of the seven countries bordering the South China Sea. Four categories of mangrove forest are recognised in the region: production forest, used on a sustainable basis for timber and wood chip production; conversion forest, a category in Indonesia representing areas of mangrove land designated for alternative land use under current plans; Parks and Protected Areas; and areas in which timber extraction is not permitted but extractive use of other resources is permitted. In the case of Thailand, another category is recognised namely “Private land, unregulated use”, which accounts for 10,000 hectares.

This table illustrates the complexity of management regimes in six of the seven countries concerned but does not provide a mechanism for objectively determining the effectiveness of the management regime. For example in Cambodia 13,558 hectares of mangrove are contained within Parks and Protected areas for which there is no legal extractive use of either the mangrove trees or other resources, this area is also listed as being under a management regime regulated in law, and again within the areas listed as being sustainably managed at the present time. The assumption is that since access to and use of this area is restricted the management is sustainable. In contrast, 58,792 hectares in Cambodia are currently not regulated under the law, and are subject to extractive resource use other than mangrove and of this area only 8,820 are considered as being exploited in a sustainable manner. The target for Cambodia is therefore to ensure that all 49,972 hectares of mangrove outside the legally protected Parks and protected areas are used in a sustainable manner by 2012.

¹² The RWG-M had not specifically discussed the goal of the SAP in both the fifth and sixth meetings.

¹³ These targets were accepted by the sixth meeting of the Regional Scientific and Technical Committee.

Table 3 Areas of Mangrove currently under different forms of land-use designation and management and potential targets for future mangrove management to be included in the SAP.

	Cambodia	China	Indonesia	Philippines	Thailand	Viet Nam	Total	%
PRESENT SITUATION								
Total area (ha)	72,350	23,446	934,000	27,251	62,618	156,608	1,276,273	100
Production	0	0	610,800	0	1,600	18,000	650,800	49.39
Conversion	0	0	165,000	500 ¹⁴	0	0	166,500	12.97
Parks & Protected Areas (Conservation) non-extractive use	13,558	15,772	158,200	[4,776] ¹⁵	11,520	20,000	223,826	17.54
Non-use of mangrove but extractive resource use (fish, crabs etc.)	58,792	7,674	0	26,751	39,496	118,608	251,323	19.69
Private land, unregulated use	0	0	0	0	10,000	0	10,000	0.78
Area currently under management Regulated in laws/regulations	13,558	15,772	768,800	23,143	11,520	155,000	987,793	77.40
Areas estimated as currently under sustainable management ¹⁶	13,558 8,820	15,772 +1,000 ¹⁷	158,200 100,000	[MPAs?] 15,000 ¹⁸	11,520 1,600	20,000 18,000 46,608	432,078	32.6
TARGETS 2012								
<i>[Proposed areas to be subject to changes in designation and management regime.]</i>								
Area to be transferred to National Parks and Protected Area status	0	5,330	20,000	0	1,400	30,000	56,730	4.44
Non-conversion of mangrove but sustainable use	0	0	165,000	0	1,600	0	166,600	13.05
Improved management relating to sustainable use	49,972	0	490,800 ¹⁹	11,751 ²⁰	10,000	50,000	602,523	47.21
Replanting of deforested mangrove land	2,500	500	0	?	8,000	8,000	19,000	1.49
Enrichment planting to increase mangrove biodiversity	0	5,000	0	?	3,200	2,000	10,200	0.80

Recognising that the existence of a management regime and legal protection did not necessarily reflect the effectiveness of the management regime the RWG-M followed the RWG-CR and developed a set of indicators of the sustainability of current management. Table 4 presents the indicators of sustainability discussed and agreed during the seventh meeting of the Regional Working Group.

Table 4 Sustainable Management Indicator Matrix.

Management Indicators	Ecological/Environmental Indicators	Socio-Economic Indicators
Management Capacity: <ul style="list-style-type: none"> Formal Management framework Trained Man-power (No./levels) Facilities and equipment Sustainable Financing 	<ul style="list-style-type: none"> Forest Cover Population structure of the dominant mangrove species Tree density (tree of over 1.5 meters high) Number of True Mangrove species <i>Scylla serrata</i> (size and abundance) 	Fisheries: <ul style="list-style-type: none"> Catch per unit effort Total landing Income
Management Approach: <ul style="list-style-type: none"> Sectoral Integrated Community-based Multiple-use 		Tourism: <ul style="list-style-type: none"> Number of visitors Number of tourism operators Income
Management Tools: <ul style="list-style-type: none"> Licensing and permits Seasonal closure Zoning 		Forestry: <ul style="list-style-type: none"> Volume of timber Weight of charcoal product Income
		Activities Other than Fisheries, Tourism and Forestry: <ul style="list-style-type: none"> Numbers of people involved Per capita income
		Overall Living Standard: <ul style="list-style-type: none"> Level of education Health of the community

¹⁴ Conversion for Infrastructure development and other uses.

¹⁵ Area is for the entire Philippines, area for South China Sea to be supplied later.

¹⁶ Areas considered as being sustainably managed at the present time include all lands designated as production forest since it is a legal requirement that these be replanted; all mangrove lands contained within National Parks and Protected Areas; and a proportion of the mangrove area subject to extractive use of non-timber resources.

¹⁷ Area outside the protected area for which some form of management plans exist – estimated.

¹⁸ Estimate of total area with local government or community based management plans.

¹⁹ This represents areas that are used both for forest production and non-timber uses.

²⁰ By 2010.

THE MANAGEMENT STATUS OF MANGROVES IN THE SOUTH CHINA SEA

Challenges for Mangrove Management

Table 5 provides information derived from the revised National Action Plans, regarding the challenges for Mangrove management at the national level which centre on: lack of sustainable financing, China, Cambodia, Philippines, and Indonesia less so in Thailand and Viet Nam; weak or non-existent law enforcement, and coastal poverty in all six of the seven countries; and, inadequacies and weaknesses in the management systems in Viet Nam and Indonesia.

The Management Status of Mangroves in the South China Sea

Table 6 lists the 45 mangrove sites bordering the South China Sea that were used in the initial cluster analysis for selection of demonstration sites. It is suggested that one way of improving the clarity of the targets would be to complete the columns in this table and ensure that there were in fact congruent with the targets established in the previous meeting.

OBJECTIVES AND ACTIONS

The proposed regional activities to promote sustainable management of Mangroves were categorised during the sixth meeting into five main components; namely:

Component 1 – Research and Monitoring

Component 2 – National Policy, Legislation, Legal and Institutional Arrangements and Co-ordination

Component 3 – Public awareness, Communication and Education

Component 4 – Capacity Building and Sustainability

Component 5 – Resource and Habitat Management.

The specific objectives and activities were elaborated during the seventh meeting and the revised listing of activities by component and sub-component is presented in Table 7.

COSTINGS

Preliminary costings were prepared during the seventh meeting and are included in Table 7.

Table 5 Challenges for Mangrove Management Outlined in each of the National Action Plans.

Cambodia	China	Indonesia	Philippines	Thailand	Viet Nam	Regional
<p>1. Low awareness among local people on mangrove importance and their conservation and sustainable management needs;</p> <p>2. Absence of specific legal, regulatory and managerial tools, and Law Enforcement weakness;</p> <p>3. Lack of political wills among and abuses by high rank people;</p> <p>4. Lack of funds/insufficient supports from external sources;</p> <p>5. Low capacity among government staff for mangrove sustainable management;</p> <p>6. Difficult accesses and facility shortage to the target localities;</p> <p>7. Poor conditions of responsible staff.</p>	<p>1. No specific legislation on mangroves in China, cross-sectoral management and poor coordination;</p> <p>2. Single ownership of mangroves and existing management regime hinder the inflow of investment;</p> <p>3. Lack of rational use technology and mode;</p> <p>4. Lack of national norms and criteria of mangrove forestation, monitoring, and evaluation;</p> <p>5. Short of funds for mangrove protection and research;</p> <p>6. No platform to improve mangrove education, information share, and public involvement.</p>	<p>1. More than 50% of total mangrove area in Indonesia is damage and lead to the decreasing its ecological function;</p> <p>2. Conservation and rehabilitation of mangrove eco-system is considering as a problem not responsibility;</p> <p>3. The mangrove rehabilitation efforts still can not easing the level of damaged;</p> <p>4. Policy maker and community have different perception on value and function of mangrove eco-system;</p> <p>5. Local community participation on planting and implementation of mangrove eco-system management is not optimal;</p> <p>6. Largest part of the community who live around the mangrove area is poor;</p> <p>7. The utilization of mangrove eco-system that environmentally friendly is not well develops;</p> <p>8. Ineffective coordination related institution;</p> <p>9. There is no synergies regulation between sectors on mangrove eco-system management;</p> <p>10. Key government institution and its role in mangrove management are not agreed yet;</p> <p>11. Ineffective of law enforcement on mangrove management;</p> <p>12. There is no legal umbrella of National Action Plan on Mangrove Eco-system management.</p>	<p>1. Non-delineation of the boundaries of the mangrove forests;</p> <p>2. Absence of firm efforts towards reversion of abandoned, undeveloped and unproductive fishponds;</p> <p>3. Lack of public awareness on the importance of the mangrove forests and their resources;</p> <p>4. Overlapping functions and conflicting policies and legislation of different national government agencies and the Local Government Units (LGUs);</p> <p>5. The non-appropriateness of the existing CBFMA or mangrove forests;</p> <p>6. Institutional constraints in the management and administration of the mangrove forests;</p> <p>7. The lack of a comprehensive research and development programmes.</p>	<p>1. Authority and responsibility for mangrove management in the past has rested with the government;</p> <p>2. Limited public and local participation;</p> <p>3. Lack of laws supporting enforcement action;</p> <p>4. Limited co-operation between mangrove management agencies;</p> <p>5. Lack of systematic and co-ordinated monitoring;</p> <p>6. Dissemination of information and publicity material is limited and does not reach its target.</p>	<p>1. Mangrove eco-systems are improperly managed;</p> <p>2. Lack of policy tools and specific regulations guiding the fishery and other economic sectors in utilization of mangrove forests;</p> <p>3. Most of policy makers have a vague perception on mangrove eco-systems;</p> <p>4. Lack of a sound and empowered inter-sectoral land-use planning, including mangrove land-use, at local levels (province and district);</p> <p>5. Personnel staff assigned to take care of mangrove forests in different locations are insufficient and lacking knowledge;</p> <p>6. Gaps and weaknesses are found in mangrove eco-system studies.</p>	<p>1. Finance-Ch, Cam, Ph, In; partial-VN&Th;</p> <p>2. Effective Management system & Land use planning- VN, In;</p> <p>3. Law enforcement-all;</p> <p>4. Coastal rural poverty-all;</p> <p>5. Lack of long term regional and international co-ordination;</p> <p>6. Lack of technical method and policy for replanting of multi-species of mangroves?</p> <p>7. To educate the public and policy makers on the function and value; of mangrove eco-system</p> <p>8. Need more Scientific research on mangroves at national level.</p>

Table 6 Status of Mangrove Management at Country and Site Levels in the South China Sea.

Country/Site	Area	Production	Conversion	Parks & Protected Areas non-extractive use	Non-use of timber but extractive resource use	Areas currently under management regulated in law	Areas estimated as currently under sustainable management	Areas to be transferred to National Parks and Protected Areas	Status of Areas to be changed from production forest to some other form of sustainable use	Improve management relating to sustainable use	Replanting of deforested mangrove land	Enrichment planting to increase mangrove biodiversity
Cambodia												
Peam Krasop	25,897	0	0	25,897	800	25,897	19,600	0	0	4,197	1,300	0
Dong Peng-Botum Sakor	198,970	0	0	198,970	8,970	198,970	103,900	0	0	85,000	1,100	0
Ream-Veal Rinh	15,000	0	0	15,000	900	15,000	11,200	0	0	2,000	900	0
China												
Shangkou	776	0	0	776	0	776	776	0	0	0	10	50
Qinglangang	2,722	0	0	2,722	0	2,722	2,722	0	0	0	20	30
DongXhaiGang	1,760	0	0	1,760	0	1,760	1,760	0	0	0	100	20
Futien	111	0	0	111	0	111	111	0	0	0	2	10
Fangchenggang	1,337	0	0	1,337	0	1,337	1,337	0	0	0	20	60
Indonesia												
Belitung Island	22,457											
Angke Kaput	328	0	0	169	0	159	144	0	0	0	0	0
Batu Ampar	15,000	30,000	6,000	29,000	0	0	0	0	0	0	0	0
Ngurah Rai	1,374	0	0	1,374	0	0	0	0	0	0	0	0
Bengkalis	42,459	23,000	3,100	0	0	21,000	17,000	0	0	20,000	0	0
Philippines			0									
Dumaran	1,421	0	0									
Pasuquin	37.5	0	0									
Coron	1,295	0	0									
San Vicente	1,338	0	0									
Ulugan	790	0	0									
Busuanga	1,298	0	0									
Taytay	3,657	0	0									
San Jose	483	0	0									
Subic	148	0	0									
Quezon	1,939	0	0									
Thailand												
Trat Province	9,232	0	0	0	9,232	9,232	0	0	1,600	3,000	1,500	2,000
Thung Kha Bay - Savi Bay	4,816	0	0	3,716	1,100	4,816	0	0	0	0	1,000	0
Pak Phanang Bay	6,987	0	0	6,986	0	6,986	0	0	0	0	1,200	0
Samut Songkram	2,553	1,500	0	0	1,053	1,053	0	0	0	0	900	0
Kung Kraben Bay	640	0	0	0	640	640	0	0	0	0	0	0
Pattani Bay	3,700	0	0	0	3,700	3,700	0	0	0	0	400	0
Ban Don Bay	3,700	0	0	0	3,700	3,700	0	0	0	0	500	0
Welu River Estuary	25,000	0	0	0	25,000	25,000	0	0	0	0	2,000	0

Table 6 cont. Status of Mangrove Management at Country and Site Levels in the South China Sea.

Country/Site	Area	Production	Conversion	Parks & Protected Areas non-extractive use	Non-use of timber but extractive resource use	Areas currently under management regulated in law	Areas estimated as currently under sustainable management	Areas to be transferred to National Parks and Protected Areas	Status of Areas to be changed from production forest to some other form of sustainable use	Improve management relating to sustainable use	Replanting of deforested mangrove land	Enrichment planting to increase mangrove biodiversity
Viet Nam												
Hai Ninh	1,260	0	0	0	1,260	1,260	800	0	0	460	600	200
Tien Yen	2,537	0	0	0	2,537	2,537	2,000	0	0	537	800	300
Yen Hung	5,736	0	0	0	5,736	5,736	4,500	0	0	786	1,200	500
Cat Ba	396	0	0	396	0	396	396	0	0	0	0	0
Xuan Thuy	1,775	0	0	1,775	0	1,776	1,776	0	0	0	150	50
Can Gio	8,958	0	0	8,958	0	8,958	8,958	0	0	0	0	0
Thanh Phu	4,510	0	0	4,510	0	4,510	4,510	0	0	0	0	0
Soc Trang	598	300	0	0	298	498	0	0	0	100	100	0
Ca Mau	5,239	1,000	0	4,239	0	5,239	5,239	4,239	4,239	0	50	0
Sao Luoi	305	250	0	100	0	305	305	100	100	0	60	0
FE184	211	211	0	0	0	211	211	0	0	0	0	0
Kien Giang	2,775	1,000	0	0	1,775	2,775	2,000	0	1,775	775	800	0
Con Dao	52	0	0	52	0	52	52	0	0	0	0	0

Table 7 Proposed Regional Actions for the Mangrove Sub-component of the regional Strategic Action Programme.

Components	Objectives	Sub-components	Regional Activities	Estimated Costs (US\$)
1. Research and Monitoring				
To provide scientific baseline for sustainable management of mangrove ecosystem at regional level.	<i>1.1 Resource Assessment</i>	1.1.1	Develop and design the standardized methodology and guideline for inventory and assessment.	(1 consultant x 1 month x 12,000) + (1 st Mtg. x 15,000) + (2 nd Mtg. x 18,000) = 45,000
		1.1.2	Establish a system to Periodically Monitor the state of Mangrove Eco-system in the region.	(1 consultant x 2 months x 12,000) + (3 Mtgs. x 15,000) = 69,000
		1.1.3	Study on the potential of impacts of sea level rise, climate change, and episode events on mangrove eco-system.	(2 months co-ordination x cost) + (3 Mtgs. x 15,000) + (1 data collection x 20,000) + (14 pers. x 7 trips x 200) = 84,600 + C
		1.1.4	Quantification of mangrove as a carbon sink.	(1 consultant x 2 months x 12,000) + (3 Mtgs. x 15,000) + (1 data collection x 20,000) + (14 pers. x 14 trips x 200) + (7 NFP co-ordinating x 4,000) = 156,200
	<i>1.2 Mapping</i>	1.2.1	Develop algorithms for interpretation of remotely sense images of mangrove association and zonation.	(1 consultant x 2 months x 12,000) + (3 Mtgs. x 15,000) + (7 pers. x 7 days x 200) = 78,800
	<i>1.3 Socio-economic and Cultural Assessment</i>	1.3.1	Build on the work of the RTF-E of economic value of mangrove goods and services in order to determine total economic value of mangrove eco-systems.	?
	<i>1.4 Database Management</i>	1.4.1	To establish a mechanism for collection and exchange of regional mangrove data and information.	(1 month co-ordination x cost) + (3 Mtgs. x 15,000) + (1 software x 2,000) = 45,000+C
	<i>1.5 Information System</i>	1.5.1	Establish a web-based regional mangrove information centre.	(1 month co-ordination x cost) + (2 Mtgs. x 15,000) = 30,000 + C
<i>1.6 Decision Support System</i>	1.6.1	Test and elaborate the criteria and indicators of sustainable mangrove management.	(Co-ordination, meetings, NFP cost) = 127,000	
	1.6.2	Develop and test guidelines to strengthen community participation in mangrove management.	(Co-ordination, meetings, NFP cost) = 127,000	
<i>1.7 Environmental Impact Assessment</i>	1.7.1	Develop and test specific guidelines for the conduct of environmental impact assessment in mangrove areas.	(Co-ordination, meetings, NFP cost) = 127,000	

Table 7 cont. Proposed Regional Actions for the Mangrove Sub-component of the regional Strategic Action Programme.

Components	Objectives	Sub-components	Regional Activities	Estimated Costs (US\$)
2. National Policy, Legal and Institutional Arrangement and Co-ordination				
To develop regional policy on ecological security.	2.1	<i>Integration of Research Programme with Management and Policy Making</i>	2.1.1 To maintain the network of communication between policy makers managers, and scientists as established under the UNEP/GEF/SCS Project, to ensure the inclusion of new research findings in management and policy making.	(7 Pers. x 1 month x 10,000) + (3 Mtgs. x 25,000) = 145,000
	2.2	<i>Monitoring the NAPs</i>	2.2.1 Establish an appropriate mechanism to monitor and evaluate the implementation of SAP.	(1 consultant x 1 month x 12,000) + (1 st Mtg. x 15,000) + (2 nd Mtg. x 18,000) = 45,000
	2.3	<i>Review and Improve Existing Laws and Policies</i>	2.3.1 Establishment of formal mechanism for cooperation in managing the marine environment in the South China Sea.	(Co-ordination x cost) + (2 Mtgs. x 15,000) = 30,000 + C
	2.4	<i>Integration of Government Agencies</i>	2.4.1 Organise periodic regional conference to facilitate cross-sectoral discussion of issues and problems relating to mangrove management.	(Co-ordination x cost) + (3 Mtgs. x 20,000) = 60,000 + C
	2.5	<i>Community Empowerment</i>	2.5.1 Establish guidelines to promote participation of local communities in management of mangrove habitats.	(1 consultant x 1 month x 12,000) + (1 st Mtg. x 15,000) + (2 nd Mtg. x 18,000) = 45,000
	2.6	<i>Linkage to Regional and International Obligations</i>	2.6.1 Establish an expert group to assist participating countries in meeting their obligations under international conventions relating to biological diversity and RAMSAR conventions.	(Co-ordination x cost) + (2 Mtgs. x 20,000) = 40,000 + C
	2.7	<i>International and Regional Co-operation</i>	2.7.1 To maintain the network of mangrove specialists established under the UNEP/GEF/SCS Project, to advice the governments on sustainable management of mangroves.	(7 Pers. x 1 month x 10,000) + (3 Mtgs. x 25,000) = 145,000
	2.8	<i>International and Regional Co-operation</i>	2.8.1 To maintain the network of mangrove specialists established under the UNEP/GEF/SCS Project, to advice the governments on sustainable management of mangroves.	(7 Pers. x 1 month x 10,000) + (3 Mtgs. x 25,000) = 145,000
3. Public Awareness, Communication and Education				
To establish a network of environmental journalists and educators, and provide them materials of awareness on mangroves.	3.1	<i>Improve Government Services (Management and Conservation)</i>	3.1.1 Organize regional forum every two years to share knowledge and experiences on how to improve government services in managing the Marine Parks and MPAs.	(1 Mtg. x 30,000) = 30,000 (every two years)
	3.2	<i>Development, Improvement, and Dissemination of Awareness Materials</i>	3.2.1 To maintain and update regional website.	1 regional person to maintain and update website (20,000 per year)
			3.2.2 To translate relevant national publications to English for regional use.	20,000 per country per year for first four years
			3.2.3 To establish a regional bibliography.	(1 consultant 120,000 for one year) + (National co-ordination, 4,000 x 7) = 148,000
			3.2.4 Produce guide books for mangrove rehabilitation, management and conservation in the region.	3 guide books (3 x 4 man-month) = 120,000
3.2.5 Produce guide books for mangrove rehabilitation, management and conservation in the region.	3 guide books (3 x 4 man-month) = 120,000			

Table 7 cont. Proposed Regional Actions for the Mangrove Sub-component of the regional Strategic Action Programme.

Components	Objectives	Sub-components	Regional Activities	Estimated Costs (US\$)
4. Capacity Building and Sustainability				
To increase the knowledge of government officials, managers and stakeholders on the function, value and sustainable management of the mangrove eco-system.	4.1 <i>Human Resource Development</i>	4.1.1 Maintain and expand the existing regional exchange programme for managers, government officials, teachers, research students, and community leaders. 4.1.2 Organise programme of study visits for government officials, community leaders, and mangrove managers to demonstration sites to study on-going practices in rehabilitation, management and conservation in the region.	Website manager (3.2.2) (already paid under 3.2.2)	
			- 4 persons from each country (28 persons) - 5 Demonstration sites - 40,000 per Demo. site visit Total cost: 200,000	
	4.2 <i>Law Enforcement</i>	4.2.1 Regional exchange of experience on how to enforce the laws in practice.	Meeting and co-ordination = 18,000/year	
	4.3 <i>Monitoring</i>	4.3.1 Regional training programme for country trainers on effective monitoring the state of mangrove eco-systems.	(1 Mtg. x 30,000) + (Co-ordination cost x cost) = 30,000 + C	
	4.4 <i>Financial Sustainability</i>	4.4.1 Regional workshop every two years for exchange of experiences of developing livelihood and other income generation activities. 4.4.2 Develop guidelines based on existing experience on micro-credit scheme. 4.4.3 Development of curricular and materials for use in training programmes relating to sustainable use and management of mangroves, offered by educational institutions in the region.	(Mtgs. x 25,000) + (Co-ordination cost x cost) = 25,000 + C (every two years)	
(1 consultant x 2 man-months) = 24,000				
(6 man-months of consultancy x 12,000) + (1 Mtg. x 15,000) + (Co-ordination cost x cost) = 87,000 + C				
5. Resource and Habitat Management				
	5.1 <i>Develop Guidelines for Sustainable Use</i>	5.1.1 To develop standards and criteria for defining sustainability of mangrove management system. 5.1.2 Document models for sustainable use of mangrove eco-system.	(1 consultant x 2 months x 12,000) + (3 Mtgs. x 15,000) + (1 software x 2,000) = 71,000	
			(1 consultant x 1 month x 12,000) + (2 Mtgs. x 15,000) + (National Co-ordination cost) = 42,000 + NC	
	5.2 <i>Environmentally Friendly Technologies</i>	5.2.1 Identify and encourage the use of environmental friendly technologies for timber harvesting, fishing and shrimp farming.	(1 consultant x 1 month x 12,000) + (3 Mtgs. x 15,000) + (National Co-ordination cost) = 67,000 + NC	
	5.3 <i>Alternative Livelihood</i>	5.3.1 Promote multiple-use of mangrove resources and alternative livelihood.	(Co-ordination x cost) + (3 Mtgs. x 15,000) + (National Co-ordination cost) = 45,800 + C + NC	
5.4 <i>Establishment of Management Zones</i>	5.4.1 Establish criteria and guidelines for zoning of mangrove eco-system.	(1 consultant x 2 months x 12,000) + (3 Mtgs. x 15,000) + (1 software x 2,000) = 71,000		

ANNEX 5

Work Plan (2006-2007) and Schedule of Meetings for 2007

Figure 1 Framework Work Plan and Time Table for Mangrove Sub-component to December 31st 2007. (F = final, A = Approved)

Quarter	2004				2005				2006				2007				2008																									
	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4																								
Month	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
National Mangrove Committee Meetings	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																										
National Technical Working Group Meetings		X			X	X			X					X			X							X																		
RWG-M Meetings		X				X								X			X																									
Provide information to RWG-M and RSTC																																										
Maintain national meta-database																																										
Publication of National Reports in local languages (Philippines outstanding)		Ind	Chi&Vie			Cam								Tha,Phi																												
Thailand provide translation of updated data table from Thai version														Sep8																												
Complete second draft and final draft of NAP																																										
Cambodia, Viet Nam			2		F									Cam																												
China			2		F																																					
Thailand, Philippines			2		F															Tha																						
Indonesia					F	2														Ind																						
Adoption of NAP (contributing to SAP targets) All countries																																										
China						A										A																										
Cambodia								A								A																										
Indonesia																		A																								
Philippines											A																															
Thailand											A							A																								
Viet Nam											A							A																								
Finalisation of SAP									1								2																									
Revised SAP inputs from RWG-M														X																												
SEAs provide data on economic valuation														X	Cam, Chi, Ind, Tha																											
Additional Inputs from members to the PCU for the 2 nd draft														X																												
Finalisation of the second draft SAP for Mangroves														X																												
Update data to regional GIS Database					X									X																												
Thailand						X											Tha																									
Indonesia						X											Ind																									
Correction of Meta-database inaccuracies																																										
Thailand (Virus free)																	Sep																									
Viet Nam						30 th Aug											X																									
Implementation of demonstration sites																																										
Up-load of substantive reports to SCS website																	Chi, Ind, Tha, Cam																									
Approval of Batu Ampar														X																												

