



# UNITED NATIONS ENVIRONMENT PROGRAMME

Programme des Nations Unies pour l'environnement

Programa de las Naciones Unidas para el Medio Ambiente

Программа Организации Объединенных Наций по окружающей среде

برنامج الأمم المتحدة للبيئة

联合国环境规划署



## PROJECT DOCUMENT

### SECTION 1: PROJECT IDENTIFICATION

<b>1.1 Project title:</b>	Implementing the Strategic Action Programme for the South China Sea and Gulf of Thailand	
<b>1.2 Project number:</b>	GFL/	PMS:
<b>1.3 Project type:</b>	FSP	
<b>1.4 Trust Fund:</b>	GEF	
<b>1.5 Strategic objectives:</b>	<p>GEF strategic long-term objective: Promotion of collective management of transboundary water systems</p> <p>Strategic programme for GEF V: GEF-5 International Waters Strategic Priority 2: Catalyze multi-state cooperation to rebuild marine fisheries and reduce pollution of coasts and large marine ecosystems while considering climate variability and change</p>	
<b>1.6 UNEP priority:</b>	SP3 - EA321-4/331 & 332	
<b>1.7 Geographical scope:</b>	Regional (South East Asia) - Cambodia, China, Indonesia, Philippines, Thailand, and Vietnam	
<b>1.8 Mode of execution:</b>	External	
<b>1.9 Project executing organization:</b>	UNOPS – SEAFDEC	
<b>1.10 Duration of project:</b>	60 months Commencing: May 2018 Technical completion: June 2023	
<b>Validity of legal instrument:</b>	60 months	
<b>1.11 Cost of project</b>	<b>US\$</b>	<b>%</b>

<b>Cost to the GEF Trust Fund</b>	<b>15,000,000<sup>1</sup></b>	<b>15</b>
<b>Co-financing</b>		
<b>Cash</b>	-	-
<b>Sub-total</b>	-	-
<b>In-kind</b>		
Governments	81,097,585	83
COBSEA	1,854,363	1.5
UNEP	500,000	0.5
<b>Sub-total</b>	<b>83,451,948</b>	<b>85</b>

<sup>1</sup> USD 9,295,000 is executed by UNOPS; USD 5,560,000 is executed by SEAFDEC and the balance is to cover Evaluation Costs.

Total	98,451,948	100
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## 1.12 Project summary

The South China Sea is a strategic body of water surrounded by nations that are currently at the helm of industrialization and rapid economic growth in the Asia-Pacific region. Bordered by the People's Republic of China to the north, the Republic of the Philippines to the east; Malaysia, the Republic of Singapore, the Republic of Indonesia and the Sultanate of Brunei Darussalam to the south, and the Kingdoms of Thailand and Cambodia, and the Socialist Republic of Viet Nam to the west, the South China Sea has always been central to issues of economic and political stability in Southeast Asia and adjacent regions. The South China Sea is also a global center of shallow water tropical marine biodiversity and is central to defining environmental sustainability and food security in the region.

Coastal communities of the South China Sea's riparian states are, however, at the highest risk globally from the impacts of increasing rates of coastal and marine environmental degradation. The Strategic Action Programme (SAP) for the South China Sea, endorsed at the inter-governmental level, represents the only agreed common vision among the participating countries on targets and actions for reversing environmental degradation trends in the South China Sea. The decadal rates of loss of coastal habitats from the SCS are high and increasing. Each decade, 30 percent of seagrass, 16 percent of mangrove, and 16 percent of live coral cover is lost from this basin due to pressures associated with unsustainable patterns of use by the 270 million people that reside on the SCS's coast.

This project entitled "*Implementing the Strategic Action Programme for the South China Sea and Gulf of Thailand*" is financed by the Global Environment Facility and is implemented by the United Nations Environment Programme. The United Nations Office for Project Services (UNOPS) and the Southeast Asian Fisheries Development Center (SEAFDEC) are executing the project in partnership with the Ministries responsible for environment in Cambodia, China, Indonesia, Philippines, Thailand and Vietnam. The overall objective of the project is to assist the governments of the participating countries in meeting the targets of the approved SAP through the provision of technical assistance as required in implementing national activities in support of the SAP; and the provision of strong regional co-ordination of the process of SAP implementation.

The project design is squarely based on achieving SAP targets. Accordingly, project activities will result in significant environmental stress reduction via actions to: establish appropriate forms of sustainable management established for 860,000 ha of mangrove; facilitate effective management arrangements for 153,000 ha of coral reef at 82 priority sites, including a reduction in the decadal rate of degradation in live coral cover from 16 to 5 percent; establish arrangements for the conservation, management and sustainable use of 25,900 ha of known seagrass area in the South China Sea; and develop integrated management of 783,900 ha of coastal wetland at 19 sites, including habitat restoration and strengthened protection at priority wetland locations. The project will also strengthen knowledge-based action planning for the management of coastal habitats and land-based pollution, and will support consensus building on arrangements for strengthened regional cooperation in the management of the marine and coastal environment of the South China Sea.

The project also responds to calls, both globally and regionally, for more results oriented approaches to investment in environmental and natural resource management. Activities will facilitate national and regional level cooperation in tracking results of Strategic Action Programme actions. The project will also make a significant contribution to the achievement of the Aichi targets and Sustainable Development Goals. It is noted that, activities undertaken during SAP formulation and those to be implemented by the present project have not, and will not, address matters relating to jurisdictional dispute. Activities of the coral reef component are restricted to coastal, or non-oceanic, coral reefs, and do not intend to blur the distinction between resolving jurisdictional matters and those aimed at

meeting immediate, and perhaps dire, issues relating to the conservation of globally significant biological diversity embedded in the Strategic Action Programme targets.

### **1.13 Executive summary: linking lessons learned and evaluation findings to project design**

The South China Sea is a strategic body of water surrounded by nations that are currently at the helm of industrialization and rapid economic growth in the Asia-Pacific region. Bordered by the People's Republic of China to the north, the Republic of the Philippines to the east; Malaysia, the Republic of Singapore, the Republic of Indonesia and the Sultanate of Brunei Darussalam to the south, and the Kingdoms of Thailand and Cambodia, and the Socialist Republic of Viet Nam to the west, the South China Sea has always been central to issues of economic and political stability in Southeast Asia and adjacent regions. Today, it is central to defining environmental sustainability and food security for its coastal nations. The coastal sub-regions of these nations are home to 270 000 000 people or 5 percent of the world's population. About 122 major rivers drain 2.5 \*106 km<sup>2</sup> of catchments and deliver materials, including suspended sediments, nutrients and pollutants, to the South China Sea. Recent findings of the Global Environment Facility's Transboundary Waters Assessment Programme identify coastal communities bordering the South China Sea and Gulf of Thailand as being among the most at risk globally from coastal and marine environmental degradation.

Like most tropical coastlines worldwide, the dominant coastal ecosystems of the South China Sea marine basin are mangroves, coral reefs and seagrass meadows. Significant other coastal ecosystems include coastal lagoons, a common coastal landform in Viet Nam, and extensive inter-tidal unvegetated mudflats that are found in many places around the South China Sea (UNEP, 2008d). Socio-economically, culturally and aesthetically, the South China Sea, the Gulf of Thailand and regional river basins and bays form part of the common heritage of the people of the Southeast Asian region. The region's expanding population relies on the SCS for nutrition, livelihoods, recreation and economic pursuits (e.g., tourism), energy (e.g., oil and gas), aquaculture, pharmaceuticals, the ornamental fish trade, construction materials and ports and shipping. The SCS region is ecologically at risk and the rates of loss of dominant coastal habitats from this marine basin are high and increasing. For example the decadal rates of loss of mangrove, seagrass, and live coral cover from the SCS are estimated to be 16 percent, 30 percent and 16 percent, respectively. Reversing this requires regional cooperation for long-term sustainability and regional growth.

Accordingly, the overall goals of this project are: to maintain an environment at the regional level, in which collaboration and partnership in addressing environmental problems of the South China Sea, between all stakeholders, and at all levels is fostered and encouraged; to enhance the capacity of the participating governments to integrate environmental considerations into national development planning; and to strengthen and expand the network of scientists, government officials and civil society established under the UNEP/GEF SCS Project. The medium term objective of the project is to assist the governments of the participating countries in meeting the targets of the approved Strategic Action Programme through the provision of technical assistance as required in implementing national activities in support of the SAP; and the provision of strong regional co-ordination of the process of SAP implementation. As this project builds on a prior SAP formulation initiative, clear guidance was provided by the GEF Secretariat and the GEF's Scientific and Technical Advisory Panel, at the time the project was endorsed for development, to the effect that; project preparation should draw as widely as possible on examples of best practices, lessons learned, and the findings of various evaluations of the SAP formulation initiative. In this connection, background Section 2.1 of this Project Document was prepared with the aim of addressing this guidance. Linkages between this situational analysis and the design of the present project are summarized below.

Firstly and from a contextual perspective, Section 2.1.1 of the background section entitled 'South China Sea TDA and SAP: Formulation Activities' describes activities which enabled the initiation of

epistemic multi-lateral collaboration, the identification of initial information needs to undertake the Transboundary Diagnostic Analysis for the South China Sea, the establishment of mechanisms for scientific and technical review of information and data to be used in planning, and the prioritization of transboundary problems and required interventions. It also provides an overview of the development, goals and objectives of the SCS formulation project. Importantly, effort of that initiative in the areas of epistemic community building and fostering consensus among the participating countries is described in Section 2.1.2 ‘Catalyzing Stakeholder Participation in SAP Formulation’. This section outlines experiences and lessons-learned associated with: the important steps of defining roles of national and regional entities involved in inter-governmental, multilateral environment initiatives; the process of confirming the causes of identified issues and problems; how the project management framework for the SCS project facilitated vertical and horizontal integration and the separation of scientific and political matters to enable clarity in discussion and decision-making; the importance of effective national-level networking to harness the range of knowledge and expertise to address the complexity of problems associated with transboundary water resource management; and the need for step-wise scientific and technical review of the SAP.

These experiences and lessons learned in the area of project organization were applied in the design of the present project and are reflected in the intervention strategy, institutional framework and in agreeing mechanisms for stakeholder participation. For example, the management structure for this SAP implementation project embodies the clear separation of scientific and technical matters from policy issues. This is aimed at fostering the veracity of the scientific and technical elements of the initiatives and minimizing the influence of political constraints on scientific issues below the levels of the Inter-Ministerial Committees within the countries and below the level of the SCS SAP Implementation Committee (equivalent to a Project Steering Committee). The evaluation of the SCS formulation project confirmed the success of this approach in ensuring that “scientific and technical considerations do not become obfuscated by political discussions”.

Importantly, this approach to project coordination also provides mechanisms for each individual or entity to interact with every other individual or entity, hence enhancing vertical as well as horizontal communication and interaction required to achieve consensus and the resolution of difficulties. Specific project activities will support this, including the revitalization of the national committees and regional working groups, and the operation of the Regional Scientific and Technical Committee. Similarly, the important lesson of ensuring transparency via region-wide sharing of a consensual information base is replicated in the present project design by the inclusion of targets relating to the operation of knowledge management platforms. Perhaps the best independent recognition of these knowledge sharing approaches is demonstrated via their showcasing by the Internet company ‘Google’ which highlighted the information sharing initiatives of the SAP formulation project in its news “as a great example of how to connect with a wide audience”<sup>2</sup>.

Section 2.1.3 entitled ‘Refining and Agreeing SAP Targets’ describes the iterative process undertaken to refine and agree upon SAP targets of the SCS SAP, and highlights the focus of this work on the planning of SAP interventions aimed at the simultaneous achievement of local benefit and high transboundary impact. Efforts to develop modeling tools in support of SAP formulation and the monitoring and evaluation of SAP implementation for land-based pollution management are also presented. Provided largely for contextual background, it highlights how the science-based planning fostered during SAP formulation was essential in meeting multi-lateral agreement on the regional targets priority actions for coastal habitat and land-based pollution management in this transboundary water body. It also highlights the imperative that the agreed common vision on priority locations and approaches for future habitat management and the commitments to action contained in the SAP be sustained. The national and local capacity built, and the vast repositories of management information,

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<sup>2</sup> Available online at <http://google-latlong.blogspot.com/2008/02/south-china-sea-project.html>

created through SAP formulation provide a solid foundation for SAP implementation, future planning, and monitoring and evaluation of management interventions. The present project builds on this via the planning of activities at priority sites which are squarely aimed at achieving the agreed SAP targets. The project will also build on the science-based planning fostered during SAP formulation via a range of planned activities to enhance the information-base for coastal habitat and land-based pollution management.

Lessons learned in coastal habitat management from the SCS project's network of 23 demonstration sites are summarized in Section 2.1.4 'Lessons Learned in Coastal Habitat Management from the SCS Project'. Specific lessons learned relate to: the elements of successful approaches to strengthening cross-sectoral coordination and management; involvement of stakeholders in application of the fisheries refugia approach as a tool for habitat management; benefits of involving of the private sector in coastal management; approaches for building the capacity of local governments and communities for law enforcement; the outcomes from integrating traditional knowledge and practices into management planning; environmental stress reduction that can be achieved via the adoption of supplementary and alternative livelihoods as tools for improved habitat and resource management; procedures for the successful promotion of sustainable tourism in coastal areas; the realities of the rehabilitation of habitats and the promotion of sustainable aquaculture practices; and the need bilateral cooperation in managing habitats that straddle transboundary water areas.

The supporting information presented in this section 2.1.4 relating to the approaches and tools used for the design and management of the demonstration activities has been used to plan the approach for operationalizing site-level management of priority mangrove, coral reef, seagrass and wetlands areas targeted through SAP implementation. Similarly, the documented lessons learned will be applied in a similar manner in site-level management planning and will act as a baseline of best practices to be built upon through the present project and will be used in the development of site-level awareness and training products. The related Section 2.1.5 'Coastal Habitat Management: Opportunities for Replication and Scaling-up' outlines considerations of the steps involved in the successful operationalization of targeted management interventions at coastal habitat sites. This was applied to the design of the project results framework and related work plan. Success associated with private sector engagement in mangrove management in China have in part also prompted the inclusion of planned targets relating to the establishment of private-sector partnerships and formulation of private sector investment plans in support of the implementation of the updated Strategic Action Programme.

Important lessons from the operation of the network of demonstration sites, including the benefits associated with mechanisms established for coordination, integration, and learning are also summarised in Section 2.15. These mechanisms which included the involvement of local officials from the demonstration site localities in Regional Scientific Conferences and Mayors Round-Table meetings will be replicated and built up by the present initiative. To support the uptake of regionally accumulated scientific knowledge in policy-making and planning, the project will facilitate exchanges between government and the scientific community via biennial Regional Scientific Conferences. This will be complemented via the development and operation of a network of local government officials and operational level managers, including annual Mayors' Round-table meetings, to share experiences and best practices in the application of science in the management of coastal habitats and land-based pollution. Local networks of community representatives will also be built into these coordination arrangements via incorporation of targets in the results framework that focus on the replication and scaling-up of the partnership with the GEF Small Grants Programme for SAP implementation.

Section 2.1.6 'Land-Based Pollution in the South China Sea: Issues, Lessons Learned and Needs' provides a brief overview of the geographical, demographic and economic context of land-based pollution in the South China Sea, a summary of land-based sources of pollution in the South China Sea, an overview of past regional initiatives addressing land-based pollution in this marine basin. It also summarises the land-based pollution activities of the SCS project (which included the regional

networking of specialists, development of a regional information base for management, hotspot characterization and priority ranking, and operation of pilot activities). An overview of the innovative work of SAP formulation in agreeing frameworks for valuing the impacts of land-based pollution and modelling the carrying capacity of the SCS marine basin is presented. These tools will be applied directly in efforts to develop National Investment Plans and plan for the more effective management of heavy metal contamination of coastal waters. An important lesson learned from SCS formulation that will be carried forward in the present initiative is that the resources required to clean-up individual sources or entire hotspots is beyond the scope of a project of this size. Rather as the SAP promotes, this project will support efforts that serve as replication models or tools to strengthen regional capacity to address land-based pollution at the national level.

Of global significance to the UNEP and GEF, as well as other development organizations and donors working in field of environmental and natural resource management, is the unique methodology and procedures developed during SAP formulation to determine the economic value of the goods and services of coastal habitats, and the application of these in evaluating the cost effectiveness of regional conservation actions. Section 2.1.7 ‘National and Regional Economic Values for Ecotone Goods and Services’ contains the best available data relating to the values of goods and services from coastal habitats of the South China Sea. It also describes the standardised method for computing national and regional weighted mean values of resources and services that can be applied more widely in handling and manipulating economic valuation data from multiple locations across any time span. The techniques can be applied in any region where multiple currencies, varying exchange rates and widespread inter-locational variation in farm gate prices are found. This will be a particularly valuable tool for SAP implementation and future GEF investment in the South China Sea. The specific targets of the revised SAP have been valued or, more specifically, the incremental benefit derived from achieving the target has been valued. The values saved by achieving the targets have been compared with the costs of implementing the actions defined in the regional SAP through a cost benefit analysis. This project will build significantly on this work via efforts to strengthen the dataset and the application of the methodology to emerging issues and planning needs.

The GEF’s Scientific and Technical Advisory Panel (STAP) recommended that the key evaluation finding to be addressed during project preparation was to ensure that frameworks and options for project cooperation be fully explored. In this connection, Section 2.1.8 ‘Legal Aspects of Environmental Management in the South China Sea’ summarizes the comprehensive review of legal aspects of environmental management in the South China Sea and Gulf of Thailand undertaken in preparation for the present project. This includes an overview of obligations concerning regional cooperation under global environment conventions, including: assessments of the status of international environment conventions in the South China Sea area; and summaries of obligations regarding regional cooperation under global conventions. This is complemented by an analysis of regional and sub-regional agreements and soft laws on marine environment in the South China Sea which includes: a summary of regional and sub-regional agreements and soft laws; an assessment of environmental cooperation among Southeast Asian countries; and a detailed overview of the scope and mandate of regional and sub-regional programmes and projects in the South China. This legal review is concluded with a comparative analysis of national legislation on the coastal and marine environment of the South China Sea. The latter includes: a summary of the general status and hierarchical structure of environmental legislation; a review of instruments and mechanisms utilised to protect the marine environment (e.g. legally mandated instruments and mechanisms, non-legally binding and policy instruments, and application of local practices and knowledge); and detailed summaries of national institutional arrangements for coastal and marine environmental management, including mechanisms for enforcement and compliance.

In this connection, Section 2.1.9 ‘Regional Cooperation for Environmental Management in the South China Sea’ a review of instruments and mechanisms for strengthening marine environmental

cooperation in the South China Sea was also undertaken in preparation for this present initiative. This includes an overview of the need for cooperation, from the perspectives of ecological, legal, and socio-economic mandates. Importantly the review includes a detailed review of cooperative efforts for marine environmental protection outside of the South Sea, to identify global lessons learned and examples of best practice, and draws on the abovementioned review of legal aspects of environmental management, to present recommended options for strengthened cooperation. The review also examines the underlying challenges to regional cooperation and presents proposed requirements, or recommended fundamental elements, of efforts to strengthen cooperation. The ecological, socio-economic and political viability of each of the proposed options has also been examined and is outlined further as part of baseline section of this Project Document.

Another key evaluation finding that the STAP recommended should be considered during project preparation is that the GEF "should more clearly define the role and linkages of regional mechanism/s in the context of its broader regional strategy, and ensure country and donor commitments to increasing levels of co-financing to cover the full costs of regional services by the end of the next phase of support". In this connection, it is noted that the Ministers responsible for the environment have previously formally endorsed, at the inter-governmental level, a Strategic Action Programme for the South China Sea. A revised SAP to be signed by Ministers, aimed at continuing the SAP approach to the management of the SCS was confirmed in the preparation of this project as a key result. Similarly, participating countries have provided a high-level of input into the formulation of options for strengthening cooperation in the South China Sea, and have agreed to explore through the present project the agreement of an arrangement for longer-term cooperation.

While preparation of this project has proceeded on the basis of the recommendations of the SCS Impact Evaluation, such recommendations were not complemented by any clear policy guidance regarding a 'regional strategy' of the GEF as alluded to by the STAP. Furthermore, while the emphasis of this project is on supporting the participating countries to meet the targets of the SCS SAP, which must be considered globally significant, this STAP comment raises a pertinent point about alignment of national budget and planning processes, as well as donor support, with longer-term commitment. In this connection, it is noted that the present project has secured co-financing commitments in excess of five-fold those realized during SAP formulation, and has embedded targets in the results framework that relate to the sustainable financing of the operational, scientific and technical, and cooperative aspects of future arrangements aimed at halting environmental degradation in the South China Sea. Section 2.1.10 'From SAP Adoption to SAP Implementation' provides further contextual background information in this regard.

Evaluations relating to the SCS formulation project have also focused on the need for strengthened arrangements for monitoring and evaluation of impact. Related evaluation recommendations align with the increasing emphasis on results oriented approaches to project planning, implementation, and monitoring and evaluation. Accordingly, a significant sub-component of this project will facilitate national and regional level cooperation in tracking results of Strategic Action Programme actions for coastal habitat management. Specific indicators of sustainability to be tracked relate to: the enabling environments for sustainable management; improvements to ecological and environmental state; and socio-economic impacts. Activities are designed to reach agreement on standardized methods and guidelines for habitat inventory and assessment, leading to the achievement of regional-level agreement on a harmonized results framework and analytical tool for tracking and reporting on sustainability of habitat management systems in the SCS basin.

Additionally, an online 'results' portal will be developed to support regional-level capacity building in results-oriented planning and management of coastal habitats, as well as the routine online sharing and syndication of information regarding the results of Strategic Action Programme implementation. The latter will involve online geospatial presentation of results linked to related initiatives of the GEF IW:LEARN initiative. Similarly, performance of the project with respect to indicators defined in the

GEF IW tracking tool will be documented and communicated annually; effort will also be made to align the agreed reporting systems with national reporting requirements to various International conventions and the Sustainable Development Goals.

The STAP also recommended that the project aim to make Marine Spatial Planning approaches more central to the project design. In this connection, a key guiding principle for the project identified during preparation, and outlined in the intervention strategy section of the Project Document, is the ‘Application of Marine Spatial Planning in Strategic Action Plan Implementation’ and is based firmly on: (a) the outcome document of Rio+20, entitled “The Future We Want”, in which world leaders reaffirmed the importance of area-based conservation measures, including marine protected areas, as a tool for the conservation of biological diversity and the sustainable use of its components; and (b) Aichi Biodiversity Target 11, which states that by 2020, 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are to be conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures.

In this connection, project activities focused on establishing marine protected areas and other area-based conservation measures, and the effectiveness of management at these sites, will be undertaken within the broader, multi-sectoral planning context that Marine Spatial Planning approaches provide. This will improve collaboration amongst multiple users of the marine environment as a means to conserve marine and coastal biodiversity while at the same time addressing human needs, including livelihood considerations across coasts around estuaries and coral reefs, in near shore lagoon environments and mangroves and seagrass habitats. Accordingly, the project is aligned closely with the Aichi Strategic Goal C ‘To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity’. This strategic design consideration, in part based on STAP guidance and aims to guide effective inter-linkages with the SEAFDEC/UNEP/GEF fisheries refugia initiative and other work of the project on economic valuation, determining the impact of land-based pollution of the SCS under various loading scenarios, and planning for national-level responses to issues relating to climate variability and change.

In relation to other recommendations of the GEF Secretariat, it is noted that alignment of SAP actions with CBD targets was a key consideration in SAP formulation. Accordingly, the design of the results framework for the SAP project, which focuses primarily on achievement of SAP targets, also aimed where possible to align outcomes with the Aichi process. Accordingly, this project will make significant contributions to the achievement of all Aichi Strategic Goals and more than half of the 20 Aichi targets. This is noted throughout relevant sections of the Project Document, although a detailed description of the alignment of project targets and activities with the Aichi goals and targets is provided in the section on policy conformity and anticipated Global Environmental Benefits. It is noted that the design of the project also took place in the context of the emergence of the Sustainable Development Goals.

Importantly, the project will make substantial contributions towards the achievement of the Sustainable Development Goals, specifically: (a) Goal 1: End poverty in all its forms everywhere – by ensuring that all men and women, in particular the poor and the vulnerable, have equal rights to natural resources, and by building the resilience of the poor and those in vulnerable situations via reducing their vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters; (b) Goal 12. Ensure sustainable consumption and production patterns – by contributing to the achievement of the sustainable management and efficient use of natural resources, and by supporting developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production; and (c) Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development – by efforts aimed at sustainably managing and protecting marine and coastal ecosystems, conserving at least 10 per cent of coastal and marine areas, and by enhancing the

conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of ‘The Future We Want’.

As recommended by the GEF Secretariat, the roles of stakeholders, particularly community representatives, have been more clearly defined and, importantly, mechanisms for their engagement and integration have been defined and reflected in various targets and indicators. Indeed a number of project targets relate to strengthening community stakeholder participation in SAP implementation. Mechanisms for the tracking of stakeholder participation and activities to develop ‘community to cabinet’ stakeholder engagement strategies are planned and budgeted. A key guiding principle for the project ‘Catalysing community action via locally driven solutions’ was agreed during project preparation and acknowledges that locally-driven solutions to key issues influencing coastal sustainability and resilience are a necessity given the high levels of coastal community dependence on natural resources for nutritional security and livelihoods, a disproportionately high percentage of the world’s population residing in coastal areas of the basin, and a highly variable environment characterised by numerous coastal hazards.

Project preparation also identified a series of nine guiding principles and strategic design considerations. These include: (i) Catalysing Community Action via Locally Driven Solutions; (ii) Resolving Problems by Negotiating Outwards; (iii) Facilitating Gender Mainstreaming in SAP Implementation; (iv) Application of Marine Spatial Planning in SAP Implementation; (v) Supporting Results Oriented Planning and Action; (vi) Integrating Climate Variability and Change Considerations in National and Regional Planning; (vii) Investing in Knowledge and Human Capital; (viii) Effectively Communicating the Benefits of Integration and Lessons Learned; (ix) Promoting Public-Private Partnerships. These principles are further elaborated in the intervention strategy of Section 3 of this Project Document. The following outlines the organization of agreed project activities under the three main components of work.

### **Component 1: Reducing habitat degradation and loss via national and local reforms to achieve Strategic Action Programme targets for coastal habitat management in the South China Sea**

**Mangroves:** Regional, national and local activities under this sub-component will result in the achievement of Strategic Action Programme targets for mangrove management. The key anticipated outcome is the establishment of appropriate forms of sustainable management including relevant reforms of laws and regulations for 860,000 ha of mangrove bordering the SCS basin. The project also aims to support these national actions through a regionally co-ordinated programme of technical support; the objective of which is to assist countries in effectively and sustainably managing their mangrove resources. At the national level, activities will focus on: the declaration of 57,400 ha of mangrove as National Parks and Protected Areas; the designation and adoption of plans for the management of 166,600 ha of mangrove as non-conversion, sustainable use areas; national reform of laws and regulations for the sustainable use of 602,800 ha of mangrove forest; the replanting of 21,000 ha of deforested mangrove land; and increased biodiversity for 11,200 ha of mangrove forest via enrichment planting.

**Coral Reefs:** Actions proposed under this sub-component are designed to promote good environmental governance, relevant national legislative and institutional reforms and sustainable management of coral reef ecosystems. The key anticipated outcome is the sustainable management of 153,000 ha of coral reef at 82 priority sites, including a reduction in the decadal rate of degradation in live coral cover from 16 to 5 percent. At the national and coral reef site levels, activities will include: support to the building of management capacity (number/levels human resources, facilities and equipment, and sustainable financing mechanisms) for 82 coral reef sites; actions to improve management approaches and frameworks (integrated, community-based, multiple use) at 82 coral reef

sites; development of management tools (licensing and permit systems, seasonal closures, zoning) in support of legal and regulatory reforms to address key threats at priority sites; and the establishment of mechanisms for monitoring management, ecological and socio-economic indicators at 82 coral reef sites.

**Seagrass:** Activities will include: putting a total of 25,900 ha of seagrass at twenty-one seagrass sites under sustainable management with supporting laws and regulations; the amendment of national management plans for 7 existing MPAs with significant seagrass areas, to include specific seagrass-related management actions; designating 7 new Marine Protected Areas focusing on seagrass areas identified in the prioritized listings of sites identified as part of the SCS SAP formulation; and establishing mechanisms for monitoring management, ecological and socio-economic indicators at 21 priority seagrass sites. The key anticipated outcome is the sustainable management of 25,900 ha of seagrass at 21 priority sites in the South China Sea.

**Estuaries, Brackish Water Lagoons, and Inter-Tidal Mud Flats:** Project activities will focus on coastal lagoons, estuaries and mudflats and will result in improved effectiveness of national policy, legal and institutional arrangements, and co-ordination mechanisms for coastal wetland management. Specific results will include: the development and implementation of management plans for at least 3 lagoons (26,818 ha), 9 estuaries (614,680 ha), 5 tidal flats (96,903 ha), 1 peat swamp (45,700 ha) and 1 non-peat swamp (9,808 ha); the declaration of at least 7 wetland areas with protection status (i.e. non-hunting area, nature reserves, protected areas, Ramsar Sites) including the implementation of the needed management reforms; the development and adoption of a regional estuary monitoring scheme and its national implementation. The key anticipated outcome is the integrated management of 783,900 ha of coastal wetlands at 19 sites bordering the South China Sea marine basin, including habitat restoration, strengthened protection at priority locations, and the enactment of relevant legal and institutional reforms.

## **Component 2: Strengthening knowledge-based action planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea**

The components of the South China Sea Strategic Action Programme addressing coastal habitat degradation, land-based pollution, and regional cooperation each highlight the need to strengthen the science and knowledge base for action planning and management. Component 2 of this project will build on the knowledge-based action planning for the management of the marine and coastal environment of the SCS achieved during Strategic Action Programme formulation. Activities are designed to support consensus building on the information and data to be used in planning and implementing the required local, national and regional reforms required to address the degradation of coastal habitats, land-based pollution, and the adoption of stronger and more formal arrangements for regional co-operation in the management of the marine and coastal environment of the South China Sea.

At the national level, activities of Component 2 both support, and build on, those implemented as part of component 1 aimed at the achievement SAP targets for habitats. For example, activities to enhance the mapping of coastal habitats through interpretation of satellite imagery and other remotely sensed information, quantify the role of habitats in the sequestration and storage of carbon, and improve data sets for the economic valuation of habitat goods and services will be used to inform national and local consultative processes regarding the delineation of management area boundaries, management planning, and the reform of by-laws and ordinances for coastal habitat and resource management at the site level. Additionally, the project will develop tools and mechanisms to guide the development of sustainable management systems for coastal habitats and land-based pollution. These will be used to provide regional level support to operational management at the site level and in tracking the effectiveness of interventions in achieving SAP targets. Similarly, outputs of national activities

associated with delivery of component 1, including the conduct of resource inventories, reviews of national and local policies and regulations, documentation of site level governance conditions, and stakeholder analyses will be used in conjunction with regional reviews of the potential impacts of sea level rise, climate change, and episodic events on coastal habitats to inform the development of updated National Action Plans, and the enactment of supporting legislation, for mangroves, coral reefs, seagrass, and wetlands.

The purpose of the land-based pollution component of the Strategic Action Programme is not to finance interventions that directly reduce the load of contaminants reaching the marine environment from land-based sources. Rather it gives direction to the implementation of activities to support the integration of regional science with national-level policy making and planning for land-based pollution management. In this connection, key outcomes of component 2 include: effective integration of regional science in the management of land-based pollution; and strengthened and harmonized national policies and laws, and supporting financial mechanism, for the management of land-based sources of pollution.

In particular, this project will develop and apply simple models of pollution impacts under different development scenarios for land-based activities to facilitate development decision-making by providing an indication of the sensitivity of specific coastal water bodies to varied heavy metal contaminant loadings. This work builds on related work undertaken during SAP formulation to model the nutrient carrying capacity of the SCS marine basin under various loading scenarios. National level activities will result in: agreement on the legislative and institutional reforms required for land-based pollution management in areas of the South China Sea; harmonization of national Standard Operating Procedures for land-based pollution control and management, including agreed sediment, biota, and water quality criteria; revised national/provincial policies; development, enactment and implementation of supporting regulations for land-based pollution; and updated and adopted of National Investment Plans for land-based pollution management in the SCS. A regional financial mechanism for managing land-based pollution in the South China Sea will also be established.

Better economic valuation of the good and services of the South China Sea's coastal habitats is critical for more sophisticated planning and in communicating with decision-makers. The values determined for coastal habitat goods and services developed during SAP formulation are incomplete since not all known goods or services from individual coastal ecosystems have been valued. One area of current weakness is that there are comparatively few existing values for the service provided by coastal habitats as nursery areas for off-shore fish and crustaceans. This is known to be a significant and major service provided by mangrove and seagrass habitats and Component 2 activities will result in the establishment of the economic value of this service.

Activities of this project at both the national and regional levels to implement the SAP will generate more extensive datasets relating to the economic values of coastal habitat goods and services. This information will be included in the regional dataset and to greatly enhance the utility of the economic valuation of coastal habitats in determining regional priorities for action and intervention. One additional area of identified need that this project will address is the determination of economic losses of coastal ecosystem goods and services consequent upon coastal shipping accidents and land-based pollution damage. Component 2 will therefore result in improved national and regional values for the Total Economic Values of coastal habitats for use in development planning and decision-making, and will make substantive contributions to the conduct of cost-benefit analyses of management options undertaken as part of national action planning for coastal habitats and land-based pollution, as well as in updating the SCS TDA and SAP. The economic valuation activities of Component 2 will also build on work undertaken during SAP formulation to value the economic impacts of land-based pollution from local, national and transboundary perspectives. This will be applied to the planning of a mechanism for the sustainable financing of land-based pollution activities as part of revising the SCS SAP.

Activities to undertake a more contemporary Transboundary Diagnostic Analysis for the SCS basin, and linked actions to prepare an updated Strategic Action Programme for the SCS, will draw on information generated via the abovementioned activities. Additionally, as part of preparing an updated TDA and SAP, Component 2 activities will: facilitate a consultative processes to reach national and regional level consensus on contemporary issues and problems in the SCS, including the quantification of environmental compromises and the prioritization of problems; prepare guidelines and mobilize technical support to assist with the characterization of the immediate and ultimate root causes of the problems identified; support consensus-building on priorities for intervention, including the assessment of the comparative net benefit of options based on revised economic valuation information; and identify and prioritize national management actions to address climate variability and change for subsequent incorporation into national marine and coastal policies and plans.

**Component 3: Facilitating regional and national level integration and cooperation for implementation of the South China Sea Strategic Action Programme**

The South China Sea Strategic Action Programme acknowledged the need for strengthened regional cooperation in SAP implementation, as well as the adoption of stronger, financially sustainable, and more formal arrangements for regional co-operation in the longer-term management of the marine and coastal environment of the South China Sea. Accordingly Component 3 activities will facilitate the regional and national level integration and cooperation required to generate the reforms required to reduce environmental degradation trends and guide the longer-term sustainable management of the marine and coastal environment of the South China Sea.

The SAP includes a number of agreed mechanisms for effective cooperation. These include the operation of a high level scientific and technical body to serve as a forum for reconciling both sectorial and national interests and priorities, and to foster the incorporation of sound science into decision-making. Accordingly, Component 3 of this project will meet this agreed need via operation of a Regional Scientific and Technical Committee that will act as a source of independent scientific and technical advice to policy-makers. To support the uptake of regionally accumulated scientific knowledge in policy-making and planning, Component 3 activities will facilitate exchanges between government and the scientific community via biennial Regional Scientific Conferences. This will be complemented via the development and operation of a network of local government officials and operational level managers, including annual Mayors' Round-table meetings, to share experiences and best practices in the application of regionally accumulated science in the management of coastal habitats and land-based pollution.

A further expected result of Component 3 is sub-regional cooperation in the integration of scientific knowledge and research outputs in two priority transboundary areas. The latter builds on a key innovation of the SCS SAP formulation process which involved the generation of bilateral cooperation between Cambodia and Viet Nam which led to the signing of a Memorandum of Understanding between the Provincial Governors of Kampot (Cambodia) and Kien Giang (Viet Nam) (and which was subsequently formalized by the central governments of these countries) for the joint management of the environment and coastal resources of their shared transboundary water area. Activities of Component 3 will result in the strengthening of this formal transboundary cooperation and facilitate its replication in an additional two transboundary areas.

An additional mechanism for cooperation emphasized in the agreed South China Sea Strategic Action Programme includes networking at all levels and amongst all stakeholders. In this connection, activities of Component 3 will build on the intra-country and inter-country consultation and cooperation fostered during SAP formulation via efforts to strengthen civil society, community organization, and private sector engagement in SAP implementation and revision. Specifically, capacity for civil society and community organization participation in SAP implementation will be strengthened via an operational partnership with the GEF Small Grants Programme. Component 3

will also result in strengthened and formalized relationships between central and local governments and the private sector via development of public-private partnerships and the formulation of an associated private sector investment plan for the implementation of the updated SAP.

Component 3 activities will also revitalize and strengthen regional mechanisms for communications, knowledge exchange, and information and data management and sharing. This will involve the development and implementation of a communications strategy for the delivery of targeted messaging to national level stakeholders, regional supporting organizations and projects, and donors on the results of SAP implementation and related efforts in strengthening regional cooperation. This is aimed at stimulating support and awareness of necessary policy and legal reforms and in ensuring that best practices generated at the national level are captured, shared and effectively communicated to guide the longer-term sustainability of investments. Component 3 will also develop regionally appropriate knowledge tools to support decision-making and planning, including the sustained operation of the SCS web portal <[www.unepscs.org](http://www.unepscs.org)> and associated regional databases, which will also be linked to IW:LEARN and other GEF knowledge management systems. Active engagement with GEF IW:LEARN [1% of project resources], including participation in IW conferences and preparation of 3 experience notes, will also be fostered.

Of significance is Outcome 3.5 “*Agreed arrangements for strengthened regional cooperation in the management of the marine and coastal environment of the South China Sea*” which involves the review and assessment of regional and national institutional frameworks and the formulation of appropriate recommendations for strengthened regional cooperation in the implementation of the SAP for the management of the marine and coastal environment of the South China Sea. Such cooperation will foster the wise use of natural, human and financial resources whilst conforming to the ethos and culture of the region. Supporting activities include: biannual meetings of the Regional Task Force on Legal Matters to review the proposed policy, cooperation and institutional strengthening recommendations in support of SAP implementation; the establishment and operation of National Working Groups on matters to be decided by the participating countries to support national and provincial level discussion and agreement on policy, cooperation and institutional reforms; and reviews and evaluation of existing arrangements for cooperation leading to adoption of an instrument to strengthen regional cooperation for coastal and marine environmental management in the South China Sea.

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## ACRONYMS AND ABBREVIATIONS

APEC	Asia-Pacific Economic Council
APEC-MRCWG	APEC-Marine Resource Conservation Working Group
ASEAN	Association of South East Asian Nations
ASEAN+1	ASEAN-China Strategic Partnership
ASEAN+3	ASEAN plus China, Republic of Korea and Japan
CIDA	Canadian International Development Agency
CITES	Convention on Trade in Endangered Species
CO	Community Organisation
COBSEA	Co-ordinating Body on the Seas of East Asia
CSO	Civil Society Organisation
DANIDA	Danish Internation Development Agency
DENR	Department of Natural Resources and Environment (of the Government of Philippines)
DEPI	Division of Environmental Policy Implementation (of UNEP)
EAS/RCU	East Asian Seas Regional Coordinating Unit
EBM	Ecosystem-based Management
EO	Executive Order
EOU	Evaluation Office (of UNEP)
EU	European Union
FAO	Food and Agriculture Organization (of the United Nations)
GEF	Global Environment Facility
GIS	Geographical Information System
GOOS	Global Ocean Observing System
GoT	Gulf of Thailand
GPA/LBA	Global Programme of Action for the Protection of the Marine Environment from Land-based Pollution
ICM	Integrated Coastal Management
IMC	Inter-Ministry Committee
IMO	International Maritime Organisation
IOC WESTPAC	Intergovernmental Oceanographic Commission Sub-commission for the Western Pacific
IUCN	International Union for the Conservation of Nature
IW	GEF International Waters Focal Area
IW:LEARN	International Waters Learning, Exchange and Resource Network
JODC	Japan Oceanographic Data Centre
LME	Large Marine Ecosystem
MPA	Marine Protected Area
MoA	Memorandum of Agreement
MoU	Memorandum of Understanding
M&E	Monitoring and Evaluation
MRT	Mayor's Roundtable Meeting
NAP	National Action Plans (developed in support of the SAP)
NBSAP	National Biodiversity Strategic Action Plans
NFP	National Focal Point
NGO	Non-Governmental Organisation
NTFP	National Technical Focal Point
NTWG	National Technical Working Group
NWG-L	National Working Groups on Legal Matters (of the SCS project)

PCU	Project Co-ordinating Unit (of the SCS project)
PEMSEA	Partnership for Environmental Management in the Seas of East Asia
PoW	Programme of Work
PPO	Project Plan of Operation
PSC	Project Steering Committee (of the SCS project)
RSTC	Regional Scientific and Technical Committee
RTF-L	Regional Task Force on Legal Matters
RTF-E	Regional Task Force on Economic Valuation
RWG-CR	Regional Working Group on Coral Reefs
RWG-M	Regional Working Group on Mangroves
RWG-SG	Regional Working Group on Seagrass
RWG-W	Regional Working Group on Wetlands
RWG-LbP	Regional Working Group on Land-based Pollution
SAP	Strategic Action Programme for the South China Sea
SAP-IC	Strategic Action Programme Implementation Committee
SAP-IU	Strategic Action Programme Implementation Unit
SCS	South China Sea
SCS Project	UNEP/GEF project entitled “ <i>Reversing Environmental Degradation Trends in the South China Sea</i> ”
SDGs	Sustainable Development Goals
SEA	Specialized Executing Agency
SEAFDEC	Southeast Asian Fisheries Development Center
SEA START RC	Southeast Asia Regional Centre of the Global Change System for Analysis, Research and Training
SGP	Small Grants Programme of the GEF
SIDA	Swedish International Development Agency
SMART	Specific, Measurable, Achievable and Attributable, Relevant and Realistic, Time-bound, Timely, Trackable and Targeted Indicators
TDA	Transboundary Diagnostic Analysis
UNEP-DEWA	UNEP Division of Early Warning and Assessment
UNON	United Nations Office at Nairobi

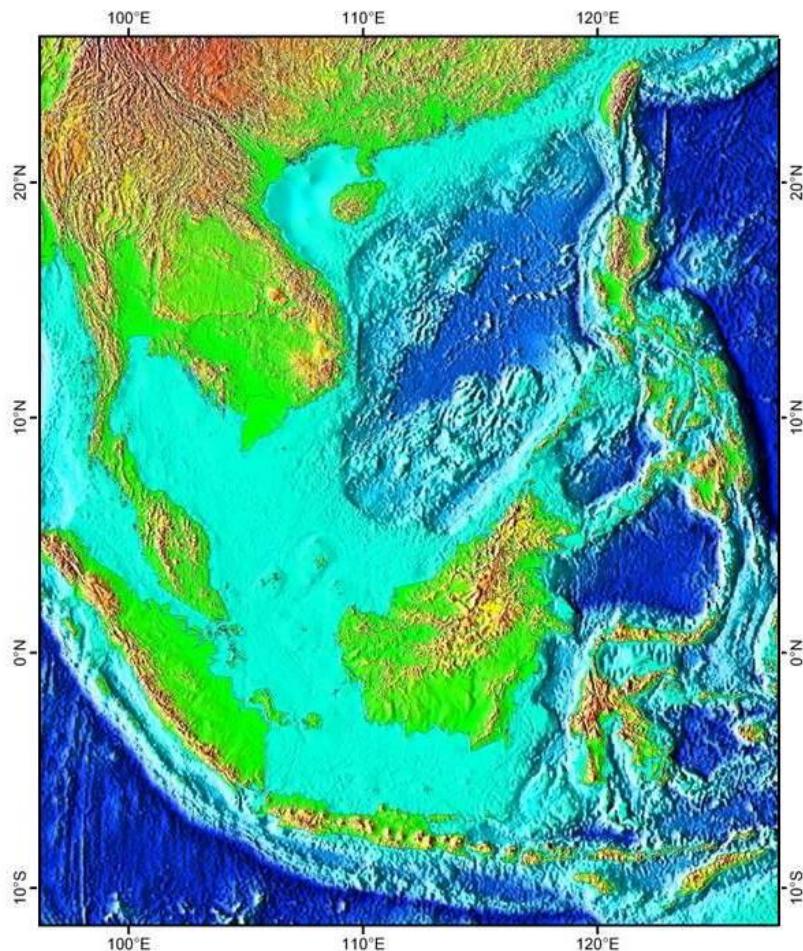
## **SECTION 2: BACKGROUND AND SITUATION ANALYSIS (BASELINE COURSE OF ACTION)**

### **2.1. Background and context**

#### **2.1.1. South China Sea TDA and SAP: Formulation Activities**

##### **2.1.1.1. Initiating epistemic multi-lateral collaboration**

1. The South China Sea (Figure 1) is a strategic body of water surrounded by nations that are currently at the helm of industrialization and rapid economic growth in the Asia-Pacific region. Bordered by the People's Republic of China to the north, the Republic of the Philippines to the east; Malaysia, the Republic of Singapore, the Republic of Indonesia and the Sultanate of Brunei Darussalam to the south, and the Kingdoms of Thailand and Cambodia, and the Socialist Republic of Viet Nam to the west, the South China Sea has always been central to issues of economic and political stability in Southeast Asia and adjacent regions. Today, it is central to defining environmental sustainability and food security for its coastal nations. The coastal sub-regions of these nations are home to 270 000 000 people or 5 percent of the world's population<sup>3</sup>. About 122 major rivers drain  $2.5 \times 10^6 \text{ km}^2$  of catchments and deliver materials, including suspended sediments, nutrients and pollutants, to the South China Sea.



**Figure 1.** Geographical location of the South China Sea marine basin

<sup>3</sup> Coastal communities bordering the South China Sea and Gulf of Thailand have been identified as being among the most at risk globally from coastal and marine environmental degradation (IOC-UNESCO and UNEP, 2016)

2. The pace of economic development in these countries has not been without environmental cost and, in 1981, the ASEAN countries of Southeast Asia formed the Coordinating Body for the Seas of East Asia as a forum in which environmental problems could be discussed and actions planned to mitigate the adverse environmental consequences of rapid economic development. In October 1996, UNEP, as an Implementing Agency of the Global Environment Facility (GEF), approached the GEF Secretariat with a proposal to develop a GEF-funded project encompassing the South China Sea that formed only part of the geographic coverage of the Coordinating Body for the Seas of East Asia (COBSEA).

3. This approach was based on a request from the member governments of COBSEA that a GEF project be developed for the region to address regional environmental management. Accordingly, UNEP, through its then Coordinating Office for the GEF, developed a proposal for a GEF project in the South China Sea, including the Gulf of Thailand. This proposal conformed to the GEF approach to funding activities addressing environmental problems in large marine ecosystems.

4. The 1995 Operational Strategy of the GEF defined the objective of its international waters focal area as “*to contribute primarily as a catalyst in the implementation of a more comprehensive, ecosystem-based approach to managing international waters and their drainage basins as a means to achieve global environmental benefits*” (GEF, 1996). Central to this strategy and its operational programmes was the recognition that, as a first step, countries would require support in joint fact-finding in order to develop the information base required to plan sectoral reforms and investments needed to mitigate or reverse transboundary environmental degradation of specific water bodies.

5. Accordingly, the first set of GEF operational programs for international waters made reference to the “*conduct of a transboundary diagnostic analysis (TDA) to identify priority environmental concerns*”<sup>4</sup> and the formulation of “*a Strategic Action Program (SAP) of actions each country needs to take to address priority transboundary concerns*”. The underlying rationale for this TDA and SAP approach was that, once the root causes of transboundary concerns had been identified and key threats to the given transboundary water system established, countries would collaborate in determining and agreeing upon the collective and national-level actions needed to address priority concerns.

6. In this connection, the United Nations Environment Programme (UNEP) implemented project entitled “*Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand*”<sup>5</sup> supported seven riparian countries of the South China Sea through this TDA-SAP process from 2002 to 2008. The project was financed by the GEF and co-financed by the participating countries. TDA and SAP development involved the design and operation of structured processes aimed at facilitating cross-sectoral collaboration, stakeholder participation, joint fact-finding and stepwise decision-making, scientific independence and veracity, and transparency with the information sharing required to establish threats and to plan priority interventions in a multi-lateral, intergovernmental setting. A key element of these processes included the development of procedures for information gathering, review and management aimed at enabling the participating countries to arrive at a consensus on a common package of information and data to be used in planning.

7. The complexity of the SCS project, which involved seven countries and six major areas of activity, resulted in the establishment of a large network of institutions and individuals involved directly and indirectly in project activities. This extensive network represented numerous entry points to a large number of national level sources of data and information relating to the science and management of habitats, fisheries and land-based pollution in the South China Sea and Gulf of Thailand. Ultimately, more than 100 institutions from the region were directly involved in the

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<sup>4</sup> GEF, 1997. Operational Programs, page 8-3 para 8.9 sub-para (a).

<sup>5</sup> Hereafter referred to as the SCS project.

execution of project activities and more than 400 institutions were involved indirectly through individual participation in meetings and national level activities. Such networks of professionals with recognised expertise and competence in particular policy domains, such as environment and natural resource management, are often referred to as ‘epistemic communities’. Epistemic communities have typically arisen in settings that require analysis of a diverse and complex range of information and data to guide multilateral decision-making on issues such as security and defence, marine pollution (e.g. Jeftic, L. 1993) and stratospheric ozone protection (see Ruggie, 1975; Haas, 1992; Olsen and Hale, 1994); Zito, 2001).

8. A key attribute in determining the degree of influence of decisions made and the advice given by epistemic communities is the level of consensus among members of the community on the set of information used in decision-making (Hass, 1989; Knorr-Cetina, 1999). While concerns for the efficacy of a consensus approach, such as possible suppression of diversity of opinion and values, have been reported in some settings (Van de Kerkhof, 2006), consensus-building was central to the operation of the SCS project.

9. As reported by Chen (2013), the complex geopolitics of the South China Sea region and the lengthy negotiations involved in the development of the SCS project required the establishment of project management procedures to support the epistemic community of scientists, resource managers, economists and lawyers in reaching consensus on the priorities for intervention in the South China Sea. The unique management framework of the SCS project with its detailed terms of reference for all involved individuals, committees and other entities, described by Pernetta and Jiang (2013), not only facilitated the flow of information and data between and among members of the network to inform the formulation of the South China Sea SAP but also provided a well-defined structure within which data and information could be evaluated and consolidated at different levels.

10. Various studies indicate that consensus building can be enhanced by institutionalising procedures to ensure: clear definition of the roles and responsibilities of the actors involved; early identification of the needs and purpose of the process; mechanisms to foster and sustain stakeholder participation; scientific veracity and step-wise review of information used; and transparency with information sharing (McKinney, 1988; Susskind et al., 2003; Reed, 2008). The SCS project paid significant attention to all of these elements in establishing procedures for information gathering, review and management aimed at achieving consensus in support of SAP formulation.

### **2.1.1.2. Identifying initial information needs**

11. Initially, the GEF provided a project development facility (PDF-B) grant of US\$ 325,000 to undertake a transboundary diagnostic analysis of the water-related issues and problems of the South China Sea and to design an appropriate multi-country intervention to address priority issues. The seven participating countries<sup>6</sup> each nominated a national focal point from within the ministries responsible for the environment to coordinate national inputs to this preparatory phase (UNEP, 1997).

12. Three meetings of national coordinators were convened between 1997 and 1999 to formulate a TDA and framework SAP for the South China Sea. These meetings initiated information gathering, review, and support for the identification of priority options for interventions to address transboundary concerns. The reports of those meetings provide a record of key steps taken and the approach developed for the compilation, step-wise review, and analysis of information and data required to identify priority issues and problems, and their immediate and ultimate causes for inclusion in a TDA report. Analysis of these causes enabled identification of the initial priority options for intervention for inclusion in the framework SAP. The first meeting, convened in Bangkok, Thailand in 1997, was

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<sup>6</sup> Cambodia, China, Indonesia, Malaysia, Philippines, Thailand, and Viet Nam.

attended by national coordinators and representatives of UNEP and other supporting organisations. Discussions focused on substantive consideration of the elements for inclusion in a TDA<sup>7</sup> and SAP.

13. The first meeting initiated national level efforts to compile the information required to identify and analyse issues and problems relating to the South China Sea. It was agreed that the starting point in the analysis of the causal chain would be the environmental issues or problems. The analysis would then lead ultimately to their social, economic, and cultural root causes. Causal chain analyses were discussed for water related issues with transboundary significance, including freshwater scarcity, pollution, habitat and biological community modification, unsustainable exploitation of fisheries, and global change<sup>8</sup>. Preliminary analyses of identified water-related issues and problems were also conducted<sup>9</sup>.

14. The national coordinators subsequently compiled national information for incorporation into national reports aimed at informing efforts to identify the extent of the sources and impacts of identified issues, as well as trends in economic development and demographic characteristics. A national report structure was agreed and included *inter alia*: analysis of water related concerns and principal issues; analysis of the social and economic costs of identified water-related environmental issues; analysis of root causes; constraints to action; on-going and planned interventions relevant to the identified issues; proposed new interventions; and an assessment of the sectoral implications of such interventions<sup>10</sup>.

#### **2.1.1.3. Establishing mechanisms for scientific and technical review**

15. The second meeting was convened in Bangkok, Thailand and participation was expanded to include national technical experts as well as senior advisors and experts from the region. In addition to an update on the status of national report preparation and TDA development, the meeting introduced mechanisms for regional level information sharing and review. Regional experts, for example, were invited to update the meeting on related on-going work in the region through presentations covering: efforts to link ecological and environmental values to economic values for mangrove ecosystems; the work of other GEF supported initiatives; and an overview of the Global Ocean Observing System.

16. Draft national reports had been prepared by six countries. These had been evaluated and feedback provided to national coordinators in advance of the second meeting. Second draft reports were submitted by these countries in advance of the meeting, three of which contained adequate information and a sufficient depth of analysis for use in the conduct of a regional analysis of water-related issues. The six reports were presented to the meeting by national coordinators and collectively reviewed by the participants. The meeting highlighted several limitations of these reports, including: the possibility that required information had not been compiled for use in the analyses due to it being held by national agencies not yet engaged in national consultations; the need to strengthen baseline information on the socio-economic implications of problems of the South China Sea; and some uncertainties regarding the science used in several studies referenced in national reports (UNEP, 1998a).

#### **2.1.1.4. Prioritizing transboundary problems and required interventions**

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<sup>7</sup> The emphasis of a TDA is on the cause and effect chain (or “causal chain”) of relationships between the environmental issue or problem and its root cause in the social, economic, and/or cultural spheres of human activity (see UNEP, 1997; Pernetta and Bewers, 2012)

<sup>8</sup> See Annex 3 of UNEP (1997) entitled “*Transboundary Diagnostic Analysis*”.

<sup>9</sup> See Annex 4 of UNEP (1997) entitled “*Preliminary Analysis of Causes of Water-related Issues and Problems in the South China Sea Region*”.

<sup>10</sup> See Annex 7 of UNEP (1997) entitled “*Outline and Content of National Reports*”.

17. Causal chain analyses by each country for each identified water-related problem were reviewed and finalised during the meeting<sup>11</sup>. The transboundary extent of these problems was characterised and then prioritised on the basis of a Delphi-type<sup>12</sup> exercise<sup>13</sup>. These priorities were then used as the foci for the preparation of a preliminary table of contents for the consolidated TDA report that was ultimately agreed by the national coordinators and regional experts<sup>14</sup>. An initial framework SAP to address the integrated management of water-related resources and environment of the South China Sea and a template for a full size GEF project document<sup>15</sup> were also discussed during the meeting. The TDA and draft SAP were presented to, and revised by, the third meeting of the national coordinators convened in 1998.

18. The national reports, the TDA and the draft framework SAP were subsequently presented to the thirteenth meeting of the Coordinating Body on the Seas of East Asia (COBSEA) convened at the end of 1998. That meeting endorsed the draft framework SAP (UNEP, 1998c). The full project document for the SCS project was subsequently developed. Following an extensive process of country consultation and endorsement, and final GEF Chief Executive Officer endorsement in December 2001, the SCS project became operational at the time of final signature of the project document by UNEP on 21 January 2002.

#### **2.1.1.5. TDA/SAP project design**

19. The design and implementation of a multilateral, intergovernmental initiative to address diverse priorities such as the loss and degradation of habitats, over-exploitation of fisheries and land-based pollution in a shared marine basin is complex. Global experience in shared water body management indicates that it often takes several decades before meaningful commitments to implementing the joint management required to address the root causes of transboundary water problems can be secured, even when only a single country is involved (e.g., the Murray Darling River system in Australia and Chesapeake Bay in the United States of America).

20. The time required for these water bodies to respond to actions aimed at reducing stress is also on the decadal time scale (Steele, 1989; Pernetta and Elder, 1993). Central to these efforts is a need to establish mechanisms that enable the countries and sectors involved to obtain a better understanding of each other's issues, build trust and confidence among the various stakeholders, and establish a common understanding regarding water and coastal concerns (Ollila et al., 2000). Accordingly, the

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<sup>11</sup> See Annex 5 of UNEP (1998a) entitled “*Causal Chain Analysis of Water Related Environmental Issues in the South China Sea; by Country*”.

<sup>12</sup> The Delphi method was utilised as a key process tool by the SCS project to facilitate consensus decision-making. Linstone and Turoff (1975) defined the Delphi method “as a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem”. A Delphi exercise involves the iterative questionnaire polling of group member views and opinions on specific problems. For example, the Delphi method was used to reach regional agreement on the transboundary significance of pelagic and demersal fish stocks. The results of this exercise were used to identify habitat areas that serve as critical fisheries refugia for fish stocks of transboundary significance.

<sup>13</sup> See Annex 6 of UNEP (1998a) entitled “*Transboundary Aspects of Water-Related Environmental Issues in the South China Sea Analysed by Country to Produce a Comparative Qualitative Ranking of Importance*”.

<sup>14</sup> See Annex 7 of UNEP (1998b) entitled “*Draft Outline for the Transboundary Diagnostic Analysis for the South China Sea and its Associated Freshwater Catchments*”.

<sup>15</sup> ‘Project document’ is a term used within the GEF community to refer to the full project design document for a project. It is the key tool for formulating and implementing a GEF project, as well as for monitoring and evaluation, and is a legal instrument that must be appropriately signed in order for funds to be disbursed to a project. The project document also constitutes the contractual basis for any undertaking with a cooperating agency or supporting organisation, as well as the basis for the terms of agreement for any consultancy or contractual services for the project. A project document is also often referred to as a ‘project brief’. The project document for the SCS project is available online at <[http://www.unepscs.org/Project\\_Background.html](http://www.unepscs.org/Project_Background.html)>.

overall goals of the SCS project focused on fostering collaboration and partnership to address environmental problems of the South China Sea marine basin.

21. Efforts aimed at fostering collaboration and partnership among the participating countries were initiated during the project PDF-B phase from 1996 to 2001. The joint fact-finding and step-wise review of national sources of information, the TDA, and the framework SAP assisted in building some experience in information gathering, review and analysis. Participants in that process also gained familiarity with the challenges involved in compiling the necessary information and data and sharing them in a regional setting using a second or sometimes third language. The development of the SCS project recognised that these initial efforts would need to be intensified, both in terms of stakeholder involvement and the range of information used, to meet the project objectives.

22. At the time of its approval by COBSEA in 1998, the member countries requested that further elaboration and development of the framework SAP be a defined output from the operational phase of the project (UNEP, 1998c). Accordingly, funds from the GEF grant were allocated to a variety of activities designed to elaborate the information base required to achieve the medium term objective of “*elaborating and agreeing at the intergovernmental level the Strategic Action Programme encompassing specific targeted and costed actions for the longer-term, to address the priority issues and concerns*”<sup>16</sup>. Projected outcomes of these activities included: an approved SAP based on a targeted and costed programme of actions; a framework for improved regional co-operation in the management of the environment of the South China Sea; and a series of national action plans for specific habitats and issues.

23. The project management framework (see Pernetta and Jiang, 2013) developed for the project was, in part, designed to enable the timely and structured flow of information and data between and among all partners. The first meeting of the Regional Scientific and Technical Committee (RSTC) for the SCS project recognized the importance of this network of partners in assembling additional information and data and establishing procedures for review as follows: “*The Committee instructed the Regional Working Groups to prepare a list of data/information requirements in their first meetings, together with a suggested standard format for use at the level of the national committees*”<sup>17</sup>; and “*The Committee also indicated that there is strong need for the National Technical Working Group, and national committees in each country to review the data/information provided in the national reports, and to provide updated data and information for the project, particularly in relation to data sources at the national level which may have been ignored during the preparation of the national reports*”<sup>18</sup>.

### **2.1.2. Catalyzing Stakeholder Participation in SAP Formulation**

#### **2.1.2.1. Defining roles of national and regional entities**

24. A total of 31 government-designated organisations signed Memoranda of Understanding (MoUs) with UNEP to act as Specialised Executing Agencies (SEAs) for national level activities of the project. These MoUs contained detailed terms of reference for the key individuals and committees and defined the roles and responsibilities of SEAs in implementing project tasks and supporting various national and regional committees established as part of the project management framework. The original MoUs outlined sixteen preparatory phase tasks for which SEAs would be responsible. These tasks related to: establishing/revitalising and chairing national committees (e.g., Inter-Ministerial Committees); information and data gathering, review and management; provision of scientific and

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<sup>16</sup> It is noted that, while contemporary results frameworks for GEF International Waters projects require Ministerial signature of Strategic Action Programmes, no such policy guidance on SAP endorsement was provided by the GEF Secretariat during the SCS SAP formulation project.

<sup>17</sup> See paragraph 7.1.3 of UNEP (2002a)

<sup>18</sup> See paragraph 7.1.4 of UNEP (2002a).

technical advice to national committees and regional working groups and task forces; development of a National Action Plan (NAP); and the revision of the regional SAP.

25. The MoUs were amended during 2004 to reflect the roles and responsibilities of the SEAs during the operational phase of the SAP formulation project (2005-2008). Terms of Reference<sup>19</sup> (ToR) were also clearly defined at project inception for the National Inter-Ministerial Committees (IMCs), National Technical Working Groups (NTWGs), and National Committees for the components and activities of the project. These ToR provided direction, for example, to the National Committees to compile and share information and data with the NTWG, the Regional Working Groups (RWGs) and the Regional Scientific and Technical Committee (RSTC). The NTWGs were, for example, charged with the responsibility of reviewing and approving the scientific and technical content of reports from the SEAs prior to their submission to the IMCs or RWGs.

26. A corresponding set of ToR were established for the RSTC and each of the RWGs established for mangroves (RWG-M), wetlands (RWG-W), coral reefs (RWG-CR), seagrass (RWG-SG), fisheries (RWG-F) and land-based pollution (RWG-LbP). The RWGs were charged with co-ordinating the work of National Committees in order to ensure the effective execution of activities in the various project components. Specific RWG activities included *inter alia*: development of criteria for determining the global, regional and transboundary significance of habitats and fish stocks; coordination of efforts to develop national meta-databases; compilation and review of information relating to economic valuation; and the stepwise review of information and data compiled by national committees. The RSTC was mandated to coordinate and review the work of the RWGs and provide sound scientific and technical advice to the inter-governmental Project Steering Committee (PSC) regarding SAP formulation.

### **2.1.2.2. Confirming causes of identified issues and problems**

#### ***Agreeing information needs and specifying data fields***

27. Specific information needs were discussed by the early preliminary phase meetings of each of the six RWGs convened between 2002 and 2003. The national reports and TDA were discussed and known national and regional sources of information were identified. Emphasis was placed on confirming the causes of identified issues and problems identified in the TDA via the conduct of causal chain analyses for each of the four priority habitats, fisheries and pollution. In addition to undertaking a technical and scientific analysis of the water-related issues and problems, the RSTC and RWGs worked to identify the information needed to prioritise actions in relation to maximising benefits from the investments or expenditures to be committed under the Strategic Action Programme.

28. Efforts to identify information needs during these early meetings considered the scale of the transboundary nature of particular marine environmental problems. The reports of those meetings indicate a progressive shift in emphasis from consideration of specific national issues to those that were significant from regional or global perspectives. It was emphasised that actions that solve local problems and simultaneously result in regional and/or global environmental benefits will generally be of higher priority because the cumulative value of the benefits will exceed the value of the actions having solely local effect.

#### ***Collation of regionally comparable information and data***

29. Given the complexity of the information required to inform decision-making, several RWGs requested that a workshop be convened to develop formats for the collation of information and data. A workshop was subsequently convened in Bangkok, Thailand, during the early phase of SAP formulation and was attended by country nominated experts, observers, and representatives of the Southeast Asia regional centre of the Global Change System for Analysis, Research and Training

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<sup>19</sup> Approved by the First Meeting of the Project Steering Committee (UNEP, 2001).

(SEA START RC), and the Project Coordinating Unit (PCU). This workshop developed detailed questionnaire templates for the compilation of information and data required to characterize known habitat sites and fisheries of national, regional and global significance in the South China Sea, and provide a basis for the analysis of the local and regional impacts of land-based pollution (UNEP, 2002b).

30. The habitat questionnaire templates provided a common tool for the development of regionally comparable national data and information sets relating to *inter alia* the distribution and diversity of coastal habitats, the richness of habitat building species and hotspots of biodiversity, present threats, and the status of management and socio-economic circumstances at the sites. The questionnaires for fisheries focused on the compilation of information and data on landings and fishing effort by fishing gear type and administrative units, the contribution of the fisheries sector to employment and food security, identification of species of regional, global and/or transboundary significance, areas of significance to the maintenance of exploited fish stocks, and threats to those areas. The land-based pollution questionnaire was directed towards the compilation of information from monitoring stations in the South China Sea, on coastal impacts, including the quality of ambient water and sediments, human health impacts and loading data from various sources.

31. The questionnaires were subsequently reviewed and amended by meetings of the RWGs. For example, the second meeting of the RWG on mangroves discussed and agreed on the list of obligate<sup>20</sup> and associated mangrove species that would be used as indicators of biodiversity during site characterisations (UNEP, 2002c). The corresponding meeting of the RWG on seagrass considered questionnaire fields relating to extractive and non-extractive uses of seagrass resources and the ecological function of seagrass beds. The RWG-SG deemed it necessary to include these economic valuation characteristics in the lists of data and information required for the identification and characterisation of seagrass sites. This was required to evaluate the potential benefits and costs of management action versus a no action scenario (UNEP, 2002d).

32. Similarly, in considering the regional formats for collecting water quality data and information, the RWG-LbP agreed that the ASEAN water quality criteria be applied, which resulted in an agreed list used by all countries. The RWG also agreed that the standards for sediment samples and biological samples used in China, which were the only criteria adopted in the participating countries at that time, would be used as regional criteria for comparison with other relevant data and information (UNEP, 2002e). The second meeting of the RSTC considered the discussions held during preceding meetings of the RWGs on the questionnaires and urged the project's National Technical Focal Points to ensure that coordination and cooperation among the various national sectoral agencies in the compilation of this data was facilitated and that corresponding activities be included in the work plans of the national committees and technical working groups (UNEP, 2002f).

#### ***Initiating the development of a regional meta-database***

33. It was also recognised by the RWGs and the RSTC that, while many valuable data sets on coastal habitats, fisheries and land-based pollution had been previously developed in the participating countries, access to, and the sharing of, this information was often limited. Contributing to such limitations were weak data management systems in most countries, coupled with limited interaction and communication among sectors, such as between environment and fisheries departments. This issue was considered and a regional meta-database entry form for the compilation of meta-data in relation to existing data sets was prepared (UNEP, 2002b). It was envisaged that a catalogue of metadata would then be made available to the project network with the aim of improving the sharing of information about data sets. The meta-data would include, for example, summary level information about the

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<sup>20</sup> Obligate or 'true' mangrove species are found only in mangrove ecosystems, whilst associated mangrove species are those which are found in other ecosystems in addition to mangroves.

spatial and temporal coverage of data, contact details for the organisation or individual holding it, and any access limitations that might apply.

### **2.1.2.3. Importance of the project management framework**

34. The project management framework for the SCS project emphasised and fostered stakeholder participation in information collection in several ways. The opportunity for groups of specialists from each country to meet together was the simplest. Through the various national and regional committees, specialists met not just as individuals but as representatives of the community of specialists in their country. Hence, the project management framework served as a conduit for the exchange of ideas and information in two directions: upward from the national to the regional and downward from the regional to the national.

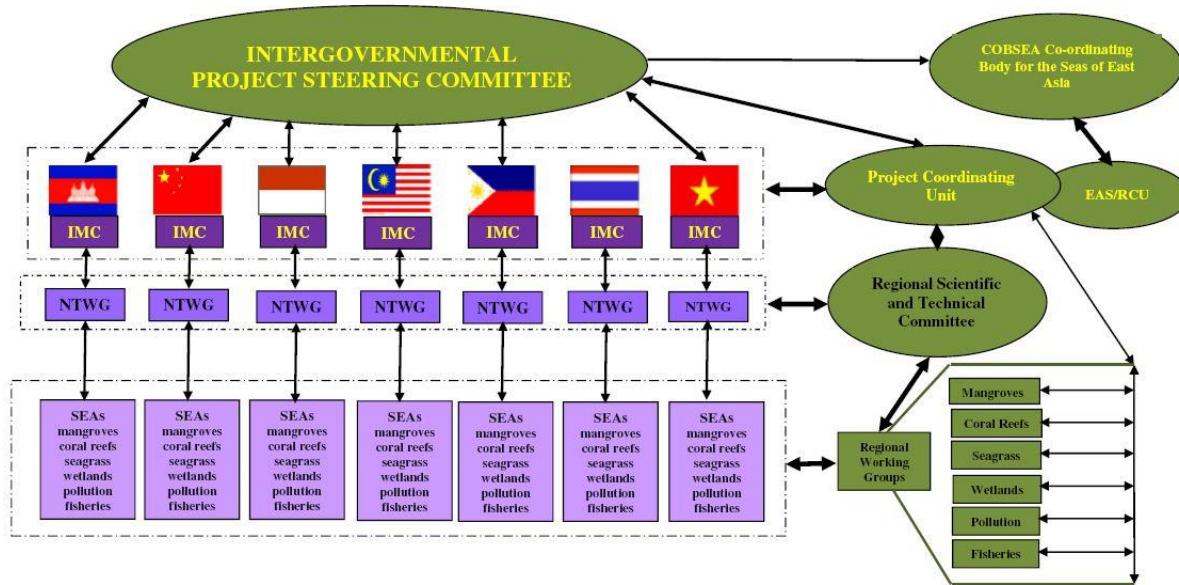
35. The National Committees established or revitalized by each of the SEAs for the project components and subcomponents provided the specialist lower-level forums required for the compilation and review of information and data. As detailed by Pernetta and Jiang (2013), too frequently, large-scale projects, if they create any kind of forum for scientific and technical specialists to meet, do so in the form of a single body advising a single political decision-making body. Limitations in such an approach are rarely considered at the project design phase as the range of scientific information required to provide a sound basis for transboundary water resource management are not well known. Conversely, the creation of multiple bodies is seen as being resource intensive whilst providing little value added.

36. A single committee comprising coral reef biologists, mangrove foresters and seagrass scientists, for example, is unlikely to contain adequate specialist knowledge with respect to each coastal habitat type and the implications for management of the varying socioeconomic and environmental situations in all participating countries. The nature of the environmental and ecological processes in coral reef, mangrove, and seagrass systems, the threats they face, and the management options for their sustainability are fundamentally different and, frequently, not part of the shared body of ecological knowledge.

37. The establishment of more specialised lower-level forums, i.e., National Committees for each project component, created opportunities for the consolidation of a wider body of highly specialised knowledge and experience prior to it being shared with specialists working on other systems. The individual members of the National Committees and their organisations represented a substantial resource of information and expertise and, through participation in committee meetings, this knowledge base was brought to the table and provided a mechanism for broad stakeholder participation in information base development. All SEAs subsequently sub-contracted selected individuals and national organisations represented on their committees to assist with the execution of data-related project activities.

38. The SEAs comprised a diverse range of government ministries, both ministries of agriculture/forestry/fisheries ministries and ministries of natural resources/environment, as well as specialized institutes or centres, universities and non-governmental organisations from the seven participating countries (see Pernetta and Jiang, 2013). The blend of SEA types varied by country and project component, mainly due to inter-country and inter-disciplinary differences in the roles and responsibilities of the types of organization in resource and environmental management. For instance, in Cambodia, SEAs were derived solely from government, with equal representation of the agriculture/forestry/fisheries and environment ministries. In contrast, a diverse mix of government agencies, specialised institutes or centres and non-governmental organisations represented the Indonesian SEAs. Half of Thailand's SEAs were universities, largely due to the highly regarded role of academia in the science and management of coastal and marine resources in Thailand.

39. The mix of SEA types also varied widely among project components, with the fisheries component SEAs represented solely by fisheries agencies, while those for the wetlands component comprised SEAs from environment ministries, universities and a nongovernmental organisation. The mandates and resource capabilities, both human and technical, of each of the SEAs varied widely as did their respective levels of experience working in cross-sectoral settings and in task management, e.g., preparing ToR for consultants, letting contracts and quality assurance of information and data products. The support secured and the experience developed via the sub-contracting of members of national committees was a key element of national coordination required to ensure successful compilation of the necessary information and data. Figure 2 below presents an organogram of the SCS project management framework.



**Figure 2.** Management framework for the UNEP/GEF project “*Reversing environmental degradation in the South China Sea and Gulf of Thailand*”. IMC = Inter-ministry committee; NTWG = National Technical Working Group; SEAs = Specialised Executing Agency; EAS/RCU = East Asia Seas Regional Coordinating Unit, of UNEP. (Green background indicates a regional body, violet a national body).

#### 2.1.2.4. Commitment of support from national networks

40. As noted above, ultimately, more than 100 institutions from the region were directly involved in the execution of project activities and more than 400 institutions were involved through individual participation in meetings. This was in a large part facilitated via the subcontracting of supporting organizations for the execution on national activities. Analysis of this subcontracting (see Paterson and Pernetta, 2013) provides some insight into the total human resource limitations of the SEAs, the extent of specialist expertise available within the SEAs, and the overall extent to which the established national networks were formally drawn upon to support information gathering and review activities. Of the 310 contracts let by the SEAs with individuals and organisations, 64 percent related to tasks associated with development of the information base required to confirm the causes of problems and in determining the comparative net benefit of options for intervention as part of SAP formulation.

41. The large number of contracts let with supporting national organisations for information collection in part reflects the disaggregated nature of data and information holdings at the national level. It is also demonstrates the need for broad stakeholder participation in the compilation of the types of information required to identify the transboundary significance of problems, their causes and the associated priorities for intervention. The total number and low average value of the contracts let in

this task area (calculated to be US\$ 3383) provides some insight into the need to engage a diverse range of stakeholders in the SAP formulation process. An alternative approach may have been to let fewer large contracts with individual consultants, or research institutes, although it is unlikely such an approach would have enabled access to the breadth and depth of information required to reach consensus on the common information base used for SAP formulation. Table 1 below summarises the Specialized Executing Agencies by country.

**Table 1.** The Specialized Executing Agencies for the SCS project by country and component

	Habitats				Fisheries	Land-based pollution	Regional task forces	
	Coral reefs	Seagrass	Mangroves	Wetlands			Economic valuation	Legal matters
Cambodia	Department of Fisheries - Ministry of Agriculture, Forestry and Fishery	Department of Fisheries - Ministry of Agriculture, Forestry and Fishery	Department of Nature Conservation and Protection – Ministry of Environment	Department of Nature Conservation and Protection – Ministry of Environment	Department of Fisheries - Ministry of Agriculture, Forestry and Fishery	Department of Pollution Control – Ministry of Environment	Department of Nature Conservation and Protection – Ministry of Environment	Department of Planning and Legal Affairs – Ministry of Environment
China	South China Institute of Oceanology – Chinese Academy of Sciences	Guangxi Mangrove Research Centre	Institute of Environmental Sciences – Zhongshan University			South China Institute of Environmental Sciences – State Environmental Protection Administration	South China Institute of Environmental Sciences – State Environmental Protection Administration	Department of Policy and Law – State Environmental Protection Administration
Indonesia	Puslitbung Oceanologi Lipi	Puslitbung Oceanologi Lipi	Institute of Mangrove Research and Development	Wetlands International (Asia Pacific Indonesia Programme)	The Directorate General of Capture Fisheries	Ministry of Environment	Budi Luhur University, Jakarta	The Lawencon Foundation
Malaysia	Department of Fisheries, Ministry of Agriculture	Department of Fisheries, Ministry of Agriculture	Department of Forestry	Conservation and Environmental Management Division, MOSTE	Department of Fisheries, Ministry of Agriculture	Department of Environment, <i>Ministry of Natural Resources and Environment</i>	University Putra Malaysia, Selangor	The Maritime Institute of Malaysia
Philippines	Marine Science Institute, University of the Philippines	Marine Science Institute, University of the Philippines	Department of Environment and Natural Resources	Protected Areas and Wildlife Bureau, Department of Environment and Natural Resources	Bureau of Fisheries and Aquatic Resources, National Fisheries Research and Development Institute, Department of Agriculture	Environmental Management Bureau, Department of Environment and Natural Resources	Department of Environment and Natural Resources	Department of Environment and Natural Resources
Thailand	Ramkhamhaeng University	Mahidol University	Department of Marine and Coastal Resources, Ministry of Natural Resources and Environment	Kasetsart University	Department of Fisheries, Ministry of Agriculture	Pollution Control Department, Ministry of Natural Resources and Environment	Kasetsart University	Office of Natural Resources and Environmental Policy and Planning
Viet Nam	Institute of Oceanography, Nha Trang	Haiphong Institute of Oceanology	Forest Science Institute of Viet Nam	Vietnam National University, Hanoi	Research Institute for Marine Fisheries, Ministry of Fisheries	Centre for Marine Environment Survey Research and Consultation, Institute of Mechanics, NCST	The Centre for Environment Research, Education and Development (CERED)	Vietnam Environmental Protection Agency

42. Efforts to foster stakeholder participation in SAP formulation were not only effective in overcoming barriers associated with limited cross-sectorial information sharing in the participating countries. Through direct involvement in national committees and the formalities associated with the contracting process, supporting organisations were exposed to the how and why their information was being used. This was not only important for generating national level support for elaboration of the framework Strategic Action Programme and supporting National Action Plans. It also provided national committee members with substantive tasks for which they were responsible for reporting progress during meetings. The subsequent review of outputs by committee members was critical in terms of ensuring consensus on the information and data to be used in subsequent steps and to be shared with committees responsible for the other project components, the NTWGs, RWGs and the RSTC.

#### **2.1.2.5. Step-wise scientific and technical review of the SAP**

##### ***National and review of information and data***

43. The project management framework not only facilitated the collection of information and data by the SEAs and national committees but also instituted mechanisms for joint fact finding and step-wise scientific and technical review. Information resources developed at the project component level were subject to national level review through National Technical Working Groups (NTWGs) prior to inclusion in the broad information base used to formulate advice for national Inter-Ministerial Committees (IMCs) and regional level bodies. Thus, the highly specialised knowledge and experience used to evaluate the status and trends in mangrove ecosystems for example, was developed by a group of mangrove specialists before it was shared with other specialists having other, often very divergent, interests and concerns.

44. In addition to providing a mechanism for the clear separation of scientific and political considerations, the NTWGs established national-level linkages and networking among mangrove scientists, other habitat specialists, pollution experts, fisheries specialists, and lawyers and economists. This was important from the perspective of enabling cross-sectoral collaboration and the broad scientific and technical evaluation of information and data. Fisheries focal points, for example, were exposed to data sets being compiled by habitat specialists. Many of these data sets contained information relevant to the efforts of the region's fisheries scientists and managers to identify habitat areas critical to the early life history of important species. Such information is not routinely collected by fisheries departments and participation in the NTWGs enabled fisheries and environment specialists to develop a better understanding of each other's information and data holdings and needs, and to identify areas in which national level information sharing could be improved.

45. The participation of the project component focal points and the national technical focal points in regular meetings of the RWGs and the RSTC established the feedback loops between national and regional organs of the management framework. The routine meetings of the RWGs, convened twice a year until the project entered its operational phase when meetings were convened annually thereafter, enabled groups of national experts on coastal habitats, fisheries and land-based pollution to meet together in a regional setting. Regional Task Forces on economic valuation (RTF-E) and legal matters (RTF-L) were established to strengthen efforts to compile and analyse information relating to economic valuation of habitats and pollution and regional arrangements for cooperation in the South China Sea.

##### ***Continuity of participation of national focal points in regional fora***

46. A key factor in the operation of such step-wise multi-lateral collaboration is the continuity of participation of national representatives in the regional forums. Senior government officials and scientists from the environment and natural resource sectors in developing East Asian countries typically carry high workloads overseeing the routine work of departments, providing advisory

services to Ministers and the Cabinet and managing a variety of externally financed projects. Participation in week-long regional meetings can present significant challenges to individuals in balancing time away from their offices combined with meeting preparation with their other work commitments. Last minute cancellations and non-attendance at meetings does occur, particularly in instances where the country representative does not have a vested interest in the planned business of the meeting or some form of binding personal or professional obligation to other participants.

47. Between 2002 and 2008, the SCS project convened a total of 69 regional working group and task force meetings, totalling 261 formal meeting days. A broad assessment of attendance by national project focal point and task force members at these meetings was reported by Paterson and Pernetta (2013) and presents an assessment of the continuity of participation in the regional forums. On average, the attendance rate of nationally-nominated focal points in regional meetings was 90 percent. Focal points were represented by alternates from their agencies on 60 percent of the occasions in which they were unable to attend. It is presented that the continued and sustained participation rates of national specialists in regional fora for SCS SAP formulation were the highest of any SAP formulation initiative globally to date, and provide unprecedented insight into the quality of consultative processes undertaken to reach consensus on the baselines and analyses of options for interventions used in agreeing SAP targets and actions<sup>21</sup>.

48. The overall non-participation rate of nationally-nominated focal points in regional working group and task force meetings (i.e., no focal point or alternate present for a given country on any meeting day) was only 4 percent of the aggregate 1718 person meeting days. Focal points for the fisheries and wetlands components contributed most to non-participation rates. In the case of fisheries, this may be explained by the large number of regional and international fisheries forums that fisheries scientists and managers from Southeast Asia are required to attend. It is also pertinent to note that the data presented above do not include the participation of the various regional expert members of the working groups and task forces in meetings. Expert members gave their time and expertise freely to the work of the project and the estimated participation rate amongst this latter group was 94 percent. The overall non-participation rate of national focal points and regional experts combined was 3.6 percent.

#### ***Region-wide sharing of a consensual information base on the South China Sea***

49. The information and data compiled to confirm and quantify key threats to the marine environment of the South China Sea and to determine priorities for intervention across areas of concern, such as habitat degradation and loss, over-exploitation of fisheries, and land-based pollution, were many and varied. Through the procedures outlined above, this information and data were reviewed at various levels and the feedback loops between national and regional organs of the project management framework enabled decisions to be made regarding whether or not these should be included in the common set of baseline information and data to be used in planning. This process relied on a culture of scientific independence and veracity established in support of National Action Plan and Strategic Action Programme formulation.

50. At the primary level, national-level sources of information were compiled into various forms, including characterisations of habitat sites, fisheries, pollution and monitoring stations, as well as national meta-data catalogues. This was accompanied by detailed desk-based reviews of past and ongoing projects, policy and legal reviews, and analysis of strategic and operational plans of relevant

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<sup>21</sup> It is acknowledged that, while such indicators relating to the quality of national and regional consultative processes for SAP formulation do not form part of the process indicators used to track the results of GEF International Waters initiatives, nor have they been the attention of evaluations of GEF International Waters investments, they are widely acknowledged in the field of International Development as fundamental element of multi-lateral decision-making and planning (see Hass, 1989; Knorr-Cetina, 1999; Van de Kerkhof, 2006; and Reed, 2008).

sectoral agencies involved in environmental and natural resource management. To enable ease of access to the information and data compiled during the preparatory phase, a series of publications were produced by the RWGs on habitats and land-based pollution. Efforts to produce comprehensive national reports on mangroves, wetlands, coral reefs, seagrass, fisheries and land-based pollution in the South China Sea were initiated during the preparatory phase.

51. Prepared in both national and English languages, these reports also benefited from step-wise review by national committees, NTWGs, RWGs and the RSTC. These were published and the outputs disseminated regionally and online in 2007. The raw information and data, in the form of discussion and information documents, was provided to RWGs, RTFs, RSTC, and PSC meetings during SAP formulation. The analysis of this information and the subsequent reports of the meetings provide a detailed account of the steps taken to arrive at consensus on various issues and priorities for inclusion in NAPs and the regional SAP. These discussion documents and meeting reports, each meticulously internally referenced to one another, number in excess of 1700 and, collectively, represent possibly one of the most insightful accounts of the collaborative analysis of issues and planning options for the joint management of any shared marine basin globally<sup>22</sup>. Building on this extensive knowledge base, the RWGs, RTFs and RSTC each contributed to the publication of a series of South China Sea knowledge documents, technical publications, regional guidelines, and training resources.

52. At the time of project development and during its early preparatory phase, the rapid proliferation of the ‘blogosphere’ and online technologies during the subsequent decade was not envisaged, nor was the rapid increase in Internet use in countries bordering the South China Sea during the same period. For example, the growth in the number of Internet users for the participating countries ranged between 300% (Malaysia) and 8,510% (Viet Nam) during the first 5-years of project operation (UNEP, 2007a). Indeed, the project document did not envisage the use of such online technologies, although a basic website was created in 2002 to overcome problems with the electronic distribution of meeting documents and reports caused by unreliable e-mail communications and limited email storage space at that time.

53. During the early stages of the operational phase of the SCS project in 2005, it became apparent that the website could be used to: improve the flow of information and data; enhance accessibility to project outputs; and facilitate the online sharing of information and experiences relating to project execution and NAP and SAP development. The project website was subsequently redeveloped in the final quarter of 2005 using free, open source, software. Efforts thereafter focused on: the use of the website to enhance ease of accessibility to information and data products; development of intuitive and user-friendly online repositories and databases; building experience within the project’s extensive partner network in the online updating of databases and information sharing; and raising general awareness of the existence of the website and its information resources.

54. A review of the development, key features and usage of the project databases and website was published as a South China Sea Knowledge Document in 2007 (see UNEP, 2007a). Key features include inter alia: a collaborative Google Earth based Geographical Information System for the management and update of habitat site characterization data<sup>23</sup>; a regional meta-database catalogue of national and regional information and data sets<sup>24</sup>; an online gridded (raster) based nutrient carrying capacity modelling system that links chlorophyll concentrations in specific locations of the SCS to land-based nutrient loading<sup>25</sup>; a repository of more than 1800 project documents and publications<sup>26</sup>; a

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<sup>22</sup> All meeting discussion documents and reports can be accessed online via the SCS project website <<http://www.unepscs.org>>.

<sup>23</sup> See <<http://gis.unepscs.org>>.

<sup>24</sup> See <<http://metadata.unepscs.org>>.

<sup>25</sup> See <[http://www.unepscs.org/nutrient\\_model/](http://www.unepscs.org/nutrient_model/)>.

<sup>26</sup> See <<http://www.unepscs.org/remository.html>>.

large collection of regionally-specific training materials<sup>27</sup>; a catalogue of multi-media public awareness resources<sup>28</sup>; and a lessons learned repository<sup>29</sup>. Of significance is the extensive online index of national language publications produced by SEAs, national committees and demonstration projects<sup>30</sup>. The wide regional and global dissemination of these information resources via establishment of a partnership with Google Earth was reported in a GEF International Waters Experience Note in 2008 (see Paterson, 2008).

### **2.1.3. Refining and Agreeing SAP Targets**

#### **2.1.3.1. Coastal habitats: the case of mangroves**

55. The structured process of the national and regional entities working simultaneously expanded opportunities for review and learning with, for example, the RTF-E providing advice on economic valuation to the biologists, and the legal specialists providing advice to the national committees regarding needs for the strengthening of national legal regimes. This was an important element in the elaboration of the regional SAP that was initiated during the fifth meetings of the RWGs in 2004. During these meetings, the specific targets and goals of the framework SAP were reviewed in the light of work completed and the more comprehensive information developed during the preparatory phase.

56. This was followed by the step-wise scientific and technical review of the SAP by the RWGs and RSTC at the regional level, and related feedback between regional and national committees on both the SAP and NAPs. For example, during its fifth meeting in September 2004, the RWG on mangroves noted that most of the mangrove related activities in the 1998 framework SAP had been initiated as part of the implementation of the SCS project. Several demonstration projects were also in the process of being launched to assist in the development of best mangrove management practices for regional sharing of experiences and lessons learned.

57. The fifth meeting of the RWG-M recommended a proposed target for the mangrove component of the revised SAP as “66% of the present area of mangroves should be brought under protection by the year 2012” (UNEP, 2004a). The RSTC, at its subsequent meeting in December 2004, considered this target and recommended that the RWG-M should consider the definition of ‘protection’ and ensure common understanding of this term in the region (UNEP, 2004b). It was pointed out by RSTC members from Indonesia and the Philippines that ‘protection’ in those countries meant ‘non-use’ of mangrove timber and other mangrove forest products (UNEP, 2004b). During its subsequent and sixth meeting in August 2005, the RWG-M used information and data on the total area of mangrove sites under various forms of land-use designation and management and the contents of the draft NAPs to identify potential targets for each of the participating countries for mangrove management.

58. In considering the recommendation of the preceding RSTC meeting, the RWG-M included the following two additional types of management regime to accommodate the various interpretations of the term ‘protection’: non-use of mangrove timber but extractive use of other mangrove resources; and ‘sustainable management area’ in which mangrove uses were considered to be conducted in a sustainable manner (UNEP, 2005a). In doing so, the RWG-M noted that ‘protection’ in the context of mangroves implied non-use of either mangroves or associated resources such as is found in national parks for example.

59. Following iterations of this step-wise review resulted in regional agreement in 2007 on five categories of mangrove forest: (1) production forest, used on a sustainable basis for timber and

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<sup>27</sup> See <<http://www.unepscs.org/Training/Workshops/Materials.html>>.

<sup>28</sup> See <[http://www.unepscs.org/South\\_China\\_Sea\\_Online\\_Public\\_Awareness\\_Centre/Community\\_Awareness\\_Materials/South\\_China\\_Sea\\_MultiMedia\\_Centre.html](http://www.unepscs.org/South_China_Sea_Online_Public_Awareness_Centre/Community_Awareness_Materials/South_China_Sea_MultiMedia_Centre.html)>.

<sup>29</sup> See <[http://www.unepscs.org/South\\_China\\_Sea\\_Knowledge/Lessons\\_Learned/SCS\\_Lessons\\_Learned.html](http://www.unepscs.org/South_China_Sea_Knowledge/Lessons_Learned/SCS_Lessons_Learned.html)>.

<sup>30</sup> See <[http://www.unepscs.org/South\\_China\\_Sea\\_National\\_Publications/](http://www.unepscs.org/South_China_Sea_National_Publications/)>.

woodchip production; (2) conversion forest, a category in Indonesia representing areas of mangrove designated for alternative land use under current plans; (3) Parks and Protected Areas; and (4) areas in which timber extraction is not permitted but extractive use of other resources is permitted. In the case of Thailand, another category was recognised as (5) “Private land, unregulated use”. Estimates of areas of mangrove in each of the countries subject to various forms of management were refined during subsequent RWG-M meetings following consultations between working group members and various national counterparts.

60. Similarly, in defining priority options for intervention, the RWG-M gave consideration to the causes of mangrove destruction identified in the TDA in the light of new information and data. The TDA in 2000 had identified the conversion of mangrove forest to sites for pond aquaculture, particularly for shrimp, clear felling of timber for woodchip production, land clearance for urban and port development and human settlements, and the harvest of timber products for domestic use.

61. It was the consensus view of the RWG-M that, based on the comprehensive set of information and data it had compiled, the present causes of loss of mangrove habitat are no longer dominated by shrimp culture although this remains one reason for conversion in China and Indonesia . It was also recognised that the 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 unimportant 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. Coastal erosion, primarily as a result of a deficit of upstream sediment supply, is increasingly becoming a contemporary cause of mangrove loss in Vietnam.

62. Thus, at the time of finalising mangrove SAP targets and priority actions, the following anthropogenic and natural threats were seen as the current priority threats to mangrove systems bordering the South China Sea. Anthropogenic threats comprise: (1) reclamation and infrastructure development; (2) pollution from shrimp farming (China, Indonesia, Thailand); (3) industrial conversion (China, small in Philippines, Indonesia and Viet Nam, negligible in Cambodia, and Thailand); (4) charcoal production (Indonesia, Philippines and Cambodia); and (5) conversion to shrimp culture (potential longterm threat in Viet Nam). Natural threats comprise: (1) sea level rise; and (2) episodic events, e.g., tsunamis and typhoons (UNEP, 2008a). This situation was confirmed by Vo *et al.* in 2013 with coastal erosion in and conversion for palm oil plantation being additional causes in Vietnam and Indonesia, respectively.

63. Accordingly, the revision of SAP targets for mangroves in the South China Sea focused on identifying mangrove areas under various forms of management, consideration of national realities with respect to various threats, management capabilities, and defining proposed areas of mangrove to be subject to changes in designation and/or management to address these threats. The target for mangroves defined in the 1998 framework SAP was defined simply as “By 2010, to maintain the area of mangroves in the region at no less than 90% of the present (1998) area”. Priority regional and national actions emphasised resource assessment, reviews of management, the piloting of various management approaches for mangroves, and awareness activities. The revised targets in the 2008 SAP provide the platform not only to build on advances made during the operation of the SCS project but also to reflect emerging trends in mangrove threats and priorities. A target associated with enrichment planting to increase mangrove biodiversity, for example, was included following lengthy consideration by the RWG-M of the results of largely single species mangrove reforestation initiatives in the region during recent decades.

#### **2.1.3.2. Planning interventions for local benefit and high transboundary impacts**

64. The cross-sectoral collaboration in information and data collection and the joint fact finding facilitated by the project enabled detailed consideration of the need for improved integration of fisheries management and coastal habitat management. This was a key element in the planning of interventions aimed at the simultaneous achievement of local level benefits for fisheries and biodiversity that would also have transboundary impacts at regional and global levels. In addition to the step-wise consideration of this issue by the various RWGs and the RSTC, the Regional Science Conferences, convened as part of the SCS project, provided members of the project network an opportunity to collegially review and assess the project's overall progress, to consider new ideas and to share experiences in project implementation and cross-sectoral coordination.

65. The programme of the second Regional Science Conference held in November 2005 included an opportunity for RWGs for the habitat sub-components of the project to meet with members of the RWG on fisheries (RWG-F) and senior fisheries advisors of the Southeast Asian Fisheries Development Center (SEAFDEC) and the Food and Agriculture Organization of the United Nations (FAO). This event focused on the critical linkages between fisheries and coastal habitats and related threats to each sector. Actions aimed at reducing the degradation and loss of habitats, the dependence and effects of fisheries on coastal habitats, and regional policy guidance for fisheries habitat management were all considered.

66. The dilemma the fisheries and environment sectors discussed during the second Regional Science Conference is that conservation of habitat does not necessarily result in increased fish stocks if the conserved habitat is not of significance to the life-cycles of the fished species; and responsible fishing effort does not necessarily result in improved habitat condition. From an integrated management perspective, consensus was reached that, although fish production is intrinsically linked to the quality and expanse of habitats and the dependence of coastal communities on fish for food and income is high, past approaches to both fisheries and habitat management had not adequately addressed these linkages. It was thus acknowledged that the effort of the RWG-F to establish a regional system of fisheries refugia should be focused on the identification of areas of habitat of critical significance to the lifecycle of important fish stocks for collaborative management by fisheries and environment departments.

67. The subsequent seventh meeting of the RWG-F in May 2006 (UNEP, 2006) initiated efforts to prepare a preliminary inventory of known spawning areas for significant pelagic, demersal, and invertebrate species in the Gulf of Thailand. This meeting agreed that fisheries focal points would coordinate with habitat component counterparts during the inter-sessional period to compile information on habitat areas that act as critical spawning and nursery areas for important fish species and, specifically, to evaluate which of the project's habitat demonstration sites are critical inshore nursery refugia for important demersal species.

68. This activity relied on a detailed review of the collective information base developed by the habitat sub-components, specifically: the national reports on mangroves, wetlands, coral reefs and seagrass; the habitat site characterisations prepared by each habitat sub-component; information and data compiled in habitat demonstration site planning; the habitat sections of the regional metadatabase catalogue; and the outcomes of various national consultations on the refugia concept. Combined with the insights gained through improved communication among fisheries and environment specialists, this information base represented a large source of information on the locations of coastal habitats and their usage by marine species that had not previously been available to the fisheries sector in such an accessible form.

69. The fisheries specialists of the RWG-F and SEAFDEC complemented the above review with the analysis of data relating to fish egg and larval distribution and abundance generated by past and ongoing fish early life history research in the South China Sea (UNEP, 2007c). This fish early life history information enabled consideration of the importance of habitat sites from the perspectives not

only of local biodiversity and fisheries benefits but also from their transboundary benefits in terms of regional fish stock sustainability and food security. For example, the distribution and abundance of larvae of the regionally significant short mackerel, *Rastrelliger brachysoma*, revealed only three distinct coastal locations utilised by the early life phase of this species, one being in the coastal waters near Mu Koh Samui in Thailand, and two on the east coast of Viet Nam<sup>31</sup>.

70. Thus the process of refugia site selection acknowledged that efforts to safeguard habitats important to fish life-cycles should give priority to those sites for which the potential exists for the simultaneous achievement of local benefits and positive transboundary impacts. This approach was used by the RWG-F to agree on the selection of 14 priority sites for inclusion in an initial system of fisheries refugia and an additional 9 sites for which additional information is required prior to their inclusion in the system. The inclusion of a refugia site at Mu Koh Samui in the initial selection of sites was based on both the potential benefits to local food security associated with effective management in national waters and the potential transboundary benefits given the importance of short mackerel to all countries of the region. Further information on the regional fisheries refugia initiative is included in Paterson et al. (2013).

#### **2.1.3.3. Developing modelling tools: determining the nutrient carrying capacity of the South China Sea**

71. The ultimate causes of land-based pollution in the South China Sea were confirmed by the RWG-LbP to include increases in coastal population density, increased food production in the agricultural sector and increased industrialisation. The proximate causes include inadequate wastewater treatment whilst intermediate causes include inadequate standards and lack of capacity to monitor, regulate and control pollution discharges. A major contributing factor is the lack of financial resources to invest in actions addressing the causes at all levels. In analysing national information it was apparent that key sources of waste ranked as follows: domestic, agricultural, industrial, poor land-use practices, and urban solid waste. To assist with the revision of the draft SAP targets, the land-based pollution component of the SCS project aimed to evaluate the carrying/assimilation capacity of sub-regions and sensitive ecosystems and the transboundary movements of contaminants within the South China Sea.

72. The fifth meeting of the RWG-LbP (UNEP, 2005b) agreed to use the ambient concentrations of contaminants in coastal waters as indicators of the input of contaminants derived from riverine sources. Subsequently, in considering available information that had been compiled by the RWG-LbP, the RSTC endorsed this approach and recommended that the RWG-LbP work with its expert member from SEA START RC to undertake a regional project to estimate the carrying capacity of the open shelf system based on its natural capacity to assimilate contaminants, in particular nutrient inputs, from land. The RSTC recognised that the modeling of heavy metal inputs and impacts required more reliable data for heavy metal concentrations in coastal waters and loading in the South China Sea marine basin than are currently available.

73. The resultant modelling system provides a tool to estimate land-based nutrient loading from rivers under data scarce scenarios. The simulation model enables variation of nutrient loading from particular rivers, stretches of coastline, or catchments to estimate the distribution of surface chlorophyll in the South China Sea, or a subregion or sub-basin therein. This enables evaluation of the response of phytoplankton biomass to nutrient input from land at various spatial and temporal scales. Importantly, the modelling system is run entirely in Microsoft Excel, to which most scientists and managers in the South China Sea region have access and with which they are familiar. The RWG-LbP

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<sup>31</sup> See Annex 5 of UNEP (2007c) entitled “Distribution and Abundance of Fish Larvae in the Gulf of Thailand and South China Sea”.

and RSTC, with the assistance of the PCU, has facilitated the wide online dissemination of this tool via the South China Sea project website<sup>32</sup>.

74. The model can be run to estimate the monthly ‘effective’ loading of total nutrient from any catchment, as point or non-point loadings. This tool was critical in demonstrating that, while nutrient pollution of the South China Sea is important from a local perspective, it is not significant from the transboundary perspective of basin-wide assimilative capacity. Priority regional level interventions for land-based pollution were refined on the basis of the model predictions, and included SAP actions to investigate the extension of the model in the estimation of total contaminant loading and carrying capacity of the SCS basin using quantitative modelling and GIS for seven heavy metals (Hg, Cd, Pb, Cu, Cr, As, Zn) (UNEP, 2008b).

#### **2.1.3.4. Significance of the work of the SCS Project in Strategic Action Programme formulation**

75. At the time of SCS project development, the overall strategic support provided to GEF-funded international waters initiatives was to meet the incremental costs of groups of countries working together to better understand environmental influences on international waters and to work collaboratively to address them. Emphasis was also placed on building the capacity of existing national institutions to effectively participate in structured processes aimed at assembling information for use in assessing the water-related environmental problems and conflicts in their part of the basin or marine ecosystem, and sharing this information at the multi-country or regional level. This collaborative, factual analysis was deemed an essential starting point for diagnosing the root causes of stress in water systems and in identifying priority options for intervention for subsequent inclusion in targeted, costed SAPs. Accordingly, the overall goal and activities of the SCS project were aligned with these objectives.

76. The approach to the gathering, review, and management of information and data followed by the SCS Project in formulating the Strategic Action Programme made a significant contribution to the GEF international waters focal area of investments. The effort of creating a regional level environment, in which collaboration and partnership in addressing environmental problems of a marine basin was fostered and encouraged by the SCS Project, demonstrates the importance of broad stakeholder participation in the compilation, analysis and agreement on the information and data to be used in decision-making.

77. In terms of the SCS project’s objective to elaborate the South China Sea SAP, the consensual approach adopted ensured that the selected issues and priority options for action contained in the SAP are of significance from the perspectives of the countries involved, the water body itself, and in terms of potential transboundary or global benefits. As a ‘foundational’ GEF international waters project, the approach established by the SCS project was aimed at developing consensus among the participating countries on the selection and use of the best available information to plan and guide investments. The case examples on the development of the mangrove, fisheries and land-based pollution components of the South China Sea SAP presented above demonstrate that this was achieved and highlight the importance of establishing a consensual information base in ensuring that selected issues and actions included in any SAP for a shared water body are of priority from the perspectives of both national and transboundary benefits. The approach also built a significant epistemic community of scientists and resource managers experienced in the application of such a consensual information base to the TDA/SAP process underpinning GEF investments in international waters.

78. One significant and perhaps unique element of the South China Sea SAP is inclusion of detailed economic values for coastal habitat goods and services and their use in the determination of regionally applicable Total Economic Values. These were applied in an analysis of the costs and benefits of the regional actions proposed in the SAP. In some instances for example, the SAP is clearly

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<sup>32</sup> 28 [http://www.unepscs/nutrient\\_model/](http://www.unepscs/nutrient_model/).

cost effective as a modest investment of 3 million US dollars at a regional level is associated with a net benefit of 1.5 billion US dollars per annum if the mangrove targets of the SAP are met over a 5-year investment period. The SAP development process was also unique in that a key element in the process was operation of national demonstration projects and pilot projects in coastal habitat and land-based pollution management that enabled participating countries to experiment and trial new management approaches and technologies; the results of which were used to guide national planning and the development of SAP targets. Endorsed inter-governmentally in August 2008, the SAP represents the first, and presently only, common vision of the riparian countries of the SCS regarding priority cost-effective actions aimed at reversing environmental degradation of this globally significant marine basin.

#### **2.1.4. Lessons Learned in Coastal Habitat Management from the SCS Project**

##### **2.1.4.1. The regional network of habitat demonstration sites of the SCS Project**

###### ***Reversing environmental degradation: goals and purpose of demonstrations***

79. The Transboundary Diagnostic Analysis for the South China Sea identified the degradation and loss of coastal habitats, the overexploitation of fish stocks, and land-based pollution as the priority environmental concerns affecting this marine basin. The framework SAP for the South China Sea outlined a wide range of proposed regional and national actions to address these concerns (UNEP, 1999). One such action was the establishment and operation of demonstration sites and pilot activities focused on the generation of regionally applicable examples of good practice in coastal habitat and pollution management. Accordingly, SCS project developed a series of interventions aimed at *inter alia*: the execution of demonstration projects at three regional priority sites within each habitat class of mangroves, coral reefs, and seagrass; and trialling pilot management interventions at priority pollution hot spots.

80. The SCS project's Regional Scientific and Technical Committee (RSTC) recommended that the demonstration sites and pilot activities should perform several important roles. The first was to provide an opportunity to implement, and experiment with, new management models and methods. It was envisaged that this would build regional experience and capacity in project implementation, cross-sectorial coordination, and the conduct of socioeconomic and biological surveys and studies needed to contribute to more sustainable management of coastal habitats and pollution. From this, the knowledge, experiences and best practices generated during project execution would be captured, shared, and used to guide National Action Plan (NAP) and regional SAP development and implementation.

81. The implementation of the SCS project was divided into two phases: first, a preparatory phase from 2002 to 2004 followed by an operational phase from 2005 to 2008. During its second meeting in 2002, the RSTC discussed and agreed on criteria and procedures for the selection of habitat demonstration sites (UNEP, 2002a). That meeting adopted a three-step procedure which utilised a cluster analysis approach to rank sites according to their significance in terms of biological diversity, threats, and transboundary importance. The Committee recommended that each of the Regional Working Groups (RWGs) established by the SCS project for mangroves, coral reefs, seagrass and wetlands should carefully consider the variables to be used in the analysis and ranking of the potential demonstration sites. The RWGs proceeded to finalise data sets, cluster analyses and ranking procedures during their third round of meetings convened in 2003 (UNEP, 2003a-d).

82. At the same time, the RWGs also agreed on the criteria to be used for the ranking of priorities based on biological, social and economic characteristics. Following considerable work on the part of the project's national Specialised Executing Agencies (SEAs), national committees, the RWGs and the Project Co-ordinating Unit, all RWGs managed to complete the ranking process during their fourth meetings convened in the last quarter of 2003 (UNEP, 2003e-h). Eighteen of the 136 habitat sites

characterised by the SCS project were prioritised for intervention<sup>33</sup>. Thereafter, the fourth RSTC meeting made recommendations regarding the selection of demonstration sites to the Project Steering Committee (PSC) (UNEP, 2004c). The PSC, at its third meeting in March 2004, approved the funding of 11 habitat demonstration sites (four mangrove, four coral reef and three seagrass) through the GEF grant to the SCS project (UNEP, 2004d). An additional seven habitat demonstration sites were proposed for funding via the GEF Medium-Sized Project (MSP) mechanism.

83. The primary goals identified for individual demonstration and pilot activities of the SCS project were to develop experience in implementing management actions for use in reversing environmental degradation and demonstrating methods of reducing the rate of degradation if they were adopted and applied on a wider scale. In this specific context, adverse impacts of significance were those on the biological community structure, productivity or species diversity of habitats through non-sustainable patterns of use resulting in over-exploitation or pollution. The purpose of the demonstration sites and pollution pilot activities was therefore biodiversity related, focussing on habitats and species. It was realised that demonstration sites could be locations where management actions were implemented for the purposes of: maintaining existing biodiversity; restoring degraded biodiversity to former levels; attempting to remove or reduce the cause of degradation; or test preventative actions that halt the adoption of unsustainable patterns of use before they commence.

84. The term ‘demonstration site’ can be interpreted by different individuals to mean quite different things. In the design of demonstration site and pilot activities, the SCS project gave careful consideration to ‘what’ would be demonstrated, to ‘whom’ it would be demonstrated and ‘how’ it would be demonstrated. This led to three classes of potential demonstration sites being identified. The first, function related sites, were identified as existing sites that demonstrate sustainable use for specific purposes, such as the 100 plus years of sustainable forestry of the mangroves in Matang District of Malaysia’s Perak State. Process related sites were identified as those that might include existing sites that demonstrate innovative management interventions and/ or regimes at the site level. Examples identified included ecotourism at the Waterlands Resort in China’s Shenzhen City and the decentralisation of responsibility for coastal resource management to local government in Indonesia. Problem related sites were identified as those suitable for demonstrating new modes of managing specific problems or causes of environmental degradation.

85. Consideration of these classes of demonstration sites was important in assisting participants to gain an appreciation of potential demonstration activities, resource requirements and challenges. It was concluded that a majority of GEF grant funds for demonstration activities would need to be directed at problem related sites. These sites enable environmental problems to be addressed directly and contribute to the development of new management models of wider regional and international significance. Similarly, it was agreed that problem related sites would yield the types of information and experiences on the costs and results from site-based coastal habitat management interventions necessary to inform the development of a realistic results framework for the habitat components of the South China Sea SAP. It was also recognised that no areas of habitat in the South China Sea were under collaborative management, i.e., involving more than one country. Furthermore, there were no examples of areas of habitat under management by one country that provided benefits to a second. Identification of such sites and their adoption as demonstration sites within the framework of the SCS project was promoted because such sites would likely provide both innovative demonstrations of regional value and attract significant international attention as replicable models for application in other regions.

86. A framework for regional co-ordination, dissemination of experience and personnel exchange between demonstration sites was considered by the fourth meeting of the RSTC in 2004 and was endorsed by the subsequent third PSC meeting (UNEP, 2004d). This framework emphasised three

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<sup>33</sup> A detailed account of the habitat site selection process is provided by Pernetta and Jiang, 2013b.

possible modes of dissemination of information and experiences: exchange of personnel between sites; training courses and/or workshops based on the demonstration sites; and publication and dissemination of technical reports and/or public awareness materials.

#### ***Causal chain analysis and project design***

87. At the time of demonstration project design, causal chain analysis was the recommended GEF tool used in the identification of the causes of change in environmental state and, accordingly, the various potential points of intervention. Optimally, all causes are identified and quantified and the potential benefits of intervention at any one point along the chain are evaluated, where possible through some form of cost benefit analysis. The causal chain is therefore used to provide an objective basis for selecting among different options for intervention. Preparation of a causal chain analysis was a required component of the proposals for intervention at any potential demonstration site in order to be considered for GEF grant support.

88. Guidelines for the preparation of demonstration site proposals were considered in the third round of the RWG meetings (UNEP, 2003a-d). These were used by national SEAs in the preparation of operational project documents and by the PCU in preparing technical evaluations of proposals for consideration by the RWGs, the RSTC and the PSC. These documents included: demonstration site summaries; site descriptions covering both environmental and socio-economic factors; a description of the goals and purpose; clear statements of the project rationale and objectives; descriptions of anticipated outcomes; detailed listings of planned activities; sustainability analyses and risk assessments; fully costed work plans and budgets; implementation plans; proposed management arrangements; and information on the proposed executing agencies. Required annexes included: fully completed site characterisations; stakeholder participation plans; causal chain analyses; and monitoring and evaluation plans<sup>34</sup>.

#### **2.1.4.2. Establishment of mechanisms for coordination, integration and learning**

89. Under the SCS project management framework the activities of the various project components were coordinated by national committees or sub-committees. Coordination among components was the responsibility of the National Technical Working Groups (NTWGs). The Inter-Ministry Committees, the highest level of national co-ordination, were responsible for the overall co-ordination of national activities of the SCS project. It was agreed that national SEAs for the habitat sub-components would assume responsibility for demonstration sites corresponding to their respective habitat type, e.g., mangrove, coral reef, seagrass and wetlands. The NTWGs assumed responsibility for oversight of all demonstration site activities conducted in each country, both those funded through the GEF grant and those funded by other means.

90. At the regional level, it was agreed that the RWGs be given the responsibility for the co-ordination of activities at all demonstration sites with the RWGs reporting to, and being advised by, the RSTC regarding overlap, potential collaboration and/or synergy that might be foreseen among the demonstration site activities in each component. It was further agreed that each demonstration site have a clearly identified demonstration site manager whose responsibility would be to report to the SEA and the national committee on activities being conducted at the site.

91. A number of common mechanisms were included in the design of all demonstration projects to assist in strengthening site level coordination, including the establishment of multi-sectoral management boards. These site-based management boards were charged with coordinating activities of the project and integrating these with the work of other projects and with the work of provincial and local governments. Membership of management boards comprised 10 to 20 persons drawn from government departments and national focal points for the relevant habitat sub-component of the SCS

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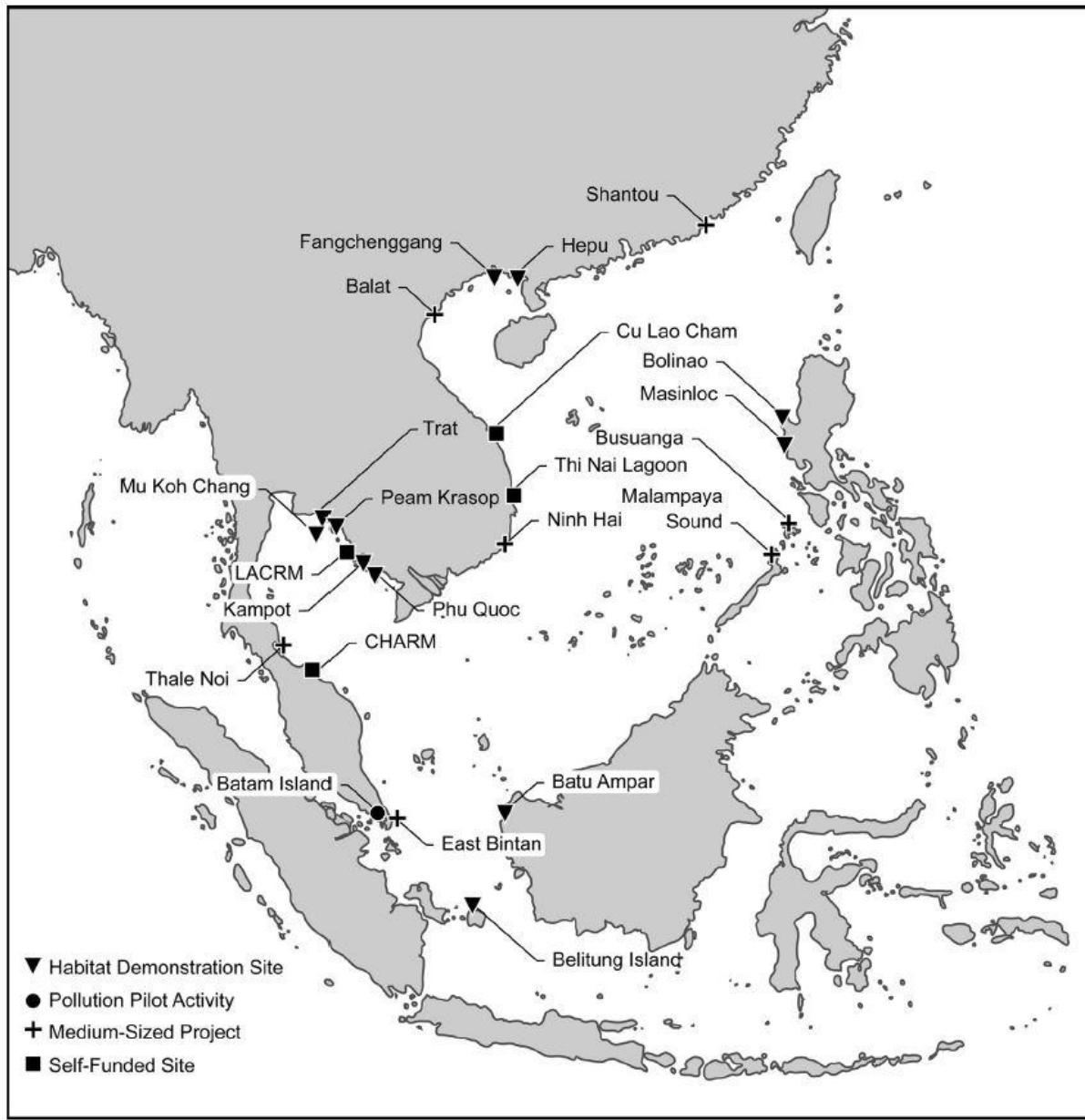
<sup>34</sup> An index of national habitat demonstration project information and documents can be accessed online at <[http://www.unepscs.org/Habitat\\_Demonstration\\_Sites\\_and\\_Pilot\\_Activities\\_Index.html](http://www.unepscs.org/Habitat_Demonstration_Sites_and_Pilot_Activities_Index.html)>

project. Many projects also involved NGOs, local communities and the private sector as members of management boards. Meetings of these groups were convened every 3-6 months and efforts were made by most projects to use local government facilities or village venues for these events. The latter were aimed at strengthening linkages between the projects and local government officials and village leaders.

92. Existing projects funded via other sources<sup>35</sup> were invited to join the regional network of demonstration initiatives. Support was provided for representatives of these projects to participate and share experience and lessons learned in coastal habitat management during the Regional Scientific Conferences (RSC) and Mayors' Round-Table (MRT) meetings convened as part of the SCS project. The locations of the GEF grant supported demonstration sites and pilot activity, as well as the self-funded habitat demonstration projects that joined the SCS project network, are shown in Figure 3 below.

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<sup>35</sup> Referred to hereafter as “self-funded sites”.



**Figure 3.** Regional Network of Demonstration Sites Established by the SCS Project

93. As the SCS project entered its operational phase, it was recognized that there was a strong need to establish a mechanism for regional level dissemination of information about lessons learned, experience and best practices generated at the site level. There was also a need to ensure that regionally accumulated scientific knowledge was made available to local government officials and operational level managers in an easily accessible manner. The approach adopted by the project was the development of a network of local government officials and operational level project staff that met annually in four MRT meetings convened from 2005 to 2008. These events provided an opportunity for mayors, local government officials and habitat demonstration site managers to share experiences and examples of good practice in the implementation of demonstration site activities and to learn from the scientific community at the regional level for improved environmental management at the site

level. These events also enabled members of the project network to collegially review the project's overall progress, accomplishments and outputs<sup>36</sup>.

#### **2.1.4.3. Achievements and examples of best practice**

94. Four technical publications reviewing the status and achievements of the SCS project's suite of habitat demonstration sites and pollution pilot activities were published during the final quarter of 2007 (see UNEP, 2007c-g). These publications were based on the outcomes of the mid-term evaluations of the projects and were used as supporting documents in presentations on the achievements and best practices at the demonstration sites delivered during the Third MRT and RSC in November 2007. The subsequent RSTC and PSC meetings in December 2007 discussed possible mechanisms for disseminating information regarding successful experience and good practice generated at the demonstration sites. The PCU was instructed to guide demonstration and pilot activity managers through the identification and documentation of best practices and lessons learned. Nine notes were prepared during the first half of 2008, discussed by the subsequent meetings of the RWGs, endorsed by the ninth meeting of the RSTC, and published for dissemination during the tenth meeting of the Conference of the Contracting Parties to the Ramsar Convention on Wetlands in October that year<sup>37</sup>. Several examples of innovation from China's suite of demonstration projects were also published as internationally; peer-reviewed academic journal articles (see Fan *et al.*, 2013 and Peng *et al.*, 2013). Examples of best practice are summarised as follows:

##### ***Strengthened cross-sectoral coordination and management***

95. Initially, there was concern regarding the preponderance of sectoral management in the region. This had created conflicts among sectors with each sector seeking to achieve maximum benefits for itself and not focussing on the achievement of overall benefits to society in the exploitation of habitat resources. Uncontrolled and competitive exploitation by different sectors had resulted in habitat degradation in many coastalwater areas bordering the South China Sea. In order to improve management effectiveness, most demonstration sites of the SCS project considered how to coordinate, integrate and maintain activities at the site level with participation of all relevant stakeholders in a single framework.

96. A number of good practices in cross-sectoral management were recorded in many of the demonstration sites. For instance, the management board for the Hepu seagrass demonstration site in China, comprising twelve persons from various government sectors, was established in 2004 and has operated smoothly. The management board was responsible for oversight of the implementation of the demonstration site activities and the development of policies and an overarching management plan. The board was shown to be an effective mechanism for ensuring cross-sectoral co-ordination. It resulted in a multi-agency task force of local government bodies, fishermen, residents and students being formed to physically remove the posts and structures supporting illegal mariculture pens and fences in the seagrass areas of the site. The first enforcement action covered an area of 1100 ha and involved the mobilisation of more than 300 people and 12 vessels. This resulted in the removal of more than 50,000 illegal wooden posts and the clearance of 13 illegal mollusc culture areas.

97. In the case of the Kampot seagrass demonstration site in Cambodia, the first and most important achievement was the establishment of two multi-sectoral and multi-level management

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<sup>36</sup> An example of the regional sharing generated via this mechanism, including multi-media materials such as video interviews with participants and PowerPoint presentations from the Third Mayors' Round-Table meeting, can be accessed via the SCS project website <[www.unepscs.org/Meetings/Mayors\\_Roundtable\\_Regional\\_Scientific\\_Conference/SCS\\_Scientific\\_Conference\\_Highlights.html](http://www.unepscs.org/Meetings/Mayors_Roundtable_Regional_Scientific_Conference/SCS_Scientific_Conference_Highlights.html)>

<sup>37</sup> These notes are accessible online via the SCS project website at <[http://www.unepscs.org/South\\_China\\_Sea\\_Knowledge/Lessons\\_Learned/SCS\\_Lessons\\_Learned.html](http://www.unepscs.org/South_China_Sea_Knowledge/Lessons_Learned/SCS_Lessons_Learned.html)>

bodies for supervising and guiding the implementation of demonstration site activities. A management board and management advisory group, comprising members of relevant public sector organisations at national and provincial levels, were established by provincial declaration in October 2006. These bodies were responsible for dealing with political and scientific matters respectively and convened regular meetings, both separately and jointly, to track progress and guide the implementation of activities. They also jointly led the development of a long-term management plan based on sound scientific data and information.

98. For the Bolinao seagrass demonstration site in the Philippines, the establishment and operation of the Management Board created a functional linkage among stakeholders and ensured that policy was formulated in the context of a multi-sectoral approach. The board conducted regular meetings to prepare and consider elements of a Bolinao Seagrass Reserve Management Plan and to prepare an ordinance for the establishment of the Bolinao Seagrass Reserve. A memorandum of agreement, encompassing partnerships among and between the Bolinao Local Government, the Bolinao Marine Ecological Fund Foundation, the Marine Science Institute and the Bolinao seagrass demonstration site was signed to enhance co-ordination in marine resource management.

#### ***Involvement of stakeholders in development of fisheries refugia***

99. Most proposals for the development of Marine Protected Areas (MPAs) in Southeast Asia have not sufficiently considered the significance of MPAs as refuges for critical stages of the life cycles of fisheries species. In addition, the linkage between habitats and the life cycles of associated species has been of little concern during the development of the management plans of operational MPAs. Zoning plans have been based mainly on habitat distribution and structure, species richness, endangered species, resource use and human impacts on resources and the environment. Poor management practice has been applied to the conservation of spawning and/or nursery grounds in operational MPAs and, as a result, the contribution of the MPAs to the restocking of fisheries resources has been limited.

100. The solution to these limitations was the use of the knowledge of local fishermen in identifying spawning and nursery areas, improving communications between local communities and scientists and promoting the participation of local people in the development and implementation of management plans and regulations. The Phu Quoc demonstration site in Viet Nam was selected to apply the concept of fisheries refugia (see Paterson et al., 2013) because of the importance of seagrass beds of Phu Quoc as spawning and nursery areas for many species of economic importance. These included *Strombus* spp., octopus, cuttlefish, rabbitfish, shrimp and seahorse. A joint project for the development of a fisheries refugium in the Ham Ninh seagrass area of the Phu Quoc site was implemented.

101. This joint activity involved co-operation among the demonstration site management board, the Viet Nam SEA for fisheries and the provincial government. The goal of the project was to improve the integration of fisheries and habitat management at the Phu Quoc Island habitat demonstration site through the establishment and management of fisheries refugia in critical spawning and nursery areas. These were intended to improve the longer-term security of sustainable fisheries yields from Phu Quoc Island waters and adjacent areas. The entire process, including the identification of critical spawning and nursery areas, preparation of a fisheries profile, development of a management framework and the establishment of procedures for the enforcement and guidelines for sustainable use and implementation of long-term operational (dayto- day) management of Ham Ninh fishery refugia, has proceeded with strong involvement of local fisherfolk.

#### ***Involvement of the private sector in coastal management***

102. Habitat management requires sustained human and financial capacity. However, any project is invariably limited to a short-term period. Furthermore, authorities appointed to undertake project

management frequently cannot complete their tasks due to inadequacy of resources. Private sector organizations conduct business for profit and maximising profits becomes a priority. The question arises as to how to encourage the private sector to participate in habitat management activities. Governments need to develop appropriate policies for encouraging the involvement of the private sector in habitat management both to ensure management effectiveness and commensurate profits for investors through the sustainable use of resources. Integration of private sector and local community interests and activities is also required.

103. At the Fangchenggang mangrove habitat demonstration site in southern Guangxi, China, urban mangroves were not co-located with the local Beilun Estuary Reserve. A local developer, the Xindi Company, planned to reclaim a large area of unmanaged mangrove forest for industrial use associated with the expansion of port facilities. The operation of the demonstration led to the Xindi Company revising these plans and agreeing to a partnership with government on mangrove conservation. Xindi invested in the construction of a mangrove ecological park within the urban mangrove area and supported reforestation and alternative livelihood generation activities for improved mangrove management. This strong private sector engagement enabled the project to leverage additional resources from local and provincial governments to scale-up mangrove management efforts at the site. As a result, it is estimated that funding for mangrove management at the site increased 17-fold during the operation of the project.

104. In the case of Batu Ampur mangrove demonstration site in Indonesia's West Kalimantan Province, the strong involvement of the provincial government in project activities fostered private sector engagement in mangrove management. Mangrove wood from this site was being used for the production of charcoal for fuel and this was identified as a major cause of habitat degradation. The project focussed on the development of appropriate kilns for converting coconut shellwaste from copra production into high quality charcoal, which was collected by middlemen and sold to a charcoal briquette manufacturing company in Pontianack City for ultimate export to Malaysia and Singapore. This resulted in a 55 percent increase in household incomes within the demonstration site from Indonesian Rupiah 503,000 to 916,000 per year<sup>38</sup> and an estimated decrease in mangrove removal for charcoal production of approximately 18 ha per year.

#### ***Building the capacity of local governments and communities for law enforcement***

105. There are a number of laws and regulations delivered by government authorities for habitat management at the national and local levels. However, in practice, enforcement always faces many obstacles resulting in poor compliance on site. A common problem is lack of human and financial capacity for compliance enforcement. In order to improve enforcement, recommended solutions typically include inter alia: appropriate mechanisms and legal bases for local government and community involvement; financial support from local government; mobilizing funds from other sources; training on habitat and enforcement skills; and raising public awareness as a means of gaining community support.

106. The creation of 'sea wardens' (Bantay Daggat) for local law enforcement in coastal management was considered good practice at the Bolinao seagrass demonstration site. The efforts of the local government in the conservation of coastal habitats were significant and worthy of special note. The Mayor of Bolinao Municipality promulgated a series of municipal ordinances to establish a number of small-scale marine protected areas or sanctuaries, including 8 for coral reefs, 8 for mangroves and 1 for seagrass. Sea wardens were appointed to enforce these ordinances. The sea wardens were fishermen from local coastal villages. Local government provided them with a patrol boat and daily allowances. Through partnerships established with related stakeholders, the wardens mobilized financial resources to equip and operate 7 motorized native outriggers (bancas) (one from

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<sup>38</sup> An approximate increase of between US\$50 and US\$95.

the SAGIP Project, one from the Bolinao seagrass demonstration site fund and five from local government) and one speedboat donated by the National Bureau of Fisheries and Aquatic Resources.

#### ***Integration of traditional knowledge and practices into management planning***

107. The coral reefs of the Belitung Islands, Indonesia, provide significant support to a variety of uses, both direct and indirect, that benefit the coastal communities. Coral reef fisheries in the area are productive although coastal management is not well developed as a result of poor local capacity. Fishing practices, such as the widespread use of trawls, mostly undertaken by foreign vessels, were beyond government control as a result of weak law enforcement, limited facilities such as surveillance vessels, and a weak fishing permit system. Destructive fishing techniques, such as the use of explosive and poisons, were also widely used at the site.

108. Selat Nasik Sub-District of Indonesia's Belitung District was selected as a coral reef demonstration site by the SCS project to develop a community-based management system that would improve the sustainability of the coral reef ecosystem as a means of increasing community welfare and reducing poverty. Initially, the development of the resource management plan and local regulations proceeded quite slowly due to the need to compile all relevant information and to consult with the legal section of the local government of Belitung, the head of the sub-district, village chiefs and prominent figures in the community, including fishermen.

109. These discussions took place against a background of previous actions by the community of Belitung's Gersik Village that had agreed internally in 1970 to prevent the use of certain fishing gear. The community agreement outlines a number of "rules" including the fact that anyone fishing in Gersik waters must use the same gear as local fishermen and banning the use of light fishing. The community of Gersik Village, specialise in line-fishing for mackerel, snapper and other pelagic species. In addition, they also own 'weirs', or fish fences, in the water near their houses. They believe that if all fishermen follow their rules, the catch will be sustainable and believed that the use of lift nets and light fishing would adversely affect their catch. Penalties included stoning, confiscation of fishing vessels and equipment, and lifelong expulsion from the village.

110. At the time of demonstration site implementation, six quarrels had previously occurred with outside fishermen, resulting initially in warnings to the fishermen to cease fishing, followed by more drastic actions including stoning and the impoundment of fishing boats and gear. In the 1990s, an agreement was reached between the local governments of Belitung District and South Bangka that stipulated that fishermen from South Bangka catching fish in the waters of Gersik Village must follow the regulations developed by the Gersik fishermen. Several years later, a disagreement arose between the fishermen of Gersik, and those of Belitung District and Pongok, Bangka District, in which the latter were accused of violating this agreement. A meeting was convened in Belitung to resolve the dispute and resulted in an agreement to adopt a series of fisheries management rules to restrict the times and locations of fishing.

111. To integrate the existing agreements initiated by the fishing community of Gersik Village into the Resource Management Plan for the entire Selat Nasik Sub-District required a series of activities, including widespread consultations followed by preparation of a draft Resource Management Plan incorporating zones of use throughout the Selat Nasik Sub-District. 'Red' zones were designated as areas that are completely protected; 'yellow' zones are areas of defined and limited use; while 'green' zones represent areas that are open to all kinds of activities. The community's aspirations and desires were taken fully into account in defining these zones. Once the draft plan had been prepared, public consultations were organised with the communities of the Selat Nasik Sub-District, after which the draft was revised and presented to the local government for comment and discussion. At the same time, drafts of local regulations (Perda) on coral reef management and fishing activities and the use of gear based on the Gersik agreements were considered and endorsed by the Local Government of Belitung District.

### ***Adoption of supplementary and alternative livelihoods as tools for improved habitat and resource management***

112. Given that many coastal communities bordering the South China Sea live in poverty, much of their livelihood depends on natural coastal resources. Resource exploitation causes habitat degradation because of inappropriate techniques and poor awareness of sustainable use practices. Most projects regarding habitat conservation have, therefore, sought different solutions to improve incomes and the food security of local communities. These include: development of alternative income and food generating activities not directly dependent upon coastal habitats; training on resource exploitation techniques, sustainable habitat protection and adding value to fisheries products; and the sustainable use of populations of natural living resources promoted by effective management.

113. Several of the SCS project demonstration sites undertook activities focused on the development of supplementary and alternative livelihoods. The practices introduced at the Batu Ampar site were tools for the improvement of not only local livelihoods but also habitat and resource management. At this demonstration site, the community largely comprises farmers and fishermen dependent on mangrove forest products and copra production. Communities in the Kubu and Teluk Pakedai districts at the site are charcoal producers operating 135 kilns and producing 420 tonnes of charcoal annually. As most of this charcoal was produced from mangrove timber, a large component of the project was the development and implementation of a business plan for production and overseas marketing of charcoal produced from coconut shell, a waste product from copra production. The outcome of the change from mangrove wood to coconut shell as the source of raw material for charcoal production resulted in a reduction of mangrove clearance by 18 ha per annum.

114. Alternative livelihoods and business opportunities based on the use of non-timber mangrove products were identified and analysed in order to reduce mangrove cutting. Business opportunities that were encouraged included the production of coconut shell charcoal (see above) and the culture of soft-shelled mud crab, *Scylla* spp. Training and study visits were provided to individuals from local communities who were interested in these activities. A training course on the improvement of charcoal quality was also conducted for small scale charcoal producers. In addition, the project supported local communities in planting Leban to be used as alternative raw material for charcoal production; and the development of soft-shell crab culture. In parallel, numerous training, education and public awareness activities were implemented including the improvement of charcoal quality, management of mangrove ecosystems and silvofishery techniques.

### ***Promotion of sustainable tourism in coastal areas***

115. Tourism development projects in tropical coastal areas frequently result in significant coral reef degradation. Studies of the carrying capacity of tourism sites are critical in order to ensure sustainable tourism. This was the focus of the Mu Koh Chang demonstration site in Thailand. Designated a National Park in 1982, the Mu Koh Chang island group was subsequently designated in 2002 as an area having special or unique tourism features and identified as a new tourism destination in Thailand. Most tourists who visit Mu Koh Chang are involved in snorkelling and SCUBA diving. The number of visitors in 2007 was approximately one million, four times the number visiting in 2003.

116. To develop guidelines and measures to control the number of visitors and prevent tourism damage to the natural environment, a study was undertaken to determine the ecological, physical, facility and psychological carrying capacity of Mu Koh Chang. For the ecological carrying capacity the national park conservation targets were taken as relative impact indicators, and existing visitor use correlated with existing ecological impacts. The study specified the carrying capacity that should limit the recreational use of each site. Conclusions from this work along with the results of a study to determine an appropriate tourist user fee for visitors to the site are being used in ongoing planning at the site.

117. The demonstration project supported activities to engage members of local communities, including fishermen, in sustainable tourism through the operation of a Local Guide Centre. Members of this centre used small fishing boats to run short tours to coral reef and mangrove areas. A large number of householders in Klongson, Daan-kao, Daan-mai and Kaibae villages received tourist licences from the Tourist Authority of Thailand following training courses on sustainable coral reef tourism supported by the demonstration site. The income of local fishermen increased by around 50% partly due to the Guide Centre being able to make bookings avoiding the surcharge previously imposed by hotels. A mechanism to obtain financial contributions from hotels, resorts and tour centres that use coral reef areas for their businesses was developed as part of the management plan.

118. To raise community and tourist awareness of coral reef restoration, a small demonstration site for coral restoration was established at Koh Kra Island. The site size was made small for ease of control and management for the benefit of tourism, education, public awareness and research. The techniques and methods used were kept simple, using affordable materials available from local suppliers and those that provided a hard substrate for coral recruitment. Four methods were displayed at the site: provision of substrate in the form of pyramids of concrete pipes; attaching branching *Acropora* spp. with screws to PVC pipe frames in the coral nursery area; provision of additional substrate using clusters of concrete blocks to encourage natural coral recruitment; and attaching coral fragments to dead branching corals by means of plastic straps. Underwater snorkelling trails were also established in order to direct visitors to unique natural features of the site's coral reef ecosystem. The latter acted as a tourism attraction and a management tool for directing visitors to coral sites less sensitive to damage.

119. Public awareness activities included training for students, tourism operators, government staff and local people on the ecology of coral reefs and how to use them sustainably. Activities to encourage and empower volunteer groups in coral reef conservation were initiated and all activities emphasised stakeholder participation because a high level of public participation is crucial to successful sustainable management. This was critical to the establishment of mooring buoys in coral reef areas for diving and snorkelling as a means of avoiding anchor damage to sensitive habitats. Local volunteers also participated in monitoring and surveillance, particularly of illegal fishing activities and the on-going collection of data on tourism activities within the site for inclusion in a GIS database.

#### ***Rehabilitation of habitats and sustainable aquaculture practices***

120. A self-funded project namely "Investigation and planning for ecological restoration and reasonable use of resources at Con Chim area of Thi Nai Lagoon, Vietnam" joined the SCS project network of demonstration sites and pilot activities. This project was aimed at demonstrating innovative management interventions for the integration of habitat management and aquaculture. Thi Nai Lagoon supports a mangrove forest of 1000 ha with associated seagrass beds covering an area of 200 ha. These ecosystems contain high biodiversity and support an abundance of aquatic species supporting the livelihoods of human communities adjacent to the lagoon, especially the population of Quy Nhon City. Unfortunately, the area and condition of the mangrove forest had been rapidly degraded with as much as one-third of the lagoon area being converted into aquaculture pond.

121. The increased discharge of wastes from the city and port of Quy Nhon and neighbouring areas has accelerated the rate of degradation (Vo et al., 2008). The consequence of these adverse changes has been marked economic losses caused by: the lagoon bottom and navigable channels becoming shallower; the aquaculture industry facing more frequent disease outbreaks; the lagoon landscape having been adversely affected; and bird sanctuaries having become abandoned. These changes have resulted in lost potential to develop ecotourism that is regarded as a major source of potential income for most provinces of central Viet Nam. It was recognized that attempts to solve the environmental problems of Thi Nai lagoon required determination and a recognition of the scale and extent of the challenges associated with designing a management plan that is both acceptable to all stakeholders

and, at the same time, takes into consideration the environmental and socioeconomic complexities of the lagoon system and its multiple uses. Of particular significance was the need for this plan to effectively balance the need to rehabilitate degraded habitats with the continued pressure of aquaculture development.

122. A key activity at this site focused on establishing sustainable aquaculture practices and local livelihood assistance programmes. These included the identification of environmentally and economically sound aquaculture techniques for appropriate species that can be employed by local communities. This was based on trials to assess various models for multi-species culture and the development and implementation of best practices among the local aquaculture practitioners. In addition, through development of a co-management system involving the local communities in planning and implementing activities, fisher folk previously involved in destructive practices have been encouraged to move into areas of sustainable aquaculture production through the provision of funds for the purchase of seed and grow-out facilities as well as technical assistance.

123. To address the problems of habitat degradation, community-based re-planting schemes for both intensive and integrated use zones for mangroves have been developed. The local community has been directly involved, not merely in re-planting but also in protection and management of the newly established mangrove forests. Species diversity within the mangrove has been increased through the establishment of multi-species mangrove seedling nurseries. The awareness of the local communities regarding the vulnerability of seagrass beds to destructive fishing gear has been increased and core areas of seagrass in the lagoon have been identified and protected. The co-management approach has been deemed a critical element of the success of these activities. Initial outcomes in terms of mangrove restoration and adoption of new models of shrimp farming and oyster rearing have proved successful. Efforts to develop tourism and continue the rehabilitation of mangroves and seagrass are currently the focus of this site and are aimed at the continued improvement of local livelihoods.

#### ***Bilateral cooperation for transboundary water resource management***

124. The transboundary waters between the two coastal provinces of Kampot in Cambodia and Kien Giang in Viet Nam are characterized by shallow water conditions favourable to the growth of seagrass and coral reefs, whilst the adjacent coastlines support important mangrove habitats. Accordingly, the area supports abundant living marine resources that sustain adjacent villages. However, increases in the number of fishing boats and improved fishing gear causes increasing pressure on resources and habitats that could lead to a decline in fish stocks and yields. Trawl fishing, which is not allowed in the near-shore waters of either Cambodia or Viet Nam, occurs commonly on seagrass beds and in shallow waters of both Kampot and Kien Giang provinces. The SCS project's Regional Working Group on Seagrass identified this as one of the greatest sources of damage to seagrass habitats and biodiversity, particularly young seagrass shoots, small juvenile fauna and endangered species (UNEP, 2008c). Transboundary fishing activities occur daily as fishing boats from Viet Nam fish in seagrass beds adjacent to the Kampot coastline and vice versa. Unfortunately, fishing using explosives, toxins and electricity still occurs in the waters of both provinces.

125. The SCS project identified this area as suitable for a joint demonstration between the Kampot seagrass demonstration and the Phu Quoc coral reef and seagrass demonstration. Initial cooperation between the two sites was constrained by a lack of coordination in fisheries management and environmental management. Informal trade in marine products, including endangered species, occurred daily between the two provinces and an effective mechanism for joint management of fisheries had not been developed. Many recent development projects had occurred in the coastal waters of both provinces to increase the income of local governments and communities. While poverty alleviation was the first priority of the governments, environmental management for sustainable development had not been adequately considered in planning and there was a lack of harmonization between economic development and environment management. The knowledge of villagers regarding

the sustainable use of resources was still limited and local people concentrated on securing direct benefits in the short-term rather than the long-term. Law enforcement was not effective due to the weak capacities of both provinces.

126. The management groups of the demonstration sites of Kampot and Kien Giang had been working closely to address these problems, including how to reduce illegal fishing and trade of endangered species. Initial steps included the preparation of guidelines for assessment and monitoring and providing training and sharing information between the sites. Training on assessment, monitoring and transplantation of seagrass was provided by Vietnamese scientists to local staff of the Kampot Provincial Government and local community leaders and agreement reached on survey methods to be used by both provinces. Both parties agreed on the software and baselines for use in the joint GIS database and developed a joint programme of activities for funding by both governments and bilateral aid and assistance agencies.

127. The local governments of Kampot and Kien Giang provinces have cooperated since the early 1980s in matters of mutual interest under a friendship alliance. In 2003, cooperative mechanisms and agreements regarding administrative management between the two provincial governments were established and yearly consultative meetings have been held to improve bilateral cooperation. In 2005, collaborative mechanisms to support natural resources and habitat management were established under the SCS project. Three Joint Meetings between the Management Teams of the Kampot and Phu Quoc demonstration sites were convened to discuss different areas of cooperation and to prepare guidelines and an operational framework, encompassing the sharing of data and information. In March 2008, a Memorandum of Agreement on the Framework for Cooperation in the Management of Coastal Ecosystems and Natural Resources between the two provinces was signed by the Vice Chairperson of the Kien Giang Provincial Peoples Committee and the Deputy Governor of Kampot.

128. This agreement has now been endorsed and signed by both the Cambodian and Vietnamese Central Governments. The goal of this agreement is to enhance and strengthen cooperation between the two provinces in the fields of biodiversity conservation, reversing environmental degradation trends and the sustainable use of resources, to improve the livelihood of local communities. The objectives of the agreement are to: strengthen institutional arrangements for management of natural resources and the marine environment in the transboundary waters between the two provinces of Kien Giang and Kampot; improve the capacity for natural resource and marine environmental management in the transboundary marine zone; enhance awareness of managers and local communities regarding the importance of conservation within the two provinces; develop cooperative research programmes and exchange information, including sharing of data and databases; and maintain financial sustainability for long-term management and conservation of natural resources and the marine environment in transboundary waters<sup>39</sup>.

129. Following the closure of the SCS project the Provincial governments have continued to meet together annually without the need for UNEP facilitation and the agreement has now been endorsed at the Central Government level in each country. The facilitation of this agreement and the cooperation which has taken place across national boundaries represents a significant unplanned achievement of the project.

## **2.1.5. Coastal Habitat Management: Opportunities for Replication and Scaling-up**

### **2.1.5.1. Findings of the independent evaluations**

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<sup>39</sup> Copies of this agreement in Khmer, Vietnamese and English languages can be accessed via the SCS project website at <[http://www.unepscs.org/Demonstration\\_Sites/Demonstration\\_Sites/Cambodia\\_and\\_Vietnam\\_Sign\\_MoA.html](http://www.unepscs.org/Demonstration_Sites/Demonstration_Sites/Cambodia_and_Vietnam_Sign_MoA.html)>

130. The GEF has recently completed an evaluation of GEF support to achieving environmental benefits in the South China Sea<sup>40</sup>. The scope of this evaluation is considerably wider than just the SCS Project and a consequence of this is that it is difficult to tease out specific elements directly relevant to an evaluation of the SCS project. Nevertheless, the report does highlight a number of significant contributions of this project to regional environmental management and highlights amongst other points the cooperative arrangements between Kampot Province in Cambodia and Kien Giang Province in Viet Nam. The independent terminal evaluation of the SCS project concluded that:

*"The project has significantly contributed to regional coordination of management of the South China Sea marine and coastal environment by further developing regional networks of environmental management institutions, non-government organizations, and professionals from the seven participating countries, over and above what already existed. During the project's lifetime these networks have functioned well, with regular meetings held and documents produced containing data on environmental status as well as issues important for ecosystem management. Project mechanisms such as the Project Steering Committee (PSC) and Regional Scientific and Technical Committee (RSTC) facilitated information exchanges between participating countries, and provided a forum for discussion of regional management issues and possible approaches to addressing or solving them."*

*An excellent tangible example of enhanced regional coordination is the Memorandum of Agreement (MOA) on management of transboundary coastal habitats and resources signed by Kampot province in Cambodia and Kien Giang province in Viet Nam. The Mayor's Round Table meetings and the regional scientific conferences are further specific examples of project outputs that contributed to regional information exchange to enhance management coordination."*

#### **2.1.5.2. Benefits of a dedicated planning phase**

131. The achievements and best practices outlined above were obtained during the operational phase of the SCS project between 2005 and 2008. In reality, and as a result of administrative steps involving the revision of the Memoranda of Understanding between UNEP and the national SEAs responsible for demonstration site activities to accommodate the demonstration and pilot activities, most projects were initiated and closed within a 3-year period. During this short period, activities costing between US\$300,000 to \$400,000 were executed at each site with the support of GEF grant funds. An equivalent value of co-financed activities were also carried out during this period. The overall delivery of on-the-ground activities at the demonstration sites can be considered as high for a multi-lateral, intergovernmental project such as the SCS project. Broad cross-sectoral participation in demonstration activities, particularly through involvement in sitelevel management boards, was also generated during this period.

132. Specification of the conditions that contributed to the ability of the SCS project to support this rate of delivery, the level of stakeholder participation observed and the generation of best practices through local level project execution in a 3-4 year period is relevant to the replication of the experiences of the SCS project not only in the SCS region but also elsewhere. The activities of the project's preparatory phase, including demonstration planning and design, provide some insight. That phase focused on extensive consideration of available information and data relating to the environmental problems of the South China Sea, their causes and various options for their resolution. The development of the consensual information base for planning in the South China Sea (as detailed above) relied on extensive engagement of national and provincial-level stakeholders in information collection and review. This built institutional and personal relations among national SEAs and focal points with provincial and local level management agencies and practitioners.

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<sup>40</sup> Available online at <<http://www.thegef.org/gef/node/5719/>>

133. As a result of the networking and information sharing described above, the local level counterparts of the national habitat and land-based pollution focal points had contributed to the process of site selection and felt some degree of ownership of the decision to develop and operationalise a demonstration site in their locality. From another perspective, the national focal points, through their participation in meetings of the RWGs and RSTC, had an obligation to other members of those groups to ensure the timely development and initiation of demonstration and pilot activities. This regional and national level consensus on the priority sites for intervention, achieved as a result of the site selection process, is considered to have been essential in ensuring that the project could progress smoothly from its preparatory phase to the operation of the demonstrations without objections and delay within countries or at the regional level.

134. Activities in the preparatory phase also enabled the SCS project to develop realistic ambitions with respect to what the demonstration projects and pilot activities could conceivably achieve. For example, the decision of the RWG-LbP to identify pilot activities addressing particular types of pollution to serve as replication models rather than attempting to clean up entire hot spots is consistent with this philosophy. This decision relied on extensive consideration of the information and data relating to pollution hot spots, the discharges of known contaminants and their impacts on the receiving environment.

135. The detailed consideration by all the RWGs and the RSTC of the ‘what’, ‘whom’ and ‘how’ described above enabled the development of a common understanding of the purpose of the demonstrations. This was reinforced by the extensive use of the causal chain analysis approach to identify social, economic, and/or cultural root causes of habitat degradation and loss and pollution at the selected sites and options for their resolution. Whilst the conduct of these analyses were difficult for all parties involved, the resultant causal webs were essential in facilitating the design of realistic and targeted actions at each site and acted as valuable tools for focal points in communicating with national and provincial level stakeholders about the ‘what’, ‘whom’ and ‘how’ of the demonstrations. This exercise is deemed to have contributed to broad stakeholder buy-in to the demonstrations that aided in their timely and efficient delivery.

#### **2.1.5.3. Benefits of the mechanisms for coordination and integration**

136. The emphasis on stakeholder analysis during the design of demonstrations contributed to the establishment of well-represented cross-sectoral demonstration site management boards. The decision to establish these boards as locally-based committees was effective in ‘embedding’ the projects within local government and community-based governance structures and engaging stakeholders in matters relating to financial management and procurement, review of activity status and monitoring and evaluation. Involvement of community representatives on these management boards contributed to the establishment of realistic views and expectations at the site-level of what the project initiatives were aiming to achieve. It also contributed to the planning of actions that aligned with local needs and traditions and is believed to have enhanced ownership over projects and their results. The integration of traditional practices in management planning at the Belitung coral reef site demonstrates the importance of this.

137. To strengthen linkages between habitat demonstration site stakeholders and members of the various regional organs of the project, all RWG, Regional Task Force, RSTC, and PSC meetings were convened at the habitat demonstration sites during the operational phase of the project. The remote location of almost all sites meant that meeting accommodation and venues were limited and often basic. Despite this, all meetings went ahead as planned, although often without air-conditioning and occasionally without power for computers and projectors. This action, endorsed by the PSC, is considered as having been instrumental in generating the high levels of local government commitment and support to the work of the demonstrations sites and pilot activities.

138. Regional experts were able to share their knowledge directly with local practitioners and learn of the unique circumstances and challenges faced by local administrations. In all cases, local government officials and community representatives extended their warmest local hospitality to meeting participants and the friendships established during the course of the meetings provided opportunities for significant informal discussion of the work of the SCS project and its national and regional planning initiatives. This is also believed to have contributed to a deeper local stakeholder understanding of the SCS project and the importance of effective management of their sites from the perspective of the broader SCS marine basin.

139. The regular review of demonstration project status by the RWGs and RSTC enabled the early identification and rectification of project management issues. For many of the responsible SEAs, the SCS project demonstrations represented the first time they had implemented projects of such magnitude, especially in terms of available financial resources, the scope of activities and the complex reporting requirements of UNEP and the GEF. For example, at the time of the mid-term reviews of the demonstration projects, a total of 55% of available demonstration project funds had been expended. To individual project managers this information was probably of little interest in the context of day-to-day challenges of stakeholder liaison and coordination, activity implementation and oversight of contracts let with local supporting organisations and individuals.

140. The RWGs, however, were able to take this information into account, together with reports of the mid-term evaluations, to consider proposed courses of action to ensure timely and efficient project completion. Such actions ranged from recommendations to resolve any financial or administrative ‘bottlenecks’ to the exchange of personnel from one site to another to assist with technical aspects of projects. Examples of the latter include the deployment of scientists of Viet Nam’s Institute of Oceanography to assist with the design and implementation of monitoring at the Kampot seagrass site in Cambodia. Where necessary, recommendations were made to the RSTC for possible consideration by the PSC, although the issues were typically resolved at the level of the RWGs. The RWG review of activities and achievements was also valuable in the planning and organisation of study tours between sites.

141. The role of the demonstration sites in integrating local governments and communities within national and regional frameworks, particularly through the MRT forums, has been identified as a key innovation of the SCS project that contributed to the success of site level activities in fostering a better understanding of how to manage the environmental problems of the South China Sea from the levels of local communities to national governments. Two of the MRT meetings were convened in conjunction with Regional Scientific Conferences. This enabled individuals involved in site-level activities to participate in larger regional discussions relating to: national and regional benefits and achievements; the use of sound science for environmental management; and planning for successful implementation of the revised SAP. This was commented on by the then Deputy Executive Director of UNEP, Dr. Shafqat Kakakhel, during the third MRT meeting as follows:

*“The range of actions undertaken in the 23 demonstration sites promoted under the project is truly great, reflecting not only the diversity of cultures and social and economic conditions found in this region, but also a major feature of the South China Sea Project of course is that it is a multi-lateral project involving the active participation of all seven countries bordering the South China Sea and has forged a strong network of scientists and government officials committed to managing sustainably the marine and coastal environment of the South China Sea.”*

142. Similarly, NGO Forums facilitated by the GEF Small Grants Programme (SGP) were convened in conjunction with the third and fourth MRT meetings. National Co-ordinators of the SGP, NGO representatives from the National Small Grants Committees, the SGP Programme Specialist and PCU staff participated in these forums to explore ways in which community groups, supported through SGP, could contribute to the implementation of the revised SAP. This resulted in the

development of a partnership in which site level interventions in support of SAP implementation were funded jointly by funds derived from the SCS project budget and the SGP. The results of this initiative are presented by Chen et al. (2013).

143. Of particular note are initiatives to build ‘self-funded’ sites into the regional network of demonstrations. For example, it is unlikely that the SCS project network and various MRT and RSC meetings would have been exposed to the Thi Nai Lagoon initiative in Viet Nam. This project acted as an important process demonstration site in the framework of the SCS project, particularly in the context of its demonstration of integrated mangrove rehabilitation and sustainable aquaculture development. Experiences shared from this project will likely be particularly valuable in guiding activities to achieve NAP and SAP targets associated with the rehabilitation of abandoned shrimp ponds whilst balancing local needs for food and income generation from the culture of fish and other seafood.

#### **2.1.5.4. Linking local action to national and regional planning**

144. The development and operation of the demonstration sites and pilot activity provided guidance to the preparation of NAPs and the revision of the SAP. The conduct of causal chain analyses and the identification of options for intervention at each site provided members of the various national committees, RWGs and the RSTC with a suite of possible actions aimed at addressing the root causes of environmental problems for inclusion in national and regional plans. Many of these actions were included in the NAPs for habitats and land-based pollution and were directed at habitat sites characterised during the demonstration site selection process.

145. Similarly, the experience gained in the operation of the sites provided information on the realities and actual costs of site-level project implementation. This information was used at the regional level to ensure that the NAPs and SAP were realistic from the perspectives of both the timing and the costs of activities. The importance of applying this site level implementation experience on the scale of national and regional action is an important lesson learned generated by the SCS project that has potential for replication in other multilateral environmental planning projects and programmes.

146. The initial GEF strategy defined the objective of its international waters focal area as “to contribute primarily as a catalyst in the implementation of a more comprehensive, ecosystem-based approach to managing international waters and their drainage basins as a means to achieve global environmental benefits” (GEF, 1996). The network of demonstration sites and pilot activities established through the SCS project made a significant contribution towards achieving this objective by developing practical experience and stimulating cooperation and coordination both within and between countries. It was not anticipated that the demonstrations would achieve measurable stress reduction or environmental state benefits during their short duration of 2-3 years. As a foundational project of the GEF international waters focal area, the SCS project demonstrations were significant from the perspectives of developing practical experience in coastal management, strengthening local coordination, and the identification of best practices for replication and scaling-up through NAP and SAP implementation.

147. The results frameworks developed and included in the various habitat and land-based pollution NAPs and the South China Sea SAP provided specific process, stress reduction and environmental state indicators for use in monitoring and evaluating the impact of activities conducted as part of NAP and SAP implementation. The SCS Project’s demonstration and pilot activities played an important role in this staged approach to GEF investment in international waters which supports groups of countries to work through processes of strengthening enabling environments and developing foundational capacity, testing management approaches through demonstration and pilot activities to inform higher level strategic planning for transboundary water resource management, and ultimately to a SAP implementation stage during which successful management approaches can be replicated and scaled-up to reduce stress and enhance environmental state.

148. The numerous best practices in coastal habitat and land-based pollution management, summarised above and documented in greater detail in the four related technical publications and nine lessons-learned notes, have significant potential for replication and scaling-up, both in the SCS marine basin and other shallow water seas. The establishment of the public-private partnership for mangrove conservation in the rapidly developing economic hub of southern China demonstrates the important role of such partnerships in exploring more effective management mechanisms based on sound science and community awareness. The regional sharing of the achievements of this partnership during meetings of the SCS project, such as the MRT and RSC, and via the publication of lessons learned notes, for example, represents the preparedness and commitment of both the private sector and government to jointly engage in regional forums relating to environmental issues in a shared water body.

149. The integration of traditional management practices in broader integrated coastal planning at the Belitung coral reef site has high potential for replication. Several other districts in Indonesia have developed local regulations or Perda for the management of coral reefs and could potentially benefit from the Belitung management planning experience. Similarly, the principles adopted at the Belitung site for dispute resolution among fishermen have potential for replication in other areas of Indonesia's South China Sea coast, particularly in the Riau Islands area and coastal waters of West Kalimantan province where similar fishing methods are used and conflicts exist. To date, these experiences have been used in the design of a planned fisheries initiative in Indonesia aimed at improving the management of important fisheries refugia.

150. It is anticipated that the experiences gained in integrated fisheries and habitat management at the Phu Quoc demonstration site will be suitable for application in other areas of Viet Nam and the South China Sea where over-fishing and the use of inappropriate fishing gear are significant impediments to more sustainable use of fisheries resources and habitats. In the past, many marine protected areas in Southeast Asia have been promoted in terms of their potential to improve the state of fisheries and their habitats but have rarely included mechanisms to ensure the effective integration of fisheries considerations into management. In contrast, fisheries departments and ministries largely focus on securing sustainable yields from fish stocks.

151. Experience of the Phu Quoc site suggests that cross-sectoral co-ordination can be achieved through the use of fisheries refugia concept in Marine Protected Areas that has provided a platform for building partnerships and enhancing communication between the environment and fisheries sectors at the provincial and local levels. Given the high rates of habitat degradation and loss in the South China Sea basin, and the impacts of fishing on soft bottom habitats such as seagrass, there exists a need to explore the scaling-up of such approaches in the region. Accordingly, efforts are underway to operationalise a regional system of fisheries refugia in the South China Sea via an inter-linked UNEP/GEF project entitled "*Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and the Gulf of Thailand*" that is being executed regionally by the Southeast Asian Fisheries Development Center in partnership with the national government agencies responsible for fisheries in the six participating countries.

152. Experiences in developing the Thi Nai sanctuary in Viet Nam provides examples of co-management approaches to a complex environment and ecosystem facing threats from multiple uses. As such, it serves as a model for potential replication in other threatened coastal lagoons both in Viet Nam and elsewhere in the region. The related experience of the Batu Ampur mangrove site in developing techniques for the evaluation of mangrove uses and the estimation of economic values of mangrove resources for application to a business plan for alternative livelihood initiatives also has high potential for use in other settings. The model for sustainable tourism management at the Mu Koh Chang coral reef site has also assisted in the development of regional experience in multiple use planning. For example, a group of 20 senior government officials from Viet Nam's coastal provinces visited Mu Koh Chang as part of an intra-regional exchange and learning initiative and have

commenced implementing some of the innovations from that site in the coastal provinces of southern Viet Nam.

153. The bilateral cooperation generated at the transboundary sites of Kampot in Cambodia and Kien Giang in Viet Nam provides an excellent example of achievements in transboundary water resource management in a marine basin characterised by past and ongoing geopolitical tensions. The elements that contributed to the signing of the Memorandum of Understanding and joint commitments for environment and natural resources management between the two provinces are worthy of wider examination. A salient point is that a similar initiative to foster cooperation in the transboundary water areas of Thailand and Cambodia was also supported by the SCS project but did not generate the level of formal joint commitment reached by Cambodia and Viet Nam. Lessons from both initiatives have the potential to strengthen and revitalise multilateral cooperation in the mentioned areas and in other transboundary areas of the South China Sea basin and beyond.

### **2.1.6. Land-Based Pollution in the South China Sea: Issues, Lessons Learned and Needs**

#### **2.1.6.1. Geographical, demographic and economic context**

154. The South China Sea is located in the Indo-West Pacific between the Pacific Ocean on the East and the Indian Ocean on the West, and has an area of 3.447 million square kilometres and a maximum depth of 5,245 meters in the Manila Trench. It is situated in the region between 3° South and 26° North latitude and between 100° and 121° East longitude. The northeastern sub-basin occupies about fifty percent of the total area of the South China Sea and includes a deep zone with abyssal plain, deep trenches and submerged peaks or guyots. There is an extensive continental shelf bordering the northern and western shores where pollution and contamination problems tend to be more prevalent than in the insular southern and eastern portions of the sea.

155. The South China Sea is connected to the Pacific Ocean by the Taiwan, and Bashi, Straits; to the Sulu and Celebes Seas by the Mindanao and Balabac Straits; to the Indian Ocean via the Straits of Malacca; and, to the Java Sea by the Kalimantan and Gaspa Straits. The Bashi and Malacca Straits are the most important in terms of the exchange of water between the South China Sea and other water bodies. The South China Sea receives freshwater input from many rivers, and the combined discharge from the Mekong, Pearl, Red and Chao Phraya Rivers is more than a billion cubic meters per year. The largest rivers draining into the South China Sea include the Mekong and Red Rivers in South and North Viet Nam, and the Pearl River in Guangdong Province, China. Discharges from these rivers, including land-based contaminants, influence the distribution of marine habitats and resources in the South China Sea.

156. The South China Sea is located in the monsoon belt of Southeast Asia with two monsoon periods: the Northeast monsoon from November to March in the winter, and the Southwest monsoon from June to August in the summer. The two inter-monsoon seasons between April and May and between September and October are transitional periods of unstable wind direction and speed. The South China Sea is influenced by typhoons which originate both inside the South China Sea and outside in the Pacific Ocean. Typhoons mainly affect the coastal areas of Taiwan, China, the Philippines and Viet Nam, and typhoon surges from 3.2 to 3.6 metres have been recorded in China and Viet Nam.

157. The tides of the South China Sea are complex in comparison with most other seas or ocean areas since there are four different tidal regimes within the basin. Semidiurnal tides only occur in the Taiwan Strait and northern Viet Nam; diurnal tides dominate in the Gulf of Tonkin, and the Gulf of Thailand while both irregular diurnal, and semi-diurnal tides are found elsewhere in the basin, the latter predominating in coastal areas of southern China, Southern Viet Nam, Eastern Malaysia, Northwest Kalimantan and in the Bashi Straits. Maximum tide level at Minjiang (China) is 7.2m; Hong Kong (China) 2.7m; Cua Ong (Viet Nam) 4.7m; Sihanoukville (Cambodia) 1.8m; Bangkok Bar

(Thailand) 1.2m; East coast of Malaysia 3.5m; Singapore Straits 3.6m; Sarawak (Indonesia) 5.4m; and Manila (Philippines) 2.2m.

158. As a consequence of the monsoons; the water exchange between the South China Sea and neighbouring water bodies; and the bathymetry of the South China Sea marine basin, there are two types of residual currents in the South China Sea. During the Southwest monsoon the main current flows in a Southwest-Northeast direction along the coast of Viet Nam, and from the Malacca and Kalimantan Straits to the Bashi and Taiwan Straits, resulting in the development of clockwise currents in the southeastern portion of the South China Sea, the Gulf of Thailand, and the Gulf of Tonkin. During the Northeast monsoon, the main current also flows along the coast of Viet Nam, but in an opposite, Northeast-Southwest direction. This is strengthened by currents from the Sulu and East China Seas, resulting in an anticlockwise current in the Gulf of Thailand and the Gulf of Tonkin. Currents are generally stronger in winter than in summer, except in the Gulf of Thailand.

159. The countries bordering the South China Sea are some of the most densely populated and with the fastest growing economies in the world. It is estimated that more than 270 million people live in the coastal zone of the South China Sea. Land-based activities are therefore the main source of contaminants and pollutants in coastal waters. Approximately 70% of contaminants entering the South China Sea are derived from coastal rivers, and include agricultural and urban run-off, industrial discharges, and discharges from ports and harbours. Coastal aquaculture is a significant and growing source of contamination, discharged directly, while inputs via groundwater have not been measured. The major categories of waste discharged into the South China Sea include domestic sewage, industrial and agricultural wastes, mining and construction wastes including sediments and mine tailings. Ship-based sources of pollution are a minor contributor to pollution problems in the South China Sea, but may have severe impacts when large volumes are released such as during major oil spills, and are significant in areas such as the Straits of Malacca where substantial volumes of shipping are concentrated during their passage from the Indian Ocean to the South China Sea.

### **2.1.6.2. Land-based sources of pollution**

#### ***Domestic sources***

160. Sewage and domestic wastes, including liquid and solid wastes are major pollutants of coastal waters. A large proportion of domestic waste in the South China Sea region is discharged directly or indirectly via rivers to the sea without proper treatment. It is estimated that the populations of countries bordering the South China Sea generate one million metric tonnes of sewage per year. The low level of sewage treatment has led to serious concern with regard to organic and nutrient pollution in the South China Sea. The high organic and nutrient content of untreated sewage leads to eutrophication, the occurrence of red-tides, and harmful algal blooms in localised areas of the coast. The consequences of this include anoxia of bottom waters, resulting in fish and benthos mass mortality. Declines in seafood quality, and public health hazards may result from build-up of toxins in maricultured seafood, particularly shellfish derived from phytoplankton in the red tides and harmful algal blooms. Domestic wastes may also introduce pathogenic bacteria, viruses and protozoa to the marine environment which can be taken up by shellfish and reintroduced into the human food chain.

#### ***Industrial sources***

161. These include liquid, solid and gaseous wastes from coastal factories involved in the manufacturing and processing of building materials, textiles, paints, food, minerals, and hydrocarbons. Most factories employ obsolete technology and processes and the waste waters discharged into the South China Sea are normally untreated or only partially treated. These wastes contain significant amounts of heavy metals, oil and organic matter which can be toxic to marine organisms.

#### ***Port and harbour sources***

162. The South China Sea carries an enormous volume of marine transport and numerous ports and harbours have been constructed over recent decades to support international, regional and domestic maritime transport. Major wastes from ports and harbours include toxic compounds released from antifouling paints, such as tributyltin (TBT), and oil discharged from ships. Tributyltin is an effective biocide and is toxic to marine organisms at concentrations as low as one nanogram per litre. Ballast water often contains high concentrations of crude oil, which is toxic to marine organisms. It may also contain exotic organisms.

#### ***Agricultural sources***

163. The countries bordering the South China Sea have a substantial agricultural base. Large and increasing quantities of pesticides and chemical fertilisers are used in the region. Improper handling and application of pesticides and fertilisers has caused pollution of ground water, nearby rivers and coastal waters of the South China Sea. Fish and shellfish are extremely sensitive to pesticides, especially chlorinated hydrocarbons (e.g. the 96hLC50 value of aldrin to fish is 1 µg/L). Intensive animal husbandry is now a growing source of nutrient and organic matter contamination in the coastal waters of China, Viet Nam, Thailand and Malaysia. In Indonesian waters of Riau Islands and Jambi Provinces, high sediment loads are observed in coastal waters due to coastal erosion associated with palm oil plantations.

#### ***Mining sources***

164. The mining of coal, minerals and building materials on land can contaminate the aquatic environment. Mining wastes include the chemicals used in the extraction and primary processing of minerals, low pH water from mine settlement ponds, sediments eroded from mining areas, and heavy metals leached from mine tailings dumps and spilled during transport. Dust from Vietnamese coal mines for example has degraded coral reef and seagrass habitats in coastal waters and sediments from mining have smothered coral reefs in the Philippines. Oil and gas mining is also a significant source in Indonesia.

#### ***Marine aquaculture sources***

165. The aquaculture sector has developed rapidly in Southeast Asia over recent decades, largely in response to increased global demand for fish and shrimp products. China is the world's largest aquaculture producer much of it freshwater, whilst Thailand, Viet Nam, Indonesia and the Philippines are also amongst the world's most important aquaculture producing countries. The major pollution problems caused by aquaculture include the discharge of faecal matter from ponds and cages, which is typically high in organic matter, nutrients, and suspended solids, and contamination from antibiotics and other drugs added to the water to treat fish and crustacean diseases. The exposure of acid sulphate soils during excavation of shrimp farm ponds and the subsequent run-off of low pH water to coastal waters during rainfall events is also an issue of concern.

#### ***Contaminants and pollutants in the South China Sea***

166. Land-based contaminants enter the marine environment through either point sources such as ports, harbours, and industrial complexes or through non-point sources such as rivers or groundwater that contain agricultural run-off, liquid domestic wastes and brackish-water aquaculture contaminants. Suspended solids are mostly derived from land-clearance, logging, coastal construction and the conversion of mangrove forests for other uses. Nutrient loads are mainly derived from untreated domestic wastes from coastal cities or urban areas discharged directly into coastal water bodies or rivers with minimal levels of treatment. Fertilisers, pesticides and herbicides in farming practices are also known to enter coastal waters of the South China Sea via runoff and leaching. Increased suspended solids and nutrient loads impact the productivity of marine ecosystems with suspended solids reducing light penetration and hence photosynthesis and enhanced nutrients increasing primary productivity. Concentrations of ammonia, nitrite, nitrate, and orthophosphate, are increasing and

exceed the ASEAN Marine Water Quality Criteria in many locations. Increased inputs of nutrients apparently correspond to the observed frequency of red tides and harmful algal blooms.

167. Compared to suspended solids and nutrients, oils, heavy metals and persistent organic pollutants (POPs) pose an immediate threat to both living resources and marine ecosystems of the South China Sea. Oil and grease pollution from land-based sources contributes about 50 % to the total oil pollution in the marine environment. The threat of oil pollution to the marine environment and resources is even greater when there are no laws or limited law enforcement. For example, in Cambodia and Viet Nam there are no regulations pertaining to the discharge of ship wastes, with most waste engine oil being discharged directly into coastal water bodies. Similarly, concentrations of oil and grease, mercury, and phenols exceed ASEAN Marine Water Quality Criteria in many coastal water areas of the South China Sea due to weak regulations and minimal monitoring and enforcement.

168. Based on several studies conducted in the coastal waters of the South China Sea particularly in Thailand, the Philippines, Viet Nam, Malaysia and Indonesia it has been found that concentrations of heavy metals such as mercury (Hg), Arsenic (As) and lead (Pb) are increasing rapidly. These heavy metals have potential negative impacts on the health of marine living resources and humans who consume seafood products. Sound and strategic actions are needed at all levels of government and by stakeholders to curb heavy metal pollution and accumulation in sediments and biota in the hotspots.

#### **2.1.6.3. Past regional initiatives addressing land-based pollution in the South China Sea**

169. Over the past three decades several regional projects concerning marine pollution have been implemented by various organisations in the South China Sea region. These projects have produced useful information for marine pollution research and monitoring at the regional level and have also built capacity in the participating countries for marine pollution monitoring and management.

170. The Intergovernmental Oceanographic Commission Sub-commission for the Western Pacific (IOC/WESTPAC) has initiated several regional projects dealing with marine pollution research and monitoring, including an assessment of marine pollution from river inputs which resulted in a regional network of river monitoring systems to monitor nutrients inputs to the Western Pacific Ocean. This network extended over a wide geographic area from Russia in the North to Australia in the South and Fiji in the East. Two inter-calibration exercises were carried out as part of the project and training courses on analytical methods were organised for technicians and scientists from water quality laboratories within the region. The data generated from the project was transmitted to the Responsible National Data Centre for WESTPAC (Japan Oceanographic Data Centre, JODC), and relevant papers were published in the proceedings of the IOC/WESTPAC Scientific Symposia.

171. During the implementation of the global International Mussel Watch Project, IOC/WESTPAC initiated a mussel watch project to monitor pollutants such as heavy metals and pesticides in the WESTPAC region. A regional network was established, and training courses were organised. During the implementation of the project, reference materials prepared by the National Environment Research Institute, Japan were introduced to and used by the project. However, due to technical difficulties monitoring activities were only carried out in a few participating countries. The project established a mussel watch monitoring network within the region, and trained scientists from regional laboratories.

172. A third activity was an assessment of pollutants from atmospheric deposition in the WESTPAC region during which some attempts to monitor the deposition of metals (Japan) and organic compounds (PAH, in Thailand) were made. The major findings of the project indicated that the inputs of nutrients to the sea via atmospheric deposition could be as significant as those from river inputs. The results of the surveys in the Yangtze River and Yellow River supported this phenomenon.

173. Following the United Nations Conference on Environment and Development (UNCED) held in 1992, the Intergovernmental Oceanographic Commission of UNESCO developed the Global Ocean Observing System (GOOS). The Intergovernmental Health of the Oceans Panel, co-sponsored by IOC

and UNEP, prepared a strategy for monitoring and prevention of marine pollution. The HOTO Strategy provided scientific guidelines for marine pollution monitoring and prevention, and managing the impacts on human health. The Strategy considered not only the chemical aspects of the pollution problem, but interdisciplinary approaches were proposed to the governments and scientists engaged in the respective activities.

174. Following the adoption of the Global Programme of Action for the Protection of the Marine Environment from Land-based Pollution (GPA/LBA) in 1992, the Regional Programme of Action for Implementation of the GPA/LBA was adopted in 1996, by the Coordinating Body for the Seas of East Asia (COBSEA). Implementation of the Regional Programme of Action has been carried out since then, including preparation of regional review, organization of relevant workshops and training courses. The primary focus of COBSEA has been on the sources of marine contamination and pollution. Linkages between the GPA and this present project will be fostered by UNEP and COBSEA as the responsible agencies for these initiatives.

175. The Partnerships in Environmental Management for the Seas of East Asia commenced as a GEF project in 1992 and has subsequently grown and extended its operations to broader Integrated Coastal Management planning approaches in the region.

#### **2.1.6.4. Land-based pollution activities of the SCS project**

##### ***Regional networking***

176. The Regional Working Group for Land-based Pollution (RWG-LbP) established in the first meeting held in Bangkok, Thailand, 3 - 5 April 2002, was comprised of seven Focal Points from the participating countries , two Regional Experts, and one member from the Project Co-ordinating Unit (PCU). The government designated Focal Points were contracted to provide 25 percent of their time to the project under the Memoranda of Understanding signed between UNEP and the Specialised Executing Agency within which the focal point worked. The RWG-LbP links to other regional working groups and two regional task forces one for Economic evaluation and one for Legal Matters.

177. At the national level, the national coordinators or focal points were responsible for convening regular meetings of a national land-based pollution committee or working group. National working groups for land-based pollution were developed in all participating countries, and were Chaired by the National Focal Points. A total of 126 individuals representing sixty six separate national institutions were members of these committees which ranged in size from eight to twenty six members. A total of 12 institutions or agencies with expertise in various aspects of land-based pollution were subcontracted at the national level to assist in the completion of tasks in the MoU signed with UNEP.

##### ***Development of a regional information base for management***

178. A problem identified during the development phase of the South China Sea Project was that, while many valuable data sets on land-based pollution were available within the region, the sharing of this information was restricted by weak data management systems in most countries. Limited cross-sectorial integration between government ministries and departments involved in marine environment and natural resource management was also identified as a key constraint in improving the information base for the management of land-based pollution of the South China Sea. In response to this, national and regional meta-databases were compiled to enable the sharing of data about existing pollution data sets (i.e., metadata). During the period from 2003-2007, a total of 226 meta-data entries on land-based pollution data sets have been contributed to the regional online meta-database for the South China Sea (<http://metadata.unepscs.org>) by Cambodia (12), China (27), Indonesia (13), Thailand (28), and Viet Nam (146). Additional metadata sets for the Philippines are available for incorporation in this regional database.

179. The Regional Working Group on Land-Based Pollution also worked during the preparatory and operational phases of the South China Sea Project to collate data for inclusion in a regional GIS database on: the coastal impacts of pollution (ambient water quality/sediment quality); the impacts of pollution on human health; pollution loading from key rivers draining into the South China Sea basin; and land-based activities in coastal catchments of the South China Sea. However, despite the large number of water quality (539), sediment quality (99), and biota monitoring stations (21) in the South China Sea and Gulf of Thailand, very little information relating to data collected at monitoring stations was contributed to the regional GIS database by the countries (61 data sets in total). A total of 35 datasets relating to the impacts of pollution on human health, and 68 data sets relating to pollution loading from river catchments, were compiled at the regional level and used in development of SAP targets for land-based pollution management.

#### ***Hotspot characterization and priority ranking***

180. The target identified for land-based pollution management was based on setting and maintaining region-wide water quality standards and water quality objectives which will assist in maintaining the health of coastal ecosystems. In order to achieve this goal, the SCS project adopted the marine water quality criteria adopted by the Association of South East Asian Nations (ASEAN) and the biological and sediment quality standards used in the People's Republic of China for use in characterising potential regional "pollution hot spots", the term which has been proposed and agreed within the context of SAP implementation as: "*A limited and definable area in which there are prevailing environmental conditions attributable to anthropogenic activities that adversely affect, or threaten to affect, human health, threaten ecosystem functioning, reduce biodiversity and/or compromise resources and amenities of economic importance in a manner that would appear to warrant priority management attention*".

181. The procedures employed in characterising pollution hot spots in this project partially benefited from work conducted within the preparative (PDF-B) phase of a UNEP/GEF project on the Russian Arctic. However, the refinement and augmentation of these procedures within the South China Sea project have substantially enhanced their potential replicability. The criteria for ranking hot spots were agreed by consensus and a total of 17 hotspots were characterised using the ranking system agreed by the RWG-LbP. In categorising the magnitude of the problems the "impact on the marine environment" was evaluated in terms of impacts on: water quality; sediment quality; biological samples; changes in living marine organisms; and affected marine communities. Ambient water quality was itself defined in terms of: nutrients; faecal coliform bacteria; heavy metals and dissolved oxygen concentration.

182. Ranking of the impacts resulting from contaminants in the South China Sea marine basin suggests that the reduction in water quality is apparently the major concern, followed by biological impacts which are less well demonstrated and thirdly contamination of sediments. In terms of the contaminants themselves the most widespread and severe problems resulted from enhanced nutrient inputs whilst heavy metals were found to be a significant problem in biological samples, and sediments of certain hotspots. The results form a sound basis for selection of pilot activities addressing regionally significant impacts of specific contaminants in hot spots of the region and capacity building.

#### ***Pilot activity***

183. In evaluating potential pilot activities it was recognised that the resources available to the project were insufficient to rectify all pollution problems at even one pollution hotspot. The focus was to identify potential pilot activities that would serve as replication models addressing particular types of land-based pollution rather than to attempt the cleanup of individual sources or an entire "hotspot". As part of this evaluation a "causal chain analysis" was conducted. A causal chain analysis is a recommended GEF tool used in the identification of the causes of change in environmental state, the

level or scale of threats at a particular site, and the alternative points of intervention, along the chain of cause and effect. Optimally, all causes are identified and quantified and the potential benefits of intervention at any one point along the chain are evaluated, where possible through some form of cost benefit analysis. The causal chain therefore is used to provide an objective basis for deciding between different types of intervention at a particular site.

184. In this context, the environment of Batam Island in Indonesia had and continues to be degraded as a consequence of increased population and demands on marine resources by residents to achieve higher living standards. This has led to overexploitation of resources, increases in domestic and industrial wastes and physical destruction of coastal habitats. With the support of the land-based pollution pilot project, a multi-sectoral management board was established and maintained beyond the life of the project at this site. This body not only co-ordinated the pilot activity but also integrated the work of related entities in the planning and implementation of activities for the sustainable development of the entire city.

185. This management board selected the peri-urban village of Tanjung Riau on Batam Island to trial communal septic and solid waste management systems. To manage solid wastes, the project organised waste collections and storage and treatment in the village. Two hundred plastic rubbish bins were provided for the collection of solid wastes separated into organic wet materials and non-organic dry wastes. The organic wastes were gathered in a temporary waste management site and used to produce compost. Around 300-400 kg of compost was produced per month from organic waste. The product was used as fertiliser and provides an additional source of income for villagers and the local women's group. Non-organic waste was transported for disposal at the Batam city solid waste dump.

186. The project worked closely with local communities in Tanjung Riau village in order to address environment problems caused by domestic waste. Ten systems of communal septic tanks were installed, each providing for the needs of 8-10 families. The local community offered its own land for the placement of these tanks. One third of householders in the village were connected to such systems and plans were developed to replicate this system elsewhere. The process of installing septic tanks included the participation of the local communities starting from planning, design, construction and maintenance. The system has not only improved sanitary conditions in the village but also proved helpful in enhancing awareness and generating support from the local community for environmental management. The project's management board encouraged the scaling-up of the practices of domestic waste management in Tanjung Riau village to the whole island level through its inclusion as a priority action area of Batam City's environmental policy.

187. The pilot activities further promoted the adoption of the Indonesian SUPER<sup>41</sup> and PROPER<sup>42</sup> programmes that were introduced in 2002 to reduce heavy metal discharges from industry. Through activities executed by the pilot project, awareness of industrial sector enterprises was significantly improved as was compliance with standards for the heavy metal content of wastewater. The project was successful in working with government and industry in clearly delineating responsibilities in the management of heavy metal discharges. Local government undertook control and evaluation of environmental management in industries (e.g., documentation and sea water quality) and the organisation of training seminars for industrial sector representatives and associated stakeholders. The industrial sector was responsible for reporting on environmental management of industrial activities, ensuring compliance with national and local government regulations and monitoring sea water quality.

188. A database on environmental status and management in Batam City was developed to include all data obtained through surveys and monitoring made by the environmental sector and data collected through the monitoring of industrial centres during recent years. This database was a useful tool for

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<sup>41</sup> National environment management system for the sustainable development of industry.

<sup>42</sup> Government system for rating the compliance of industry with environment standards.

environmental management in the city, for assessing changes in environment status and evaluating the effectiveness of the SUPER and PROPER programmes in terms of reductions in the heavy metal content of wastewater discharged from industrial enterprises in the city.

189. In terms of land-based pollution management, the potential for replicating activities to promote the SUPER and PROPER programmes within the industrial sector is high. Involvement of industrial enterprises in environment management in Batam serves as a good example for wider dissemination. Pilot-scale improvements to domestic waste management systems in Tanjung Riau village on Batam Island have been scaled up by the Batam City Government. A key experience at Tanjung Riau is that solid wastes can be used to generate income for the community, if managed properly. This provides a positive example for use in encouraging other villages to establish similar systems.

#### ***Valuing the impacts of land-based pollution***

190. The Regional Task Force on Economic Valuation has developed a framework for the valuation of land-based pollution impacts on coastal habitats that includes: a checklist of the impacts of land-based pollution on coastal habitats, specifying types of pollutants and their specific impacts on the four major habitats [mangroves, coral reefs, seagrass, and wetlands]; a framework for valuing the impacts of land-based pollution on the four habitat types, categorising the various specific impacts in the checklist into three categories, i.e. productivity, amenity, and human welfare; and procedures to undertake valuation of impacts of land-based pollution on the four habitat types, in which valuation techniques, indicator of measurement, data needed, and notes and assumptions were described for each specific impact identified in the checklist and framework.

191. The impact checklist, the framework, and the procedures for valuing the impact on the coastal habitats have been reviewed and checked by the members of all Regional Working Groups and guided adoption of SAP targets. It was identified that impacts resulting from land-based pollution either cause reductions in production of specific resources which can be measured in terms of losses in market value; in loss of ecosystem services resulting from ecosystem level impacts; and economic losses resulting from illness of individuals eating contaminated seafood. Detailed procedures for the economic evaluation of these impacts in terms of applicable valuation techniques for: productivity, amenity value, and human welfare are provided in the guidelines for economic valuation adopted by the SCS project and which underpin the cost-benefits analysis of action versus non-action presented in the SAP (the adopted guidelines on economic valuation were published as UNEP, 2007h).

#### ***Modelling the carrying capacity of the SCS marine basin with respect to nutrients***

192. As part of the overall work of the project on the impacts of land-based pollution a model was developed to evaluate the sensitivity of coastal ecosystems to changes in nutrient flux from land via rivers. The model is based on the relationship between chlorophyll and nutrient concentration and was developed by SEA START RC using river runoff data and remote sensing information of monthly chlorophyll concentration in the surface waters of the South China Sea (UNEP, 2007a). Marine water along the Philippine coast from Luzon to the Palawan Islands were found to have the highest assimilative capacity and this part of the South China Sea is never likely to become eutrophic. However, this does not apply to the potential eutrophication of bays and estuaries that were not the focus of this model. The Gulf of Thailand was also found to have a high assimilative capacity while areas with low assimilative capacity include for example the southern coast of China, central Viet Nam, Peninsular Malaysia and the Straits of Malacca (UNEP, 2007a).

193. The work of the SCS project in this area resulted in a tool and trained people in each country to undertake modelling of different scenarios of nutrient inputs to coastal waters. The model can be run to estimate the monthly ‘effective’ loading of total nutrient from any catchment, as point or non-point loading. The model output in chlorophyll equivalent units can be converted to nutrient elements,

such as N, using a Chlorophyll to nutrient ratio. The model can be used to simulate the monthly responses of the chlorophyll biomass in any area of the South China Sea (at a resolution  $0.1^\circ \times 0.1^\circ$ ) to different loading scenarios and to estimate the maximum monthly load of nutrient from any selected catchment that would ensure the chlorophyll-defined biomass remains under a pre-defined limit. It is reiterated that the results of this modeling demonstrating that, while nutrient pollution of the South China Sea is important from a local perspective, it is not significant from the transboundary perspective of basin-wide assimilative capacity.

#### **2.1.6.5. Strategy for future action to address land-based pollution**

194. Countries bordering the South China Sea are experiencing problems with pollutants such as nutrients and organic wastes in their coastal waters. These contaminants are derived mainly from sewage and agricultural discharge and if left unmanaged could lead to eutrophication, decline in living resources, and impacts on human health. Current land-based pollution management practices differ between countries. Most countries have environmental laws which require the establishment of standards and enforcement to ensure compliance. In order to meet standards and regulations stipulated under the law, structural facilities like waste water treatment plants are required, yet often the financial resources to invest in such infrastructure are lacking. The scale of action required to address issues of national pollution are being supporting through the GEF financed PEMSEA.

195. All countries in the region require an Environmental Impact Assessment (EIA) prior to initiating a major development project and all have programmes to increase environmental awareness, and educate the public regarding environmental issues. In addition, monitoring of pollution discharge points and water quality monitoring is also currently undertaken by all countries. Although these management practices are in place some countries lack the capacity to enforce the Environmental Acts due to limited budgets and manpower. Private sector waste producers generally do not have treatment facilities resulting in a low level of compliance with standards stipulated under the law.

196. Monitoring programmes for some countries involve extensive numbers of sites, but the data collected are not used appropriately, being used merely for the publication and dissemination of annual and environment quality reports. In order to address the key challenges and weakness in land-based pollution management, the SAP promotes targets for land-based pollution including the setting and maintaining of region-wide water quality standards and water quality objectives which will assist in maintaining coastal ecosystem health. Modelling of carrying capacity of the marine basin with respect to heavy metals is among the regional priorities.

#### **2.1.7. National and Regional Economic Values for Coastal Habitat Goods and Services**

##### **2.1.7.1. Determining regionally applicable economic values for environmental goods and services**

197. The challenge facing the SCS project was that the only "ecosystem values" readily available were those of Costanza et al. (1997) that were based on global data and have subsequently been challenged on both economic and scientific grounds. The Project Steering Committee, composed solely of participating government representatives insisted not only that the project activities include the revision of the SAP but also the determination of regionally applicable economic values for environmental goods and services. Initially, the plan was for each national working group to review the economic data and information relating to their areas of expertise (mangroves, coral reefs, seagrass, wetlands, fisheries and land-based pollution) and to assemble data sets that would enable some form of regional analysis of values to be undertaken by the regional working groups.

198. It became apparent by the end of the preparatory phase of the SCS project that, the national working groups contained specialists in the subject matter with few or no economists amongst the members. The Project Steering Committee therefore decided to establish a Regional Task Force on Economic Valuation (RTF-E) consisting of nine economists from the region charged with providing economic assistance and advice to the national and regional working groups addressing habitat,

fisheries and pollution issues and determining “regionally applicable economic values for environmental goods and services”. That task force reviewed the data and information assembled by the regional working groups and provided advice regarding the further elaboration and refinement of these data sets. In addition, work commenced on the development of simple guidelines for the conduct of economic valuation studies that could be applied during the implementation of demonstration site activities, particularly in support of the activities concerned with sustainable financing of the management regime and the assessment of alternative livelihoods and sources of income.

199. The Project Steering Committee subsequently allocated funds to the Regional Task Force to assemble an empirical dataset of economic values of goods and services provided by the coastal ecotones bordering the South China Sea. The task force assembled such data that were comprehensively reviewed during the two meetings of the Task Force convened in 2006 (UNEP, 2006b; 2006c). Data were taken from published sources in the international literature and from the “grey” literature of government reports. The focus was on data derived from studies along the coasts of the South China Sea although, in some instances, data from elsewhere in the seven participating countries were included. Data used represent “Farm Gate Prices” and this is assumed to be equivalent to the value of natural production, i.e., the value of the labour involved in harvesting is considered negligible in comparison with the “value” of the natural production. Data derived from secondary markets were included because the value added cannot be accurately determined in most cases.

200. As the compiled data were derived from diverse studies undertaken over the course of some twenty years, the methods used to undertake the valuations differ, as did the forms of the actual data and information contained in the publications and reports. Every attempt was made to ensure that the data contained in the final tabulations were based on primary data collection and did not represent merely the use of values derived elsewhere. In order to ensure that values were regionally comparable, all data were expressed as production values in US dollars per hectare per annum, including the values for ecosystem services.

201. Values were converted to a standard year (2005) by means of the Consumer Price Index (UNEP, 2007j) and values in local currency were converted to US dollars using the 2005 exchange rate. Tables 1 to 8 of Annex 4 of the report of the seventh meeting of the RTF-E (UNEP, 2007j) present the empirical data and derived values for the goods and services provided by mangroves, coral reefs, seagrass and wetlands bordering the South China Sea. The largest volume of data relates to the mangrove habitat and these data are reproduced in Tables 2 and 3 below. Discussion of the contents of these tables provides an overview of all the issues faced in agreeing upon the final data sets for all habitats for use in determining regional values.

202. Surprisingly few data were available for either coral reefs or wetlands and it was identified that this was most likely an artefact as scientific data and information tend to be highly compartmentalised in the participating countries and it is often not easy to access data from sources outside an individual’s own institution or organisation. The lack of data for seagrass habitats is less surprising because the actual extent of this habitat in the region could not be accurately determined at that time and the numbers of scientists involved in the study of seagrass ecosystems of the South China Sea marine basin is quite limited resulting in a comparatively small body of published literature.

203. These data sets were extensively discussed and reviewed by the regional task force and, where anomalies or questions remain unresolved or unanswered, the data were excluded from further consideration. Such cells are shaded in the tables presented in this section and it can be seen that a number of values for wild capture of fish, crab and prawns and for natural production of molluscs were been excluded from further analysis as the values were considered by the task force to be too high to represent natural production and more likely represent production from some form of mariculture. In the case of services, data were excluded from further consideration that the task force deemed to represent unrealistically high, or unrealistically low, values. The extremely high value for

ecotourism for Youstefa Bay in Indonesia was excluded, for example, because this almost certainly represents the total annual value for all tourism at this location and not merely the value of tourism associated with the mangrove habitat in this Bay.

**Table 2** Values of goods from mangrove ecosystems at various locations bordering the South China Sea. Shaded cells include values not used in the subsequent analysis to determine national and regional weighted mean values for each resource.

Country	Year	Location	Total Area (ha)	Volume (per ha)	Unit Net Price	Currency	Value (per ha)	CPI (base 2005)	Exchange rate 2005	Standard National Value, 2005, per hectare in local Currency	Regionally comparable Value per hectare US\$	Total Stock Value by Locality (Area xValue/ha in US\$)
<b>Timber M<sup>3</sup>/Ha</b>												
Cambodia	2006	Peam Krasop	12,638.00	9.20	90.00	US\$	828.00	106.16	4,187.17	779.95	779.95	9,857,068.58
China	2002	Fangchenggang	1,414.50	1.13	933.45	RMB	1,050.13	93.38	8.20	1,124.58	137.09	193,911.96
Indonesia	2004	Youtefa Bay	188.00	130.00	12,057.69	Rupiah	1,567,499.70	90.54	9,721.65	1,731,278.66	178.08	33,479.95
	2004	Bali	9.00	50.00	27,160.00	Rupiah	1,358,000.00	90.54	9,721.65	1,499,889.55	154.28	1,388.55
	2004	Karawang, West Java	1,692.40	40.00	52,500.00	Rupiah	2,100,000.00	90.54	9,721.65	2,319,416.83	238.58	403,777.17
	2004	Marisa District, Gorontalo	5,332.00	7.95	200,000.00	Rupiah	1,590,000.00	90.54	9,721.65	1,756,129.89	180.64	963,178.35
	2003	Kangean Island	5,716.00	30.76	72,480.00	Rupiah	2,229,484.80	85.22	9,721.65	2,616,152.08	269.11	1,538,208.28
	2003	Sikka district NTT	220.00	28.12	88,880.00	Rupiah	2,499,305.60	85.22	9,721.65	2,932,768.83	301.67	66,368.26
	2001	Kalimantan	14,941.00	91.92	27,440.00	Rupiah	2,522,284.80	71.46	9,721.65	3,529,645.68	363.07	5,424,637.40
	2001	Buton, Southeast Sulawesi	144.00	17.25	60,000.00	Rupiah	1,035,000.00	71.46	9,721.65	1,448,362.72	148.98	21,453.58
	2000	West Seram District : Area I	175.00	50.00	181,000.00	Rupiah	9,050,000.00	64.09	9,721.65	14,120,767.67	1,452.51	254,188.73
	2000	West Seram District : Area II	706.00	40.00	181,000.00	Rupiah	7,240,000.00	64.09	9,721.65	11,296,614.14	1,162.01	820,375.97
	2000	West Seram District : Area III	110.00	64.30	181,000.00	Rupiah	11,638,300.00	64.09	9,721.65	18,159,307.22	1,867.92	205,471.65
	2000	Batu Ampar, Pontianak	10,277.00	91.92	47,498.71	Rupiah	4,366,081.42	64.09	9,721.65	6,812,422.25	700.75	7,201,581.06
	1999	Segara Anakan	8,975.00	17.00	10,000.00	Rupiah	170,000.00	61.79	9,721.65	275,125.42	28.30	253,994.97
	1999	Segara Anakan	12,090.00	19.40	50,000.00	Rupiah	970,000.00	61.79	9,721.65	1,569,833.31	161.48	1,952,269.54
	1999	Gelumbang District, South Sulawesi	9,538.00	20.00	60,000.00	Rupiah	1,200,000.00	61.79	9,721.65	1,942,061.82	199.77	1,905,374.32
	1998	Tulung Selapan, South Sumatra	8,232.00	64.40	100,000.00	Rupiah	6,440,000.00	51.28	9,721.65	12,558,502.34	1,291.81	10,634,159.02
	1997	Batam Rempang and Galang Island	16,520.00	49.74	7,840.00	Rupiah	389,961.60	32.38	9,721.65	1,204,328.60	123.88	2,046,515.22
	1996	Subang District	5,327.00	38.00	160,000.00	Rupiah	6,080,000.00	30.48	9,721.65	19,947,506.56	2,051.86	10,930,279.09
	1991	Bintuni Bay Papua	300,000.00	80.00	128,000.00	Rupiah	10,240,000.00	20.16	9,721.65	50,793,650.79	5,224.80	1,567,438,901.94
	1988	Sumatra	386,100.00	66.00	7,520.00	Rupiah	496,320.00	16.06	9,721.65	3,090,410.96	317.89	122,737,133.01
Philippines	1996	Pagbilao, Philippines	1,440.00	4.00	1,664.00	PHP	6,656.00	59.56	55.14	11,175.29	202.67	291,846.46
Malaysia	1998	Kuala Selangor	379.00	61.80	4.12	RM	254.81	87.87	3.79	289.99	76.54	29,009.24
	1997	Coast of Malacca	78,395.00	N/A	N/A	RM	913.36	83.47	3.79	1,094.24	288.82	22,642,333.56
Viet Nam	2005	Balat estuary	3,000.00	8.05	200,000.00	VND	1,610,000.00	100.00	15,967.54	1,610,000.00	100.83	302,488.76
	2004	CanGio	75,740.00	12.25	400,000.00	VND	4,900,000.00	92.38	15,967.54	5,304,178.39	332.19	25,159,704.55
	2005	CaMau	5,800.00	17.00	370,000.00	VND	6,290,000.00	100.00	15,967.54	6,290,000.00	393.92	2,284,760.87
	2005	SocTrang	1,686.60	11.52	390,000.00	VND	4,492,800.00	100.00	15,967.54	4,492,800.00	281.37	474,560.18
<b>Firewood M<sup>3</sup></b>												
Cambodia	2006	Peam Krasop	12,638.00	1.84	10.00	US\$	18.42	106.16	4,187.17	17.35	17.35	219,284.06
Indonesia	2005	Makassar	27.00	25.00	183,851.85	Rupiah	4,596,296.30	100.00	9,721.65	4,596,296.30	472.79	12,765.32
	2005	Mamuju	976.00	70.00	21,183.04	Rupiah	1,482,813.00	100.00	9,721.65	1,482,813.00	152.53	148,866.21
	2005	Donggala	18,300.00	70.00	18,195.43	Rupiah	1,273,679.92	100.00	9,721.65	1,273,679.92	131.01	2,397,570.19
	2004	Karawang, West Java	1,692.40	50.00	5,600.00	Rupiah	280,000.00	90.54	9,721.65	309,255.58	31.81	53,836.96
	2004	Bali	9.00	20.00	79,541.65	Rupiah	1,590,833.00	90.54	9,721.65	1,757,049.92	180.74	1,626.62

**Table 2 cont.** Values of goods from mangrove ecosystems at various locations bordering the South China Sea. Shaded cells include values not used in the subsequent analysis to determine national and regional weighted mean values for each resource.

Country	Year	Location	Total Area (ha)	Volume (per ha)	Unit Net Price	Currency	Value (per ha)	CPI (base 2005)	Exchange rate 2005	Standard National Value, 2005, per hectare in local Currency	Regionally comparable Value per hectare US\$	Total Stock Value by Locality (Area xValue/ha in US\$)
	2002	Tinanggea District, SE Sulawesi	6,596.00	25.92	9,000.00	Rupiah	233,280.00	79.95	9,721.65	291,782.36	30.01	197,970.11
	2002	Talise, Minahasa	62.00	68.16	7,500.00	Rupiah	511,200.00	79.95	9,721.65	639,399.62	65.77	4,077.78
	2000	Batu Ampar, Pontianak	7,460.00	40.00	4,300.00	Rupiah	172,000.00	64.09	9,721.65	268,372.60	27.61	205,938.21
	1999	Gelumbang District, South Sulawesi	9,538.00	50.00	10,000.00	Rupiah	500,000.00	61.79	9,721.65	809,192.43	83.24	793,905.96
	1999	Segara Anakan	7,904.00	42.40	1,013.97	Rupiah	42,992.44	61.79	9,721.65	69,578.31	7.16	56,569.30
	1998	Tulung Selapan, South Sumatera	8,232.00	40.00	1,250.00	Rupiah	50,000.00	51.28	9,721.65	97,503.90	10.03	82,563.35
Philippines	2004	Busuanga	1,298.50	4.12	800.00	PHP	3,296.00	87.67	55.14	3,759.55	68.18	88,534.28
	1996	Pagbilao, Philippines	1,440.00	4.00	810.00	PHP	3,240.00	59.56	55.14	5,439.89	98.66	142,064.68
Thailand	1995	Trang not included	35,665.28	15.62	1,616.25	Baht	25,245.83	72.65	40.31	34,749.93	862.15	30,748,845.10
	1993	Ranong	19,236.64	2.11	1,616.25	Baht	3,410.29	65.37	40.31	5,216.90	129.43	2,489,839.00
	1993	Krabi	28,273.48	1.49	1,616.25	Baht	2,408.20	65.37	40.31	3,683.95	91.40	2,584,178.78
Viet Nam	2005	Balat estuary	3,000.00	4.64	195,000.00	VND	904,500.00	100.00	15,967.54	904,500.00	56.65	169,938.56
	2004	Can Gio	75,740.00	8.18	325,000.00	VND	2,658,500.00	92.38	15,967.54	2,877,787.40	180.23	13,650,423.38
	2005	CaMau	97,187.00	16.00	299,000.00	VND	4,784,000.00	100.00	15,967.54	4,784,000.00	299.61	29,117,994.61
	2005	SocTrang	1,686.60	7.97	184,615.38	VND	1,471,384.60	100.00	15,967.54	1,471,384.60	92.15	155,417.68
<b>Poles value per pole</b>												
Philippines	2004	Busuanga Philippines	1,298.50	0.60	200.00	PHP	120.00	92.91	55.14	129.16	2.34	3,041.54
<b>Charcoal Kg</b>												
Cambodia	2006	Peam Krasop	12,638.00	1,010.00	0.08	US\$	75.75	106.16	4,187.17	71.35	71.39	902,226.82
Indonesia	2004	Bali	4.00	797.00	1,229.22	Rupiah	979,688.34	90.54	9,721.65	1,082,050.30	111.30	445.21
	2000	Batu Ampar, Pontianak	7,460.00	246.00	400.03	Rupiah	98,407.38	64.09	9,721.65	153,545.61	15.79	117,824.65
Philippines	2004	Busuanga Philippines	1,298.50	911.25	0.04	PHP	36.45	87.67	55.14	41.58	0.75	979.09
	1996	Pagbilao, Philippines	1,440.00	1,012.50	0.04	PHP	35.44	59.56	55.14	59.50	1.08	1,553.94
Thailand	1980	Chathaburi	24,064.00	12.16	1.67	Baht	20.31	37.38	40.31	54.33	1.35	32,434.54
	1980	Ranong	22,592.00	29.19	4.20	Baht	122.60	37.38	40.31	327.98	8.14	183,834.91
	1980	Krabi	31,760.00	18.72	1.20	Baht	22.46	37.38	40.31	60.10	1.49	47,354.09
	1980	Phang Nga	48,716.00	12.30	1.10	Baht	13.53	37.38	40.31	36.20	0.90	43,748.11
<b>Leaves/palm fronds (Thatch, fodder) per frond</b>												
Cambodia	2006	Peam Krasop	12,638.00	14.50	1.00	US\$	14.50	106.16	4,187.17	13.66	0.00	41.23
Philippines	2004	Busuanga Philippines	1,298.50	6.37	5.00	PHP	31.85	87.67	55.14	36.33	0.66	855.53
	1996	Pagbilao, Philippines	1,440.00	22.50	4.50	PHP	101.25	59.56	55.14	170.00	3.08	4,439.52
<b>Fruit - propagules Kg</b>												
China	2002	Fangchenggang	1,414.50	321.69	2.40	CNY	772.00	93.38	8.20	826.73	100.78	142,553.64

**Table 2 cont.** Values of goods from mangrove ecosystems at various locations bordering the South China Sea. Shaded cells include values not used in the subsequent analysis to determine national and regional weighted mean values for each resource.

Country	Year	Location	Total Area (ha)	Volume (per ha)	Unit Net Price	Currency	Value (per ha)	CPI (base 2005)	Exchange rate 2005	Standard National Value, 2005, per hectare in local Currency	Regionally comparable Value per hectare US\$	Total Stock Value by Locality (Area xValue/ha in US\$)
<b>Wildlife Values per hectare</b>												
Indonesia	2004	Youtefa Bay	188.00	N/A	N/A	Rupiah	21,660.00	90.54	9,721.65	23,923.13	2.46	462.63
	2004	Karawang, W. Java, Perhutani's property	1,292.40	N/A	N/A	Rupiah	364,000.00	90.54	9,721.65	402,032.25	41.35	53,446.32
	2004	Karawang, W. Java, Private property	400.00	N/A	N/A	Rupiah	351,000.00	90.54	9,721.65	387,673.96	39.88	15,950.95
	2004	Marisa District, Gorontalo	5,332.00	N/A	N/A	Rupiah	604,538.73	90.54	9,721.65	667,703.48	68.68	366,212.97
	1999	Segara Anakan	12,090.00	N/A	N/A	Rupiah	24,311.00	61.79	9,721.65	39,344.55	4.05	48,929.51
<b>Extraction for Medicine Values per hectare</b>												
Indonesia	2004	Marisa District, Gorontalo	5,332.00	20.00	155,125.00	Rupiah	3,102,500.00	90.54	9,721.65	3,426,662.25	352.48	1,879,409.33
	2002	TNL Bunaken	2,689.00	10.00	92,611.70	Rupiah	92,611.70	79.95	9,721.65	115,837.02	11.92	32,040.41
<b>Fish capture Kg</b>												
China	2002	Fangchenggang - wild fish	1,414.50	500.00	2.85	CNY	1,427.00	93.38	8.20	1,528.16	186.29	263,502.65
Indonesia	2005	Mamuju	976.00	890.93	2,442.40	Rupiah	2,176,000.00	100.00	9,721.65	2,176,000.00	223.83	218,458.35
	2005	Donggala	18,300.00	1,246.95	1,346.49	Rupiah	1,679,000.00	100.00	9,721.65	1,679,000.00	172.71	3,160,543.15
	2004	Youtefa Bay	188.00	?	?	Rupiah	25,425,040.00	90.54	9,721.65	28,081,555.11	2,888.56	543,048.90
	2004	Karawang, W. Java, Perhutani's property	1,292.40	1,262.17	780.40	Rupiah	985,000.00	90.54	9,721.65	1,087,916.94	111.91	144,628.08
	2004	Karawang, W. Java, Private property	400.00	410.54	2,252.67	Rupiah	924,800.00	90.54	9,721.65	1,021,426.99	105.07	42,026.89
	2005	Pondok Bali, Subang	225.45	225.33	5,000.00	Rupiah	1,126,650.00	100.00	9,721.65	1,126,650.00	115.89	26,127.58
	2004	Bali	9.00	5,152.00	8,285.49	Rupiah	42,686,857.00	90.54	9,721.65	47,146,959.35	4,849.69	43,647.17
	2004	Marisa District, Gorontalo	5,332.00	819.15	18,428.87	Rupiah	15,096,008.86	90.54	9,721.65	16,673,303.36	1,715.07	9,144,747.75
	2001	Buton, Southeast Sulawesi	144.00	728.00	3,000.00	Rupiah	2,184,000.00	71.46	9,721.65	3,056,255.25	314.38	45,270.16
	2000	West Seram District	991.00	?	?	Rupiah	1,440,968.72	64.09	9,721.65	2,248,351.88	231.27	229,191.17
	2000	Batu Ampar, Pontianak	8,800.00	8.00	13,797.75	Rupiah	110,382.00	64.09	9,721.65	172,229.68	17.72	155,901.61
	1999	Segara Anakan - Cilacap	12,090.00	63.74	4,080.01	Rupiah	260,060.00	61.79	9,721.65	420,877.16	43.29	523,409.50
	1999	Gelumbang District, South Sulawesi	9,538.00	1,095.00	3,000.00	Rupiah	3,285,000.00	61.79	9,721.65	5,316,394.24	546.86	5,215,962.19
Philippines	2004	Philippines	1,298.50	4.12	41.25	PHP	169.95	92.91	55.14	182.92	3.32	4,307.59
	1996	Pagbilao, Philippines	1,440.00	409.80	24.28	PHP	9,949.94	59.56	55.14	16,705.75	302.97	436,276.44
Thailand	1995	Trang	35,665.28	18.98	30.00	Baht	569.42	72.65	3.79	783.79	206.88	7,378,430.34
Malaysia	1998	Kuala Selangor District all fisheries resources	379.00	3,750.00	3.33	RM	12,477.50	87.87	3.79	14,199.95	3,748.07	1,420,520.18
	1997	Straits of Malacca all fisheries resources	78,395.00	6.61	1,737.04	RM	11,486.88	83.47	3.79	13,761.69	3,632.39	284,761,505.39
Viet Nam	2005	Ba Lat estuary	2,889.00	200.00	16,000.00	VND	3,200,000.00	100.00	15,967.54	3,200,000.00	200.41	578,974.76
	2004	Can Gio	7,990.00	12,000.00	10,000.00	VND	120,000,000.00	92.38	15,967.54	129,898,246.37	8,135.15	64,999,824.11
	2005	Soc Trang	10,702.00	5,000.00	10,000.00	VND	50,000,000.00	100.00	15,967.54	50,000,000.00	3,131.35	33,511,746.72

**Table 2 cont.** Values of goods from mangrove ecosystems at various locations bordering the South China Sea. Shaded cells include values not used in the subsequent analysis to determine national and regional weighted mean values for each resource.

Country	Year	Location	Total Area (Ha)	Volume (per ha)	Unit Net Price	Currency	Value (per Ha)	CPI (base 2005)	Exchange rate 2005	Standard National Value, 2005, per hectare in local Currency	Regionally comparable Value per hectare US\$	Total Stock Value by Locality (Area xValue/Ha in US\$)
<b>Young Milkfish kgs</b>												
Indonesia	2001	Buton, Southeast Sulawesi	144.00	21,600.00	30.00	Rupiah	648,000.00	71.46	9,721.65	906,801.01	93.28	13,431.81
	2000	West Seram District : Area III	706.00	?	?	Rupiah	234,560.91	64.09	9,721.65	365,986.75	37.65	26,578.47
Thailand	1997	Samut Sakorn fish larvae	1,696.00	N/A	N/A	Baht	751.78	81.21	40.31	925.72	22.97	38,952.59
	1997	Ranong fish larvae	19,237.00	N/A	N/A	Baht	414.23	81.21	40.31	510.07	12.65	243,443.74
	1997	Trang prawn larvae	24,696.00	N/A	N/A	Baht	89.03	81.21	40.31	109.63	2.72	67,171.14
	1997	Samut Sakorn crab larvae	1,696.00	N/A	N/A	Baht	1,673.04	81.21	40.31	2,060.14	51.11	86,686.58
	1997	Ranong crab larvae	19,237.00	N/A	N/A	Baht	984.82	81.21	40.31	1,212.68	30.09	578,780.53
	1997	Trang crab larvae	24,696.00	N/A	N/A	Baht	207.11	81.21	40.31	255.03	6.33	156,259.85
<b>Crabs Kg</b>												
China	2002	Fangchenggang	1,414.50	165.00	9.30	CNY	1,535.00	93.38	8.20	1,643.82	200.39	283,445.39
Indonesia	2005	Makassar	27.00	?	17,292.90	Rupiah	4,779,761.90	100.00	9,721.65	4,779,761.90	491.66	13,274.86
	2005	Mamuju	976.00	233.13	24,424.00	Rupiah	5,694,000.00	100.00	9,721.65	5,694,000.00	585.70	571,646.06
	2005	Donggala	18,300.00	242.24	23,424.90	Rupiah	5,674,513.90	100.00	9,721.65	5,674,513.90	583.70	10,681,683.15
	2004	Karawang, W. Java, Perhutani's property	1,292.40	21.57	22,256.70	Rupiah	480,000.00	90.54	9,721.65	530,152.42	54.53	70,478.66
	2004	Karawang, W. Java, Private property	400.00	20.49	22,256.70	Rupiah	456,000.00	90.54	9,721.65	503,644.80	51.81	20,722.60
	2004	Bali	9.00	1,248.00	19,006.41	Rupiah	23,719,999.68	90.54	9,721.65	26,198,365.01	2,694.85	24,253.62
	2004	Marisa District, Gorontalo	5,332.00	202.29	34,444.44	Rupiah	6,967,765.77	90.54	9,721.65	7,695,787.24	791.61	4,220,881.22
	2002	Tinanggea Distric, SE Sulawesi	6,596.00	784.75	21,500.00	Rupiah	16,872,125.00	79.95	9,721.65	21,103,345.84	2,170.76	14,318,314.61
	2001	Buton, Southeast Sulawesi	144.00	720.00	10,000.00	Rupiah	7,200,000.00	71.46	9,721.65	10,075,566.75	1,036.40	149,242.29
	2000	West Seram District : Area I	175.00	16.43	10,000.00	Rupiah	164,300.00	64.09	9,721.65	256,358.25	26.37	4,614.72
	2000	West Seram District : Area II	706.00	3.38	10,000.00	Rupiah	33,800.00	64.09	9,721.65	52,738.34	5.42	3,829.93
	2000	West Seram District : Area III	110.00	86.73	10,000.00	Rupiah	867,300.00	64.09	9,721.65	1,353,253.24	139.20	15,311.99
	2000	Batu Ampar, Pontianak	10,277.00	25.00	8,405.48	Rupiah	210,137.00	64.09	9,721.65	327,877.98	33.73	346,607.97
	1999	Segara Anakan	7,904.00	9.40	14,339.57	Rupiah	134,791.96	61.79	9,721.65	218,145.27	22.44	177,358.77
	1998	Tulung Selapan, South Sumatera	8,232.00	0.20	6,000.00	Rupiah	1,200.00	51.28	9,721.65	2,340.09	0.24	1,981.52
Philippines	2004	Philippines	1,298.50	5.24	126.00	PHP	660.24	95.66	55.14	690.19	12.52	16,253.49
	1996	Pagbilao, Philippines	1,440.00	694.60	7.60	PHP	5,278.96	59.56	55.14	8,863.26	160.74	231,467.22
Thailand	1995	Trang	35,665.28	7.71	85.00	Baht	655.35	72.65	40.31	902.06	22.38	798,201.51
Viet Nam	2005	Balat estuary	2,889.00	260.00	80,000.00	VND	20,800,000.00	100.00	15,967.54	20,800,000.00	1,302.64	3,763,335.96
<b>Prawn Kg</b>												
China	2002	Fangchenggang	1,414.50	34.50	30.00	CNY	1,035.00	93.38	8.20	1,108.37	135.11	191,117.90
Indonesia	2005	Makassar	27.00	162.00	17,292.90	Rupiah	2,801,375.00	100.00	9,721.65	2,801,375.00	288.16	7,780.28
	2005	Mamuju	976.00	132.84	24,424.00	Rupiah	3,244,444.44	100.00	9,721.65	3,244,444.44	333.73	325,724.25
	2005	Donggala	18,300.00	182.53	23,424.90	Rupiah	4,275,714.29	100.00	9,721.65	4,275,714.29	439.81	8,048,588.14
	2004	Karawang, W. Java, Perhutani's property	1,292.40	102.50	22,256.70	Rupiah	2,281,250.00	90.54	9,721.65	2,519,604.59	259.17	334,957.17

**Table 2 cont.** Values of goods from mangrove ecosystems at various locations bordering the South China Sea. Shaded cells include values not used in the subsequent analysis to determine national and regional weighted mean values for each resource.

Country	Year	Location	Total Area (Ha)	Volume (per ha)	Unit Net Price	Currency	Value (per Ha)	CPI (base 2005)	Exchange rate 2005	Standard National Value, 2005, per hectare in local Currency	Regionally comparable Value per hectare US\$	Total Stock Value by Locality (Area xValue/Ha in US\$)
	2004	Karawang, W. Java, Private property	400.00	83.68	22,256.70	Rupiah	1,862,500.00	90.54	9,721.65	2,057,101.83	211.60	84,640.01
	2005	Pondok Bali, Subang	225.00	288.85	15,000.00	Rupiah	4,332,750.00	100.00	9,721.65	4,332,750.00	445.68	100,278.10
	2004	Bali	9.00	1,248.00	11,995.73	Rupiah	14,970,667.00	90.54	9,721.65	16,534,865.25	1,700.83	15,307.46
	2004	Marisa District, Gorontalo - Windu	5,332.00	44.12	85,000.00	Rupiah	3,750,200.00	90.54	9,721.65	4,142,036.67	426.06	2,271,768.21
	2004	Marisa District, Gorontalo - Putih	5,332.00	14.71	20,000.00	Rupiah	294,200.00	90.54	9,721.65	324,939.25	33.42	178,218.28
	2002	Tinanggea Distric, Southeast Sulawesi	6,596.00	9,187.00	12,500.00	Rupiah	114,837,500.00	71.46	9,721.65	160,701,791.21	16,530.30	109,033,838.65
	2001	Buton, SE Sulawesi - Udang Windu	144.00	640.00	35,000.00	Rupiah	22,400,000.00	71.46	9,721.65	31,346,207.67	3,224.37	464,309.36
	2001	Buton, SEt Sulawesi - Udang Putih	144.00	60.00	15,000.00	Rupiah	900,000.00	71.46	9,721.65	1,259,445.84	129.55	18,655.29
	2000	Batu Ampar, Pontianak	9,800.00	17.60	34,688.18	Rupiah	610,511.97	64.09	9,721.65	952,585.38	97.99	960,262.40
	1999	Segara Anakan	7,904.00	122.20	17,222.72	Rupiah	2,104,616.00	61.79	9,721.65	3,406,078.65	350.36	2,769,246.03
	1999	Segara Anakan	12,090.00	92.57	19,254.81	Rupiah	1,782,417.76	61.79	9,721.65	2,884,637.90	296.72	3,587,381.33
	1998	Tulung Selapan, South Sumatera	8,232.00	9.08	25,000.00	Rupiah	227,000.00	51.28	9,721.65	442,667.71	45.53	374,837.59
Philippines	2004	Busuanga, Philippines	1,298.50	1.88	300.00	PHP	564.00	92.91	55.14	607.04	11.01	14,295.26
	1996	Pagbilao, Philippines	1,440.00	1,226.90	200.00	PHP	245,380.00	59.56	55.14	411,987.91	7,471.67	10,759,207.47
Thailand	2003	Chanthaburi	192.00	43.17	130.00	Baht	5,611.45	93.08	40.31	6,028.63	149.57	28,717.67
Viet Nam	2005	Balat estuary	2,889.00	1,500.00	70,000.00	VND	105,000,000.00	100.00	15,967.54	105,000,000.00	6,575.84	18,997,609.43
	2004	Can Gio	7,990.00	4,000.00	65,000.00	VND	260,000,000.00	92.38	15,967.54	281,446,200.48	17,626.15	140,832,952.23
	2005	Ca Mau	247,510.00	4,000.00	60,000.00	VND	240,000,000.00	100.00	15,967.54	240,000,000.00	15,030.50	3,720,198,436.09
	2005	Soc Trang	43,311.00	3,200.00	70,000.00	VND	224,000,000.00	100.00	15,967.54	224,000,000.00	14,028.46	607,586,818.72
							<b>Eels kg</b>					
Indonesia	2004	Karawang, W. Java, Perhutani's property	1,292.40	75.60	5,000.00	Rupiah	378,000.00	90.54	9,721.65	417,495.03	42.94	55,501.94
	2004	Karawang, W. Java, Private	400.00	64.00	5,000.00	Rupiah	320,000.00	90.54	9,721.65	353,434.95	36.36	14,542.18
							<b>Shellfish kg</b>					
Indonesia	2004	Bali	9.00	302.50	6,869.01	Rupiah	2,077,875.53	90.54	9,721.65	2,294,980.70	236.07	2,124.62
	2004	Marisa District, Gorontalo	5,332.00	32.50	5,000.00	Rupiah	162,500.00	90.54	9,721.65	179,478.68	18.46	98,438.04
Thailand	2003	Bang Khun Thien	192.00	352.69	41.11	Baht	14,499.09	93.08	40.31	15,577.02	386.47	74,201.87
Philippines	2004	Philippines (MUSSELS)	1,298.50	2.62	30.00	PHP	78.60	92.91	55.14	84.60	1.53	1,992.21
	2004	Philippines (Shellfish- "KIBAW"	1,298.50	6.75	20.00	PHP	135.00	92.91	55.14	145.30	2.64	3,421.74
China	2002	Fangchenggang	1,414.50	260.00	33.61	CNY	8,738.00	93.38	8.11	9,357.46	1,153.82	1,632,075.59
Viet Nam	2005	Ba Lat estuary	2,889.00	12,000.00	5,200.00	VND	62,400,000.00	100.00	15,967.54	62,400,000.00	3,907.93	11,290,007.89
	2004	Can Gio oysters	7,990.00	5,000.00	2,500.00	VND	12,500,000.00	92.38	15,967.54	13,531,067.33	847.41	6,770,815.01
							<b>Worms Kg</b>					
China	2002	Fangchenggang	1,414.50	1,190.00	16.62	CNY	19,781.00	93.38	8.20	21,183.34	2,582.30	3,652,660.10
Philippines	2004	Philippines	1,298.50	1.13	20.00	PHP	22.60	92.91	55.14	24.32	0.44	572.82

**Table 3**

Values of services from mangrove ecosystems at various locations bordering the South China Sea. Values in the shaded cells were not used in the subsequent analysis to determine national and regional weighted mean values for each service.

Country	Year	Location	Total Area (Ha)	Currency	Value per Ha Local currency	CPI (base 2005)	2005 Exchange Rate	Valuation Method	Standard National Value, 2005, per hectare in local Currency	Regionally comparable Value per hectare US\$	Total Value by Locality
<b>Ecotourism</b>											
Indonesia	2004	Youtefa Bay (not included)	4.00	Rupiah	203,400,011.25	90.54	9,721.65	Travel cost	224,652,099.90	23,108.43	92,433.72
	1999	Segara Anakan	12,089.99	Rupiah	18,508.40	61.79	9,721.65	Travel cost	29,953.71	3.08	37,250.88
	1999	Gelumbang District, South Sulawesi	9,538.00	Rupiah	790,889.08	61.79	9,721.65	Travel cost	1,279,962.91	131.66	1,255,783.12
<b>Nursery ground</b>											
China	2002	Fangchenggang, Guangxi	1,414.50	RMB	9,762.00	93.38	8.20	market price	10,454.06	1,274.37	1,802,601.88
Indonesia	2005	Makassar	27.00	Rupiah	120,707.76	100.00	9,721.65	CVM	120,707.76	12.42	335.24
	2005	Mamuju	975.50	Rupiah	3,922.57	100.00	9,721.65	CVM	3,922.57	0.40	393.60
	2005	Donggala	18,300.00	Rupiah	196.38	100.00	9,721.65	CVM	196.38	0.02	369.66
	2005	Pondok Bali	225.45	Rupiah	2,540.70	100.00	9,721.65	CVM	2,540.70	0.26	58.92
	2004	Bali	9.00	Rupiah	67,013.00	90.54	9,721.65	CVM	74,014.80	7.61	68.52
	2004	Karawang, W. Java Perhutani's property	1,292.40	Rupiah	7,269,454.28	90.54	9,721.65	Shadow Project	8,028,997.44	825.89	1,067,377.90
	2004	Karawang, W. Java Private property	400.00	Rupiah	7,269,454.28	90.67	9,721.65	Shadow Project	8,017,485.70	824.70	329,881.62
	2003	Kangean Island	1,887.00	Rupiah	7,112,000.00	85.22	9,721.65	Shadow Project	8,345,458.81	858.44	1,619,877.06
	2003	Sikka district NTT	74.00	Rupiah	7,112,000.00	85.22	9,721.65	Shadow Project	8,345,458.81	858.44	63,524.59
	2003	Belanakan, Subang	287.75	Rupiah	65,550.00	85.22	9,721.65	CVM	76,918.56	7.91	2,276.70
	2001	Buton, Southeast Sulawesi	144.00	Rupiah	9,739,596.57	71.46	9,721.65	Shadow Project	13,629,438.25	1,401.97	201,883.30
	2001	Kalimantan	14,941.00	Rupiah	720,000.00	71.46	9,721.65	CVM	1,007,556.68	103.64	1,548,492.43
	2000	West Seram District : Area I	175.00	Rupiah	2,719,214.00	64.09	9,721.65	Shadow Project	4,242,805.43	436.43	76,374.98
	2000	West Seram District : Area II	706.00	Rupiah	2,550,141.64	64.09	9,721.65	Shadow Project	3,979,000.84	409.29	288,960.63
	2000	West Seram District : Area III	110.00	Rupiah	2,550,909.09	64.09	9,721.65	Shadow Project	3,980,198.30	409.42	45,035.74
	2000	Batu Ampar, Pontianak	13,900.00	Rupiah	1,078,305.67	64.09	9,721.65	market price	1,682,486.61	173.07	2,405,616.29
	1999	Segara Anakan	12,089.99	Rupiah	74,769.00	61.79	9,721.65	market price	121,005.02	12.45	150,483.63
	1998	Tulung Selapan, South Sumatera	8,232.00	Rupiah	3,432,000.00	51.28	9,721.65	Shadow Project	6,692,667.71	688.43	5,667,148.10
	1996	Subang district	5,327.00	Rupiah	2,850,000.00	30.48	9,721.65	Shadow Project	9,350,393.70	961.81	5,123,568.32
<b>Nutrient - Sediment Retention</b>											
China	2002	Fangchenggang	1,414.50	RMB	86,902.00	93.38	8.20	market price	93,062.75	11,344.56	16,046,886.80
<b>Coastal protection (replacement values divided by 25 years to provide annual benefit)</b>											
China	2002	Fangchenggang	1,414.50	RMB	8,000.00	93.38	8.20	replacement Cost	8,567.14	1,044.35	1,477,239.81
Indonesia	2005	Makassar	27.00	Rupiah	83,532,059.26	100.00	9,721.65	replacement Cost	83,532,059.26	8,592.37	231,994.07
	2005	Mamuju	976.00	Rupiah	4,485,291.92	100.00	9,721.65	replacement cost	4,485,291.92	461.37	450,298.47
	2005	Donggala	18,300.00	Rupiah	110,919.62	100.00	9,721.65	replacement cost	110,919.62	11.41	208,794.67
	2004	Karawang, W. Java Perhutani's property	16,000.00	Rupiah	415,380.00	90.54	9,721.65	replacement cost	458,780.65	47.19	755,066.17
	2004	Karawang, W.t Java Private property	7,200.00	Rupiah	403,849.44	90.54	9,721.65	replacement cost	446,045.33	45.88	330,347.81

**Table 3 cont.** Values of services from mangrove ecosystems at various locations bordering the South China Sea. Values in the shaded cells were not used in the subsequent analysis to determine national and regional weighted mean values for each service.

Country	Year	Location	Total Area (Ha)	Currency	Value per Ha Local currency	CPI (base 2005)	2005 Exchange Rate	Valuation Method	Standard National Value, 2005, per hectare in local Currency	Regionally comparable Value per hectare US\$	Total Value by Locality
	2004	Marisa District, Gorontalo	5,332.00	Rupiah	1,815,650.00	90.54	9,721.65	replacement cost	2,005,356.75	206.28	1,099,870.93
	2003	Kangean island	1,708.00	Rupiah	14,000,000.00	85.22	9,721.65	replacement cost	16,428,068.53	1,689.84	2,886,252.42
	2002	TNL Bunaken	160,700.00	Rupiah	3,432,000.00	79.95	9,721.65	replacement cost	4,292,682.93	441.56	70,958,532.54
	2001	Kalimantan	14,941.00	Rupiah	3,816,000.00	71.46	9,721.65	replacement cost	5,340,050.38	549.29	8,207,009.90
	2000	Ameth Village, Maluku	8,500.00	Rupiah	255,000.00	64.09	9,721.65	replacement cost	397,877.98	40.93	347,879.45
	2000	Batu Ampar, Pontianak	127,600.00	Rupiah	4,163,880.00	64.09	9,721.65	replacement cost	6,496,926.20	668.29	85,274,375.08
	1999	Segara Anakan	12,090.00	Rupiah	3,195,105.47	61.79	9,721.65	replacement cost	5,170,910.29	531.90	6,430,625.85
	1999	Gelumbang District, South Sulawesi	9,538.00	Rupiah	1,641,000.00	61.79	9,721.65	replacement cost	2,655,769.54	273.18	2,605,599.38
	1996	Subang district	5,327.00	Rupiah	3,500,000.00	30.48	9,721.65	replacement cost	11,482,939.63	1,181.17	6,292,101.45
	1988	Sumatra	386,100.00	Rupiah	1,815,000.00	51.28	9,721.65	replacement cost	3,539,391.58	364.07	140,568,610.57
Thailand	1998	Surathanee	400.00	Baht	77,775.00	87.77	40.31	replacement cost	88,612.28	2,198.48	879,393.26
<b>Windbreak (40%of coastal defence costs)</b>											
China	2002	Fangchenggang	1,414.50	RMB	9,194.73	93.38	8.20	market price	9,846.57	1,200.32	1,697,852.66
<b>Carbon sequestration (carbon fixed per hectare per annum)</b>											
China	2002	Fangchenggang	1,414.50	RMB	2,500.56	93.38	8.20	market price	2,677.83	326.43	461,740.85
Indonesia	2001	Kalimantan	14,941.00	Rupiah	222,008.00	71.46	9,721.65	market price	310,674.50	31.96	477,469.04
	1999	Segara Anakan	8,975.00	Rupiah	282,900.00	61.79	9,721.65	market price	457,841.07	47.09	422,677.52
	1996	Subang district	5,327.00	Rupiah	222,200.00	30.48	9,721.65	market price	729,002.62	74.99	399,458.55
	1991	Bintuni BaY	300,000.00	Rupiah	289,825.00	20.16	9,721.65	market price	1,437,624.01	147.88	44,363,572.24
	1989	Sumatra	386,100.00	Rupiah	159,400.00	17.09	9,721.65	market price	932,709.19	95.94	37,042,986.52
Thailand	1998	Surathanee	400.00	Baht	2,136.81	87.77	40.31	market price	2,434.56	60.40	24,160.67
<b>Oxygen release</b>											
China	2002	Fangchenggang	1,414.50	RMB	3,331.00	93.38	8.20	market price	3,567.14	434.84	615,085.73
<b>Option value – biodiversity</b>											
Indonesia	2005	Makassar	27.00	Rupiah	156,855.00	100.00	9,721.65	benefit transfer	156,855.00	16.13	435.63
	2005	Mamuju	976.00	Rupiah	500,558.80	100.00	9,721.65	benefit transfer	500,558.80	51.49	50,253.33
	2005	Donggala	18,300.00	Rupiah	154,365.00	100.00	9,721.65	benefit transfer	154,365.00	15.88	290,576.08
	2004	Youtefa Bay	188.00	Rupiah	142,500.00	90.54	9,721.65	benefit transfer	157,389.00	16.19	3,043.63
	2004	Karawang, W. Java Perhutani's property	1,292.40	Rupiah	135,262.50	90.54	9,721.65	benefit transfer	149,395.29	15.37	19,860.67
	2004	Karawang, W.t Java Private property	400.00	Rupiah	135,262.50	90.54	9,721.65	benefit transfer	149,395.29	15.37	6,146.91
	2004	Marisa District, Gorontalo	5,332.00	Rupiah	375,000.00	90.54	9,721.65	benefit transfer	414,181.58	42.60	227,164.71
	2003	Derawan Island	44.60	Rupiah	2,867,680.00	85.22	9,721.65	benefit transfer	3,365,031.68	346.14	15,437.75
	2003	Pulau Derawan	44.60	Rupiah	2,867,680.00	85.22	9,721.65	benefit transfer	3,365,031.68	346.14	15,437.75

**Table 3 cont.** Values of services from mangrove ecosystems at various locations bordering the South China Sea. Values in the shaded cells were not used in the subsequent analysis to determine national and regional weighted mean values for each service.

Country	Year	Location	Total Area (Ha)	Currency	Value per Ha Local currency	CPI (base 2005)	2005 Exchange Rate	Valuation Method	Standard National Value, 2005, per hectare in local Currency	Regionally comparable Value per hectare US\$	Total Value by Locality
Indonesia	2002	TNL Bunaken	2,689.00	Rupiah	12,000,000.00	79.95	9,721.65	benefit transfer	15,009,380.86	1,543.91	4,151,581.02
	2002	Tinanggea, Southeast Sulawesi	6,596.00	Rupiah	147,606.69	79.95	9,721.65	benefit transfer	184,623.75	18.99	125,264.54
	2001	Kalimantan	14,941.00	Rupiah	123,760.00	71.46	9,721.65	benefit transfer	173,187.80	17.81	266,168.64
	2000	West Seram District	991.00	Rupiah	1,019,500.00	64.09	9,721.65	benefit transfer	1,590,731.78	163.63	162,155.08
	2000	Batu Ampar, Pontianak	13,900.00	Rupiah	123,750.00	64.09	9,721.65	benefit transfer	193,087.85	19.86	276,076.65
	1999	Gelumbang District, South Sulawesi	9,538.00	Rupiah	243,751.31	61.79	9,721.65	benefit transfer	394,483.43	40.58	387,031.24
	1999	Segara Anakan	12,090.00	Rupiah	146,700.00	61.79	9,721.65	benefit transfer	237,417.06	24.42	295,255.61
	1996	Subang district	5,327.00	Rupiah	115,200.00	30.48	9,721.65	benefit transfer	377,952.76	38.88	207,100.02
	1991	Bintuni BaY	44.60	Rupiah	37,500.00	20.16	9,721.65	benefit transfer	186,011.90	19.13	853.37
	1989	Sumatra	44.60	Rupiah	37,500.00	17.09	9,721.65	benefit transfer	219,426.57	22.57	1,006.66
<b>Aesthetic (5% of land prices)</b>											
China	2002	Fangchenggang	1,414.50	RMB	14,300.00	93.38	8.20	Hedonic Price	15,313.77	1,866.78	2,640,566.17

204. The valuation of the nursery function of mangroves is of some interest as apparently, in no case, has any attempt been made to value the natural production resulting from the use of mangroves by off-shore demersal fish and crustaceans as nursery areas. This is somewhat surprising in that McNae, for example, was able to demonstrate as early as 1974 a strong correlation between the off-shore catch of penaeid shrimp and the area of mangrove on the adjacent coastline (McNae, 1974) and such relationships could have been used to value this function. In contrast, valuations have been done either in terms of the market value of larval fish and crustaceans caught in the mangrove area for sale to mariculture farmers or through a shadow pricing method using the costs of producing such larvae through other means. Neither of these methods can be considered ideal, nor do they actually represent a "true" evaluation of the "nursery function"; nevertheless, they were used in the absence of other data.

#### **2.1.7.2. Determination of weighted mean national values**

205. Examination of any one portion of this dataset revealed wide variation in farm gate prices. Mangrove timber from Indonesia, for example, apparently varies from US\$ 76 to in excess of US\$ 5,000 per cubic metre. In this instance, a weak but significant negative correlation exists between the value per cubic metre and the stock or more precisely the area of mangrove. This issue of widely differing prices within each country is addressed through the calculation of weighted mean national values. As is well known, farm gate prices for environmental goods vary within countries reflecting both the local supply and the demand. Where blood cockle beds (*Anadara granosa*), for example, are located in close proximity to a centre of population, the unit farm gate price is higher than when an equivalent sized resource is located farther away.

206. In order to address this problem of the wide variation in prices within one country, the RTF-E decided to weight the data from each location and determine a "Weighted Mean National Value" that reflected both the prices for the same resource at each location and the "stock" of that resource at the same locations. Hence, the price at location A was multiplied by the stock (or area where the stock could not be estimated) in area A and this value was added to other values determined for locations B, C, etc. The summation was then divided by the total stock for which prices were available, thus providing the Weighted Mean National Value. This results in a national value that reflects the totality of the national stock rather than being a simple arithmetic average of all values. Tables 4 to 7 present the weighted mean national and weighted mean regional values for mangroves, coral reefs, seagrass and wetlands respectively.

#### **2.1.7.3. Determination of weighted mean regional values**

207. The determination of weighted mean regional values was undertaken in a similar manner to the computation of weighted mean national values but using data and information concerning the total stock (or area) in each country and the weighted mean national values. Thus, the weighted mean national value for each resource was multiplied by the stock for each country and the resultant values summed, then divided by the total stock (or area) of the habitat bordering the South China Sea. The absence of values in a particular table may reflect one of two circumstances: (a) first, and most commonly, no data for farm gate prices and hence no value could be found for that resource in the country concerned; and, (2) secondly, that a particular resource is not used in the country concerned.

208. An example of the latter is the case of sipunculid worms that are highly prized in China and also eaten to a lesser extent in the Philippines but which are not consumed in the other countries of the region. Consequently, there are no market values from Cambodia, Indonesia, Malaysia, Thailand and Viet Nam reflecting the fact that these worms are not eaten and do not enter the market in these countries. Sipunculid worms are, however, found in all mangrove areas in all countries. The contribution of the weighted mean regional value for sipunculid worms to the total economic value of mangrove production in the region is therefore much smaller than if a benefits transfer method of determining value were used to value the entire South China Sea stock of sipunculid worms.

**Table 4** Weighted mean national and regional values for the per hectare annual production of goods and services by mangroves bordering the South China Sea.

Mangrove Goods	Cambodia	China	Indonesia	Malaysia	Philippines	Thailand	Viet Nam	Regional
<b>Timber</b>	779.95	137.07	73.55	9.59	202.67	0.00	10.91	<b>73.45</b>
<b>Firewood</b>	17.35	0.00	65.06	0.00	84.21	106.80	242.63	<b>2.08</b>
<b>Poles</b>	0.00	0.00	0.00	0.00	2.34	0.00	0.00	<b>0.06</b>
<b>Charcoal</b>	71.39	0.00	15.85	0.00	0.92	2.42	0.00	<b>0.43</b>
<b>Leaves/palm fronds (Thatch, fodder)</b>	13.66	0.00	0.00	0.00	1.93	0.00	0.00	<b>0.27</b>
<b>Fruit/propagules</b>	0.00	100.78	0.00	0.00	0.00	0.00	0.00	<b>0.59</b>
<b>Bark (tanning &amp; dyes)</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Medicine</b>	0.00	0.00	238.31	0.00	0.00	0.00	0.00	<b>172.52</b>
<b>Sap (sugar, alcohol, Acetic acid)</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Wood tar</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Fish capture</b>	0.00	186.29	281.88	0.00	160.89	206.88	200.41	<b>230.64</b>
<b>Fish fry</b>	0.00	0.00	47.07	0.00	0.00	51.11	0.00	<b>37.43</b>
<b>Eels</b>	0.00	0.00	41.39	0.00	0.00	0.00	0.00	<b>30.21</b>
<b>Crab capture</b>	0.00	200.39	266.67	0.00	12.52	22.38	0.00	<b>199.46</b>
<b>Prawn capture</b>	0.00	135.11	272.33	0.00	11.01	149.57	0.00	<b>210.19</b>
<b>Shellfish collection</b>	0.00	1,153.82	18.83	0.00	2.08	386.47	0.00	<b>55.26</b>
<b>All Fisheries resources</b>	0.00	0.00	0.00	3,632.95	0.00	0.00	0.00	<b>513.54</b>
<b>Insect and larvae collection</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Worms</b>	0.00	2,582.30	0.00	0.00	0.44	0.00	0.00	<b>40.66</b>
<b>Wildlife</b>	0.00	0.00	25.13	0.00	0.00	0.00	0.00	<b>18.19</b>
<b>Zooplankton</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Jellyfish</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Honey &amp; wax</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Algae</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Total value of goods US\$ per Ha</b>	<b>882.35</b>	<b>4,495.76</b>	<b>1,346.06</b>	<b>3,642.54</b>	<b>479.02</b>	<b>925.63</b>	<b>453.95</b>	<b>1,584.97</b>
<b>Mangrove Services</b>								
<b>Ecotourism</b>	0.00	0.00	59.79	0.00	0.00	0.00	0.00	<b>43.28</b>
<b>Nursery Function</b>	0.00	1,274.37	781.50	0.00	0.00	0.00	0.00	<b>573.23</b>
<b>Sediment retention</b>	0.00	11,344.56	0.00	0.00	0.00	0.00	0.00	<b>66.43</b>
<b>Coastal Protection</b>	0.00	1,044.35	421.56	0.00	0.00	2,198.48	0.00	<b>443.85</b>
<b>Windbreak</b>	0.00	1,200.32	0.00	0.00	0.00	0.00	0.00	<b>7.03</b>
<b>Carbon Sequestration</b>	0.00	326.43	115.62	0.00	0.00	60.40	0.00	<b>89.26</b>
<b>Oxygen Production</b>	0.00	434.84	0.00	0.00	0.00	0.00	0.00	<b>2.55</b>
<b>Option Value</b>	0.00	0.00	70.07	0.00	0.00	0.00	0.00	<b>50.73</b>
<b>Aesthetic Value</b>	0.00	1,866.78	0.00	0.00	0.00	0.00	0.00	<b>10.93</b>
<b>Total value of services US\$ per Ha</b>	<b>0.00</b>	<b>17,491.67</b>	<b>1,448.53</b>	<b>0.00</b>	<b>0.00</b>	<b>2,258.88</b>	<b>0.00</b>	<b>1,287.28</b>
<b>Grand Total Goods and Services</b>	<b>882.35</b>	<b>21,987.43</b>	<b>2,794.59</b>	<b>3,642.54</b>	<b>479.02</b>	<b>3,184.51</b>	<b>453.95</b>	<b>2,872.25</b>
<b>Total Area of Mangrove Ha</b>	<b>72,350</b>	<b>23,446</b>	<b>934,000</b>	<b>532,100</b>	<b>28,014</b>	<b>62,618</b>	<b>156,608</b>	<b>1,809,136.00</b>
<b>Value of Total Annual Production US\$</b>	<b>63,838,022</b>	<b>515,517,394</b>	<b>2,610,142,421</b>	<b>1,938,197,499</b>	<b>13,419,183</b>	<b>199,407,799</b>	<b>71,091,633</b>	<b>5,196,296,711</b>

**Table 5** Weighted mean national and regional values for the per hectare annual production of goods and services by coral reefs bordering the South China Sea.

	Cambodia	Indonesia	Malaysia	Philippines	Thailand	Viet Nam	Regional
<b>Coral Reef Goods</b>							
<b>Capture Fisheries (food and aquarium fish)</b>	0.00	285.49	0.00	150.98	0.00	0.00	<b>108.31</b>
<b>Shrimp</b>	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Shellfish collection</b>	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Molluscs</b>	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Sea Cucumbers</b>	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Echinoderms-Sea urchins</b>	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Coral - Building materials m3</b>	0.00	482.81	0.00	0.00	0.00	0.00	<b>25.28</b>
<b>Coral (curio trade)</b>	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Seaweed</b>	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Total Value Goods US\$ per Ha</b>	<b>0.00</b>	<b>768.30</b>	<b>0.00</b>	<b>150.98</b>	<b>0.00</b>	<b>0.00</b>	<b>133.59</b>
<b>Coral Reef Services</b>							
<b>Coral Reef Tourism</b>	0.00	0.00	0.00	270.19	7,149.70	964.17	<b>1,024.62</b>
<b>Research</b>	0.00	0.00	0.00	0.00	0.00	0.00	
<b>Beach Protection</b>	0.00	7,330.56	0.00	0.00	0.00	0.00	<b>383.80</b>
<b>Biodiversity Option Value</b>	0.00	10.57	0.00	0.00	0.00	0.00	<b>0.55</b>
<b>Total Value Services US\$ per Ha</b>	<b>0.00</b>	<b>7,341.13</b>	<b>0.00</b>	<b>270.19</b>	<b>7,149.70</b>	<b>964.17</b>	<b>1,408.97</b>
<b>Total Value Goods and Services US\$</b>	<b>0.00</b>	<b>8,109.43</b>	<b>0.00</b>	<b>421.17</b>	<b>7,149.70</b>	<b>964.17</b>	<b>1,542.56</b>
<b>Total coral reef area in the South China Sea (ha)</b>	<b>2,807</b>	<b>39,287</b>	<b>44,276</b>	<b>464,000</b>	<b>90,000</b>	<b>110,000</b>	<b>750,307</b>
<b>Value of Total Annual Production US\$</b>	<b>0</b>	<b>318,595,042</b>	<b>0</b>	<b>195,422,880</b>	<b>643,473,000</b>	<b>106,058,248</b>	<b>1,157,393,756</b>

**Table 6** Weighted mean national and regional values for the per hectare annual production of goods and services of seagrass meadows bordering the South China Sea.

	Cambodia	China	Indonesia	Malaysia	Philippines	Thailand	Viet Nam	Regional
<b>Seagrass Goods</b>								
<b>Capture Fisheries (food and aquarium fish)</b>	452.15	176.33	0.00	0.00	34.84	0.00	0.00	<b>222.92</b>
<b>Shrimp</b>	96.14	158.82	0.00	0.00	0.00	0.00	0.00	<b>48.29</b>
<b>Crabs</b>	117.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>53.63</b>
<b>Crustaceans</b>	0.00	0.00	0.00	0.00	0.00	0.00	117.54	<b>14.24</b>
<b>Shellfish/Molluscs collection</b>	12.04	0.00	0.00	0.00	0.00	0.00	399.30	<b>53.91</b>
<b>Acorn worms</b>	0.00	794.10	0.00	0.00	0.00	0.00	0.00	<b>21.10</b>
<b>Seaweed-algae</b>	508.67	584.69	0.00	0.00	0.00	0.00	36.40	<b>253.11</b>
<b>Seagrass fertiliser</b>	0.00	0.00	0.00	0.00	0.00	0.00	29.12	<b>3.53</b>
<b>Handicrafts</b>	0.00	559.84	0.00	0.00	0.00	0.00	0.00	<b>14.87</b>
<b>Cosmetics</b>	0.00	1,007.76	0.00	0.00	0.00	0.00	0.00	<b>26.78</b>
<b>Total Value of Goods US\$ per Ha</b>	<b>1,186.00</b>	<b>3,281.53</b>	<b>0.00</b>	<b>0.00</b>	<b>34.84</b>	<b>0.00</b>	<b>582.36</b>	<b>712.38</b>
<b>Seagrass Services</b>								
<b>Seagrass Tourism</b>	0.00	0.00	0.00	0.00	0.00	0.00	1,264.13	<b>153.20</b>
<b>Research</b>	0.00	57.83	0.00	0.00	0.00	0.00	0.00	<b>1.54</b>
<b>Beach Protection</b>	0.00	1,190.80	0.00	0.00	0.00	0.00	0.00	<b>58.41</b>
<b>Nursery Function</b>	0.00	1,966.79	0.00	0.00	0.00	0.00	414.64	<b>102.51</b>
<b>Biodiversity Option Value</b>	0.00	439.02	0.00	0.00	0.00	0.00	0.00	<b>11.66</b>
<b>Turtle Nesting beaches</b>	0.00	0.00	0.00	0.00	0.00	4,097.93	0.00	<b>141.82</b>
<b>Carbon sequestration</b>	0.00	2.26	0.00	0.00	0.00	0.00	0.00	<b>0.06</b>
<b>Water quality-nutrient removal</b>	0.00	38.54	0.00	0.00	0.00	0.00	0.00	<b>1.02</b>
<b>Oxygen release</b>	0.00	3.71	0.00	0.00	0.00	0.00	0.00	<b>0.10</b>
<b>Total Value of Services US\$ per Ha</b>	<b>0.00</b>	<b>3,656.70</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>4,097.93</b>	<b>1,678.77</b>	<b>469.21</b>
<b>Grand Total Goods and Services Value US\$</b>	<b>1,186.00</b>	<b>6,938.23</b>	<b>0.00</b>	<b>0.00</b>	<b>34.84</b>	<b>4,097.93</b>	<b>2,261.13</b>	<b>1,181.59</b>
<b>Total known areas of seagrass</b>	<b>33,814</b>	<b>1,960</b>	<b>3,035</b>	<b>222</b>	<b>23,245</b>	<b>2,553</b>	<b>8,940</b>	<b>73,769</b>
<b>Value of total Annual production in US\$</b>	<b>40,103,435</b>	<b>13,598,940</b>	<b>0</b>	<b>0</b>	<b>809,766</b>	<b>10,462,004</b>	<b>20,214,500</b>	<b>87,164,402</b>

**Table 7** Weighted mean national and regional values for the per hectare annual production of goods and services of wetlands<sup>43</sup> bordering the South China Sea.

	Cambodia	China	Indonesia	Malaysia	Philippines	Thailand	Viet Nam	Regional
<b>Wetland Goods</b>								
<b>Timber</b>	0.00	92.58	0.00	0.00	0.00	0.00	147.53	<b>14.23</b>
<b>Firewood</b>	0.00	0.00	0.00	0.00	0.00	0.00	135.04	<b>12.61</b>
<b>Charcoal</b>	0.00	0.00	0.00	0.00	0.00	0.00	5.87	<b>0.55</b>
<b>Leaves/palm fronds (Thatch, fodder)</b>	0.00	0.00	0.00	0.00	0.00	21.84	0.00	<b>1.43</b>
<b>Medicine</b>	0.00	0.00	0.00	0.00	0.00	0.00	<b>22.51</b>	<b>2.10</b>
<b>Fish capture</b>	0.00	109.66	0.00	0.00	0.00	438.67	966.93	<b>119.53</b>
<b>Crab capture</b>	0.00	192.55	0.00	0.00	0.00	0.00	0.00	<b>0.93</b>
<b>Wildlife</b>	0.00	0.00	0.00	0.00	0.00	4.38	0.00	<b>0.29</b>
<b>Honey &amp; wax</b>	0.00	0.00	0.00	0.00	0.00	0.00	164.18	<b>15.34</b>
<b>Total Goods US\$ per Ha</b>	<b>0.00</b>	<b>394.79</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>464.89</b>	<b>1,442.05</b>	<b>167.00</b>
<b>Wetland Services</b>								
<b>Ecotourism</b>	0.00	294.46	0.00	0.00	0.00	75.45	26.62	<b>8.84</b>
<b>Research &amp; Education</b>	0.00	954.54	0.00	0.00	0.00	0.00	0.00	<b>4.61</b>
<b>Migratory species</b>	0.00	373.62	0.00	0.00	0.00	0.00	0.00	1.80
<b>Sediment retention</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Nutrient retention</b>	0.00	0.52	0.00	0.00	0.00	0.00	0.00	<b>0.00252</b>
<b>Coastal Protection</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Windbreak</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Carbon Sequestration</b>	0.00	140.61	0.00	0.00	0.00	0.00	0.00	<b>0.68</b>
<b>Oxygen Production</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
<b>Option Value</b>	0.00	0.00	0.00	0.00	0.00	0.13	0.00	<b>0.01</b>
<b>Aesthetic Value</b>	0.00	0.00	0.00	0.00	0.00	0.00	1,201.32	<b>112.21</b>
<b>Total Services US\$ per Ha</b>	<b>0.00</b>	<b>1,763.75</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>75.58</b>	<b>1,227.94</b>	<b>128.15</b>
<b>Grand Total Goods and Services Value US\$</b>	<b>0.00</b>	<b>2,158.54</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>540.47</b>	<b>2,670.00</b>	<b>295.15</b>
<b>Total known areas of wetlands</b>	<b>77,202</b>	<b>20,276</b>	<b>3,252,780</b>	<b>0</b>	<b>183,818</b>	<b>274,653</b>	<b>392,416</b>	<b>4,201,145</b>
<b>Value of total annual production in US\$</b>	<b>0.00</b>	<b>43,766,563</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>148,440,949</b>	<b>1,047,749,247</b>	<b>1,239,956,427</b>

<sup>43</sup> It is noted that, in the context of the SCS project, the only habitats included in the coastal wetlands group were: coastal lagoons, estuaries, inter-tidal mudflats, and peat and non-peat swamp forest.

209. In the case of mangrove “fruit” or propagules, the value from China represents the price of *Avicennia marina* propagules that are used in soup and other dishes in southern China and are apparently not eaten elsewhere in the region. Propagules of other species are processed as sweets and eaten in Thailand but no farm gate price is available from that country. What is interesting is the apparent absence of a market for mangrove propagules in countries where propagules are purchased from local villagers for use in re-forestation and re-planting schemes. During the sixth meeting of the regional Working Group on Mangroves (UNEP, 2005a), there was a discussion regarding the value and sale of propagules during which it was noted that propagules from the Batu Ampur demonstration site were being sold for replanting elsewhere in West Kalimantan at a price for Rhizophora of 1\$ for 200 propagules. In Thailand and Viet Nam the price was cited at around 1\$ for 100 propagules, whilst in the Philippines the price was higher at 1\$ for 50 propagules. Markets thus do exist for these products but values are apparently not formally recorded in the literature.

#### **2.1.7.4. Determination of Total Economic Value (TEV)**

210. The SCS project task force agreed that the Total Economic Value of the habitats bordering the South China Sea should be estimated as the summation of the values of all goods and services produced by each habitat on an annual basis. The summation of the regionally weighted values therefore represents the Total Economic Value of the annual production per hectare, whilst the Total Economic Value for the entire area of each habitat is derived from the product of this value multiplied by the total area of the habitat bordering the South China Sea. In the case of mangroves, the annual values of production per hectare for both goods and services varies from 450 US dollars in Viet Nam and the Philippines to in excess of 21,000 US dollars in the case of China. The latter value reflects the high value for the service of sediment retention by mangroves determined by the difference in annual cost of dredging of the Fangchenggang Port before and after removal of mangroves. As the total area of mangrove in China is only 23 thousand hectares compared with nearly 2 million hectares along the Indonesian coast of the South China Sea, this very high value does not distort the regional value for this service which computes at a modest 66 US dollars per hectare annually.

211. The most comprehensive dataset is that for mangroves, whilst the least comprehensive are those for coral reefs and wetlands. Only three national datasets were found for coral reef goods and, in the case of wetlands, the bulk of the data are from Viet Nam. This results in a regional value of coral reef production of a modest 1,500 US dollars per hectare per annum and for wetlands of around 300 US dollars per hectare per annum. These should be compared with the regional value for mangrove of nearly three thousand dollars per hectare and the value of 1,118 US dollars per hectare for seagrass meadows. On first principles, one might expect the value of mangrove goods to exceed those for coral reefs and seagrass because the former will include values for mangrove timber and other direct derivatives that have few, if any, equivalents in coral reef and seagrass habitats. In contrast, one would expect that the service values for coral reefs would be greater than those for the other three habitats given the extensive coral reef tourism in the region.

212. Examination of the value of total annual production of goods and services by the four habitats from areas bordering the South China Sea demonstrates unequivocally the importance of mangroves in this region. The total annual value of mangrove production exceeds 5.1 billion US dollars annually compared with around 1.2 billion for wetlands and coral reefs and a mere 86 million US dollars for seagrass habitats. It is important to recognise that the values for goods and services, both individually and collectively, are extremely conservative as a consequence of the manner in which they have been calculated using weighted means. Where data are lacking for a good or service from one country, the consequence will be a lowering of the weighted mean regional value. Given the absence of values for many goods and services in each habitat, the values are likely to be as low as 50% or less of the real value. For comparison, the values derived by Costanza et al. are presented along-side those from the work of the SCS project on economic valuation in the following table.

**Table 8** Comparison of the Total Economic Value of coastal habitats as determined by Costanza *et al.* 1997 and during the SCS project work on economic valuation.

Area ha	US\$ per hectare per annum		Total Economic Values	
	Costanza <i>et al</i>	SCS project study	Costanza <i>et al</i>	SCS project study
Mangroves	1,799,136	9,990	2,872.25	17,973,368,640
Coral reefs	750,307	6,076	1,542.56	4,558,865,332
Seagrass	73,769	22,400	1,181.59	1,652,425,600
"Wetlands"	4,201,145	14,785	295.15	62,113,928,825
				1,239,967,947

213. In all four cases, the values cited by Costanza *et al.* 1997 are greater than those determined in the present study and consequently would result in Total Economic Values ranging from 3 to 22 times greater than those determined in the present instance. It is important to recognise, however, that the two sets of values are not directly comparable since those of Costanza *et al.* relate to capital values whilst those of the present study reflect annual production values. Uniquely in the context of a foundational GEF International Waters TDA/SAP project, these values were applied in an analysis of the costs and benefits of the regional actions proposed in the Strategic Action Programme.

214. Furthermore, what has resulted from this work is a standardised method for computing national and regional weighted mean values of resources and services that can be applied more widely in handling and manipulating economic valuation data from multiple locations across any time span. The techniques can be applied in any region where multiple currencies, varying exchange rates and widespread inter-locational variation in farm gate prices are found. The specific targets of the revised SAP have been valued or, more specifically, the incremental benefit derived from achieving the target has been valued. The values saved by achieving the targets have been compared with the costs of implementing the actions defined in the regional SAP through a cost benefit analysis (see Annex 6 of UNEP, 2007j for details of the methodologies and procedures use to conduct the cost benefit analysis). This work of the TDA/SAP SCS project has also been published as a paper in the internationally peer-reviewed journal Ocean and Coastal Management (see Pernetta *et al.*, 2013).

### 2.1.8. Legal Aspects of Environmental Management in the South China Sea

215. As noted in previous sections of this Project Document, the margins of the South China marine basin have experienced high rates of economic growth and rapid urbanisation over the past five decades. Each country has actively and in certain respects very successfully pursued a goal of economic development sometimes at the expense of environmental quality. Industrialisation, urbanisation, and population growth along the coastlines are the main driving forces of marine environmental degradation in the South China Sea. According to the Transboundary Diagnostic Analysis, approximately 69% of the original mangrove forest area was destroyed during the 20th century. Serious land-based pollution is generated by coastal industrial activities and has resulted in the increasing occurrence of red tides in some parts of the marine basin. The three most important environmental concerns identified in the TDA are: loss and degradation of coastal habitats; over-exploitation of living marine resources; and land-based pollution. The environmental degradation of the South China Sea has significant transboundary implications due to the ecological interdependence of sub-basins and the sea's globally significant biological diversity; and poses a serious challenge to the sustainable development of the littoral countries.

216. Legal instruments play a key role in ensuring the sustainable management of coastal habitats, preventing marine pollution, and prohibiting certain fishing activities, which threaten the marine environment of the South China Sea. Recognising the importance of the legal issues in marine environmental management, the Project Steering Committee of the SCS Project created a Regional Task Force on Legal Matters to strengthen the legal aspects of the project. The Task Force took a gradual approach to exploring possible ways to strengthen the legal aspects of coastal and marine environmental management, by first reviewing signatory states' obligations for regional co-operation

under major global environmental conventions. In considering the countries' existing obligations for regional co-operation, the Task Force collectively reviewed the status of existing regional cooperative mechanisms and instruments, including regional agreements and soft laws, and suggested that great potential exists for countries bordering the South China Sea to strengthen regional co-operation on marine environmental management.

217. The Task Force further reviewed national legislation, and conducted a comparative analysis of national environmental legislation regarding major issues/themes of interest, and to identify strengths and weaknesses of national legislation so that countries with a less well developed legislative base could derive lessons from countries with more comprehensive legislation. As part of SAP development, the task force published a comprehensive review of legal matters relating to environmental management in the South China Sea and Gulf of Thailand which is presented in three parts: a review of the obligations of signatory states regarding regional co-operation on environmental protection; a review of regional and sub-regional agreements and soft laws regarding environmental protection with relevance to the South China Sea; and a comparative analysis of the national legislation of the seven countries bordering the South China Sea that endorsed the SAP at the intergovernmental level<sup>44</sup>. The key findings of this report were also recently published, together with a contemporaneous assessment of legal issues affecting environmental management in this marine basin, as a paper in the internationally peer-reviewed journal Ocean and Coastal Management<sup>45</sup>.

### **2.1.9. Regional Cooperation for Environmental Management in the South China Sea**

218. The environment of the South China Sea continues to degrade despite actions taken at the national, sub-regional and regional levels. Part of the problem stems from the transboundary marine problems in the region and their impact on the ecosystems and resources of the South China Sea. This provides the ecological impetus for co-operation that is also based on the fact that the region is a large marine ecosystem with intrinsic integrity and inter-connections between all trophic levels. Fish and other migratory species do not recognise national boundaries, and the loss of endangered species in one area has not only regional but global significance. Due to the inherent conflict between the boundaries of the ecological system and man-made, national boundaries, it is necessary to establish an effective regional coordination mechanism to address transboundary issues and countries must co-operate to meet the challenges to managing and sustainably using the shared ecological system.

219. These ecological issues are compounded by gaps in regional co-operation, which exist despite the ratification of many international conventions, which contain the legal basis for regional collaboration. Moreover, the present instruments and mechanisms for regional co-operation in the management of the marine and coastal environment of the South China Sea area are neither extensive nor well developed. While a number of sub-regional agreements or soft laws have been developed and numerous bi-lateral agreements have been entered into by, all governments individually and severally, there exists no overarching regional agreement governing the management of the marine environmental in the South China Sea. The necessity for co-operation is reinforced by the need to prevent wastage of scarce financial resources that result from duplication of actions by countries in the region and the need to ensure that regional efforts are co-ordinated and effective. This in turn depends on the efficacy of related national actions which form the foundations of regional action and co-operation.

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<sup>44</sup> See UNEP (2007). Review of the Legal Aspects of Environmental Management in the South China Sea and Gulf of Thailand. UNEP/GEF/SCS Technical Publication No. 9. This report is accessible online at <[http://www.unepscs.org/remository/Download/19\\_-\\_Technical\\_Publications\\_and\\_Guidelines.html](http://www.unepscs.org/remository/Download/19_-_Technical_Publications_and_Guidelines.html)>

<sup>45</sup> See Basiron, M.N., Lexmond, S.M. (2013) Review of the legal aspects of environmental management in the South China Sea and Gulf of Thailand. *Ocean and Coastal Management*, 85(b): 257-267.

220. Despite the widespread recognition of the necessity to promote formal inter-governmental regional co-operation, there exist some common obstacles to strengthening existing mechanisms or forging new ones for regional co-operation. These identified obstacles include:

- Financial constraints; continued long-term financing;
- Lack of understanding of the root causes of regional marine environmental problems;
- Lack of consideration of long-term impacts;
- Inability to predict the impacts of future threats;
- Lack of a regional and global perspective;
- Lack of respect and recognition of regional expertise among some high-level decision-makers;
- Lack of a regional political consensus;
- Lack of a regional network and mechanism for action; and,
- Lack of understanding of the benefits of regional co-operation.

221. In identifying ways to overcome the obstacles the Regional Task Force on Legal Matters (RTF-L) of the SCS project conducted a number of reviews including: a review of states obligations to co-operate regionally under existing multi-lateral environmental agreements; a comparative review of national legislation relating to coastal habitats and pollution; a review of existing regional and sub-regional legal agreements in the field of marine environmental management. In addition the RTF-L commissioned a study by a regional consultant, of instruments and mechanisms used elsewhere for strengthening and enhancing regional co-operation in the management of the marine environment. As part of this study a questionnaire was administered to various regional entities around the world regarding the effectiveness or otherwise of their existing instruments and mechanisms, the responses suggest that:

- Regional legal agreements are the most influential instruments, in strengthening regional co-operation and fostering regional stability and confidence building among the countries;
- The ecological effectiveness and economic efficiency of regional co-operation are necessary to avoid the waste of scarce financial resources;
- A process-oriented focus to improving the effectiveness of actions and implementation is appropriate for regional cooperation;
- A strong, proactive institutional mechanism empowered to act effectively, results in the most effective regional co-operation; and lastly;
- That regional co-operation may take many forms, but it must be appropriate to the regional ethos and culture.

222. The RTF-L also conducted a survey and carried out consultations at national level to gauge views among government and non-government organisations on the level and effectiveness of co-operation in the South China Sea and whether an alternative mechanism is needed to enhance co-operation in marine environment management in the region. The results of the surveys and a comparative analysis of national views is given in Annex 5 “Comparative Analysis of Countries Perspectives from informal National Consultations” of the Report of the Fifth Meeting of the RTF-L. Based on the results of the review and national consultation, and notwithstanding the outcomes of the commissioned study the RTF-L was of the opinion that the optimum way forward in this region at that time was the preparation of a non-legally binding framework. A comprehensive review of instruments and mechanisms for strengthening marine environmental cooperation in the South China Sea<sup>46</sup> was

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<sup>46</sup> See Lexmond, S.M. (2008) online at <[http://www.unepscs.org/repository/Download/19\\_Technical\\_Publications\\_and\\_Guidelines/Technical\\_Publication\\_17\\_Review\\_of\\_Instruments\\_and\\_Mechanisms\\_for\\_Strengthening\\_Marine\\_Environmental\\_Co-operation\\_in\\_the\\_South\\_China\\_Sea.html](http://www.unepscs.org/repository/Download/19_Technical_Publications_and_Guidelines/Technical_Publication_17_Review_of_Instruments_and_Mechanisms_for_Strengthening_Marine_Environmental_Co-operation_in_the_South_China_Sea.html)>

published as part of SAP formulation and underpins the recommended proposed mechanisms for regional cooperation in the agreed SAP.

223. The intergovernmentally endorsed Strategic Action Framework recommends that the development of any such framework must be functional and effective in resolving environmental problems and fostering strong regional cooperation and coordination of appropriate cost-effective actions. It was agreed further in the SAP that the framework must include, *inter alia*:

- Sound science. The use of sound science must be incorporated into policy-making processes and underpin decisions to foster ecological and economic soundness.
- Ecologically effective actions. It is increasingly recognised that many laws, policies and actions are ineffective in terms of ecological improvements. Ecological ineffectiveness also results in waste of scarce financial resources. Ecologically effective actions must be based on sound science and not on perceptions.
- Cost effective actions.
- Economic valuation. Economic valuation of environmental goods and services as a tool for sound development planning.
- Knowledge-based decision-making. This entails gathering all relevant information for the purpose of making effective decisions. Studies indicate that working toward a consensual knowledge-base for decision-making purposes improves the effectiveness of decisions and it also improves cooperation.
- Consensual knowledge-base. Promoting and building a consensual knowledge base (a base of information that the parties agree is applicable) facilitates cooperation and decision-making processes. This is particularly true where progress on regional cooperation is stalled or slowed due to complexities or uncertainty surrounding the issue.
- Communication. The need to strengthen effective vertical and horizontal communication has been identified as a serious impediment to effective cooperation.
- Periodic assessment and review and revision of instruments or actions as required. Significant amounts of money and valuable resources are wasted due to the failure to assess or review laws, policies, mechanisms and measures to ensure they are effective or even implemented. Where assessments indicate problems, it is imperative that revisions are undertaken.
- Adaptive management. This provides a flexible approach that allows for the inclusion of new information.

#### **2.1.10. From SAP Adoption to SAP Implementation**

##### **2.1.10.1. Sustainability of SCS project outcomes**

224. One measure of success of a project is the extent to which benefits realized during project execution are sustained following its closure. In this regard, the SCS project must rank fairly highly in that management action initiated at the demonstration sites has continued at nearly all of them. Of particular note is the outcome of the joint demonstration site operated by Kampot Province in Cambodia and by Kien Giang Province in Viet Nam. At the time that the Project Steering Committee approved the demonstration sites, both Viet Nam and Cambodia requested the PCU to assist in establishing the programme of work and promoting collaboration.

225. During the project, a series of joint meetings attended by provincial government officials, scientists and managers from both countries were convened under the auspices of the PCU. These culminated in the signing of a joint memorandum of agreement between the Deputy Governors of both provinces that encompassed an agreement on the regulation of cross border trade in marine products, joint programmes of action and the mechanisms for funding them. Following closure of the project, annual meetings between these two provincial governments have continued and the agreement has now been endorsed by the central governments of both countries.

226. The procedures used in the selection of demonstration sites for the project have been used at the national level in Viet Nam and the Philippines in prioritising sites for national intervention. Furthermore, the management board established for the Hepu seagrass site in China has been accepted by the local government as a model for future management of various areas of conservation interest. The active involvement of provincial and local governments in the demonstration site activities at Hepu and Fangchenggang, including their initial designation as provincial conservation areas has resulted, ultimately, in their being accepted as national mangrove and seagrass reserves. In China, such a designation automatically means that central government funds are allocated for the management of these areas. In both cases, the construction of ‘learning centres’ funded by the provincial government has meant that information on the ecology and significance of these critical habitats has been made widely available to the local school children and civil society at large. Both learning centres are supported by institutions actively engaged in mangrove and seagrass research and management. A number of the other projects included the generation of public awareness and education materials amongst their activities. The coral reef site at Belitung, Indonesia, generated materials on coral reef ecology that were ultimately incorporated into the school curriculum at the provincial level.

227. At a more operational level, many of the activities at the demonstration sites have been continued by the local communities partly because they have resulted in increased income whilst at the same time providing environmental benefits. The use of coconut shells in Batu Ampur, West Kalimantan, for the manufacture of charcoal as a substitute for mangrove wood has resulted in a thriving local trade in coconut charcoal outside the area of production. The involvement of the Provincial Government fostered the establishment of a factory to produce charcoal briquettes that are now exported to Singapore and Malaysia. This has generated increased income for the mangrove dependent communities within the project area. In Batam, the project designed to address solid waste disposal in ‘stilt’ villages has also provided a source of income in terms of the generation of organic compost from household wastes that is sold to provide income to the women of the fishing community in which the project was developed. In Fanchenggang, China, the project supported a small activity to trial eco-farming in mangrove areas, the idea being to develop a non-destructive, non-invasive way of increasing the value of annual production. The initial success of the trials led to further investment and extension of the techniques as reported in Fan *et al.*, (2013).

228. The manner in which the fisheries refugia approach to improving fisheries conservation and production was enthusiastically adopted by local communities in the Gulf of Thailand has resulted in the wider adoption of the concept in other areas of the South China Sea, and in other areas of the Philippines outside the region. The endorsement of a full-sized UNEP/GEF International Waters project to operationalize a regional a system of fisheries refugia, and the Southeast Asian Fisheries Development Center’s efforts in partnership with the Ministries responsible for fisheries, is further evidence of support to this approach.

#### **2.1.10.2. Development of a GEF-financed SAP implementation project**

229. At the time of project closure in January 2009, all governments had endorsed the revised, updated and expanded Strategic Action Programme. A major question that arose during preparation of the present project is that why, given the multitudes of successes of the foundational TDA/SAP project, did UNEP and the GEF not proceed immediately with support for the implementation of the SAP as a mechanism to further strengthen the cooperation, understanding and mutual trust that had been established through the project?

230. The question as to why UNEP and the GEF did not immediately continue support for the SAP implementation and its associated mechanisms for collaboration can only be answered definitively by those two entities. However, a number of possible reasons can be conceived. Around the time of closure of the project, the GEF, for reasons of financial constraint, was accepting no new project proposals in international waters for the period up to June 2009. That moratorium continued into the

next phase of the GEF for around eighteen months (i.e., until Oct 2010). Thereafter, the GEF Evaluation Office initiated a major review of GEF investments in East Asia with a view to rationalising GEF investments in water-related projects in the region and indicated that no support would be provided to initiatives in the South China Sea until the conclusion of the review. The final report of that evaluation and review was only made public early in 2013; consequently the GEF faced its own internal delays in considering further support to activities in the South China Sea.

231. During the same period, UNEP was undergoing internal management and financial difficulties with what was then the Division of Global Environment Facility Coordination that resulted in a restructuring such that the division was dismantled and the staffing absorbed into other UNEP divisions. During this hiatus UNEP did not appoint anyone to assume overall responsibility for GEF International Waters matters. The period was also characterized by a high turn-over staff within UNEP's COBSEA, the organization responsible for oversight and coordination of SAP implementation, and UNEP staff members posted to the Asia-Pacific regional office with responsibility to support project preparation. As a result, UNEP interest in South China Sea SAP implementation waned until efforts were made to revitalize the development of a SAP implementation project in 2014. Following approval by the GEF CEO to proceed with the development of this project, UNEPs administrative capacity to execute preparatory activities was severely constrained for a period exceeding 18 months as a result of a long and tumultuous transition to the new UN-wide administrative and financial system UMOJA.

232. The above is not intended as a criticism of neither UNEP nor the GEF; rather it presents an account of the realities of operating initiatives of this magnitude within the framework of the International system. The result has been a loss of momentum and awareness within the participating countries regarding SAP implementation. This has been further influenced by significant structural reforms of some national agencies involved and the turn-over of staff which one would expect to occur over a 7-year period such as from when the SAP was adopted until present. It is indeed testament to the scientific veracity, epistemic community building and approach to documenting project outcomes which were fostered by the Project Co-ordinating Unit for the SCS project that the preparation of this SAP implementation Project Document could be undertaken on the basis of perhaps the most comprehensive baseline of information and data for any shared marine-basin globally. It is also a testament to the patience, mutual trust and understanding of all parties involved, attributes that are at the very center of the International Waters strategy of the GEF. The South China Sea region has also not been without its difficulties during this period. Territorial disputes, skirmishes and increasing political tensions have been reported by International and national media outlets in the riparian countries. While the latter issues have never been the concern of the SCS project, nor will they be addressed by this SCS SAP implementation project in any way or form, the commitment among the countries to cooperate in the area of coastal and marine environmental management remains highly significant.

## **2.2. Global significance**

### **2.2.1. The South China Sea Marine Basin**

233. The Indo-West Pacific marine biogeographic province has long been recognized as the global centre of marine tropical biodiversity. Forty-five mangrove species out of a global total of 51 (Spalding et al., 1997); 50 of 70 coral genera (Tomascik et al., 1997); 20 of 50 seagrass species (Sudara et al., 1994); and 7 of 9 giant clam species (Tomascik et al., 1997) are found in the nearshore areas of the South China Sea<sup>47</sup>. Compared to the Atlantic, the tropical Indo- West Pacific is highly

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<sup>47</sup> The South China Sea is defined by the International Hydrographic Organization (IHO) as the semi-enclosed body of water stretching in a southwest to northeast direction, whose southern border is three degrees south latitude between South Sumatra and Kalimantan (Karimata Straits), and whose northern border is the Strait of Taiwan from the northern tip of Taiwan to the Fukien coast of China (IHO, 1953)

diverse. Only 5 mangrove species and some 35 coral species are found in the Atlantic compared with the 45 mangrove species and 450 coral species recorded from the South China Sea (UNEP, 2008c, 2007l).

234. Like most tropical coastlines worldwide, the dominant coastal ecosystems of the South China Sea marine basin are mangroves, coral reefs and seagrass meadows. Significant other coastal ecosystems include coastal lagoons, a common coastal landform in Viet Nam, and extensive inter-tidal unvegetated mudflats that are found in many places around the South China Sea (UNEP, 2008d). Socio-economically, culturally and aesthetically, the South China Sea, the Gulf of Thailand and regional river basins and bays form part of the common heritage of the people of the Southeast Asian region. The region's expanding population relies on the SCS for nutrition, recreation and economic pursuits (e.g., tourism), energy (e.g., oil and gas), aquaculture, pharmaceuticals, the ornamental fish trade, construction materials and ports and shipping. The SCS region is ecologically at risk. Reversing this requires regional cooperation for long-term sustainability and regional growth.

## 2.2.2. Mangroves

235. The South China Sea is considered to be one of two global hotspots of mangrove diversity (Polidoro et al., 2010; Vo et al., 2013). According to data generated through the SCS project, the largest total area of mangrove on the South China Sea coast is observed in Indonesia (934,000 ha), followed by Malaysia (532,000 ha) and Viet Nam(157,000 ha). The combined area of mangrove observed on the South China Sea coastlines of Cambodia, China, the Philippines and Thailand is less than 150,000 ha (Table 1). The total area of mangrove on the South China Sea coast of all countries combined is estimated to be 1,770,000 ha (UNEP, 2008c), representing 11.4% of the world's remaining 15.5 million ha of mangrove forest (Vo et al., 2013).

236. In terms of mangrove species richness, the greatest number of true mangroves are observed in Malaysia, where 41 species are recorded, followed by Indonesia and Viet Nam with 37 species each (UNEP, 2008c). The RWG on mangroves (RWG-M) identified that the richness of true mangrove species is comparatively lower in the Philippines, Thailand and China and ranges between 26 and 28 species, while 16 species of true mangroves occur in Cambodia(UNEP, 2008c) (see Table 1). Investigation of the latitudinal variation in the number of true mangrove species in Viet Nam indicates an increase in the number of species from higher to lower latitudes, e.g., 14 species in the Gulf of Tonkin, 18 species in mid-central Viet Nam, 23 species in south-central waters, and 33 species in the Dong Nai and Mekong estuaries in the south (Vo, 2010). Similarly, there exists considerable variation in the eastern and western Gulf of Thailand, with species richness being lower in the eastern Gulf (18 and 16 species recorded in Gulf of Thailand waters of Viet Nam and Cambodia, respectively) compared to Thai waters in the West where 27 species are observed (UNEP, 2008c).

237. Analysis of data compiled in the National Reports on Mangroves (UNEP, 2008c) and Chan et al. (1996) indicates that the southern part of the South China Sea is a regional hotspot in terms of mangrove area. More than 550,000 ha and 86,900 ha of mangrove are observed in Indonesia's Riau and West Kalimantan Provinces respectively, whereas Malaysia's Sarawak and Sabah regions contain mangrove areas of 167,000 ha and 365,000 ha respectively. In contrast, the total area of mangrove along the Malaysian peninsular is approximately 3,500 ha. Mangrove areas become more extensive northward in the eastern Gulf of Thailand and southern Viet Nam. In terms of areal extent, notable mangrove sites are located in: Trat and Chantaburi Provinces in Thailand, with total areas of 9,500 ha and 12,500 ha respectively; Peam Krasop in Cambodia's Koh Kong Province (25,800 ha); and Ca Mau in the southern Mekong estuary (58,000 ha) and Can Gio in the Dong Nai estuary (34,500 ha) in Viet Nam.

**Table 9** Approximate total area (values rounded to three significant figures) and species richness of mangroves bordering the South China Sea determined by the RWG-M (UNEP, 2008c)

<b>Country</b>	<b>Area of mangroves (ha)</b>	<b>Number of true mangrove species</b>
Cambodia	72,300	16
China	23,400	26
Indonesia	934,000	37
Malaysia	532,000	42
Philippines	23,400	28
Thailand	28,000	27
Viet Nam	157,000	37
<b>Total</b>	<b>1,770,000</b>	<b>45</b>

### 2.2.3. Coral reefs

238. Southeast Asia is recognised as the global centre of coral reefs, both in terms of areal extent and species diversity. An estimated 1/3 of the Earth's coral reefs (91,700 of 284,000 sq. km) are located in the seas of Southeast Asia (Burke et al., 2002). Fringing reefs are well developed away from the major river estuaries, particularly in the Philippines and the central and southern areas of the South China Sea. All major reef types from fringing, patch or platform reefs and atolls occur in the South China Sea<sup>48</sup>. Based on data compiled by members of the Regional Working Group on Coral Reefs (RWG-CR) (UNEP, 2007l), approximately 750,000 ha of coral reef has been identified in the South China Sea coastal waters of the following six countries: Cambodia (2807 ha); Indonesia (39,300 ha); Malaysia (43,400 ha); the Philippines (464,000 ha); Thailand (90,000 ha); and Viet Nam (110,000 ha). The area of coral reefs in the waters of the South China Sea countries/ territories that did not participate in the coral reef activities of the SCS project were reported by Burke et al. (2002) as follows: China (90,000 ha); Taiwan (70,000 ha); Brunei Darussalam (20,000 ha); and Singapore (5500 ha). Accordingly, the total area of coral reefs in the coastal waters bordering the South China Sea is approximately 930,000 ha.

239. Large coastal coral reef areas were identified by the RWG-CR to be located at the following South China Sea sites: Ninh Hai (Ninh Thuan) (1070 ha), Ca Na Bay (2270 ha), and Con Dao Islands (1000 ha) in Viet Nam; Muh Ko Chang (18,700 ha), Muh Ko Samui (39,000 ha) and Mu Koh Samei (4200 ha) in Thailand; Palau Redang (2550 ha), Palau Perhentian Besar (1820 ha) and Palau Tioman (5023 ha) in Malaysia; Anambas (6260 ha), Barelang dan Bintan (6150 ha) and Natuna (15,900 ha) in Indonesia; and the Bolinao/Lingayen Gulf (9560 ha), Calamianes Group of Islands (18,200 ha) and El Nido, Palawan (4250 ha) in the Philippines. In terms of species richness, the southern and eastern coastlines of the South China Sea fall within the so-called coral triangle and within the isopangeneric contour of 70 coral genera (Veron, 1995). Comparative analysis of the distribution of maximum marine biodiversity for various taxonomic groups has been reviewed by Hoeksema (2007) who notes that different authors have defined different 'triangles' and applied different names to this 'centre' of marine biodiversity. Some of these triangles only include the eastern side of the South China Sea, while others encompass the southern half of the South China Sea.

240. As a consequence of more recent surveys in Viet Nam (Vo et al., 2013), it has been recommended that this contour be expanded westwards to cover the south-central waters of Viet Nam thus corresponding more closely to the coral triangle delimited by Briggs (2005a,b). The recent finding of the hard coral *Leptoseris kalayaanensis* in Nha Trang (westernmost location in the South China Sea), the Northeast Investigator Shoal (Kalayaan islands) and North Danger Reefs complex indicate that little is known about the coral fauna of the South China Sea relevant to the positioning of the northwestern boundary of the centre of maximum coral species richness, the Coral Triangle

<sup>48</sup> It is noted that activities of the SAP formulation project, and this SAP implementation project, have and will focus only on coastal, or non-oceanic, coral reefs.

(Hoeksema et al., 2010). In terms of diversity at individual localities, hotspots of coral species richness occur at Nha Trang (Viet Nam) with 351 species (Vo et al., 2002) and El Nido (Palawan, Philippines) with 305 species (UNEP, 2007l) and Bolinao (Philippines) with 322 species (Licuanan, 2009). Records of more than 200 species occur at a number of sites in Viet Nam, Indonesia and the Philippines (UNEP, 2007l), and Malaysia (Yaman, personal communication). Verde Island passage, for example, is considered a globally significant hotspot of coral reef associated species.

#### **2.2.4. Seagrass**

241. The World Atlas of Seagrasses (Green and Short, 2003) provides information on the world's seagrass habitats globally and, incorporates their status in the context of environmental change. There are, however, still substantial information gaps for the South China Sea. The SCS project worked to develop the first comprehensive seagrass data set for this basin, including characterisations for seagrass sites and the first ever seagrass data sets and maps for China (UNEP, 2008e). It is recognized, however, that these data, based on field surveys at known seagrass locations in SCS countries do not reflect the total distribution of seagrass or seagrass beds in the riparian countries. Some algorithms for mapping seagrass using remote sensing have been developed but have not yet been applied to the entire South China Sea coastline (UNEP, 2008b).

242. Of the approximately 60 seagrass species described worldwide, 18 species are found in the coastal waters of the South China Sea. The numbers of seagrass species known to occur in each country are: Cambodia, 9; China, 8; Indonesia, 12; Malaysia, 14; Thailand, 12; Philippines, 15; and Viet Nam, 14 (UNEP, 2008e). *Halophila* is the most diverse and widespread genus in coastal waters throughout the region. The coastlines of the northern sub-region, in China and northern Viet Nam, have characteristics of subtropical areas and the species include *Zostera japonica* together with *Halophila beccarii*, *Halophila ovalis*, *Halophila decipiens*, *Enhalus acoroides*, *Thalassia hemprichii*, *Halodule pinifolia*, *Halodule uninervis*, *Cymodocea rotundata* and *Ruppia maritime* (UNEP, 2008e). All but the first of these species are widespread throughout the South China Sea region. Additional seagrass species recorded in the tropical zone include *Halophila spinulosa*, *Halophila minor*, *Cymodocea serrulata*, *Syringodium isoetifolium* and *Thalassodendron ciliatum* (UNEP, 2008e).

243. The sub-tropical species *Z. japonica* often forms mono-specific seagrass beds and has been recorded in Tieshan Bay and Pearl Bay, Guangxi Province, and Hong Kong, China. Its distribution also extends down to northern and central Viet Nam and its occurrence in Binh Dinh Province represents the southernmost limit of this temperate species in the Indo-west Pacific. Of the tropical species, *T. ciliatum* is generally found in seagrass beds from the intertidal to the low sub-tidal zone (2-17 m) in the eastern part of Indonesia, and the southern and western shores of the Philippines. This species also occurs in the seagrass beds in Con Dao, southern Viet Nam. In the Philippines, it has been reported in Cuyo Island, the northernmost limit of its distribution in the Indo-west Pacific (UNEP, 2008e).

244. The largest areas of seagrass meadows identified in the South China Sea to date are in the coastal waters of Kampot Province in Cambodia (25,200 ha), Cape Bolinao in the Philippines (22,400 ha), Phu Quoc and neighbouring islands in Viet Nam (12,500 ha), and East Bintan in Indonesia (2000 ha) (UNEP, 2008e; Vo, 2010). The transboundary water area between Cambodia and Viet Nam, including the large connected seagrass meadows of Kampot and Phu Quoc, contain possibly the largest seagrass bed in the South China Sea (37,000 ha) and play a globally significant role as a critical fisheries refugia for fish stocks of significance to regional food security (see Paterson et al., 2013). The record of 10 species of seagrasses and a dugong population (combined list from UNEP, 2008e; Tu Thi Lan Huong et al., 2002) at this locality also indicates the importance of these transboundary waters to regional biodiversity conservation.

#### **2.2.5. Fisheries**

245. The South China Sea also supports a significant world fishery that is important to the food security of, and as a source of export income for, Southeast Asian countries. Landings from this area contribute approximately 10 percent of reported global fisheries production per annum and make significant contributions to the economies of countries bordering the Gulf of Thailand and the South China Sea. This is significant considering that capture fisheries production in Southeast Asia, including landings from both Indian and Pacific Oceans, ranges between 14-16 million tonnes per annum, which represents approximately 18 percent of marine capture fisheries production worldwide. Thailand, Viet Nam, and Indonesia are among the top five fish exporting countries in the Asia-Pacific region, and the riparian countries of the SCS marine basin produce 23 percent of the world tuna catch and almost three-quarters of the world's canned tuna. The majority of fisheries are small-scale in nature, and fish are landed in a large number of decentralised locations for distribution through complex marketing networks at the community level.

246. The majority of Southeast Asian countries are among the top 20 capture fisheries producing countries in the world, with some experiencing annual increases in production of up to 5 percent. Pelagic fishes dominate landings by volume and value, as most demersal fisheries are over-exploited. It is well accepted, however, that regional fisheries statistics rarely reflect: (a) production from small-scale coastal fisheries, (b) the high level participation of coastal communities in fishing, or (c) the social and economic importance of artisanal and subsistence fishing to coastal communities. Fish stocks of this basin are subject to high levels of fishing effort, such that stocks of most economically important species are considered to be fully fished or overexploited. Increasing global demand for fisheries products, and the dependence of coastal communities on fish for food and income results in continued increases in fishing effort. This has led to an increasing dependence of the artisanal sector on small pelagic species due to declining availability of demersal species.

247. Declining fish availability, coupled with over-capacity and the dependence of the small-scale sector on coastal fisheries for income generation, has led to the adoption of destructive fishing practices by some fishers in order to maintain incomes and food production in the short-term. Fisheries trends suggest that production from capture fisheries will decline over coming years unless total fishing effort and capacity are reduced. The obvious problem in the reduction of fishing capacity is that most fisheries are small-scale with the majority of participants (and their families) being highly dependent on fisheries for income, food and well-being. Fisheries issues in the context of Strategic Action Programme implementation are being addressed by the UNEP/GEF project entitled "Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand".

## **2.2.6. Aquaculture production**

248. China (41 million tonnes), Viet Nam (3 million tonnes), Indonesia (3 million tonnes) and Thailand (1.2 million tonnes) are among the top ten aquaculture producers by volume worldwide, and in the top ten aquaculture producing states by value (FAO, 2014). In Southeast Asia, highly priced crustaceans account for 47 percent of total aquaculture production by value. Four of the five top shrimp producers in the world are states bordering the South China Sea (China, first; Thailand, second; Viet Nam, third; and Indonesia, fourth, whereas the Philippines is among the world's top ten shrimp producing countries (FAO, 2014). Giant Tiger shrimp (*Penaeus monodon*) is the top produced species, although this position is being challenged by increased production of white leg shrimp (*Penaeus vannamei*) by all countries, except Cambodia. The high dependence of the aquaculture sector on marine shrimp production has, and continues to contribute, to the loss of habitats bordering the South China Sea. Shrimp pond construction and the release of waste water from shrimp farms also contribute to localised coastal water quality problems, particularly in areas of south-central Viet Nam and the western Gulf of Thailand (UNEP, 2008c).

## **2.2.7. Goods and services derived from coastal habitats**

249. The South China Sea's globally significant, stock of genetic, specific and ecosystem diversity is currently suffering severe degradation and loss and the threats are increasing rather than decreasing due to rapid and extensive coastal development, habitat removal and modification, pollution, overharvesting of marine living resources, and poor planning resulting in enhanced vulnerability of coastal systems to episodic and extreme weather events. When coastal ecosystems and habitats are destroyed and replaced by other forms of land use, not only are the species of plants and animals lost but also many services provided by these systems are adversely impacted. Degradation of coastal habitats therefore results in loss of both direct and indirect economic values that support socio-economic development at both local and national scales.

#### ***Mangrove goods and services***

250. Table 10 indicates that extractive uses of mangrove ecosystems include direct use of the mangrove plants themselves, together with direct use of the secondary consumers and decomposers that are dependent upon the primary production of the mangrove trees. The use of mangrove trees for timber, poles, fuelwood, charcoal production, thatch and fodder are widespread activities throughout the region, whilst the use of mangrove propagules (fruits) for human consumption, bark for tanning, Nipa sap for alcohol, and use of mangrove associates for medicines are more restricted uses, characteristic of certain locations.

**Table 10** Summary of Extractive and Non-extractive Direct Uses of Coastal Habitats of the South China Sea.

Extractive Uses	Mangroves	Coral Reefs	Seagrass	Wetlands
Vegetable Products	Timber	Building materials, curios	N/A	Timber
	Firewood	N/A	N/A	Firewood
	Poles	N/A	N/A	Poles
	Charcoal	Quick lime	N/A	Charcoal
	Leaves/palm fronds (thatch/fodder)	N/A	Handicraft (woven)	Leaves/Thatch
	Fruits/propagules	Algae	Seeds Food	Fruits
	Bark (Tannin and dyes)	N/A	N/A	Tanning Bark
	Medicine	Bioactive substance	Medicine	Medicine
	Sap (sugar, Alcohol, Acetic acid)	N/A	N/A	N/A?
	Wood tar	N/A	N/A	N/A?
Animal Products			Fertilizer	Peat/energy
	Fish capture	Fish (food /aquarium)	Fish	Fish
	Crab capture		Swimming crabs	Crab
	Prawn capture	Crustacean	Prawn capture	Prawn
	Shellfish collection	Molluscs	Molluscs	Molluscs
	Insect and larvae capture			
	Worms	Echinoderm	Echinoderm	Worms
	Wildlife hunting			Wildlife
	Zooplankton (koey)			
	Jellyfish			
Non-extractive Uses	Bees, honey, and wax			
	Seaweed			
	Mangroves	Coral Reefs	Seagrass	Wetlands
	Tourism/recreation	Tourism/ recreation	Tourism/Recreation	Tourism/Recreation
	Transport			Transportation
	Education	Education	Education	Education
	Research	Research	Research	Research
	Fish culture	Mariculture		Agriculture
	Crab culture			Aquaculture
	Prawn culture			
	Other aquaculture (pearls)			

251. Similarly, the direct uses of many secondary producers dependent upon the mangrove primary production are widespread throughout the region. The mud-crab (*Scylla* spp.) penaeid shrimp, and a wide variety of fish and shell-fish, such as *Crassostrea* species, are exploited wherever they are found. The mangrove clam *Geloina coaxans* and the cockle *Anadara granosa* are eaten throughout the region and are found in muddy substrates, often in close proximity to mangrove areas. In some locations specific organisms are exploited depending upon their distribution and abundance. Hence mangroves backed by freshwater swamp forest often provide abundant wildlife, while honey, sipunculid worms, insect larvae, jellyfish, and in some rare instances zooplankton are directly exploited in mangrove areas. In Trat Province, Thailand, Sesarmid crabs are exploited in the back mangroves for production of “pickled” crabs, an essential ingredient of “*Som Tham*”, green papaya salad.

252. Widespread non-extractive uses of mangroves include their use as venues for tourism and recreation, educational and research purposes, and for various types of mariculture of fish, crabs and prawns in the creeks that meander through mangroves, or in the ocean in front of mangrove areas that do not involve destruction or clearance of the mangrove forest itself. In China, pearl farming takes place along the South China Sea coastline, and the quality and quantity of pearls produced can be directly related to the presence or absence of mangroves along the adjacent coast. Tourism activities include kayaking along the mangrove-lined creeks and nocturnal visits to observe fireflies. Local authorities and community groups in many areas have now constructed boardwalks through the mangroves allowing easy access for both tourists and school parties.

253. In addition to the direct use of mangrove habitats and their associated resources, mangroves provide a number of environmental and biological services, whilst some areas have particular social, cultural or historical significance, all of these attributes must be valued if a total economic value for a particular mangrove area is to be determined. The importance of mangroves to shoreline protection, prevention of erosion, and flood protection, has been well demonstrated by the impacts of the 2005 tsunami, which were more pronounced in coastal areas where vegetation had been cleared than in areas where intact mangrove stands remained. Where the inputs of allochthonous (land-derived) sediments are high, mangroves may in some instances trap sufficient sediment to cause shoreline accretion and an increase in land area. In addition, mangrove forests provide protection against strong winds, including typhoons, and sequester carbon in the accumulating anaerobic soils and as a temporary sink in the biomass of the trees themselves.

254. The role of mangroves as a natural filter for land-based materials results from the trapping of fine suspended sediments, and their removal from the water column, as a consequence of the physical slowing of water flow through the mangrove root systems. This leads ultimately to both upward and seaward accretion of the land surface and to, less turbid water immediately in front of mangrove stands. Not only is the suspended sediment trapped within the mangrove system but adsorbed and associated contaminants are trapped leading to an overall improvement in coastal water quality. In addition, mangroves remove nutrients from the water column.

255. Mangroves serve as nursery and spawning grounds for a number of marine fish and penaeid shrimps and the volume of the off-shore trawl catch of shrimp can be directly related to the area of mangroves on the adjacent shoreline. Juveniles of the giant freshwater prawn (*Macrobrachium* spp.) may be found in the landward margins of mangrove swamps. Estuarine fish of subsistence and commercial significance in the region include the milk-fish, *Chanos chanos* and the Barramundi or sea bass, *Lates calcarifer*. In terms of their services to biological diversity mangroves provide habitat to both endangered and migratory species of birds, and in some areas land vertebrates including reptiles such as the estuarine or salt-water crocodile. The diversity of true and associated mangroves species is higher around the margins of the South China Sea than anywhere else world-wide. In some specific locations mangroves have particular social or cultural significance as for example in the vicinity of Fangchenggang, China where mature, *Avicennia marina* are conserved by, the local communities, due to their Feng Shui properties.

### **Coral reef goods and services**

256. Coral reefs are one of the most biologically diverse shallow water marine habitats in the world, and are host to an extraordinary variety of marine plants and animals. Coral reefs provide essential fish habitats, support endangered and threatened species, and serve as nursery and spawning areas for a variety of species. They are a significant source of food, provide income and employment through tourism and marine recreation, and offer countless other benefits to humans, including supplying compounds for pharmaceuticals. The uses of coral reefs in the South China Sea can be categorised into four kinds of uses: direct uses (extractive and non-extractive uses) (Table 10), environmental services, biological diversity services, and social/cultural significance (Table 11).

257. Coastal communities have directly extracted materials and resources from coral reefs for generations. The hermatypic corals themselves are used as building materials and for making quicklime, a practice which is now less prevalent than in the past. An important aspect of coral reefs from the perspective of coastal communities is their contribution to capture fisheries. Reef systems provide shelter to smaller fish and invertebrates and habitat essential as nursery and breeding grounds. Some pelagic fish species such as the “jacks” are found as juveniles in the vicinity of coral reefs. It has been suggested that in Malaysia approximately 40 percent of the commercial fish caught within 30 nautical miles from shore originate from or, make use of, coral reefs (Paterson et al., 2013).

258. Indirect uses of coral reefs include tourism and recreation, education and research, and mariculture which is often practiced in sheltered lagoonal areas of reef systems. Reef-based tourism is essentially a non-extractive industry that attracts millions of divers and snorkelers to Southeast Asia each year, and contributes significantly to the economies of countries such as Thailand, the Philippines, Malaysia and Indonesia. Coral reefs provide scientists and researchers with a coastal habitat that has high biological diversity, and coral formations can be used to reconstruct past climates and storm patterns. They also serve as a source of natural products which are in high demand from the international pharmaceutical companies for testing as bioactive compounds.

259. Coral reefs provide significant “sinks” of biological diversity and support numerous species restricted to such habitats. The reef structure itself is important as a buffer against wave action thus providing protection to beaches on the coast, and as sources of the “white sand” that is so attractive to tourists.

### **Seagrass goods and services**

260. As in the case of the two habitats previously considered seagrass beds provide the basis for sustainable livelihoods in many coastal communities bordering the South China Sea. The range of uses to which the seagrass itself can be put by coastal communities is fewer than in the case of mangroves but includes its use for fertiliser in coastal agriculture, and as raw material for the production of woven handicrafts, including chair seats, mats and baskets. Direct use of seagrass for human consumption is limited in the region being restricted to the experimental production of cookies from seeds of *Halophila* in the Philippines. Seagrass is used directly as a covering for wounds in many coastal communities and some species are used in the preparation of traditional medicines.

261. Of far greater significance however, is the use of secondary consumers that rely on the high primary productivity and production that characterise tropical seagrass communities. These include a variety of resident fishes including many species in the family Siganidae, echinoderms such as the sea urchin, *Tripneustes gratilla* whose eggs are exploited both for subsistence and commercial production, and molluscs such as the strombid gastropods in particular *Strombus carnarium*, which is widespread along the southern margins of the South China Sea. The sea horses, permanent residents of seagrass beds are commercially threatened along the northern margins of the South China Sea as primary ingredients in various Chinese and Vietnamese traditional medicines and alcoholic drinks.

262. Non-extractive uses of seagrass beds include tourism and recreation, research and education although these are generally not as well developed as in the case of coral reefs, the generally sheltered lagoon environments in which seagrass beds occur are used as areas for water sports and snorkelling. In some areas seaweed culture is practiced in coral reef and seagrass habitats, whilst in the Philippines healthy seagrass beds are used as grow-out areas in giant clam culture.

263. Seagrass beds provide a variety of environmental services including reduced erosion of subtidal substrates. Seagrass species trap and stabilise suspended sediment providing benefit to adjacent coral reefs by reducing suspended sediment loads in the water. The dense root systems and extensive rhizomes of some seagrass species form an interlocked mat that prevents erosion of the sub-tidal substratum, which may be especially important during storms and hurricanes. As in the case of mangroves the trapping of sediment derived from land-based sources results in significant removal of adsorbed contaminants, which are stored in the sediments.

264. Seagrass feature high rates of primary production and hence exhibit high rates of oxygen production, which is released to the surrounding waters. Consequently seagrass species can remove elevated levels of nutrients through enhanced primary production. However excessive inputs of nutrients result in fouling of the seagrass leaves by algae and interferes with photosynthesis thus having an adverse impact on primary production and the health of the system. Although seagrass primary production is only 1% of ocean total primary production it may be responsible for as much as 12% of the total amount of carbon stored in ocean sediments. This suggests that seagrass beds may play a role in the regulation of the global carbon cycle.

265. Seagrass beds serve as nursery and spawning grounds for fish that constitute important constituents of the offshore demersal fish catch. Some species move into and out of seagrass beds over their life history, while others live their entire lives in association with seagrass beds. In addition, seagrass forms the bulk of the diet of the endangered dugong and some marine turtle species whilst some seagrass areas are important feeding grounds for migratory birds. Tiger prawns settle in seagrass beds at the post-larval stage (3-4 weeks) and remain until they become adults while many endeavour prawns also spend their juvenile life stages in the seagrass habitat. Seagrass meadows provide an ideal environment for juvenile fish and invertebrates to conceal themselves from predators, whilst seagrass leaves serve as areas for attachment of larvae and eggs and for filter-feeding animals like bryozoans, sponges, and forams.

266. While seagrass beds serve as ideal *refugia* for juvenile and small adult fish to escape from larger predators, many in-faunal organisms (animals living in soft sea bottom sediments) also live within seagrass meadows. Species such as clams, worms, crabs, and echinoderms, like starfishes, sea cucumbers, and sea urchins, use the buffering capabilities of seagrass to provide a refuge from strong currents. The dense network of roots established by seagrass also helps deter predators from digging through the substratum in search of in-faunal prey organisms.

267. As in the case of mangroves the seagrass beds of the South China Sea are the most biologically diverse worldwide, as such they represent a significant store of biological diversity having value of transboundary significance. Whilst many coastal communities use the resources derived from seagrass habitats both directly and indirectly and hence are, to varying degrees dependent upon the health of the system, seagrass is not generally of particular social or cultural significance although the organisms associated with the habitat such as dugong and marine turtles may be in some locations.

**Table 11** Summary of Environmental and Biological Services, Social and Cultural Significance of Coastal Habitat Types Bordering the South China Sea.

	Mangroves	Coral Reefs	Seagrass	Wetlands
<b>Environmental services</b>	Shoreline/erosion prevention	Beach protection	Shoreline protection Erosion prevention	Shoreline protection
	Flood protection	N/A	N/A	Flood Control
	Windbreak	N/A	N/A	Windbreak
	Carbon sequestration	Carbon sequestration	Carbon sequestration	Carbon sequestration
	Water purification (Prevention of saline water intrusion)	N/A	Water purification Waste catchment	Water purification prevention of salt water intrusion & ground water recharge
	Sediment, Contaminant, Nutrient removal/storage	N/A	Sediment and nutrient retention	Sediment and Nutrient Retention and Export
	Oxygen release	Climate change record	Oxygen release	Oxygen release
	Nursery feeding area	Nursery ground	Nursery area	Nursery area
	Shoreline accretion/Land increase	N/A	N/A	N/A
	N/A	N/A	N/A	Climate Change Mitigation
	N/A	N/A	N/A	Water supply (subsistence value)
<b>Biological diversity services</b>	Existence values of species, genes, and communities	Biodiversity Storage	Biological diversity	Biological diversity (existence value of species, genes and communities)
	Migratory species	Secondary producers	N/A	Migratory species
	Endangered Species	Food sources for other biota	N/A	Endangered Species
	Ecosystem Existence values	Coral reef Ecosystem Existence values	N/A	Wetlands Ecosystem Existence Value
<b>Social/cultural significance</b>	Religious/spiritual significance	N/A	N/A	Religious/spiritual significance
	Historical importance	N/A	N/A	Historical importance
	Presence of distinctive human activities	N/A	N/A	
	Aesthetic	Aesthetic	Aesthetic/culture	Aesthetic

## 2.3. Threats, root causes and barrier analysis

### 2.3.1. Threats to dominant coastal habitats

#### 2.3.1.1. Threats to mangroves

268. Around 30% of the world's remaining mangrove is found in the countries participating in the SCS project and 11% of the world's total is found along the margins of the South China Sea marine basin (Polidoro, et al., 2010; Spalding, et.al., 2010; UNEP, 2008c). Rates of loss are generally higher along the South China Sea coastlines than elsewhere in the seven countries participating in the SCS project. For example, around 80% of the mangrove bordering the Gulf of Thailand has been lost compared with only around 20% on the Andaman Sea coast of Thailand (UNEP, 2008c). The annual rates of loss in the seven countries between 1990 and 2000 were greater than the world average (Table 12). Such losses represent a loss of global biological diversity that must be a matter of global concern (UNEP, 2008c). 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. The RWG-M estimated the ongoing decadal rate of loss of mangroves from the South China Sea basin in 2007 as 16% (UNEP, 2008c).

**Table 12** Estimates of area (ha) (rounded to three significant figures) and rates of loss of mangrove habitat in seven countries bordering the South China Sea (based on UNEP, 2008b)

	Recent global estimate ha	Date of global estimate	National Estimates of total mangrove area			Current South China Sea area ha	Rate of loss per year %	
			1980 ha	1990 ha	2000 ha		1980 - 1990	1990-2000
<b>Cambodia</b>	72,800	1997	83,000	74,600	63,700	72,400	-1.01	-1.46
<b>China</b>	36,900	1994	65,900	44,800	23,700	23,400	-3.20	-4.71
<b>Indonesia</b>	3,490,000	1988	4,250,000	3,530,000	2,930,000	934,000	-1.70	-1.70
<b>Malaysia</b>	587,000	1995	669,000	621,000	572,000	532,000	-0.72	-0.78
<b>Philippines</b>	128,000	1990	207,000	123,000	110,000	28,000	-4.02	-1.11
<b>Thailand</b>	244,000	2000	286,000	262,000	244,000	62,600	-0.82	-0.69
<b>Viet Nam</b>	253,000	1983	227,000	165,000	157,000	157,000	-2.73	-0.51
<b>Total</b>	4,810,000		5,790,000	4,820,000	4,100,000	1,770,000	-1.67	-1.61
<b>World</b>	15,800,000	1992	19,800,000	16,400,000	14,700,000	3,579,400	-1.74	-1.04
<b>% world total</b>	30.5		29.2	29.4	27.8	11.4		

269. The causes of mangrove destruction identified in the TDA 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 (Talaue-McManus, 2000; UNEP, 2008b). Contemporary causes of loss of mangrove habitat are no longer dominated by shrimp culture although this remains one cause in China and Indonesia (UNEP, 2008b). 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 unimportant in Thailand and Cambodia (UNEP, 2008b).

270. 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 (UNEP, 2008b). At a regional level, the following are seen as the current anthropogenic threats to mangrove systems bordering the South China Sea: reclamation and infrastructure development; pollution from shrimp farming (China, Indonesia, Thailand); and conversion to industrial uses (China, small in the Philippines, Indonesia and Viet Nam, negligible in Cambodia and Thailand). Degradation of mangrove habitat as a result of

coastal erosion caused by a deficit of upstream sediment supply is a contemporary issue in Vietnam. Similarly conversion of mangrove for palm oil plantations is a contemporary threat in Indonesia. Natural threats include sea level rise and episodic threats, including tsunamis and typhoons (UNEP, 2008b).

271. Transboundary influences are seen through the global trade in shrimp, for example. The high level of world demand for shrimp is driven by demand in Japan, North America and Europe. This demand essentially sets the world price for shrimp such that economic incentives for the conversion of “non-productive” mangrove habitats operate at both the local and national levels in the producing countries. Opportunities for hard currency income and economic development fuel the motives at the national level while individual producers, at least in the short-term, derive considerable cash income from cutting mangrove and converting it to shrimp ponds (UNEP, 2008b).

272. On a smaller scale, trade in charcoal derived from mangrove in Cambodia to Thailand was, until very recently, a major cause of mangrove loss in the areas of Cambodia close to the Thai border. This market appears to have declined somewhat over the last five years under the influence of more widespread use of cheap and convenient liquefied natural gas in Thailand (UNEP, 2008b). 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 recognised 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 on both local and national scales.

### **2.3.1.2. Threats to coral reefs**

273. Not only are the coral reefs of South East Asia the most biologically diverse and productive reef ecosystems in the world but they are also the most threatened and damaged with unprecedented rates of destruction from anthropogenic pressures that have accelerated over recent decades (Tun et al., 2004; UNEP, 2008b). The RWG-CR identified regionally significant threats to coral reefs in the South China Sea as being over-fishing, use of destructive fishing techniques, pollution (mainly eutrophication) and increased sedimentation (Table 13) (UNEP, 2008b). Indirect causes of these threats are unsustainable practices in the fisheries sector, coastal development and reclamation, deforestation and unsustainable tourism. Coral bleaching and ocean acidification are also considered serious threats to coral reefs in the region. The RWG-CR of the SCS project estimated the ongoing decadal rate of loss of coral reef from the South China Sea basin in 2007 as 16%.

**Table 13** Prioritisation of the Threats to Coral Reefs Bordering the South China Sea (excluding China) (based on UNEP, 2008b)

	Cambodia		Indonesia		Malaysia		Philippines		Thailand		Viet Nam		Region
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Weighted Score
<b>Direct threats</b>													
Over-fishing	1	0.4	1	5.2	5	29.0	1	61.9	7	84.07	1	14.69	195.2
Destructive fishing	2	0.7	2	10.5	2	11.6	2	123.8	5	60.05	2	29.38	236.1
Sedimentation	5	1.9	4	21.0	1	5.8	3	185.7	4	48.04	3	44.04	306.4
Pollution (Eutrophication)	4	1.5	5	26.2	4	23.2	5	309.6	6	72.06	4	58.72	491.2
Coral bleaching	8	3.0	3	15.7	7	40.5	9	557.2	1	12.01	5	73.4	701.8
<b>Indirect threats</b>													
Unsustainable fisheries and aquaculture	3	1.1	8	41.9	9	52.1	4	247.6	8	96.08	8	117.4	556.3
Coastal development	6	2.2	7	36.7	6	34.7	6	371.5	3	36.03	6	88.08	569.2
Unsustainable tourism	9	3.3	9	47.2	3	17.4	8	495.3	2	24.02	9	132.1	719.3
Deforestation on upland areas	7	2.6	6	31.4	8	46.3	7	433.4	9	108.09	7	102.8	724.6

Total area of coral reefs <sup>49</sup>	2,810	39,300	43,400	464,000	90,000	110,000	749,500
Proportion of total coral reef area	0.37	5.24	5.79	61.91	12.01	14.68	

274. Table 13 presents the threats ranked for each country from 1 to 9 with 1 representing the most serious and 9 representing the least serious threat. The ratio of the coral reef area in each country compared to the total area for the South China Sea (excluding China) was used to weight the individual country ranks resulting in a regionally weighted score. The weighted scores suggest that, on a regional scale, the most serious threat is over-fishing; followed by destructive fishing; sedimentation; pollution; unsustainable fisheries practices; coastal development; coral bleaching; unsustainable tourism; and, finally, deforestation on upland areas. Domestic solid waste and the use of coral for building materials are additional threats in densely inhabited areas of Indonesia, including Batam. Extensive bleaching in the entire region occurred in 1998 and bleaching with high severity was observed in the Gulf of Thailand and the south-west South China Sea (from south Viet Nam to Singapore) in 2010 (Tun *et al.*, 2010).

### 2.3.1.3. Threats to seagrass

275. In the South China Sea region, there has been a rapid rate of seagrass loss in recent years. Indonesia has lost about 30-40% of its seagrass beds with as much as 60% being destroyed around Java. In Singapore, the patchy seagrass habitats have suffered severe damage largely through burial under landfill operations. In Thailand, losses of seagrass beds amount to about 20-30% and in the Philippines it is about 30-50%. The Regional Working Group on seagrass (RWG-SG) identified six threats to seagrass including: use of destructive fishing gears such as push nets and demersal trawl nets; increased sedimentation from coastal development; waste water effluent discharges; domestic solid waste; nutrient discharges and runoff; conversion to other uses and sedimentation associated with coastal construction; and over-fishing (UNEP, 2008b). The RWG-SG of the SCS project estimated the ongoing decadal rate of loss of seagrass habitat in the South China Sea basin in 2006 as approximately 30% (UNEP, 2008b; UNEP, 2008e).

276. Focal points from each country were asked to rank the relative importance of the six threats outlined in the previous paragraph. The regional significance of each threat was determined by the rank for each threat weighted by the proportion of the area of seagrass in the country concerned compared with the total for the region. The resulting values were summed to produce the regionally weighted total, which is inversely related to the regional significance (small values are more significant than larger values). The relative importance of the threats from a regional perspective is summarised in Table 14. The impacts of destructive fishing techniques are of particularly concern as seagrass habitat supports extensive populations of rabbit fish, crustaceans and sea urchins of subsistence and commercial significance. The national reports on seagrass indicate various local-level threats, including extensive reclamation for tourist and port development at a number of locations in the eastern Malaysian Peninsular and Puerto Galera in the Philippines, shrimp culture in the Liusha area of China and Thuy Trieu lagoon in Viet Nam, and fresh water inputs from irrigation and land clearance in Pattani Bay (Thailand) (UNEP, 2008e).

### 2.3.1.4. Threats to wetlands

277. Population growth, and urbanisation of the coastal fringe, combined with rapid economic growth in the South China Sea region places tremendous pressure on coastal wetland ecosystems. Major threats to the coastal wetlands bordering the South China Sea can be grouped as follows: loss of wetland areas through conversion for agriculture, aquaculture, port and harbor development, human settlement, tourist development, urbanization, industrialization. Wetland ecosystems are also highly degraded as a result of over-exploitation of living resources, use of inappropriate fishing techniques and gear, pollution, deforestation in upland area, invasive species, global trends and natural episodic

<sup>49</sup> Rounded to three significant figures

events such as sea-level rise, typhoons and tsunami. In Indonesia, the conversion of wetland areas for palm oil plantations presents a high threat to coastal wetlands bordering the South China Sea. Overall it has been estimated that around 30% of coastal wetlands are lost in Southeast Asia each decade giving an approximate annual loss in value of 3% per annum.

### **2.3.2. Threats from land-based pollution**

Excessive nutrient loads and suspended solids are among the most common problems arising from land-based pollution in the coastal waters of countries bordering the South China Sea. High concentrations of suspended solids largely result from poor land-use practices, including logging activities and conversion of forests in upland areas. On the other hand, high nutrient loads mainly result from untreated domestic wastes, and waste from intensive animal husbandry that are directly discharged into the receiving water bodies. Both types of contaminant impact the ecological functioning of coastal ecosystems. In addition, heavy metals such mercury (Hg), Arsenic (As) and lead (Pb), have tended to increase in both biota and sediments in coastal waters of the South China Sea during the last decade. The contaminants entering the marine environment have a number of impacts in terms of living resource and ecosystem degradation and potential impacts on aquaculture, food quality of export products, and human health. It must however be pointed out that almost all these pollutants are localised. Modelling of the spread of nutrients (see UNEP, 2007i) strongly suggests present and projected pollution rates will have minimal effects on the South China Sea and Gulf of Thailand as a whole.

278. Table 15 provides a checklist of potential impacts of various types of contaminant on coastal habitats relevant to South China Sea SAP implementation, namely mangroves, coral reefs, seagrass and coastal wetlands. The impacts of land-based pollution on coastal habitats are complex and intertwined, but essentially they fall into three classes from the perspective of changes in economic value, namely: productivity/production, amenity and human welfare. Table 16 provides a checklist of the occurrence or non-occurrence of impacts in each habitat in terms of changes to productivity, amenity and human welfare.

### **2.3.3. Threats from fisheries**

279. Over-capacity in commercial and small-scale fisheries, and the combined problem of over-exploitation, is an enduring issue facing regional fisheries. The impacts of over-capitalisation and over-exploitation are magnified by the use of subsidies and the dependence of coastal communities on fish resources for income, as well as food and nutritional security. For example, the Phu Quoc Island district of Vietnam is significant in terms of its coral reef and seagrass ecosystems, overall employment in Vietnam's marine capture fisheries, fisheries production and related export earnings, and tourism (both domestic and international). However, over-capitalisation and over-exploitation are issues that not only threaten the sustainability of fisheries in the area, but also the coral reef and seagrass habitats upon which fisheries and other sectors (e.g. tourism) depend.

280. The number of fishing vessels and total engine capacity (hp) in the area has increased rapidly over recent decades, and although there has been a general increase in landings throughout this period, catch per unit of effort (CPUE) has declined significantly. Recent interviews with fisherfolk suggest that fisheries yields in the area have declined by 50 to 70 percent in the past five years. Rapid growth in the number of high-powered boats in the district has put heavy pressure on marine resources, especially in shallow waters surrounding the islands, and the subsequent diminishing returns on investment in fishing is believed to be driving the increased occurrence of destructive fishing events.

281. The use of destructive and unselective fishing gear and practices is prevalent across a range of fisheries and habitat types in the South China Sea. For example, destructive and/or unsustainable fishing gear and practices have been identified as key threats to fish stocks and their habitats in the mangrove areas at Trat in Thailand and at Batu Ampur in Indonesia, the extensive seagrass areas of

Bolinao in the Philippines and Kampot in Cambodia, and at the regionally significant coral reef areas at Belitung in Indonesia, Masinloc in the Philippines and Phu Quoc in Vietnam.

282. Push netting and inshore trawl fishing cause habitat impacts and selectivity issues. Catches in these gear types from inshore waters are largely composed of juveniles, and at high fishing effort levels are thought to contribute to growth over-fishing in South China Sea basin. Such a situation hinders fisheries management efforts which largely focus on development of sustainable livelihoods, and is a key threat in inshore where push nets are used extensively over seagrass beds to take juveniles of the economically important species.

283. Digging and gleaning of seagrass beds and mangrove forests is an area of concern at a majority of the priority refugia sites in the South China Sea. Growing demand for seafood in local markets has resulted in a marked increase over recent years in the number of people digging for sipunculid worms, gastropods, and crustaceans in the seagrass beds, leading to damage of seagrass plants, de-stabilisation of sediments (and subsequent erosion), and the over-exploitation of benthic organisms. Intensive digging and grazing in some mangrove areas is considered to be contributing to the occurrence of dwarf, low-density mangrove stands at several sites due to disturbance of mangrove roots and seedlings.

284. Blast fishing, poisons, and unselective fishing gears/practices are well-known and documented threats to fisheries and habitats in nearly all areas of the South China Sea. These fishing practices often result in mortalities of a wide range of size-classes of target and non-target species, contributing to both growth and recruitment over fishing. The effects of blasting on the physical structure of coral communities is of particular concern, and the occurrence of blast fishing “craters” on heavily blasted reefs has a major impact on coral reef associated fish assemblages. Non-selective fishing gears, such as trammel nets, are utilised in most fished coral reef areas along the South China Sea coast. The growing need to minimise the impacts of such practices on critical habitats necessitates the development of best practices in the management of these problems. A framework produced by the SCS project for assessing the ecosystem effects of fishing and aquaculture activities in the South China Sea is presented in Tables 17a-b.

285. Illegal, unregulated and unreported fishing, particularly the use of illegal and destructive fishing gear is common in many areas of the South China Sea. The illegal encroachment of foreign fishing vessels into national waters, and the conduct of large commercial fishing operations in inshore areas set aside for small-scale fishers is common throughout the region. However, the illegal fishing problem is complicated by poor definitions of “illegal” fishing gear and operations in fisheries law, low-level community awareness of the effects of unsustainable fisheries, and minimal resources for monitoring, control, and surveillance (MCS). While this issue is being addressed by broader regional programmes operated by FAO and SEAFDEC, local application of regional guidance on IUU management in the production and implementation of management plans for refugia sites has been identified as a priority. Regional coordination of efforts to address threats from fisheries is presently being addressed by the UNEP/GEF project entitled “Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand”.

### **Threats associated with climate variability and change**

286. Coastal communities of the South China Sea riparian countries live in and continuously adapt to dynamic and often difficult climatic environments. Shallow tropical marine environments such as the coastal areas of the South China Sea are inherently vulnerable to the extremes of climate variability, and this vulnerability has compelled East Asia’s coastal communities over time to build a level of resilience to extreme weather events. However today, population growth and social changes have created a situation where many communities are far less prepared for the floods, extended droughts, and storms that remain an ongoing feature of the region.

287. In this regard, the uncertainty and extremes of climate variability compound and exacerbate the social and economic challenges faced by coastal communities of East Asia. Large-scale features such as the Inter-tropical Convergence Zone and the West Pacific Monsoon drive the seasonal variations in rainfall experienced by Pacific Island Countries, including wet and dry seasons. Together, they influence rainfall, winds, tropical cyclones, ocean currents and other aspects of the weather and climate. While these features drive the wet and dry seasons experienced annually in most of the riparian countries of the South China, the single greatest factor affecting climate variability from year to year is the El Niño/La Niña Southern Oscillation, or ENSO. This cycle of warming and cooling of sea surface temperatures of the Western Pacific has a profound effect on the hydrological cycle of East Asian countries, driving periods of drought and elevated rainfall across the region.

288. The effects of the ENSO cycle are not restricted to drought. It is also a driver of periods of elevated rainfall and rainfall intensity, and plays a role in both suppressing and stimulating the propagation and severity of tropical cyclones, all of which have significant impacts on the people and economies of coastal communities. However, while regional understanding of climate variability and change has improved considerably over the past years, this improvement has not translated into a corresponding increase in community resilience.

289. Key geophysical issues associated with climate variability and change, particularly those associated with anticipate sea-level rise, relate to coastal inundation, coastal flooding, changes to coastal geomorphology, saline intrusion, water table elevation, compression of the marine/terrestrial transition, and turbidity. It is anticipated that permanent coastal inundation may be expected to occur to a significant extent in areas where the coastal profile is flat or gently sloping. The extent and nature of coastal land loss will be the subject of related activities of the present project. Inundation may be expected to be economically significant in the region, given the distribution of fertile agriculture areas at or close to present sea-level; coastal infrastructure, including aquaculture facilities, which lie in close proximity to the sea and the large number of coastal communities living immediately adjacent to the coast. It is anticipated that this will place significant pressure on low-lying wetlands, with a corresponding decrease in species richness and diversity in many areas.

290. Inundation of coastal agriculture areas is already resulting in a progressing shift of locations of these activities into coastal watersheds with consequent increases in erosion and soil fertility problems. By and large the large estuarine/deltaic systems in the region are backed by relatively flat coastal plains, coastal regression may be extensive in such areas resulting in reduced habitats for some species of conservation significance. Episodic flooding of the coastal zone may be expected to increase both in frequency and geographically as a consequence of increased cyclonic/typhoon activity. Flooding can be expected to have impacts on storm water drainage and sewage disposal systems both in urban and peri-urban areas. Extension of periods of the periods of inundation may render coastal areas, particularly in areas of beach ridges backed swamp unusable in the long-term.

291. Overall, beaches of the South China Sea coast with a stable beach plan form which currently receive sediments inputs via longshore drift will, under increased sea level receive lower inputs of sediments resulting in consequent beach erosion and shoreline retreat. The extent of this retreat will depend on the profile of the terrestrial/marine inter-face and the current importance of sediments derived from longshore drift. Depending on the rate of sediment input into the coastal system from riverine sources the system can be expected to stabilize only if sea level itself stabilizes, and only following filling of the transitory sinks in the system (estuarine, and beach sinks). In areas of reduced rainfall riverine sediment inputs may be reduced further exacerbating coastal erosion. In areas of higher rainfall riverine sediment inputs may not be significantly increased depending on the nature of the vegetation cover. Additionally, beach plan forms will be changed by changing wave patterns resulting from modification of regional and sub-regional wind patterns. Such changes will be of significance for coastal marine communities, particularly seagrass meadows, coral flats and algal beds.

292. In estuarine areas an inland extension of the tidal prism may be expected. In coastal plains saltwater contamination of the groundwater may have profound effects on both the suitability of areas for human occupation and upon the nature of the vegetation. A rise in sea level will also cause a rise in the water table which may have important consequences for freshwater lenses which currently float on saline water bodies. Such influences are also linked to compression of the marine/terrestrial transition, particularly in areas currently having a flat coastal plain, where changes in coastal vegetation following sea level rise and inundation may be dramatic. Zonation is likely to be compressed, particularly in mangrove areas, resulting not only in an overall reduction in the extent of such transitional habitats but extensive reduction in the seaward sides. Such coastal habitat reduction will result in important changes to the distribution and abundance of species of subsistence and economic importance, and a general loss of estuarine/mangrove species. In general, declines in both individual species abundance and species richness are anticipated. Increased turbidity, linked to more intense or frequent rainfall, will also likely affect shallow water primary producers, including corals, seagrass and macro-algae.

#### **2.3.4. Root causes**

293. The TDA and SAP process confirmed the root cause of coastal environmental degradation as present density and growth of coastal populations. A total of 270 million people live in the coastal sub-regions of the seven countries covered by this project. The population is concentrated in 93 cities with over 100,000 inhabitants and the weighted mean population growth rate in the coastal zone is 2.17%, indicative of doubling of populations in 32 years. In Cambodia, Indonesia and the Philippines, growth rates in the coastal sub-regions are 1.5 to 2.0 times the national growth rates. Coastal tourism, increasing fisheries development, and oil exploration and exploitation, are among the major economic driving forces behind this dramatic increase in coastal populations.

#### **2.3.5. Barriers**

The obvious barrier in terms of environmental and natural resource governance and management is that environment, natural resource management and coastal infrastructure are treated as separate sectors for planning and management purposes leading to: overlapping or conflicting mandates between different ministries, as in the case of fisheries and environment for example, where internal mechanisms for managing the impacts of fishing practices on habitats and the physical environment do not exist; problems related to an effective control of environmental degradation resulting from land-based pollution where the interface between the industrial and environmental sectors is not well developed; and lack of adequate consideration of the consequence of environmental degradation and habitat loss due to ineffective means of valuing environmental goods and services, and where they exist, a failure to use such values in social cost-benefit analysis.

**Table 14** Regional ranking of threats to seagrass specified by the RWG-SG, 1 = most serious and 6 = least serious. (*regional score based on country score provided by the focal points and the ratio of seagrass areas of each country to that of the region*) (based on UNEP, 2008b; UNEP, 2008d).

Country	Cambodia		China		Indonesia		Malaysia		Philippines		Thailand		Viet Nam		Total	
Area (ha)	33,800		1,960		3,000		222		23,200		2,550		13,500		78,300	
Proportion of regional total	0.458		0.027		0.041		0.003		0.315		0.035		0.121		1.00	
	Rank	Weight score	Rank	Weight score	Rank	Weight score	Rank	Weight score	Rank	Weight score	Rank	Weight score	Rank	Weight score	Total Weight score	Regional ranking
Destructive fishing such as push nets and trawls	1	0.432	1	0.025	1	0.039	3	0.009	2	0.593	1	0.033	1	0.172	1.30	1
Sedimentation from coastal development	4	1.730	3	0.075	3	0.116	4	0.012	3	0.890	2	0.065	2	0.345	3.20	2
Wastewater effluent	3	1.300	4	0.100	5	0.194	5	0.015	4	1.187	4	0.130	5	0.862	3.78	3
Over-fishing	2	0.863	6	0.150	6	0.232	1	0.003	6	1.780	5	0.163	4	0.690	3.88	4
Nutrients	6	2.590	5	0.125	4	0.155	6	0.018	1	0.297	3	0.098	6	1.030	4.32	5
Coastal construction	5	2.160	2	0.050	2	0.077	2	0.006	5	1.480	6	0.196	3	0.517	4.49	6

**Table 15** Checklist of the Impacts of Land-based Pollution in SCS Coastal Ecosystems

Contaminant	IMPACTS	Mangroves	Coral Reefs	Seagrass	Wetlands
<b>Heavy metals</b>	Water quality Reduced reproductive capacity in molluscs Contamination of human food sources Bio-accumulation	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓
<b>Organic matter</b>	Water quality - Increased turbidity	-	✓	✓	✓
<b>Nutrients</b>	Eutrophication Algal blooms and/or overgrowth Red tides Anoxia – fish kills Fish shellfish poisoning	- - - - -	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓
<b>Oil/hydrocarbons</b>	Contamination/tainting of aquaculture and wild fish Extreme spills smothering of organisms Water quality	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
<b>Sediments</b>	Smothering of coral reefs, seagrass, and mangrove pneumatophores Reduced light penetration from increased turbidity leading to reduced primary production Water quality Change of water depth Change of species composition in the benthic community	✓ - ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	- ✓ ✓ ✓ ✓
<b>POPs</b>	Water quality Contamination of seafood Reduced fish reproductive capacity	✓ ✓ -	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
<b>Solid waste (plastics)</b>	Smothering of organisms Loss of amenity value Biosorption of plasticizing agents	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
<b>Thermal pollution</b>	Reduced productivity Loss of species	✓ ✓	✓ ✓	✓ ✓	✓ ✓
<b>Bacterial contamination</b>	Loss of amenity value Contamination of human food sources	✓ ✓	✓ ✓	✓ ✓	✓ ✓
<b>Acid Pollution</b>	Change in pH Loss of species (fish)	✓ ✓	- -	✓ ✓	✓ ✓

**Table 16** Framework for Valuing Impacts of Land-based Pollution on Coastal Habitats. Impacts are Grouped into Three Classes: Changes in Production/productivity; Changes in Amenity Value; and Impacts on Human Welfare.

Types of Contaminant	Impacts	Mangroves			Coral Reefs			Seagrass			Coastal Wetlands		
		PROD.	Amenity	Human welfare	PROD.	Amenity	Human welfare	PROD.	Amenity	Human welfare	PROD.	Amenity	Human welfare
Heavy metals	<ul style="list-style-type: none"> <li>Water quality</li> <li>Reduced reproductive capacity in molluscs</li> <li>Contamination of human food sources</li> <li>Bio-accumulation</li> </ul>	V V -	V - -	V V V	V - -	V - -	- V -	V - -	V - -	- V -	V - -	V - -	
Organic matter	<ul style="list-style-type: none"> <li>Water quality</li> </ul>	- -	- -	- -	V V -	V - -	- - -	V V -	V - -	- V -	V - -	V - -	
Nutrients	<ul style="list-style-type: none"> <li>Eutrophication</li> <li>Algal blooms and/or overgrowth</li> <li>Anoxia – fish kills</li> <li>Fish shellfish poisoning</li> </ul>	- - - -	- - - -	- - - -	V V V -	- - - -	- - - -	V V V -	- - - -	- V -	V V V -	- - - -	
Oil and hydrocarbons	<ul style="list-style-type: none"> <li>Contamination/tainting of aquaculture and wild fish</li> <li>Extreme spills smothering of organisms</li> <li>Water quality</li> </ul>	V V V	V V V	V - V	- V V	- - -	V V V	- V V	- V V	V - V	- V V	- - -	
Sediments	<ul style="list-style-type: none"> <li>Smothering of benthic communities</li> <li>Reduced light penetration from increased turbidity leading to reduced primary production</li> <li>Water quality</li> <li>Change of water depth</li> <li>Change of species composition of benthic communities</li> </ul>	V - V V V	V - V V V	- - V V V	V V V V V	V V V V -	- V V V V	V V V V V	- V V V V	V V V V V	V V V V V	- - - - -	
POPs	<ul style="list-style-type: none"> <li>Water quality</li> <li>Contamination of seafood</li> <li>Reduced fish reproductive capacity</li> </ul>	- - V	- - -	V V -	V - -	- - -	V V V	V - -	V - -	V - -	V - -	V - -	
Solid waste (plastics)	<ul style="list-style-type: none"> <li>Smothering of organisms</li> <li>Loss of amenity value</li> <li>Biosorption of plasticizing agent</li> </ul>	V V	V -	- V	V V -	V - -	- V V	V V -	V - -	V - -	V V -	V - V	- - V
Thermal pollution	<ul style="list-style-type: none"> <li>Reduced productivity</li> <li>Loss of species</li> </ul>	V V	- V	- V	V V -	- - -	- V V	V V -	- V -	V - -	V V -	- V -	- - -
Bacterial contamination	<ul style="list-style-type: none"> <li>Loss of amenity value (reduced bathing)</li> <li>Contamination of human food sources</li> </ul>	- V	- -	- V	- - -	V - -	- V -	- - -	V - -	- V -	- V -	V - -	- - V
Acid Pollution	<ul style="list-style-type: none"> <li>Change in pH of water column and sediment pore water</li> <li>Loss of species (fish)</li> </ul>	V V	- V	- V	V V -	- V -	- V -	V V -	V V -	- V -	V V -	- V -	- - -

**Table 17a** Framework for assessing the effects of fishing

<b>Effects of fishing and related Activities on:</b>	<b>Reported problems in relation to coastal environmental management</b>
Populations and communities of fished and harvested species	Declining availability and biomass of important species
	Size at first capture of important species low relative to historic average
	Change in the age and sex structure of catches of important species
	Changes in the species composition of catches
	Number of species in the catch low relative to historic average
	Changes in community structure due to direct reduction of populations representing specific trophic levels of the community (e.g. predator or prey)
	Indirect changes in community structure caused by habitat changes or provision of additional food or nutrients as a result of fishing
	Capture/mortality of large vertebrates/rare and endangered species
Nursery functions of coastal habitats	Fishing in nursery areas and the targeting of juveniles Large incidental captures of juveniles
Habitat	Removal and alteration of habitats as a result of fishing Change in current and sediment patterns as a result of fish fence construction
Water and sediment quality	Pollution of coastal waters by fishing vessels
	Release of wastewater and organic pollutants into coastal waters from fish processing facilities
	Localised and short-term changes in turbidity, oxygen levels, and changes in water and sediment chemistry due to fishing
Human Environment	User group conflicts (e.g., commercial v. small-scale fishers) Fishing gear conflicts (e.g., push netters v. gill netters)

**Table 17b** Framework for assessing the effects of aquaculture

<b>Effects of aquaculture and related activities on:</b>	<b>Reported problems in relation to coastal environmental management</b>
Water and Sediment Quality – solid waste pollution	Smothering of coastal habitats (e.g., seagrass) and shellfish
	Increased turbidity of the water quality
Water Quality – Increased dissolved nutrient inputs	Algal blooms and pathogens as a result of increased nutrient inputs to coastal waters
	Fish kills due to low dissolved oxygen concentrations caused by eutrophic conditions
	Removal of oxygen from deep water and sediments as a consequence of the biological oxygen demand created by the sinking and decay of blooming algae
Habitat	Conversion of coastal habitats for construction of farms and onshore facilities
Populations and communities	Over-grazing of seagrass from re-stocking with sea urchins
Human Environment	Littering of coastal waters and inter-tidal area with aquaculture materials
	User group conflicts (e.g., aquaculturists v. fishers)
	Reduced aesthetics as a result of the development of aquaculture infrastructure

#### 2.4. Institutional, sectoral and policy context

294. Implementing the Strategic Action Programme is a complex task since it will involve actions from the local up to the regional and international levels and requires not only that all stakeholders participate but also that they share a common vision of the need for action. The management framework, described in Section 4 below is based on that developed during the SCS project which has proven to be of value providing connections and linkages from local to central government levels within countries and between the political and scientific domains at the regional level. Several types of constraints continue to operate at both the national and regional levels in terms of institutional and sectorial arrangements but the policy context appears not to be a problem in any country as all are committed to the Sustainable Development Goals, and the principles of ecosystem based management, and sustainable development.

295. At the national level the institutional context at the central government level has changed in the recent past in four of the countries bordering the South China Sea as a consequence of restructuring of the ministries responsible for the environment at the national level. This restructuring

reflects adjustments aimed at establishing the institutional enabling environments required to meet various International environmental instruments, with notable attention being given to aligning work of sectorial agencies to enable the integrated approaches required to contribute to the achievement of the sustainable development goals. The situation has remained unchanged in Cambodia, Indonesia and the Philippines the two former each having a Ministry of Environment headed by a Minister (Senior Minister in the case of Cambodia). In the case of the Philippines the Department of Environment and Natural Resources (equivalent to a Ministry) is headed by a Secretary.

296. Four countries have changed their institutional arrangements during recent years. In China the State Environment Protection Administration was elevated to the status of a Ministry (Ministry of Environment Protection) following the National Party Congress in the first quarter of 2008. In Thailand restructuring of the responsibilities of Government Departments and Ministries resulted in the creation of a Department of Marine and Coastal Resources within the Ministry of Natural Resources and Environment that assumed some responsibilities previously discharged by the Fisheries and Forestry Departments of other ministries. Similarly, the Vietnam Administration for Seas and Islands was established within the Ministry of Natural Resources and Environment. Changes in government structures at the Ministerial and Departmental level can and do impact, at least in the short term, on the efficiency and responsiveness of individual governments to external demands and pressures. A major factor determining the success or otherwise of regional initiatives is the extent to which all countries respond at comparable speeds.

297. All participating countries have completed National Biodiversity Strategic Action Plans (NBSAP) and each has identified specific focal points for the Biodiversity Convention, the Global Environment Facility, the RAMSAR Convention on Wetlands, and CITES. The extent and effectiveness of co-ordination at the national level between these focal points varies from country to country but is generally good in the case of the Biodiversity related conventions. The SCS project required the focal ministries to establish inter-ministry committees to co-ordinate actions across sectors at the national level and in most instances proved to be quite effective but have stagnated in recent years due to lack of regional stimulation of priority actions in the realm of coastal and marine environmental management in the South China Sea.

298. In all participating countries the environment is treated as a separate sector for planning and management purposes leading to: overlapping or conflicting mandates between different ministries, as in the case of fisheries and environment for example, where internal mechanisms for managing the impacts of fishing practices on habitats and the physical environment do not exist; ineffective control of environmental degradation resulting from land-based pollution where the interface between the industrial and environmental sectors is not well developed; inadequate consideration of the consequence of environmental degradation and habitat loss due to ineffective means of valuing environmental goods and services, and a failure to use such values in social cost-benefit analysis, where they exist; and the failure to use sound science as the basis for development decision making due to reasons such as: the inability of scientists in the region to present the information in a simple and persuasive manner; a lack of respect from political decision makers and others for scientists from the region; the overwhelming push towards economic development.

299. Over recent years there has been a progressive movement in all participating countries away from centralised government control to a more decentralised management and control of natural resources and development at the Provincial and municipal levels. Developments in this regard are most noticeable in Cambodia, Indonesia and Thailand with China, Viet Nam and Philippines also having considerable local autonomy with respect to decisions regarding coastal resource use and development. It is noticeable that in those countries with devolution of decision making power and management responsibility to the provincial and local levels of government, the interactions between the provincial level representatives of the central government ministries and departments are

frequently better developed and more frequent than in the capital cities, particularly in terms of operational level interactions.

## **2.5. Stakeholder mapping and analysis**

300. The primary level stakeholders in the implementation of the Strategic Action Programme are the central governments of the seven participating countries since these are the entities that must agree on, and oversee the co-ordination of actions at the regional level and support the achievement of the regional targets through the implementation of project activities in each country. Other stakeholders at the national level include NGOs, the academic and research community that is in some countries organised through national organisations such as academies of science or professional societies. At the provincial and local levels stakeholders include the provincial and local government units, community groups and local associations or co-operatives of farmers, fisherfolk and other groups dependent upon coastal space and resources such as aquaculture producers and processing groups which are often controlled and operated by women.

301. The importance of different stakeholder groups at any one location reflects differences in the types of resources, and the human activities of exploitation and processing, characteristic of each area. In mangrove areas for example gleaning and catching crabs and village level processing of the catch may be undertaken by women's groups, whilst canoe based net and trap fishing may be undertaken predominantly by men. The project aims to provide appropriate fora in which scientists and government officials may periodically interact and exchange knowledge and experience regarding scientifically sound approaches to managing coastal resources (regional scientific conferences); together with fora designed to allow interaction between more operationally involved managers, government officers and community leaders (e.g. revitalization of the Mayor's Round Table meetings described above). Stakeholder analysis and engagement planning will be a central element of project coordination and management and reported on annually to national IMCs and the regional Project Steering Committee. The following summarises stakeholder mapping conduct in preparation of this project:

### ***Cambodia***

302. The national lead agency for the project in Cambodia is the Ministry of Environment which will draw on inputs from its Department of Nature Conservation and Protection, Department of Planning and Legal Affairs, National Park and Wildlife Sanctuary Office, Department of Pollution Control and Coastal Coordinating Unit. Given the fact that coral reef and seagrass are managed by the Fisheries Administration of the Ministry of Agriculture, Forestry and Fisheries, the Fisheries Administration will also play a major role in national coordination and work on governance reforms. National level coordination and planning will be undertaken in collaboration with the Ministry of Land Management, Urban Planning and Construction, Ministry of Public Works and Transport, Ministry of Foreign Affairs and International Cooperation, Ministry of Planning, and the Ministry of Women's Affairs.

303. The Ministry of Environment and the Fisheries Administration will also play significant roles in the technical and national-level execution of project activities given their growing human resource and technical capacities. Networks with other government ministries and agencies will be established to secure specialized technical inputs to project activities as required. The Royal University of Agriculture, Phnom Penh and the University of Phnom Penh are also key technical stakeholder as will be representatives of the Provincial governments of Kampot, Kep, Sihanoukville and Koh Kong. While the offices of the Governor and Deputy-Governor will be the key focal agencies within each of the coastal provinces, their departments are major project stakeholders from the perspective of local operational management and implementation of management reforms.

304. Each of the abovementioned provincial governments have a Department of Environment, Department of Agriculture, Provincial Fisheries Office, Department of Land Management, Department of Tourism, Department of Rural Development, Department of Women's Affairs, Department of Planning, Department of Public and Transport, Department of Mines and Industry, Department of Water and Meteorology, and Police Department. The effective coordination of inputs of the multitude of capacities of these provincial departments can enable a high level of operational management impact at the local level. In Koh Kong Province, the Peam Krasop Wildlife Sanctuary Administration is a major stakeholder, particularly with respect to mangrove and wetland management. Additionally, provincial and community level NGOs, CSOs and COs that have demonstrable experience and success working in the area of coastal and marine environmental management in these provinces include: the Coastal Community Fisheries Khan Stung Hav in Sihanoukville; the Environmental Protection and Development Organization; the Kampong Samaki Community Fisheries Coastal Resources Protection organization; and the Potsar and Champey Community Fisheries Federation and are key stakeholders.

### ***China***

305. In China, the Ministry of Environmental Protection (MEP) given its role as a member of COBSEA, the regional executing entity for the project, will lead project execution at the national level. MoP's Department of Pollution Control, Department of International Cooperation, and Department of Policy and Law, and South China Institute of Environmental Sciences have been identified as key stakeholders. The Department of International Cooperation of the State Oceanic Administration is also a primary stakeholder. From the perspective of national technical and execution capacity, the Guangxi Mangrove Research Centre, the South China Sea Institute of Oceanology of the Chinese Academy of Sciences, the Institute of Environmental Sciences of Sun Yat-Sen University, the Research Centre of Wetland Science of Sun Yat-Sen University, and the Department of Natural Resources and Environment at Guangdong Ocean University are critically important stakeholders.

306. . The large provincial governments of Guangdong, Guangxi and Hainan provide services to more than 160 million people in southern China and the offices of the Governors for these provinces are important political stakeholders. Similarly, the governments of the prefecture-level cities of these provinces are also important stakeholders from the perspective of harnessing local-level support for operational management. The government of Shantou City, particularly the Shantou Wildlife Conservation and Management Office and Shantou Wetland Natural Reserve Station and the government of Shenzhen City and the Baoan Bureau of Environmental Protection are important local-level authorities in the area of the priority mangrove and wetland areas in Guangdong province. In Guangxi, similar local authorities identified as primary stakeholders include the Beihai Municipal People's Government, particularly the Environmental Protection Bureau of Beihai City, and the Hepu County Government, including its administration for the Hepu Dugong Nature Reserve. The Fangchenggang City government, including its Oceanic Administration Bureau, Environmental Protection Bureau, Forestry Bureau, City Planning Bureau, Fisheries Bureau and Tourist Bureau is another primary stakeholder in Guangxi.

307. Project preparation identified significant emerging capacities within a range of NGOs, CBOs and COs operating in the coastal provinces of Guangdong, Guangxi and Hainan, many of which have a demonstrable track record in the area of community-based approaches to coastal and marine environment and natural resource management. These include inter alia: the Guangdong Ecological Society; the Zhuhai Biological Society; the Leizhou Peninsula Coastal Ecological Conservation and Education Society; Guangxi Biodiversity Research and Conservation Association; the Fangchenggang Mangrove Protection Association; the Hainan South China Sea Institute of Tropical Marine Biology and Disease; and the Beihai Civil Volunteers Association.

### ***Indonesia***

308. In Indonesia, the Ministry of Environment and Forestry will lead project national-level project execution and will draw on inputs from its Directorate of Marine and Coastal Degradation Control, Directorate of Water Pollution Control, Directorate of Management of Essential Ecosystem, Directorate of Environmental Impact Assessment and Regional Planning, and Directorate General of Catchment Area Management and Conservation Forest. The Ministry of Marine Affairs and Fisheries and Coordinating Ministry of Maritime and Natural Resources are also a primary stakeholder at the level of national coordination and governance, and operation of the Inter-Ministerial Committee will ensure engagement of the Ministry of Foreign Affairs, the Ministry of Agriculture, the Ministry of Administrative and Bureaucratic Reform; Ministry of Communications and Informatics; and the Ministry of Research, Technology and Higher Education, Ministry of Transportation, Ministry of Tourism, Ministry of Public Work and Housing, Ministry of Spatial Planning, Ministry of National Development Planning, and Geo Spatial Information Board.

309. Technical expertise of the above-mentioned Ministries will also be harnessed in support of the scientific, knowledge exchange, and national execution of project activities. The latter will also engage key research and academic stakeholders from the Center for Coastal and Marine Resources Studies of Bogor Agricultural University, Research Center for Oceanography of the Indonesian Institute for Sciences, the Faculty of Economics of Budi Luhur University, and the Faculty of Law at the University of Padjadjaran-Bandung.

310. The provincial governments of Riau, Kepulauan Riau, Jambi, West Kalimantan and Bangka-Belitung are also primary stakeholders in terms of local operational management and on-the-ground implementation of the SAP. The city-level governments of these provinces also play a significant role given Indonesia's decentralized approach. Specific offices identified during project preparation to be engaged include the Environmental Office of West Kalimantan Province, the Batu Ampar Local Government and the Regional Planning and Development Agency of Bangka-Belitung. In Riau, the Sub-Directorate of Sea, Shore and Land Ecosystems of the Environmental Management Impact Board of Batam City Government, the Sub-Directorate of Environment Monitoring and Rehabilitation of Batam City Government, the Local Office of Fisheries and Marine Affairs in Batam, the Infrastructure and Natural Resources Division of Bintan City Government, and the Local Agency for Development Planning in Bintan were identified as key local stakeholders.

311. As in other countries, the past five years has seen the emergence and improved capacities of NGOs, CSOs and COs working the field of coastal and marine environmental management in the abovementioned provinces of Indonesia bordering the South China Sea. These include, among others, Indonesian Institute of Mangrove Research and Development, WWF Indonesia, Wetland Indonesia, Komunitas Sahabat Alam, Koperasi Panter, Yayasan Karya Banua Pulanggana, Kelompok Peduli Lingkungan Belitung, Komunitas Sahabat Alam, Lembaga Pengelola Sumberdaya Terumbu Karang (LPSTK) Desa BENAN, Lembaga Swadaya Masyarakat Pelita Alam, Belukap and Yayasan Gema Lingkungan Indonesia.

### ***Philippines***

312. In the Philippines, the Department of Environment and Natural Resources will act as the lead agency and draw on inputs from its Office of the Undersecretary for Environment and International Environmental Affairs, Biodiversity Management Bureau, Environmental Management Bureau, River Basin Control Office, Mines and Geoscience Bureau, Land Management Bureau, Ecosystems Research and Development Bureau, National Water Regulatory Board, and the Foreign Assisted Service and Project Service Office. At the level of national coordination and governance, other primary stakeholders include the National Economic Development Authority and its Office of Agriculture, Natural Resources and Environment, the Bureau of Fisheries and Aquatic Resources and its National Fisheries Research and Development Institute, the Department of Foreign Affairs and its Maritime and Ocean Affairs Office, the Department of Science and Technology and the Philippine

Council for Agriculture, Aquatic and Natural Resources Research and Development, the Department of Interior and Local Government, and the Philippine National Police Maritime Group, and the National Commission on Indigenous Peoples.

313. Technical capacities of the abovementioned departments and offices will also be drawn on to support scientific and technical elements of the project and national level execution. In this connection, the University of the Philippines' Marine Science Institute and the Institute of Environmental Science and Meteorology are key technical stakeholders, as are the Policy Studies Division of DENR's Planning and Policy Studies Office, the Environmental Research Section of DENR's Environmental Management Bureau, and the Caves, Wetlands and Other Ecosystems Section of DENR's Biodiversity Management Bureau. At the provincial and municipal level, key stakeholders identified during project preparation include the Palawan Council for Sustainable Development, offices of the Provincial Agriculturists, the Municipal Government of Bolinao in Pangasinan, the Municipal Governments of Busuanga and Taytay in Palawan, the Malampaya Sound Protected Land and Seascapes Administration in Palawan, the Municipal Government of Masinloc in Zambales, the Fisheries and Aquatic Resources Management Council, the Association of Resort Owners and Tourism Establishments, and Peoples' Organizations. Key NGOs were identified to be Anak ng Dagat and Amahan at Ugnayan ng Pangisdaan ng Orion.

### ***Thailand***

314. In Thailand, the Department of Marine and Coastal Resources of the Ministry of Natural Resources and Environment will act as the lead agency and is a principle stakeholder. It will be supported in areas of coordination and governance by the Office of Marine and Coastal Resources Conservation. Its Mangrove Conservation Office, Legal Affairs Unit, Coastal Area Management Division, Planning Division, Marine and Coastal Resources Management Promotion Division, and Marine and Coastal Resources Research and Development Institute will also be engaged and are key stakeholders. The Office of Natural Resources and Environmental Policy and Planning and the Office for International Cooperation under the Ministry of Natural Resources and Environment are the broader involved agencies.

315. Other Ministries to be engaged at the level of national coordination and governance include the Ministry of Agriculture and Cooperatives' Department of Fisheries, the Ministry of Transport's Marine Department, the Ministry of Finance, the Ministry of Foreign Affairs, the Ministry of Science and Technology, the Kingdom of Thailand's Geo-Informatics and Space Technology Development Agency, Maritime Enforcement Coordinating Center, and the office of Tourism Authority of Thailand.

316. The full range of technical expertise from National government will be harnessed and supported by Universities and other academic institutes. Academia plays a highly respected role in coastal and marine resource management in Thailand and key stakeholders in this area include the Marine Biodiversity Research Group of Ramkhamhaeng University, the Faculty of Environment and Resource Studies at Mahidol University, the Faculty of Fisheries of Kasetsart University, the Faculty of Economics of Kasetsart University, the Marine Science Department and Aquatic Resources Research Institute of Chulalongkorn University and the Faculty of Sciences at Prince of Songkla University.

317. The governments of Thailand's provinces of Narathiwat, Pattani, Songkhla, Nakhon Si Thammarat, Surat Thani, Chumphon, Prachuap Khiri Khan, Petchaburi, Samut Songkram, Samut Sakhon, Samut Prakan, Chonburi, Rayong, Chantaburi, and Trat are also key stakeholders from the perspective of operational management and on-the-ground implementation of SAP activities. Accordingly, the Governors offices of these provinces are pivotal from an implementation perspective, as they facilitate important 'community to cabinet' inter-linkages. It is important to note that Thailand's 15 provinces bordering the Gulf of Thailand are comprised of 194 district governments, 1,657 sub-districts with associated administrative units of governments, and 7,879 villages each with

elected Chiefs and strong community-level management arrangements. Accordingly, the offices of the district and sub-district governments, and village Chiefs, are key stakeholders.

318. The administrations of several key institutions for the management of national significant wetlands such as the Mu Koh Chang National Park in Trat Province and the Thale Noi Hunting Non-Hunting Area Administration in Songkhla will be important stakeholders, particularly with regards to knowledge exchange activities. Additionally, a number of NGOs, CSOs and COs were identified as being of contemporary relevance to SAP implementation. These include: the Prednai Mangrove Development and Conservation Group; fisherfolk associations; the Six-Tambol (Sub-district) Network for Collective Coastal Management in Trat Province; the Thai Nature Study Centre; the Ao Baan Don Conservation Network; the Traditional Knowledge Protection Network; the Songkhla Community Natural Resources and Environment Protection Volunteer; the Wetland Conservation Group Baan Bangnokkork; the Pattani Small-scale Fisher Network; the Phatthalung Provincial Environment Network; and the Community Natural Resources Development Institute.

#### ***Vietnam***

319. In Vietnam, the Vietnam Administration of Seas and Islands of the Ministry of Natural Resources and Environment will lead national-level coordination and execution of the project. Other important stakeholders to be involved in coordination, governance reform and planning include the Ministry of Agriculture and Rural Development which encompasses fisheries, the Ministry of Planning and Investment, the Ministry of Finance, the Ministry of Transport, the Ministry of Science and Technology, the Ministry of Culture, Sport and Tourism, the Ministry of Education and Training, and the Vietnamese Academy of Science and Technology and its Institute of Oceanography.

320. The full capacities of these line agencies will be harnessed in support of the scientific and technical aspects of the project. Other institutions that will act as key stakeholders for this aspect of the project include the Mangrove Ecosystem Research Centre, the Vietnamese Academy of Science and Technology's Institute of Oceanography (particularly its Department of Marine Botany) and Institute of Marine Environment and Resources, and the Vietnam's Administration of Seas and Islands' Centers for Integrated Coastal Planning and Management (both northern and southern centers), Institute of Strategy and Policy on Natural Resources and Environment, and Department of International Cooperation and Science Technology. Academic institutes to be engaged as stakeholders include the Vietnam National University, the Department of Environmental Economics and Management of the National Economics University of Vietnam, the Center for Environmental Research and Education of the Hanoi University of Education, and the Faculty of Geology at the Hanoi University of Science.

321. The offices of Vietnam's coastal provincial governments are key stakeholders, again providing an important 'community to cabinet' conduit between complex sub-provincial administrative units. Coastal provincial governments, are typically comprised provincial departments of environment and natural resources, fisheries, tourism, agriculture and rural development, planning and investment, science and technology, and police. Administratively, provinces are divided into districts, provincial cities, and district-level towns, commune-level towns and communes. Municipalities are further divided into rural districts and urban districts, which are further subdivided into wards. CSOs, COs and NGOs play an important role in capturing community level inputs and some of these identified during project preparation include district level farmers' associations, ward level women's associations, provincial unions of science and technology associations, provincial level fisheries associations, town level youth unions, and provincial forestry clubs.

322. In implementing the demonstration site activities of the SCS project each responsible organisation was required to establish a cross-sectorial management board Chaired by the Mayor or Provincial Governor or their Deputy. Membership of the board included representatives from all sectors of government involved in the use of coastal space, local stakeholder groups including the community, and where appropriate non-governmental and scientific organisations. Almost without

exception this proved to be extremely valuable in mobilising additional and unplanned actions and resources and the model has now been adopted by several agencies as a standard model for project coordination. The mainstreaming of gender and youth into such coordinating bodies will be emphasized through this project.

## **2.6. Baseline analysis and gaps**

323. The benefits of regional cooperation in marine environmental management were recognised more than 35 years ago when in 1981 the five original ASEAN states, under the auspices of the UNEP regional seas programme, approved the Action Plan for the Protection and Development of the Marine and Coastal Areas of the East Asian Region (EAS Action Plan). There is no convention in the East Asian Seas (EAS) region and the action plan has been superseded to some extent by New Strategic Directions for COBSEA. The Coordinating Body on the Seas of East Asia (COBSEA) is a regional institutional mechanism, membership of which was expanded to 10 in 1994. The challenges for COBSEA and its Secretariat have included chronic funding and staff deficiencies, a large and diverse region, regional states that are not members (Brunei Darussalam, Myanmar, Papua New Guinea and Timor Leste) and the lack of country ownership. Political commitment and support for the programme has been generally weak throughout and coordination and cooperation have been problematic on many levels, across disciplines and with other regional bodies. The strategic directions for COBSEA generally focus on areas such as: information management; national capacity building; strategic and emerging issues; and regional cooperation.

324. Numerous other programmes, projects, agencies, organisations and donors operate in the region. The major regional players, in addition to COBSEA and the SCS Project are: the Association of Southeast Asian Nations (ASEAN), ASEAN-China Strategic Partnership (ASEAN+1), ASEAN+3 (China, Republic of Korea and Japan), PEMSEA, the Asia-Pacific Economic Council (APEC), the Mekong River Commission (MRC), the Southeast Asian Fisheries Development Centre (SEAFDEC), the Asia-Europe Meeting (ASEM) and the World Fish Centre. Two other players of interest have been the Southeast Asian Programme in Ocean Law, Policy and Management (SEAPOL) and the Southeast Asia Regional Centre for Global Change System for Analysis, Research and Training network (SEA-START RC). Numerous institutions and organisations operate or fund projects alone or in cooperation with others, such as the Coral Triangle Initiative, International Coral Reef Action Network, the International Coral Reef Initiative, IUCN, the Asian Development Bank, the World Bank, IMO, WWF, the Canadian International Development Agency (CIDA) and the Swedish International Development Agency (SIDA).

325. Numerous actions are taking place at the national and regional levels to address the environmental problems that have resulted from the rapid pace of development and industrialisation, which has occurred over the last decade. Indonesia, Thailand and Viet Nam for example, have extensive national mangrove reforestation programmes, Indonesia, Philippines and Cambodia have several localised programmes of coastal zone management supported by various International NGOs including WWF, IUCN and Wetlands International; bilateral assistance agencies such as DANIDA and SIDA; and multi-lateral entities such as the EU. Many of these include examples of community based approaches to management of coastal resources or sectors, and include poverty alleviation as a major objective. All countries have activities and programmes related to the conservation of significant coastal biological diversity including wetlands.

326. Not only are many of the actions at national level undertaken outside the framework of nationally co-ordinated programmes resulting in significant duplication and overlap, but co-ordination and collaboration at the regional level has been weak up to the present. Although tasked with a co-ordination role by its member states COBSEA has been hampered by the absence of any mechanism or procedures for national reporting to the Secretariat on actions being undertaken at the national level in line with regional programmes and targets.

327. Despite the continuance of unresolved territorial disputes that are a source of sensitivity in the region, the countries have demonstrated an increasing willingness to co-operate in matters relating to environmental management, and there is widespread recognition that the benefits resulting from co-operative environmental management actions are not dependent on the resolution of such sensitive issues. Recognising these sensitivities however, it has been agreed that no activities shall be undertaken under this project in disputed areas of the South China Sea, nor shall issues of sovereignty be addressed directly or indirectly through project activities.

328. The lack of a regionally co-ordinated approach to remedial actions significantly reduces their effectiveness, and recognising this the countries bordering the South China Sea have initiated a number of joint programmes involving two or more countries within the region. These include inter alia, the major oceanographic and fisheries studies of the South China Sea and Gulf of Thailand undertaken by the Southeast Asian Fisheries Development Center. Many of these initiatives can be considered transitory with specific activities or programmes existing for a few years before falling into disuse or going through cyclic phases characterised by periods of high activity separated by periods of little or no activity.

329. Various sub-regional agreements are in place regarding joint actions on the part of two or more seven participating countries including: an agreement on terrestrial, forest biological diversity between Cambodia, Viet Nam and Laos; a trilateral agreement between Malaysia, Philippines and Indonesia regarding Marine Turtles; and a bilateral agreement on joint management of transboundary marine waters between Cambodia and Viet Nam negotiated as part of the work of the SCS Project and signed by the Deputy Governor of Kampot Province, Cambodia, and the Vice-Chairperson of the Provincial People's Committee of Kien Giang Province, Viet Nam in March on behalf of their respective provincial governments.

330. The over-riding gap that this project seeks to fill is the absence of a strong regional co-ordination mechanism for implementing the Strategic Action Programme and providing a focus for actions by all parties directed towards improving the state of the coastal and marine environment of the South China Sea. In the absence of a GEF intervention it is probable that the present types of national and regional intervention, which have been demonstrated over the last thirty years as being ineffective in halting the pace of environmental degradation, will continue. Without a concerted regional approach to environmental management it is unlikely that the present rates of habitat degradation will be slowed and the likely consequence of such a scenario is the loss of globally significant biological diversity over the next century.

#### ***Baseline Information and Data***

331. This project will be operated on the basis of comprehensive baseline information and data that will be critical in guiding day-to-day project decision-making, monitoring and evaluation, and in designing targeted communications for use in raising stakeholder awareness, particularly among decision-makers and politicians, of the results of SAP implementation. Uniquely, comprehensive site characterization information and data have been compiled and updated during project preparation to establish detailed baselines for each of the mangrove, coral reef, seagrass and wetland sites identified as priority locations for management within the framework of SAP implementation. These site characterisations contain geographical coordinates, information on the physical environment, environmental state information, socio-economic and resource use information, biological data, and information on the status of existing management at these sites<sup>50</sup>. These baseline assessments of the

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<sup>50</sup> It was not possible during project preparation to identify another SAP implementation project that has proceeded on the basis of such a comprehensive and detailed set baseline information and data for locations of target intervention such as in the case of the present project

sites have been made accessible online at <http://gis.unepscs.org><sup>51</sup>. A supporting meta-database of the data used to establish the baselines has also been developed as a preparatory activity<sup>52</sup>.

332. Detailed national reports on the status and trends in mangrove, coral reef, seagrass and wetland management were also published in preparation for SAP implementation in both English and national language. These reports are the only existing national-level overviews of the state of coastal habitats and their management in the South China Sea, and importantly present information in a regionally comparable format on the: geographic distribution of each of the habitats, including maps and areas; distribution of species and formations; descriptions of environmental state at habitat sites, including physical and biological data; chapters on social use and ownership, including detailed information on land and sea tenure and associated issues with habitat management, overviews of present and projected uses, and summaries of current management regimes. The latter outline institutional arrangements, existing national and provincial policies, and legislation and regulations relating to habitat management. These reports also contain compiled national-level information and data on the economic valuation of coastal habitats, including use (both direct use and indirect use) and non-use values. Threats to habitats, both anthropogenic and natural, are also assessed both from the perspective of current situation and future scenarios and are summarised in these reports. These reports form an integral part of the national baseline<sup>53</sup>. A regional synthesis of the information and data presented in these reports has been published in preparation for this project and is presented in summary form in the above background section of this Project Document. Of significance are the large number of national language reviews and publications that were prepared as inputs to these national reports<sup>54</sup>.

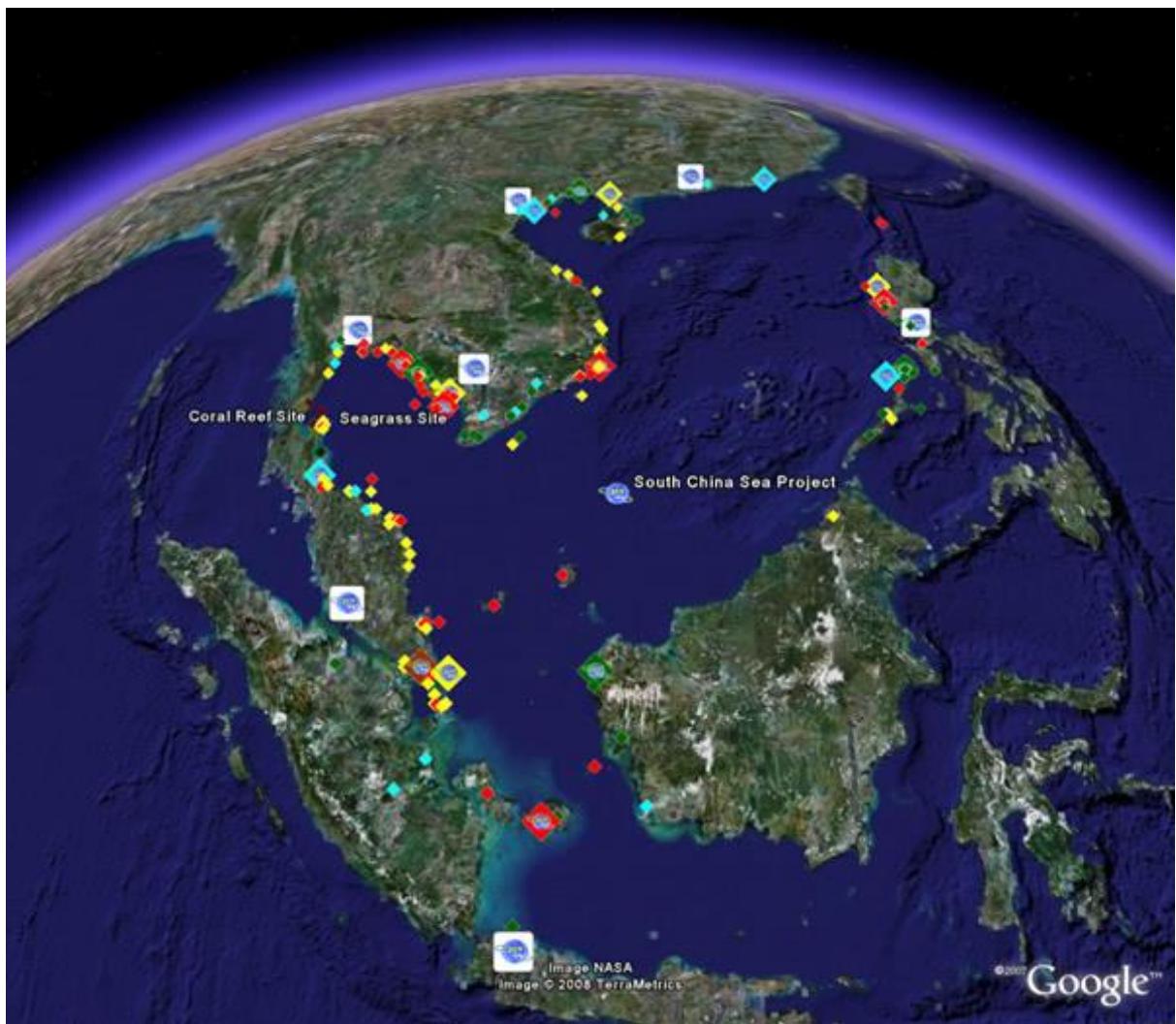
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<sup>51</sup> Data be accessed via Google Earth at <<http://www.unepscs.org/google/South-China-Sea-Project.kmz>>

<sup>52</sup> See <<http://metadata.unepscs.org>>

<sup>53</sup> See <[http://www.unepscs.org/South\\_China\\_Sea\\_National\\_Reports/](http://www.unepscs.org/South_China_Sea_National_Reports/)>

<sup>54</sup> See <[http://www.unepscs.org/South\\_China\\_Sea\\_National\\_Publications/](http://www.unepscs.org/South_China_Sea_National_Publications/)>



**Figure 4** Locations for which baseline site characterisations have been prepared for priority mangrove, seagrass, coral reef and wetland sites in the South China Sea

#### ***Baseline assessment of regional governance arrangements***

333. From the perspective of regional governance, this SAP implementation project will also be implemented on the basis of comprehensive baseline analyses of institutional and legal arrangements, and options for strengthened cooperation, in the environmental management of the South China Sea. In preparation for this project, a comprehensive review of legal aspects of environmental management in the South China Sea and Gulf of Thailand was undertaken. This includes an overview of obligations concerning regional cooperation under global environment conventions, including: assessments of the status of international environment conventions in the South China Sea area; and summaries of obligations regarding regional cooperation under global conventions. This is complemented by an analysis of regional and sub-regional agreements and soft laws on marine environment in the South China Sea which includes: a summary of regional and sub-regional agreements and soft laws; an assessment of environmental cooperation among Southeast Asian countries; and a detailed overview of the scope and mandate of regional and sub-regional programmes and projects in the South China. This legal review is concluded with a comparative analysis of national legislation on the coastal and marine environment of the South China Sea. The latter includes: a summary of the general status and hierarchical structure of environmental legislation; a review of instruments and mechanisms utilised to

protect the marine environment (e.g. legally mandated instruments and mechanisms, non-legally binding and policy instruments, and application of local practices and knowledge); and detailed summaries of national institutional arrangements for coastal and marine environmental management, including mechanisms for enforcement and compliance.

334. A review of instruments and mechanisms for strengthening marine environmental cooperation in the South China Sea was also undertaken in preparation for this present initiative. This includes an overview of the need for cooperation, from the perspectives of ecological, legal, and socio-economic mandates. Importantly the review includes a detailed review of cooperative efforts for marine environmental protection outside of the South Sea, to identify global lessons learned and examples of best practice, and draws on the abovementioned review of legal aspects of environmental management, to present recommended options for strengthened cooperation. The review also examines the underlying challenges to regional cooperation and presents proposed requirements, or recommended fundamental elements, of efforts to strengthen cooperation. The ecological, socio-economic and political viability of each of the proposed options has also been examined. It is important to note that each of the abovementioned reviews were prepared with extensive national stakeholder input and that, a regional summary of this preparatory work on regional governance has passed the rigours of independent peer review as evidenced by its recent publication in the international academic literature<sup>55</sup>. Further background to the formulation of these baseline reviews and assessments is provided in Section 2 of this Project Document.

335. This SCS SAP implementation project will also benefit from proceeding with a large cadre of coastal and marine environmental scientists and managers experienced in the application of the TDA/SAP approach to transboundary water resource management and familiar with working in inter-governmental, multilateral settings. The experience and capacity built within the national Specialized Executing Agencies during SAP formulation has been addressed above although it is important to note that an important contribution to baseline capacity was the operation of a large regional training programme aimed at better preparing institutions for the implementation of this SAP implementation initiative.

336. Courses were delivered in areas of: Sustainable Use and Management of Mangrove Ecosystems; Larval Fish Identification and Fish Early Life History Science; Management Models and Strategies for Coral Reef and Seagrass Ecosystems; Establishing and Managing Fisheries Refugia in the South China Sea; Sustainable Use of Coastal Wetlands Bordering the South China Sea; Economic Valuation of Goods and Services of Coastal Habitats of the South China Sea; and Advanced Larval Fish Identification. Regional elements of this training programme involved more than 100 days of regional training, more than 150 participants from the SCS countries, and involved more than 70 resource persons from the Southeast Asian region in training delivery. This was complemented via the delivery of abridged national language versions of each training course in each of the participating countries. The latter involved more than 1,600 individuals from national Specialized Executing Agencies, provincial offices of environment and natural resource management agencies, local governments, Civil Society Organizations, Community Organizations and NGOs that were all trained in various aspects of the SAP and best practices in its implementation. This not only resulted in a large network of individuals but also resulted in detailed training syllabi, training materials and a network of academic institutions and research facilities experienced in the delivery of training in support of SAP implementation. This baseline scenario in the area of human capital and knowledge is also complemented by the large number of knowledge products and tools that have been developed to support SAP project implementation (e.g., regional guidelines on the economic valuation of coastal

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<sup>55</sup> See Basiron, M.N. and Lexmond, S.M., 2013. Review of the legal aspects of environmental management in the South China Sea and Gulf of Thailand. *Ocean and Coastal Management*, 85(b): 257-267.

habitats, online GIS and applications for modeling the carrying capacity of the SCS marine basin<sup>56</sup>, reviews of options for strengthened cooperation, and extensive online multi-media and public awareness catalogues which will be built upon by the present initiative<sup>57</sup>).

#### ***Emerging availability of global and regional knowledge and tools***

337. UNEP's work on coral reefs, undertaken through a global partnership among Regional Seas and technical agencies, is leading towards the production of a number of knowledge products that will build on the extensive baseline established to date. For example, downscaled climate model projections of coral bleaching conditions are expected to emerge by the end of 2016. This will provide information on the spatial variation in the onset of annual coral reef bleaching and severe bleaching conditions, at a resolution of 4km for every year up until 2050, and maps will be prepared for ocean basins, for each tropical Regional Sea, and for each of the 106 countries and territories with reef resources. These downscaled projections will aid in identifying where bleaching conditions are projected to occur sooner and where bleaching conditions are projected to occur later. These projections, to be made publicly accessible through a coral reef theme on UNEP-Live, as well as the NOAA Coral Reef Watch website, will be a useful resource in updating the Transboundary Diagnostic Analysis and revising the Strategic Action Programme for the South China Sea.

338. UNEP developed guidance on the assessment of coral reef resilience, including indicators, field methods, analysis and decision-support is also anticipated to be available by the end of 2016 . Targeted at reef planners, managers, and scientists, the guidelines encompass key steps such as selecting appropriate indicators; methods for collecting and compiling data and how to best utilize existing data; guidance on data analysis and interpretation and guidance on the various ways of reporting on the results. The guidelines will integrate results of ecological resilience assessments with downscaled climate model outputs (see above) as well as with other existing data on historical and projected future exposure to disturbances, such as ocean acidification. This will provide a concrete, practical and science-based approach to how climate change resilience of reefs can be protected and enhanced through MPA planning, systematic conservation planning marine spatial planning and other efforts, and as such contribute to EBM. This guidance will be a useful resource in guiding the update of resource assessment methodologies developed during SAP formulation and mainstreamed into the operation of national agencies.

339. A report entitled Mesophotic Reefs – A Life Boat for Coral Reefs was recently published by UNEP and GRID-Arendal 24 May 2016. It constitutes the most comprehensive compilation on mesophotic reefs to date, covering their prevalence and distribution, imminent threats, prospects of survival under climate change scenarios, role in climate change resilience of shallower reefs, and critical knowledge gaps. The report aims to enhance awareness of the importance of mesophotic reefs including as a possible climate refuge, and advocate for and catalyse appropriate policy, management and research responses based on concrete science-based recommendations. Similarly, a science to policy brief on wastewater pollution in coral reef is being developed by UNEP in partnership with the GPA and the Global Waste Water Initiative and is also expected to emerge by the end of 2016. The management and policy recommendations on addressing wastewater in coral reef areas may act as a useful resource in the planning of actions at the 82 priority coral reef sites of this project.

340. Additionally, further development and implementation of the Green Fins initiative for Sustainable Snorkeling and Diving, originally established by UNEP, COBSEA and Reef World Foundation, is ongoing. The approach encompasses three main elements; certification of dive centre operations based on a code of conduct and a robust assessment system; support towards developing or strengthening implementation of relevant regulatory frameworks; and strategic outreach to dive

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<sup>56</sup> See <[http://www.unepscs.org/nutrient\\_model/](http://www.unepscs.org/nutrient_model/)>

<sup>57</sup> All accessible via <<http://www.unepscs.org>>

centres and their customers as well as government partners. Through collaboration with COBSEA and with support from the Mangroves for the Future (MFF) initiative, Green Fins has been introduced to Vietnam and the total membership has been extended to over 500 diving and snorkelling operators across six countries in Asia, who are continuously improving their business practices to mitigate negative environmental impacts. A comprehensive Green Fins ‘Toolbox’ was launched in April 2016, providing a consolidated, comprehensive and standardized set of guidance materials and tools that cover Green Fins implementation, learning and outreach. A short animated video entitled ‘Green Fins for a Blue Planet’ was also launched in April 2016. Key outreach and awareness materials have already been translated into South East Asian languages, and a number of additional materials including the video are being translated into Chinese in preparation for a regional Green Fins promotional campaign.

341. Guidelines for Coral Reef Environmental Impact Assessment, Compensation and Mitigation Schemes are being developed based on initial work by IFRECOR (the French Initiative for Coral Reefs) and other partners. A guide is being prepared for publication later in 2016 that addresses (i) how to conduct adequate Environmental Impact Assessments (EIA) in or around coral reef ecosystems and (ii) how to design/implement/monitor compensation schemes for impacts of development. The guide will initially be prepared in English and Spanish, in addition to the French version currently targeting French reef jurisdictions. This knowledge product may be of utility e.g. in relation to tourism and shipping infrastructure in coral reef areas and will be drawn upon by the present project once available. Activities focus on enhancing data and information provision for ecosystem-based coral reef planning and management by strengthening Global Coral Reef Monitoring Network (GCRMN) status and outlook reporting at the regional level and through the Regional Seas, as well as supporting development and application of indicators for tracking progress towards global and regional targets, although it is noted that the limitation of this system, in that it presents regional syntheses rather than basin-level information. Planned activities of the present project to coordinate assessment and monitoring at the SCS basin level will build on the work of the GCRMN.

342. Similarly, UNEP’s programme on Ecosystem-based Spatial Planning and Management for Sustainable Oceans and Coasts is developing tools, guidance, mentoring and lessons-sharing mechanisms that enable planners in countries and regions to more effectively apply ecosystem-based spatial planning and management approaches to sustain marine and coastal ecosystem services, including the ecological foundation for food-security. These include: (1) a process oriented spatial planning framework with governance indicators and outcome markers for context-specific planning, (2) guidance on governance analysis for marine protected area design in wider coastal planning, and (3) a coupled Integrated Ecosystem Assessment and spatial management scenario tool. These will be tested and demonstrated. Lessons will be synthesized and shared through local to regional peer-to-peer exchanges and networking underpinning longer-term uptake and institution building. This present project will draw on these tools and lessons.

343. Additionally, the Coordinating Body on the Seas of East Asia (COBSEA) assisted six COBSEA countries (Cambodia, China, Indonesia, Philippines, Thailand and Vietnam) during the period 2001-2013 in strengthening their capacity in coastal and marine spatial planning and integrated coastal management through the SIDA financed ‘Spatial Planning in the Coastal Zone – Disaster Prevention and Sustainable Development’ project which aimed to prevent/reduce the impacts from natural disasters, climate change and sea-level rise, and to promote sustainable development of the coastal areas through the application of spatial planning for ICM and EBM. The project developed a Regional Resource Document ‘Spatial Planning in the Coastal Zone of the East Asian Seas Region: Integrating Emerging Issues and Modern Management Approaches’, which helped countries to introduce the basic concepts of coastal and marine spatial planning and how to integrate emerging issues such as climate change and sea-level rise, and new management concepts such as ecosystem-based management, disaster risk reduction and results-based management into their existing spatial

planning and coastal zone management procedures and processes. Using the document as reference, existing planning guidebooks and toolkits were amended incorporating emerging issues and modern management approaches. The project established national teams of instructors that have the knowledge and capacity to design and conduct national training programs in their own countries and languages, with sufficient understanding of the emerging issues and modern management approaches related to coastal and marine spatial planning and sustainable development.

344. A strong community of practice now exists that will conduct further training and capacity building according to national needs, in other government ministries and agencies, at sub-national and local levels. The project has helped the countries develop and produce national training manuals and national resource documents (NRD) which were translated into national languages and used in national training courses. The NRD is a comprehensive document in local language and contain relevant material on the legal, administrative and institutional aspects of MSP. They also contain reference to case studies of projects that have applied coastal spatial planning and examples of integrating disaster risk reduction, climate change, ecosystem-based management, etc. into national planning. These documents helped local planners, researchers, students, and national authorities on relevant information on coastal spatial planning in the country and in developing future training programs. A small scale pilot project was also implemented in Kampot province in Cambodia. COBSEA, the regional executing agency for this project, has direct access to the abovementioned networks and resource materials in furthering the Marine Spatial Planning elements of this initiative.

345. During 2012-2013, COBSEA also executed a KOICA/Yeosu financed project entitled ‘Addressing the Challenge of Sea-Level Rise and Coastal Erosion in the East Asian Seas – Initial Implementation of the COBSEA Regional Strategy’. That initiative built capacity in COBSEA developing countries on the sustainability, resilience and wise management of threatened coastal resources and associated ecosystems through the implementation of the COBSEA Regional Programme on Coastal Erosion. This work was built upon during the period 2013-2014 via a COBSEA executed project entitled ‘Strengthening the Resilience of Coastal Communities, Ecosystems and Economies to Sea-Level Rise and Coastal Erosion’. It aimed to strengthen the resilience of coastal ecosystems, communities, local and national economies to the adverse impacts of sea-level rise and coastal erosion in Cambodia, Indonesia, Philippines, Thailand and Vietnam. Key outcomes of this project were National Assessment Reports on coastal vulnerabilities due to coastal erosion, including mapping existing policies, legal and institutional mechanisms and past, current and planned interventions. The reports, which identify gaps and needs relevant for addressing coastal erosion at national and sub-national levels, were used as basis for the development of ‘national roadmaps’ and identified priorities for action that will be implemented by governments and/or by follow-up projects. The reports include a menu of specific pilot interventions identified as priorities for action to address the gaps and needs of the country. This work will be drawn upon in updating the Transboundary Diagnostic Analysis and revised Strategic Action Programme. Analysis of work conducted by other development partners and donors, including Conservation International, WWF, and bilateral agencies indicates that little work has been done in areas of the South China Sea over the past 5-7 years given the large focus of coastal and marine environment management initiatives in the Asia-Pacific region on areas of the so-called Coral Triangle.

## **2.7. Linkages with other GEF and non-GEF interventions**

346. This project is an outcome of the UNEP/GEF project entitled “Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand” (the SCS project) that was operational from 2002 to 2008. Specifically it builds upon the institutional and operational network established during that project to implement the regional Strategic Action Programme and associated National Action Plans that were also developed and approved during the course of the SCS project. The SAP itself may be viewed as an operational level, intergovernmental approved course of action that will serve to implement, in the South China Sea, the Sustainable Development Strategy for the

Seas of East Asia developed through the UNDP/GEF supported “Partnerships for Environmental Management of the Seas of East Asia” (PEMSEA), and the Declaration on the Code of Conduct for Parties in the South China Sea. Significantly, PEMSEA aims to establish Integrated Coastal Management arrangements for 25 percent of East Asia coastline by 2021. This present project will ensure that efforts are made regionally and nationally by the lead agencies to engage with PEMSEA in areas of joint planning, knowledge and information sharing, and political advocacy. Importantly, representatives of the PEMSEA Integrated Coastal Management sites will be invited to participate in regular meetings of the National Technical Working Groups to ensure planned activities at the SAP implementation sites are congruent with those of PEMSEA supported initiatives and that synergies can be best leveraged to achieve transformational change of national institutional arrangements and enabling environments needed to reverse environmental degradation trends in the South China Sea marine basin. It is important to note however, that of the 16 PEMSEA Integrated Coastal Management (ICM) sites to be operationalized in China, Indonesia and Philippines under the Sustainable Development Strategy for the Seas of East Asia none are located in coastal areas of the South China Sea. Of the six participating countries in the present project, only two, namely Cambodia and Vietnam, will be addressing the operationalization of ICM approaches in areas of the South China Sea. The present project will add value to this process, specifically through targeted activities to build upon the transboundary cooperation in coastal and marine resource management between Vietnam (Kien Giang province) and Cambodia (Kampot province) fostered during SAP formulation. It is also relevant to note there are presently no plans for the operationalization of ICM approaches in Thailand<sup>58</sup>. The present project will also fill a significant gap in this regard through targeted actions to address habitat and environmental degradation trends in the western Gulf of Thailand which is of high transboundary significance from the perspective of livelihoods and food security. PEMSEA has also piloted the application State of Coasts reporting albeit for only 4 provinces in the East Asian Seas region, with only one produced almost a decade ago being focused on a coastal province of the SCS. The activities of the present project in monitoring and reporting on coastal habitat areas and land-based pollution hotspots will provide contemporary and regionally comparable information and data for possible future use in the broader application of State of Coast reporting in the region. To ensure effective collaboration between PEMSEA and efforts to implement the SCS SAP, the regional executing agency for this project will explore the formalization of an agreement with PEMSEA aimed at: (a) guiding effective joint planning of project activities, particularly in Vietnam and Cambodia where ICM is being operationalized along the SCS coast; and (b) in promoting the uptake of information, knowledge products and best practices generated through SAP formulation and implementation in future strategy development for the broader ‘Seas of East Asia’.

347. The project will be managed on a day-to-day basis by a SAP Implementation Unit, hosted by SEAFDEC and actions will therefore be closely co-ordinated with the Fisheries Refugia Project Coordinating Unit hosted also by SEAFDEC. Outcomes will be reported to the periodic intergovernmental meetings of COBSEA member countries and to ASEAN member states through the ASEAN Working Group on Coastal and Marine Resources. This project addresses the habitat, pollution, economic valuation and regional co-ordination components of the SAP, whilst the fisheries section of the SAP or more specifically the development of the regional system of refugia has been prepared as a separate GEF project with more restricted participation. It is anticipated that there will be cross representation between the regional fisheries working groups established under that project and the Regional Scientific and Technical Committee established under this project to ensure that the refugia identified and developed in each country take into account biodiversity considerations and vice versa. As the GEF Implementing Agency for both projects UNEP will ensure that at a management

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<sup>58</sup> It was identified during project preparation that ICM sites will be operationalized by PEMSEA in coastal areas of the South China Sea in only 2 of the 6 countries participating in the present initiative

level there is day-to-day contact between the SAP-IU and PCU in SEAFDEC as the regional GEF executing agency for both projects.

348. Whilst this project forms the primary mechanism for regional co-ordination of the implementation of the Strategic Action Programme for the South China Sea it is anticipated that national level actions will be undertaken at priority sites and that these will be supported through a variety of mechanisms including: national recurrent budgets; financial assistance from bilateral and other assistance agencies; and individual actions supported through the Small Grants Programme (SGP) of the GEF. During the final phase of its implementation the Project Co-ordinating Unit for the SCS developed in close consultation with the management of the Small Grants Programme of the GEF a joint mechanism to support community interventions in priority areas identified in the SAP. It is anticipated that these interventions will be linked through national and regional activities to the activities undertaken in the framework of this project.

349. In Cambodia, project activities will be closely aligned with IUCN projects investigating coastal habitat zonation and marine mammal usage of Cambodia's coastal habitats. A UK Darwin supported initiative focusing on the strengthening of capacity for management of Marine Protected Areas will be engaged, with opportunities for collaboration and learning exchanges with national-level fisheries *refugia* activities explored. Whereas in Indonesia, linkages have been established with the "Coral Reef Rehabilitation and Management Program-Coral Triangle Initiative (COREMAP-CTI) project which has project activities on the South China Sea coast of Indonesia. In the Philippines, a GEF funded biodiversity project focusing on the strengthening of nation-wide capacity for management of Marine Protected Areas will be engaged, with opportunities for collaboration and learning exchanges with national-level fisheries *refugia* activities explored.

350. Similarly in Thailand, the project will be linked to the implementation of the master plan of marine fisheries management of Thailand to prohibit encroachment within 3 mile from shoreline by trawl fisheries; and implementation of the master plan of marine fisheries management of Thailand to support local government agencies and strengthen community organizations in coastal fisheries management. In Viet Nam the project will be linked to the large nation-wide programme entitled "Investigation of biodiversity, fisheries resources and planning of marine protected areas in Vietnam".

351. While it was recognized during project preparation that no activities of the GEF supported PEMSEA initiative are planned in areas of the priority sites to be addressed by this present project, efforts would be made regionally and nationally by the lead agencies to engage with PEMSEA in areas of joint planning, knowledge and information sharing, and political advocacy. Importantly, representatives of the PEMSEA Integrated Coastal Management sites will be invited to participate in meetings of the national planning bodies of this project to ensure that planned activities are congruent with those of PEMSEA supported initiatives and that synergies can be best leveraged to achieve transformational change of national institutional arrangements and enabling environments needed to reverse environmental degradation trends in the South China Sea marine basin. Additionally, the best practices and lessons learned from the related UNEP/GEF fisheries *refugia* management project will, where applicable, be used to inform the update of the Strategic Action Programme for the South China Sea and the National Action Plans for coastal habitats and land-based pollution management to be undertaken as part of this initiative.

352. The project will actively engage in global knowledge sharing through IW:LEARN/LME:LEARN and set aside one percent (1%) of the GEF project budget from Component 3 to support IW:LEARN activities, such as setting up and running a project website consistent with IW:LEARN guidance; participation of project staff in IW Conferences and relevant regional conferences; and production of at least three IW Experience Notes.

353. The project fits within and complements the objectives and expected outcomes of the Programme Framework for 2014-2017 and its Ecosystem Management Sub-Programme (EMSP)

which seeks to secure the long-term provision of sustainable and equitable ecosystem services for human wellbeing through ecosystems that are functional and resilient to anthropogenic and natural impacts by catalyzing enabling conditions for the integration of the ecosystems approach into development planning in the wider landscape and seascapes.

354. The project will further catalyze the use of the ecosystem approach that integrates the management of land, water and living resources to conserve biodiversity and sustain natural capital for sustainable development and improved human wellbeing as articulated in Decision V/6 of the Convention on Biological Diversity; building on participatory approaches including the use of UNEP's convening power to work with governments and key stakeholders. In particular, this project is complementary to EA (B) looking at increasing the use of ecosystem management approaches in countries to sustain ecosystem services from coastal and marine systems and PoW 321 looking at developing and testing methodologies, tools and global and regional policy frameworks that apply the ecosystem approach to sustain coastal and marine ecosystem services and productivity in particular food provisioning.

### **SECTION 3: INTERVENTION STRATEGY (ALTERNATIVE)**

#### **3.1. Project rationale, policy conformity and expected global environmental benefits**

355. This project builds on activities funded via the GEF Project entitled “*Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand*” that was completed in December 2008. During the preparation for and implementation of that project, the participating countries developed an epistemic community of scientists and government officers having a shared understanding of the environmental problems of the South China Sea and of the approaches and interventions necessary to reverse current degradation trends. The problem analysis contained in the TDA was agreed at the regional level and refined and amplified during the operational phase of the SCS project hence the problems and their potential solutions are clearly understood by all stakeholders. The costed and targeted programme of actions contained in the Strategic Action Programme was endorsed at the intergovernmental level. This project will serve to implement the SAP at the regional level.

356. What is lacking at the moment is a regional, long-lasting more formal arrangement to ensure continued implementation of the SAP and its periodic revision. A primary anticipated output of the present project will be to put in place a regionally approved more formal and long-lasting arrangement for the continued implementation of the SAP beyond the life-span of the project, including an appropriate instrument for regional co-operation and an approved mechanism to foster and maintain that co-operation. This approach is aligned with the GEF-5 International Waters Strategic Priority 2: Catalyze multi-state cooperation to rebuild marine fisheries and reduce pollution of coasts and Large Marine Ecosystems (LMEs) while considering climatic variability and change, and will contribute specifically to the achievement of the following International Waters focal area outcomes:

- Outcome 2.1: Implementation of agreed Strategic Action Programmes (SAPs) incorporates ecosystem-based approaches to management of LMEs, ICM principles, and policy/legal/institutional reforms into national/local plans
- Outcome 2.2: Institutions for joint ecosystem-based and adaptive management for LMEs and local ICM frameworks demonstrate sustainability
- Outcome 2.3: Innovative solutions implemented for reduced pollution, rebuilding or protecting fish stocks with rights-based management, ICM, habitat (blue forest) restoration/conservation, and port management and produce measurable results

- Outcome 2.4: Climatic variability and change at coasts and in LMEs incorporated into updated SAP to reflect adaptive management and ICM principles (including protection of “blue forests”)

357. The project will also indirectly contribute to two GEF-5 Biodiversity Strategic Objectives, namely Strategic Objective 1 which focuses on improving the sustainability of Protected Area Systems, and Strategic Objective 2 which focuses on mainstreaming biodiversity in production landscapes/seascapes and sectors.

358. The project will make significant contributions toward the achievement of the Aichi biodiversity strategic goals and targets. The project is closely aligned with Aichi Strategic Goal A ‘Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society’. Project activities associated with the development of management plans for priority coastal habitat sites, the updating and adoption of national investment plans for land-based pollution, and the revision of the Transboundary Diagnostic Analysis and Strategic Action Programme for the South China Sea will make significant contributions to Aichi Targets 1, 2 and 4.

359. The projects targets associated with the reducing the rate of degradation of coastal habitats and the management of land-based pollution are aligned squarely with Aichi Strategic Goal B ‘Reduce the direct pressures on biodiversity and promote sustainable use’. For example, the projects aims to establish appropriate forms of management for 860,000 ha of mangrove, sustainably manage 153,000 ha of coral reef, conserve 25,900 ha of coral reefs and establish integrated management of 783,900 ha of coastal wetlands (lagoons, estuaries, tidal flats, and peat and non-peat swamps). This will make a significant global contribution to Aichi Targets 5, 8 and 10. The targeted reduction in the decadal rate of live coral cover across 83 priority coral reef sites from 16 percent to 5 percent represents a globally significant contribution to Aichi target 10 relating to the reduction of anthropogenic pressures on coral reef ecosystems.

360. A key guiding principle for the project identified during preparation, and outlined in the intervention strategy section of the Project Document, is the ‘Application of Marine Spatial Planning in Strategic Action Plan Implementation’ and is based firmly on: (a) the outcome document of Rio+20, entitled “The Future We Want”, in which world leaders reaffirmed the importance of area-based conservation measures, including marine protected areas, as a tool for the conservation of biological diversity and the sustainable use of its components; and (b) Aichi Biodiversity Target 11, which states that by 2020, 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are to be conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures.

361. In this connection, project activities focused on establishing marine protected areas and other area-based conservation measures, and the effectiveness of management at these sites, will be undertaken within the broader, multi-sectoral planning context that Marine Spatial Planning approaches provide. This will improve collaboration amongst multiple users of the marine environment as a means to conserve marine and coastal biodiversity while at the same time addressing human needs, including livelihood considerations across coasts around estuaries and coral reefs, in near shore lagoon environments and mangroves and seagrass habitats. Accordingly, the project is aligned closely with the Aichi Strategic Goal C ‘To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity’.

362. Coastal communities bordering the South China Sea are at the highest risk globally from the effects of continued degradation of the coastal and marine environment due to a high level of dependence on the goods and services of coastal ecosystems for nutritional security and livelihoods. The project is closely aligned with Aichi Strategic Goal D ‘Enhance the benefits to all from biodiversity and ecosystem services’. A key guiding principle identified during preparation, and

outlined in the intervention strategy section of the Project Document, is ‘Facilitating Gender Mainstreaming in SAP Implementation’ which will ensure that considerations of women, men and vulnerable social groups are mainstreamed into project activities at all levels. Importantly, analyses of needs and the planning of management actions will ensure the equitable distribution of the benefits resulting from the restoration and safeguarding of ecosystems. Similarly, the project will result in significant levels of protection and restoration of ‘blue forests’, sustaining and increasing the capacity of these ecosystems to store carbon. Accordingly, the project will contribute to the achievement of Aichi targets 14 and 15, respectively.

363. The project is also aligned with Aichi Strategic Goal E ‘Enhance implementation through participatory planning, knowledge management and capacity building’. In the South China Sea, considerable pressures on coastal resources to sustain and increase GDP, complex socio-economic circumstances, and at times unstable political economies make locally-driven solutions to key issues influencing coastal sustainability and resilience a necessity. Institutional reform and mechanisms put in place by the project for the integration of communities in planning and decision-making will make a substantial contribution from the field of coastal and marine environmental management in East Asia to Aichi Target 18. This SAP implementation initiative will also invest in developing the knowledge and human capital for science-based planning and the scaling-up of efforts to reduce environmental degradation rates and in doing so contributes to the achievement of Aichi Target 19.

364. The project will also make substantial contributions towards the achievement of the Sustainable Development Goals, specifically: (a) **Goal 1**: End poverty in all its forms everywhere – by ensuring that all men and women, in particular the poor and the vulnerable, have equal rights to natural resources, and by building the resilience of the poor and those in vulnerable situations via reducing their vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters; (b) **Goal 12**. Ensure sustainable consumption and production patterns – by contributing to the achievement of the sustainable management and efficient use of natural resources, and by supporting developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production; and (c) **Goal 14**. Conserve and sustainably use the oceans, seas and marine resources for sustainable development – by efforts aimed at sustainably managing and protecting marine and coastal ecosystems, conserving at least 10 per cent of coastal and marine areas, and by enhancing the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of ‘The Future We Want’.

365. At the regional level, the project is aligned with COBSEA’s Strategic Direction which focusses on the following thematic areas: i) marine and land based pollution; ii) coastal and marine habitat conservation; and iii) management and response to coastal disasters. This project will directly support and contribute to these thematic areas as well as to COBSEA’s regional strategic approach which is built on the four operative and interlinked components: a) information management (including state of the marine environment); b) national capacity building (including knowledge and experience transfer); c) strategic and emerging issues (especially those that will emerge as affecting or being affected by environment and ecosystems changes and their respective response measures); d) regional cooperation. Hence, this project’s objectives and activities will directly contribute to UNEP’s regional priorities.

366. The global environmental benefits derived from successful achievement of the targets of the SAP can be measured in terms of the areas of critical coastal habitats placed under sustainable management or more restricted uses in marine protected areas; and the numbers of species that these systems continue to support. For example, if the current rate of mangrove loss of 1.6% per annum can be halted or even reduced by 50%, and the decadal rate of loss in live coral cover can be reduced from 16% to 5% as specified in the targets of the SAP, then significant global environmental benefits will

be achieved in the sense that significant losses of biodiversity will have been avoided. Similar losses will be avoided in the case of seagrass although as a consequence of the inadequate data and information base it is not possible to quantify the benefits in a comparable manner. Avoidance of any such losses of habitats at the global centre of shallow-water marine biological diversity represents a significant if unquantifiable global environmental benefit. The following nine (9) guiding principles and strategic considerations for the project were identified during the project's conceptualisation and preparation phases:

367. **(i) Catalysing Community Action via Locally Driven Solutions:** The Transboundary Water Assessment Programme has recently confirmed the well-known challenges communities of the South China Sea face in fashioning sustainable futures (IOC-UNESCO and UNEP, 2016). These include high levels of dependence on natural resources for nutritional security and livelihoods, a disproportionately high percentage of the world's population residing in coastal areas of the basin, and a highly variable environment characterised by numerous coastal hazards. The above combined with considerable pressures on coastal resources to sustain and increase GDP, complex socio-economic circumstances, and at times unstable political economies make locally-driven solutions to key issues influencing coastal sustainability and resilience a necessity. Of particular note are the complex land and marine tenure systems and institutional relationships between national and community-based governance structures. While the participating countries have largely adopted western-style constitutions and legal systems, such community-based governance and leadership arrangements remain highly influential at all levels. Accordingly, the participation of civil society organisations and community leaders in development planning is essential to increase the local relevance of management actions and their results, particularly within the context of SAP implementation.

368. **(ii) Resolving Problems by Negotiating Outwards:** This principle seeks to guide problem solving or imbalances within and between jurisdictions by allowing discussions to facilitate consensus building at one level and working towards the mainstreaming of agreements or decisions by larger entities or jurisdictions, at for example the country and/or regional levels. The implementation of this principle provides each jurisdiction the necessary freedom to define the nature of its activities to meet local needs and explore opportunities which may be unique to particular a location or municipality for example. Inherent in the approach is the philosophy of cross-sectorial coordination in the planning and management associated with, for example, the balancing of coastal livelihoods and biodiversity conservation or convincing provincial planners of the importance of mangroves from a hazard risk reduction perspective rather than swamplands suitable only for conversion for coastal infrastructure development or the expansion of coastal aquaculture. The approach also acknowledges the need for more 'community to cabinet' type planning which fosters the integration of communities, stakeholders within cross-sectorial planning frameworks. The approach overall emphasizes the effective engagement and participation of stakeholders in the planning, implementation, and monitoring and evaluation of initiatives aimed at fostering integrated approaches to natural resource and environmental management<sup>59</sup>.

369. **(iii) Facilitating Gender Mainstreaming in SAP Implementation:** Assessing the different implications of project activities, consultative processes, management decisions, and policy reforms for women, men and vulnerable social groups is central to mainstreaming gender. Valuing the diversity among these groups involves the process of integrating their different needs into development planning and decision-making process. It is an attempt to take gender equality and social inclusion issues into the 'mainstream' of the project's results framework and activities. Given the anticipated results of this project in terms of environmental stress reduction, improvement in

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<sup>59</sup> Such approaches are equivalent to the 'horizontal integration' of separate economic sectors and 'vertical integration' of associated units of government used in the coastal area management literature (e.g. Pernetta and Elder, 1993; Sorenson, 1997)

environmental state and associated livelihood and nutritional security benefits, it is critical that decisions on planning issues and the design of management measures are arrived at through the participation of men and women, and ensure the equitable distribution of the resulting benefits. Improving gender and diversity mainstreaming means increasing attention to gender perspectives and the goal of gender equality, and strives to enhance the appropriate inclusion of women and men at all levels. To ensure best practice in this area, this project will: advance gender equality and social inclusion (gender awareness); balance women and men's participation in decision-making; reflect the different roles and responsibilities of men and women and the different values they may hold; strive for inclusiveness, cooperation and partnerships; document how gender and diversity issues were made central to project implementation; and provide for appropriate gender mainstreaming opportunities at all levels (planning, management, and monitoring and evaluation).

370. **(iv) Application of Marine Spatial Planning in SAP Implementation:** In the outcome document of Rio+20, entitled “The Future We Want”, world leaders reaffirmed the importance of area-based conservation measures, including marine protected areas, as a tool for the conservation of biological diversity and the sustainable use of its components. They noted Aichi Biodiversity Target 11, which states that by 2020, 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are to be conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures. It has been identified that much of the success in this effort from a biodiversity perspective will depend on the degree to which these protected areas are situated within a broader, multi-sectoral planning context. The GEF Council has identified that marine spatial planning represents an important step in improving collaboration amongst multiple users of the marine environment as a means to conserve marine and coastal biodiversity while at the same time addressing human needs, including livelihood considerations across coasts around estuaries and coral reefs, in near shore lagoon environments and mangroves and seagrass habitats. In addressing such issues in the South China Sea, this SAP implementation initiative will apply a marine spatial planning approach for reconciling sectoral interests while balancing biodiversity considerations. Specifically the approach will draw on recommendations and guidance on marine spatial planning promoted by the Secretariat of the Convention on Biological Diversity and the GEF’s Scientific and Technical Advisory Panel.

371. **(v) Supporting Results Oriented Planning and Action:** The need for results-based approaches to the management of development assistance programmes and projects has received recent high-level recognition. In adopting the Paris Declaration on Aid Effectiveness in 2005, national government Ministers responsible for development from both developed and developing countries joined with Heads of multilateral and bilateral development institutions in committing to “work together in a participatory approach to strengthen country capacities and demand for results-based management”. This commitment was reaffirmed in the 2008 Accra Agenda for Action which called for accelerated progress on aid effectiveness by better demonstrating the results of development efforts and openly accounting for them. The Southeast Asian region and its development partners have responded accordingly. The region’s leaders have called for more results-oriented approaches to development in many regional and global fora across a range of sectors, including the environment. Similarly, Southeast Asia’s multilateral and bilateral development partners and donors, including inter alia the Global Environment Facility, the European Commission, and the development aid agencies of Australia, New Zealand and the United States of America are guided by their own results-based management policies. This project will foster a results oriented approach to SAP implementation and will develop an innovative approach to align SAP implementation results reporting with Sustainable Development Goals targets.

372. **(vi) Integrating Climate Variability and Change Considerations in National and Regional Planning:** Coastal communities of the South China Sea riparian countries live in and

continuously adapt to dynamic and often difficult climatic environments. Shallow tropical marine environments such as the coastal areas of the South China Sea are inherently vulnerable to the extremes of climate variability, and this vulnerability has compelled East Asia's coastal communities over time to build a level of resilience to extreme weather events. However today, population growth and social changes have created a situation where many communities are far less prepared for the floods, extended droughts, and storms that remain an ongoing feature of the region. In this regard, the uncertainty and extremes of climate variability compound and exacerbate the social and economic challenges faced by coastal communities of East Asia. Large-scale features such as the Inter-tropical Convergence Zone and the West Pacific Monsoon drive the seasonal variations in rainfall experienced by Pacific Island Countries, including wet and dry seasons. Together, they influence rainfall, winds, tropical cyclones, ocean currents and other aspects of the weather and climate. While these features drive the wet and dry seasons experienced annually in most of the riparian countries of the South China, the single greatest factor affecting climate variability from year to year is the El Niño/La Niña Southern Oscillation, or ENSO. This cycle of warming and cooling of sea surface temperatures of the Western Pacific has a profound effect on the hydrological cycle of East Asian countries, driving periods of drought and elevated rainfall across the region. The effects of the ENSO cycle are not restricted to drought. It is also a driver of periods of elevated rainfall and rainfall intensity, and plays a role in both suppressing and stimulating the propagation and severity of tropical cyclones, all of which have significant impacts on the people and economies of coastal communities. However, while regional understanding of climate variability and change has improved considerably over the past years, this improvement has not translated into a corresponding increase in community resilience. This SAP implementation project will address this imbalance through targeted efforts to integrate climate variability and change considerations into national action planning and the revision of the costed Strategic Action Programme for the South China Sea.

**373. (vii) Investing in Knowledge and Human Capital:** Support for country capacity development is an integral part of the GEF, with a focus on strengthening the capacities of countries to manage their priority environmental issues and contribute to global environmental benefits. It has also been identified by Southeast Asia leaders as a priority concern and was reflected in the 1999 framework Strategic Action Programme (SAP) and the inter-governmentally endorsed 2008 SAP for the South China Sea. Over recent years the GEF has provided the participating countries with support to conduct a National Capacity Self-Assessment of national capacity needs and to develop capacity action plans. These assessments and plans identified the need for capacity development to: improve the harmonization sectoral legislation and governance frameworks to support integrated management approaches; make timely and cost effective use of financial resources available to the environment and natural resource sectors; enhance research and monitoring capabilities, including strengthened national data and information systems; strengthen human resource capabilities and retain skilled practitioners; improve institutional coordination; and to enhance awareness of priority threats to national significantly coastal areas, particularly from the perspective of the risks coastal communities face as a result of continued degradation of the coastal and marine environment. This SAP implementation initiative will address these needs via a regionally coordinated programme of investments in building the knowledge base for planning, action, and monitoring and evaluation.

**374. (viii) Effectively Communicating the Benefits of Integration and Lessons Learned:** Global experience in integrated natural resource and environmental management has shown that efforts to promote integrated approaches to natural resource and environmental management are initially vulnerable fledglings when introduced at national and sub-national units of government, and as such, at the mercy of the bureaucratic pecking order. In order for efforts to survive and grow, national-level leaders of such processes need to be able to effectively communicate the benefits of such integrated approaches across a broad range of government agencies and local institutions in order to convince government and community leaders that it is in their self-interest to voluntarily coordinate across areas such as: (1) policy and development planning; (2) investment in efforts to reduce stress

on natural resources and improve environmental state; and (3) strengthening community engagement in management. Effective communications and use of the media has been identified by various evaluations as being an essential element of success in stimulating reform, specifically through awareness raising, stimulating support for necessary policy and legal reforms, and for global outreach with development partners and donors. This SAP implementation initiative will adopt innovative approaches, including strong linkages with GEF:IWLEARN and LME:LEARN, in ensuring that best practices generated through national management interventions and national and regional policy development process are captured, shared and effectively communicated to best guide the longer-term sustainability and scaling-up of investments.

375. **(ix) Promoting Public-Private Partnerships:** Policy-makers of the Southeast Asian region increasingly recognize the importance of the private sector in the sustainable development of coastal communities, particularly from the perspective of the growing need for commercially viable activities that simultaneously deliver local and global environmental benefits. While it is acknowledged that the priorities of the public and private sectors are often quite different, this project promotes the development of public-private partnerships aimed at leveraging their respective interests for innovation and impact. This is considered central to the financial sustainability of the programmatic approach of this initiative, particularly from the perspective of coordinated investment in national action plan implementation and the updated Strategic Action Programme for the South China Sea to be developed through this initiative. A consultative approach to identifying opportunities for private sector investment will be adopted, including regional investment forums to facilitate cooperation with the private sector and donors on investment in SAP implementation.

### **3.2. Project goal and objective**

376. The overall goals of this project are:

- to maintain an environment at the regional level, in which collaboration and partnership in addressing environmental problems of the South China Sea, between all stakeholders, and at all levels is fostered and encouraged;
- to enhance the capacity of the participating governments to integrate environmental considerations into national development planning;
- to strengthen and expand the network of scientists, government officials and civil society established under the UNEP/GEF SCS Project.

377. The medium term objective of the project is to assist the governments of the participating countries in meeting the targets of the approved Strategic Action Programme through the provision of technical assistance as required in implementing national activities in support of the SAP; and the provision of strong regional co-ordination of the process of SAP implementation.

### **3.3. Project components and expected results**

#### **Component 1. Reducing habitat degradation and loss via national and local reforms to achieve Strategic Action Programme targets for coastal habitat management in the South China Sea**

378. This component will result in: appropriate forms of sustainable management established for 860,000 ha of mangrove; 153,000 ha of coral reef at 82 priority sites managed sustainably, including a reduction in the decadal rate of degradation in live coral cover from 16 to 5%; conservation, management and sustainable use of 25,900 ha of known seagrass area in the South China Sea; integrated management of 783,900 ha of coastal wetland at 19 sites, including habitat restoration and protection strengthened at priority locations; and national and regional level cooperation in tracking results of SAP actions for coastal habitat management. Importantly, the operationalization of management measures at each of the priority mangrove, coral reef, seagrass and wetlands sites will be

undertaken within a broader Marine Spatial Planning framework. The aim of which is to facilitate: multi-objective planning which recognises the connections between land, freshwater and marine ecosystems, and human uses and impacts in each of these systems; the promotion of ecosystem approaches in the forward thinking planning of human uses and non-uses in the marine environment, followed by the implementation of these plans; and the strengthening of institutional and legal frameworks to enable improved cross-sectorial and multi-stakeholder participation in coastal and marine environmental and resource management. The package of environmental stress reduction and habitat protection measures to be implemented as part of component 1 represents a globally significant test of Marine Spatial Planning approaches that will yield many lessons for the management of other shallow water marine basins and large marine ecosystems. Significantly, the embedding of activities under this component to operationalize the monitoring and evaluation of the results of the project's habitat management measures will assist in building knowledge of the realities of implementing Marine Spatial Planning approaches. Each of the outcomes to be delivered through Component 1 of the project are outlined below.

### **Outcome 1.1 Appropriate forms of sustainable management established for 860,000 ha of mangrove by Yr 5**

379. Information relating to the management of mangrove areas in the six participating countries is presented in Table 18. Five 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 development 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" that accounts for 10,000 hectares.

**Table 18** Estimated Areas (rounded to three significant figures) of South China Sea Mangrove under Different Forms of Land-use Designation and Management (based on Vo et al., 2013)

	Cambodia	China	Indonesia	Philippines	Thailand	Viet Nam	Total	%
Total area (ha)	72,400	23,400	934,000	28,000	62,600	157,000	1,280,000	100
Production forest	0	0	611,000	0	1,600	18,000	631,000	49
Conversion	0	0	165,000	0	0	0	165,000	13
Parks & Protected Areas (Conservation) non-extractive use	13,600	15,800	158,000	27,100	11,500	20,000	246,000	19
Non-use of mangrove but extractive resource use (fish, crabs etc.)	58,800	7,670	0	942	39,500	119,000	226,000	18
Private land, unregulated use	0	0	0	0	10,000	0	10,000	0.8
Area currently under management Regulated in laws/regulations	13,600	15,800	769,000	27,100	11,500	155,000	992,000	78
Areas estimated as currently under sustainable management <sup>60</sup>	13,600 8,820	15,800 1,000 <sup>61</sup>	158,000 100,000	26,000	11,500 1,600	20,000 18,000 46,600	421,000	33

<sup>60</sup> Areas considered as currently being sustainably managed include all lands designated as production forest as 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.

<sup>61</sup> Estimated area outside the protected area for which some form of management plans exist.

380. Table 18 illustrates the complexity of management regimes in the countries concerned but does not provide a mechanism for objectively determining the effectiveness of these regimes. For example, in Cambodia, 49% of mangroves 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 currently being sustainably managed. The assumption is that because access to, and use of, this area is restricted, the management is sustainable. In contrast, 51% of Cambodia's mangrove are currently not regulated under the law and are subject to extraction of non-timber resources but not the mangroves themselves. Of this area, only 8,820 ha are considered as being exploited in a sustainable manner. The SAP target for Cambodia is therefore to ensure that all mangroves outside the legally protected Parks and Protected Areas are used in a sustainable manner. Targets developed by the Regional Working Group on Mangroves for the mangrove component of the Strategic Action Programme are presented in Table 19 below. The target for enrichment planting to increase mangrove biodiversity, for example, was included following lengthy consideration by the RWG-M of the results of largely single-species mangrove reforestation initiatives in the region over recent decades.

**Table 19** Strategic Action Programme targets [proposed areas in hectares to be subject to changes in designation and/or management regime] for future mangrove management

	Cambodia	China	Indonesia	Philippines	Thailand	Viet Nam	Total	% of total area of mangrove
Area to be transferred to National Parks and Protected Area status	0	5,330	20,000	631	1,400	30,000	57,400	4.5
Non-conversion of mangrove but sustainable use	0	0	165,000	0	1,600	0	166,600	13.1
Improved management relating to sustainable use	49,900	0	490,800	2,000	10,000	50,000	602,800	47.2
Replanting of deforested mangrove land	2,500	500	0	2,000	8,000	8,000	21,000	1.6
Enrichment planting to increase mangrove biodiversity	0	5,000	0	1,000	3,200	2,000	11,200	0.9

381. In preparation for implementation of the mangrove activities of the SAP, comprehensive site characterization information and data were compiled to establish detailed baselines for the 26 mangrove sites identified as priority locations for management within the framework of SAP implementation. These site characterisations contain geographical coordinates, information on the physical environment, environmental state information, socio-economic and resource use information, biological data, and information on the status of existing management at these sites. These baseline assessments of the sites have been made accessible online at <http://gis.unepscs.org><sup>62</sup>. A supporting meta-database of the data used to establish the baselines has also been developed as a preparatory activity. A summary of information at the 26 sites is presented in Table 20. Detailed national reports on the status and trends in mangroves and mangrove management were also published in preparation for SAP implementation<sup>63</sup>.

<sup>62</sup> Alternatively, Google Earth users can access the baseline site characterisations via the following link:  
<http://www.unepscs.org/google/South-China-Sea-Project.kmz>

<sup>63</sup> Accessible online at [http://www.unepscs.org/South\\_China\\_Sea\\_National\\_Reports/](http://www.unepscs.org/South_China_Sea_National_Reports/)

**Table 20** Selected physical and biological properties and variables for the 26 priority mangrove sites for management within the framework of Strategic Action Programme implementation. (M = data unavailable)

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

382. Accordingly, national level activities of this project will focus on the declaration of 57,400 ha of mangrove as National Parks and Protected Areas, the designation and plans for the management of 166,600 ha of mangrove as non-conversion, sustainable use areas, national reform of laws and regulations for the sustainable use of 602,800 ha of mangrove forest, replanting of 21,000 ha of deforested mangrove land and biodiversity increased for 11,200 ha of mangrove forest via enrichment planting.

383. The project also aims to support these national actions through a regionally co-ordinated programme of technical support; the objective of which is to assist countries in effectively and sustainably managing their mangrove resources. This will include periodic national and regional meetings of mangrove specialists, and local and central government officials that will ensure the integration of sound science into policy making and management decision making, and foster cost effective strategic actions that enhance regional cooperation.

384. It will also involve furthering the knowledge of government officials, managers and stakeholders regarding the functions, value and approaches to sustainable management of mangrove ecosystems will be further strengthened through regional mechanisms such as continued information exchange via the World Wide Web; study tours and visits; periodic meetings and targeted training activities; and the development and dissemination of the necessary materials for use at all levels in promoting knowledge and awareness of sustainable mangrove management practices. Activities designed to provide the sound scientific and technical basis for sustainable management of mangrove ecosystems at the regional level include: the development of guidelines and other tools as information resources; facilitation of their regional dissemination and adoption by mangrove managers; and applied research concerning the sustainable management and monitoring of mangroves ecosystems. Specific project targets for Outcome 1.1 are summarized in Table 21.

**Table 21.** Baselines, targets and project indicators for Outcome 1.1

Baselines	Targets	Indicators
14 percent (246,122 ha) of mangrove area in SCS presently managed as national park or protected area	1.1.1 Declaration of 57,400 ha of mangrove as National Parks and Protected Areas	Total area (ha) of mangrove designated as national park or protected area
13 percent (225,512 ha) of mangrove area in SCS presently managed as non-conversion, extractive resource use areas (fish, crabs etc.)	1.1.2 Designation and plans for the management of 166,600 ha of mangrove as non-conversion, sustainable use areas	Status of endorsement of management plans Total area (ha) of mangrove under management plan for sustainable use
Legal frameworks to enable sustainable management of an estimated 56 percent of mangrove area in the SCS	1.1.3 Reform of laws and regulations for the sustainable use of 602,800 ha of mangrove forest	Total area (ha) of presently unmanaged mangrove for which regulations/ordinances are adopted to enable sustainable management
Decadal rate of loss of total mangrove area from SCS is estimated at 16 percent	1.1.4 Replanting of 21,000 ha of deforested mangrove land	Total area (ha) of deforested mangrove land rehabilitated
Predominantly single-species mangrove reforestation initiatives over recent decades have compromised biodiversity and hazard risk reduction potential of rehabilitated mangrove areas	1.1.5 Biodiversity increased for 11,200 ha of mangrove forest via enrichment planting	Measures of ecological & environmental indicators at enrichment planting sites: forest cover; number and diversity of true mangrove species; and size and abundance of Scylla spp and Sesarma spp

**Outcome 1.2 153,800 ha of coral reef at 82 priority sites managed sustainably by Yr 5, including a reduction in the decadal rate of degradation in live coral cover from 16 to 5%**

385. The characterisation of target coral reef sites bordering the South China Sea, including *inter alia* their legal status and the effectiveness of management was undertaken in preparing the coral reef component of the Strategic Action Programme. In the case of Cambodia, Indonesia, Malaysia and Thailand, the total coral reef area was estimated as being the same as the areas of targeted sites. The area of coral reefs in the 82 target coral reef sites is 217,000 ha (29% of the total area in the South China Sea excluding China) of which almost 100,000 ha (13% of the total area) at 61 sites was under management at the time of SAP development (Vo et al., 2013). In terms of management effectiveness, only around 16% of this area at thirteen sites was deemed as being successfully managed. Thirty seven percent of sites were considered to be moderately well managed (medium effectiveness) while, for 24% of the sites, management effectiveness is considered low and 23% have plans but no effective management.

386. The general status of coral reef management in the South China Sea geographic region was also assessed as part of SAP development preparation and is summarized in Table 22. This summary was prepared on the basis of the best available information for 82 individual coral reef areas compiled in the national reports on coral reefs<sup>64</sup>. The area identified by the RWG-CR to be added to the total area managed sustainably by the year 2015 was approximately 54,000 ha. This would increase the total area under sustainable management to 153,800ha which represents 20% of the total reef area of the South China Sea and 71% of the area of the target sites.

**Table 22** Status of Coral Reef Management in the South China Sea Biographic Region (based on Vo et al., 2013) (Figures for area rounded to three significant figures)

	Cambodia	Indonesia	Malaysia	Philippines	Thailand	Viet Nam	Total
Total coral reef area in the South China Sea (ha)	2,808	39,300	43,400	464,000	90,000	110,000	750,000
Total coral reef area of the 82 target sites	2,808	39,300	43,400	36,700	89,530	5,710	217,000
Coral reef area under existing management at the 83 sites	293	12,500	28,200	2,390	54,000	2,270	99,700
Number of target sites with management information	7	7	36	9	14	9	82
Number of target sites with effective management, plans only	6	3	0	1	5	4	19
Number of target sites with low management effectiveness	0	2	11	2	5	0	20
Number of target sites with medium management effectiveness	1	2	12	6	4	5	30
Number of target sites with high management effectiveness	0	0	13	0	0	0	13
Existing management types <sup>65</sup>	FMA, MPA, NP	MMA, MR	MP	PLS, MCDP, MTS, MBR, ECPZ	NP, MNP, NCA,	MPA, NP, CBM, WH	

<sup>64</sup> Accessible online at [http://www.unepscs.org/South\\_China\\_Sea\\_National\\_Reports](http://www.unepscs.org/South_China_Sea_National_Reports)

<sup>65</sup> Cambodia - FMA: Fisheries Management Area, MPA: Marine Protected Area, NP: National Park. Indonesia - MMA: Marine Management Area, MR: Marine Reserve. Malaysia - MP: Marine Park. Philippines - PLS: Protected Land/Seascape, MCDP: Municipal Coastal Development Plan, MTS: Marine Tourism Reserve, MBR: Man & Biosphere Reserve, ECPZ: Environmental Critical Protection Zone. Thailand - NP: National Park, MNP: Marine National Park, NCA: Navy Control Area. Viet Nam - MPA: Marine Protected Area, NP: National Park, CBM: Community-based Management, WH: World Heritage.

Target area to be added for management through SAP implementation	1,970	5,580	15,200	10,100	18,000	3,300	53,100
Total area to be under management following SAP implementation	2,260	18,100	43,400	12,500	72,000	5,570	154,000

387. Coral reef monitoring has expanded in most countries bordering the South China Sea during recent decades and has provided baselines for long-term coral reef management. The data obtained in the framework of the Global Coral Reef Monitoring Network (GCRMN) indicate that the percentage of reefs in Southeast Asian countries had declined in state from one quartile category to a lower one, equivalent to a decadal loss of 16%.

388. As part of setting the coral reef targets of the SAP, it was noted that setting a target for the total area under management did not represent a target for the state of the reef although it could be assumed that those under management would, depending on the management regime, be more likely to sustain their biological diversity than those that were not under management. Therefore, an additional target related to the reduction of the degradation rate was developed. Regional coral specialists involved in target setting agreed that improvement of coral reef management could feasibly support a reduced decadal degradation rate of coral reefs in the South China Sea from 16% to 5%, and that ongoing regional assessments of coral reef status will enable comparisons of degradation rates in future years.

389. Accordingly, the specific targets for coral reef management contained within the intergovernmentally endorsed Strategic Action Programme for the South China Sea are:

- at least 70% of the existing area of coral reefs in the 82 target coral reef sites (153,800ha) to be put under an appropriate form of sustainable management;
- reduce the regional decadal rate of degradation in live coral cover from the present rate of 16% to 5%.

390. In preparation for implementation of the coral reef activities of the SAP, comprehensive site characterization information and data were compiled to establish detailed baselines for the coral reef sites identified as priority locations for management within the framework of SAP implementation. These site characterisations contain geographical coordinates, information on the physical environment, environmental state information, socio-economic and resource use information, biological data, and information on the status of existing management at these sites. These baseline assessments of the sites have been made accessible online at <http://gis.unepscs.org><sup>66</sup>. A supporting meta-database of the data used to establish the baselines has also been developed as a preparatory activity. A summary of information at the 82 sites is presented in Table 23. As noted above, detailed national reports on the status and trends in coral reefs and coral reef management were also published in preparation for SAP implementation.

**Table 23** Management status of coral reef sites in the South China Sea

Country & Site Name	Area (ha)	Live Coral Cover (%)	Management legal status	Area under Management (ha)	Management Effectiveness <sup>67</sup>
<b>Cambodia</b>	<b>2,808</b>			<b>293</b>	
Koh Kong archipelago	73	47	Fisheries Management Area (FMA)		

<sup>66</sup> Alternatively, Google Earth users can access the baseline site characterisations via the following link: <<http://www.unepscs.org/google/South-China-Sea-Project.kmz>>

<sup>67</sup> **Categories of Management Effectiveness:** **Low:** Area declared or proposed to be declared for management; Management Plan developed and approved. **Medium:** Existing Management Framework is implemented with inadequacy of manpower, finance and/or equipment. **High:** Existing Management Framework is implemented with enough trained manpower, equipment, facilities and sustainable finance.

Koh Sdach archipelago	529	29	Proposed MPA		
Koh Rong archipelago	468	23	Proposed MPA		
Koh Takiev archipelago	293	58	National Park	293	Medium
Koh Tang archipelago	439	38	FMA		
Prek Ampil	953	53	FMA		
Koh Pouh archieplago	53	41	FMA		
<b>Indonesia</b>	<b>39,286</b>			<b>12,511</b>	
Anambas	6,255	52	Marine Management Area (MMA)	6,255	Low
Bangka	2,934	37	MMA	2,934	Medium
Belitung	2,271	52	MMA	2,271	Low
Karimata	1,041	53	Marine Reserve	1,041	Medium
Senayang Lingga	4,735	37			
Barelang dan Bintan	6,145	44			
Natuna	15,905	31			
<b>Malaysia</b>	<b>43,394</b>			<b>28,209</b>	
Pulau Redang	2,550		Marine Park	1,658	High
Pulau Lima	878		Marine Park	571	High
Pulau Ekor Tebu	812		Marine Park	528	High
Pulau Pinang	978		Marine Park	636	High
Pulau Perhentian Kecil	1,621		Marine Park	1,054	High
Pulau Perhentian Besar	1,824		Marine Park	1,186	High
Pulau Lang Tengah	1,230		Marine Park	800	Medium
Pulau Susu Dara	286		Marine Park	186	Medium
Palau Tenggol	480		Marine Park	312	Low
Palau Nyireh	288		Marine Park	187	Low
Pulau Kapas	427		Marine Park	277	Low
Pulau Tioman	5,023		Marine Park	3,265	High
Pulau Labas	896		Marine Park	582	Medium
Pulau Sepoi	891		Marine Park	579	Medium
Pulau Gut	904		Marine Park	588	Medium
Pulau Tokong Bahara	903		Marine Park	587	Low
Pulau Chebeh	898		Marine Park	584	High
Pulau Tulai	1,272		Marine Park	827	High
Pulau Sembilang	1,212		Marine Park	788	Low
Pulau Seri Buat	1,544		Marine Park	1,004	Low
Pulau Rawa	1,016		Marine Park	660	Medium
Pulau Hujung	1,047		Marine Park	681	Medium
Pulau Tengah	1,030		Marine Park	669	Medium
Pulau Besar	1,683		Marine Park	1,094	Medium
Pulau Tinggi	2,036		Marine Park	1,323	High
Pulau Aur	1,949		Marine Park	1,267	Low
Pulau Pemanggil	1,758		Marine Park	1,143	Low
Pulau Harimau	980		Marine Park	637	Medium
Pulau Gual	914		Marine Park	594	Medium
Pulau Mensirip	932		Marine Park	606	Medium
Pulau Sibu	852		Marine Park	554	High
Pulau Sibu Hujung	237		Marine Park	154	High
Pulau Mentinggi	880		Marine Park	572	High
Pulau Kuraman	1,339		Marine Park	870	Low
Pulau Rusukan Besar	894		Marine Park	581	Low
Pulau Rusukan Kecil	930		Marine Park	605	Low
<b>Philippines</b>	<b>464,000</b>			<b>2,390</b>	
Batanes	2,050	55	Protected Land/Seascape	40	Medium
Bolinao/Lingayen Gulf	9,560	40	Municipal Coastal Development Plans & National Park	750	Medium
Masinloc, Zambales	2,000	31	Protected Land/Seascape & Fish Sanctuary	120	Medium
Batangas Bay, Maricaban Strait	100	52	Marine Tourism Reserve	80	Medium
Puerto Galera, Mindoro	48	22	Man & Biosphere Reserve	20	Medium
Calamianes Group of Islands	18,200	29		300	Low
El Nido, Palawan	4,250	21	Marine Park	1,000	Medium
Port Barton	454	38.2		80	Low

Balabac	2500		Environmental Critical Protection Zone		
<b>Thailand</b>	<b>90,000</b>			<b>54,000</b>	
Mu Koh Chumphorn	7,790	55	National Park	7,360	Medium
Mu Koh Chang	18,670	40	Marine National Park	11,780	Medium
Mu Koh Ang Thong	5,110	55	Marine National Park	5,110	Medium
Mu Koh Samui	38,990	40	Marine National Park	22,770	Low
Mu Koh Samet	4,200	35	Marine National Park	3,240	Medium
Sichang Group	760	20	None	0	
Sattaheep Group	1,670	33	Navy Control Area	1,320	Low
Lan and Phai Group	3,910	18	Navy Control Area	1,200	Low
Chao Lao	860	30	None	0	
Prachuab	2,450	40	Marine National Park	270	Low
Koh Tao Group	2,300	45	None	0	
Song Khla	1,200	20	None	0	
Koh Kra	670	40	None	0	
Losin	950	40	Navy Control Area	950	Low
<b>Viet Nam</b>	<b>110,000</b>			<b>2,270</b>	
Cu Lao Cham	200	34	MPA	100	Medium
Nha Trang bay	570	26	MPA	100	Medium
Con Dao	1,000	23	National Park	1,000	Medium
Phu Quoc	600	42	Proposed MPA	0	
Ninh Hai	1,070	37	Proposed MPA & Community -based Management	1,070	Medium
Ca Na bay	2,270	41	Proposed MPA	0	
Ha Long - Cat Ba	N/A	43	World Heritage & National Park	No Available	Medium
Hai Van - Son Tra	N/A	51	Proposed MPA	0	
Bach Long Vi	N/A	22	Proposed MPA	0	

391. At the site and national levels, activities will include supporting building management capacity (number/levels human resources, facilities and equipment, and sustainable financing mechanisms) for 82 coral reef sites, improving management approaches (integrated, community-based, multiple use) at 82 coral reef sites, developing management tools (licensing and permit systems, seasonal closures, zoning) in support of legal and regulatory reforms to address key threats at priority sites, and establishing mechanisms for monitoring management, ecological and socio-economic indicators at 82 coral reef sites.

392. Regional actions will focus on the review, synthesis, assessment and dissemination of good experiences and lessons learnt in the management of coral reefs. The use of sound science in the sustainable management of coral reefs in the South China Sea will be promoted through: the work of the regional expert group; empowerment of stakeholders and communities; and sharing experiences between countries on coral reef research and management. Increased awareness of stakeholders regarding the ecological roles, economic values, and need for sustainable management of coral reefs underpins successful achievement of the SAP targets; and activities will facilitate the mainstreaming of information into educational programmes, the development of information campaigns and sharing of training materials through the regional website.

393. Despite the wealth of information available on the ecology of coral reefs, scientific data and information relevant to the sustainable management of coral reefs is limited. Regional actions will support the scientific community in: periodic assessment of the status of coral reefs; monitoring ecological and socio-economic factors; maintaining, and updating the regional GIS and meta-databases and disseminating information for management purposes; and developing guidelines for the conduct of environmental impact assessments in transboundary coral reef areas. Strengthening regional and national capacity in the management of coral reefs will also be supported by expert exchange between countries; training of trainers; sharing experiences in enforcement; developing capacity in fund raising and financial sustainability; fostering the network of coral reef management

sites, research centres and coral reef management agencies; and provision of guidelines for sustainable use of coral reefs. Specific project targets for Outcome 1.2 are summarized in Table 24.

**Table 24.** Baselines, targets and project indicators for Outcome 1.2

Baselines	Targets	Indicators
13 of 82 priority coral reef sites in the SCS characterised as being sustainably management due to management capacity constraints	1.2.1 Management capacity built for 82 coral reef sites	Status of management capacity, including: human resource capacity; facilities and equipment; and sustainable financing
Predominantly single sector (environment) and centralised approach to coral reef management	1.2.2 Management approaches (integrated, community-based, multiple use) improved at 82 coral reef sites	Status of institutional reform for multi-sectorial, community-based and multiple use coral reef management at priority sites
Coral reef management largely focused on awareness raising with limited use of management tools to address threats to coral reef sites	1.2.3 Management tools (licensing and permit systems, seasonal closures, zoning) developed and utilized to address key threats at priority sites	Number of management tools developed, adopted and applied at priority coral reef sites
Status of mechanism established for monitoring coral reef management effectiveness and stress reduction	1.2.4 Established mechanism for the monitoring of management, ecological and socio-economic indicators at 82 sites	Status of mechanism established for monitoring coral reef management effectiveness and stress reduction

### **Outcome 1.3 Conservation, management and sustainable use of 25,900 ha of known seagrass area in the South China Sea by Yr 5**

394. On the basis of data collated and analysed in preparation of the seagrass component of the Strategic Action Programme, a total of 43 target seagrass sites for management are recorded in the coastal areas bordering the South China Sea. These comprise: Cambodia 33,800 ha from 4 sites; China 1,960 ha from 4 sites; Indonesia 3,035 ha from 7 sites; Malaysia 222 ha from 13 sites; Philippines 23,200 ha from 5 sites; Thailand 2,550 ha from 4 sites; and Viet Nam 13,500 ha from 6 sites (see Table 25).

**Table 25** Status of known seagrass sites in the South China Sea

Country and Site Name	Area (ha)	Legal Status	Area under Management	Management Effectiveness <sup>68</sup>	Target for Management through SAP
<b>Cambodia</b>	<b>33,814</b>		<b>2,000</b>		<b>11,446</b>
Kampong Sam Bay	164	None	No	N/A	0
Chroy Pros	3,910	Provincial designated MPA	2,000	Medium	0
Kampot	25,240	Proposed fish Sanctuary	No	N/A	10,096
Kep Beach & Koh Tonsay	4,500	None	No	N/A	1,350
<b>China</b>	<b>1,960</b>		<b>150</b>		<b>700</b>
Hepu seagrass bed	540	National Dugong Reserve	150	Medium	150
Liusha seagrass bed	900	None <sup>69</sup>	No	N/A	200
LiAn seagrass bed	320	Proposed Marine Park	No	N/A	200
Xincun seagrass bed	200	Proposed Marine Park	No	N/A	150
<b>Indonesia</b>	<b>3,035</b>		<b>0</b>		<b>2,420</b>
Medang-Mesanak	5	None	No	N/A	5
Temiang	5	None	No	N/A	5
East Bintan	2,000	Proposed Marine Management Area	No	N/A	1,500

<sup>68</sup> Categories of Management Effectiveness: **Low:** Area declared or proposed to be declared for management; Management Plan developed and approved. **Medium:** Existing Management Framework is implemented with inadequacy of manpower, finance and/or equipment. **High:** Existing Management Framework is implemented with enough trained manpower, equipment, facilities and sustainable finance.

<sup>69</sup> Local Reserve.

<b>Country and Site Name</b>	<b>Area (ha)</b>	<b>Legal Status</b>	<b>Area under Management</b>	<b>Management Effectiveness<sup>68</sup></b>	<b>Target for Management through SAP</b>
Mapor	275	Proposed Marine Management Area	No	N/A	275
Anambas	150	Proposed Marine Management Area	No	N/A	35
Bangka-Belitung	350	Proposed Marine Management Area	No	N/A	350
Senayang	250	Proposed MPA	No	N/A	250
<b>Malaysia</b>	<b>222</b>		<b>17</b>		<b>40</b>
Tanjung Adang Laut Shoal	40	None	No	N/A	40
Tanjung Adang Darat Shoal	42	None	No	N/A	0
Merambong Shoal	30	None	No	N/A	0
Sungai Kemaman	17	None	No	N/A	0
Telaqa Simpul	28	None	No	N/A	0
Sungai Paka Shoal	43	None	No	N/A	0
Pulau Tinggi Mersing	3	Marine Park	3	Medium	0
Pulau Perhentiar	3	Marine Park	3	Medium	0
Pulau Redang	2	Marine Park	2	Medium	0
Setiu Terengannu	3	None	No	N/A	0
Pulau Besar Mersing	3	Marine Park	3	Medium	0
Merchang	2	None	No	N/A	0
Tunku Abdul Rahman Park	6	State Park	6	Medium	0
<b>Philippines</b>	<b>23,245</b>		<b>6,641</b>		<b>6,920</b>
Cape Bolinao	22,400	Environmentally Critical Area - MPA	6,000	Medium	6,720
Puerto Galera	114	Fish sanctuary part of the Man and Biosphere reserve/	60	Low/Medium	50
Ulugan Bay	11	Fish sanctuary part of the Man and Biosphere reserve/	11	Medium	0
Honda Bay	470	Fish Sanctuary part of the Man and Biosphere reserve/	320	Medium	150
Puerto Princesa	250	Protected Area part of the Man and Biosphere reserve/	250	Medium	0
<b>Thailand</b>	<b>2,553</b>		<b>1,780</b>		<b>0</b>
Kung Krabane Bay	700	None <sup>70</sup>	700	High	0
Tungka Bay	1,080	National Park	1,080	Low	0
Sarat Thani	500	None	No	N/A	0
Pattani Bay	273	None	No	N/A	0
<b>Viet Nam</b>	<b>13,503</b>		<b>2,340</b>		<b>5,050</b>
Phu Quoc archipelago	4,600	Phu Quoc Marine Protected <sup>71</sup> Area	2,050	Low	3,000
Con Dao Islands	200	National Park	200	Medium	200
Phu Qui Island	400	Proposed MPA	No	N/A	0
Thuy Trieu	800	Proposed MPA	50	N/A	350
Tam Giang	2,000	Proposed Ramsar	No	N/A	1,000
Cu Lao Cham	40	MPA	40	Medium	0

395. A review of the management status of seagrass sites indicates that 12,900 ha (16.5%) of the total known area of seagrass in the South China Sea is currently under some form of management, although the effectiveness of management was rated medium to low. Very few seagrass sites have any specific legal status. To address this, it was agreed that 25,900 ha (33% of the total known 78,300 ha) would be targeted to be brought under sustainable management through SAP implementation.

396. In preparation for implementation of the seagrass activities of the SAP, comprehensive site characterization information and data were compiled to establish detailed baselines for the seagrass sites identified as priority locations for management within the framework of SAP implementation. These site characterisations contain geographical coordinates, information on the physical environment, environmental state information, socio-economic and resource use information,

<sup>70</sup> Under a King of Thailand's project.

<sup>71</sup> Phu Quoc National Park is an area of designated terrestrial Forest whilst the Marine Protected Area has recently been declared by the Provincial Government adjacent to the National Park.

biological data, and information on the status of existing management at these sites. These baseline assessments of the sites have been made accessible online at <http://gis.unepscs.org>. A supporting meta-database of the data used to establish the baselines has also been developed as a preparatory activity. Detailed national reports on the status and trends in seagrass and seagrass management were also published in preparation for SAP implementation<sup>72</sup>.

397. The RWG-SG agreed the goal of the SAP with respect to seagrass as:

*“To conserve, manage and sustainably utilise seagrass habitats and resources”*

398. Specific targets agreed in the SAP for the management and conservation of seagrass ecosystems in the SCS included:

- bringing 21 managed areas totalling approximately 25,900 ha under sustainable management;
- amendment of the management plans for seven existing MPAs with significant areas of seagrass habitat to include specific seagrass-related management actions; and
- the adoption of 7 new MPAs specifically focusing on seagrass habitats by the year 2012.

399. Accordingly, activities in support of achieving Outcome 1.3 are aimed at assisting countries in effectively managing their seagrass resources and ecosystems in a sustainable manner including supporting countries in engaging in the relevant national reforms. This will be done through: regional co-ordination of national actions in SAP implementation; the regional sharing of experiences and practices; and the exchange of views and knowledge among the scientific and local communities with local government.

400. Specific national activities will include putting under sustainable management with supporting laws and regulations twenty-one seagrass areas totaling 25,900 ha, amending national management plans for 7 existing MPAs with significant seagrass areas, to include specific seagrass-related management actions, designating 7 new Marine Protected Areas focusing on seagrass areas identified in the prioritized listings of the SCS Project and establishing mechanisms for monitoring management, ecological and socio-economic indicators at 21 sites.

401. The key anticipated outcome is the sustainable management of 25,900 ha of seagrass at 21 priority sites in the South China Sea. To ensure the effectiveness of actions in implementing the NAPs and SAP mechanisms will be established to monitor the achievement of regional and national targets. Since a significant proportion of the total seagrass in the South China Sea lies in transboundary areas, the project will also seek to promote and strengthen transboundary management, zoning, and promotion of regional/sub-regional mechanisms for bilateral management of seagrass resources and ecosystems, where appropriate.

402. The need to enhance the knowledge and awareness of government officials, managers, and stakeholders concerning the importance and value, of seagrass resources and ecosystems in the region is perhaps greater than in the case of mangroves and coral reefs. This component also includes actions required to maintain and elaborate regional mechanisms for knowledge and information exchange through training, site visits, meetings, regional symposia, a South China Sea website, and publications; and the production of materials for use in promoting knowledge and awareness of seagrass ecology and sustainable practices.

403. Activities are also designed to enhance the management skills and experience of all stakeholders by providing a sound scientific and technical basis for the management of seagrass resources and ecosystems in the South China Sea. Given the current uncertainties regarding the extent and diversity of seagrass in the region effort will be expended to enhance the knowledge of seagrass

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<sup>72</sup> Accessible online at [http://www.unepscs.org/South\\_China\\_Sea\\_National\\_Reports/](http://www.unepscs.org/South_China_Sea_National_Reports/)

distribution and socio-economic importance, and to develop appropriate criteria for selecting regional and national priority sites for future intervention and management. Specific project targets for Outcome 1.3 are summarized in Table 26.

**Table 26** Baselines, targets and project indicators for Outcome 1.3

Baselines	Targets	Indicators
Majority of seagrass areas in the SCS are unmanaged, or managed ineffectively, due to lack of enabling environment for zoning/regulation	1.3.1 Twenty-one seagrass areas totalling 25,900 ha under sustainable management with supporting laws and regulations	Number of sites under sustainable management Number of seagrass sites for which management regulations exist
Sustainable use and management of seagrass and related resources is rarely addressed in management plans for MPAs in the SCS	1.3.2 Amended management plans for 7 existing MPAs with significant seagrass areas, to include specific seagrass-related management actions	Number of MPA management plans containing seagrass-related management actions
MPA management in SCS predominantly focuses on strict protection of coral reef areas	1.3.3 Designation of 7 new Marine Protected Areas focusing on seagrass areas	Number of newly established MPAs focused on seagrass management
Management, ecological and environmental, and socio-economic indicator frameworks developed but not yet applied at priority sites	1.3.4 Established mechanism for monitoring management, ecological and socio-economic indicators at 21 sites	Status of mechanism established for monitoring coral reef management effectiveness and stress reduction

**Outcome 1.4 Integrated management of 783,900 ha of coastal wetland at 19 sites, including habitat restoration and protection strengthened at priority locations**

404. The wetland component of the Strategic Action Programme focuses on five specific types of wetlands, namely intertidal mudflats, estuaries, lagoons, peat swamps and non-peat swamp, excluding mangroves, coral reefs and seagrass beds which are the subjects of separate components and addressed above. Table 27 summarises the legal and management status of major lagoons, estuaries, inter-tidal mudflats, peat swamps and non-peat swamps bordering the South China Sea. A total area of 4,201,145ha of the five specific types of wetland sites has been identified, specifically lagoons (34,921ha), estuaries (1,203,871ha), inter-tidal flats (691,859ha), non-peat swamps (1,623,567ha), peat swamps (646,927 ha).

**Table 27** Legal and management status of known inter-tidal mudflats, estuaries, coastal lagoons and coastal peat swamps bordering the South China Sea

Name of site	Area (ha)	Legal and Management Status		
		Protected – Non-use (Subsistence/commercial)	Sustainable use	Non-sustainable use
<b>Estuaries</b>				
<b>Cambodia</b>				
Koh Kapik Ramsar in Koh Kong Province	12,000	National Park and RAMSAR site	N.A.	N.A.
<b>China</b>				
Pearl river	12,783	Wetland Park (200ha)	N.A.	N.A.
Beilun river	1,083	National level nature reserve	N.A.	N.A.
<b>Indonesia</b>				
Bakau Selat Dumai	60,000	Yes		
Pulau Padang dan Tanjung Pandan	111,500	-		✓
Muara Sungai Guntung	26,000	Small part		✓
Delta Banyuasin	200,000	Yes		
Sembilang	387,500	Yes	-	-
<b>Philippines</b>				
Malampaya Sound	24,500	Protected seascape	N.A.	N.A.
Pansipit River Estuary	15	N.A.	N.A.	✓

Name of site	Area (ha)	Legal and Management Status		
		Protected – Non-use (Subsistence/commercial)	Sustainable use	Non-sustainable use
<b>Thailand</b>				
Pattani Bay	6,149	N.A.	N.A.	✓
Ban Don Bay	49,459	N.A.	N.A.	✓
Welu River Estuary	10,400	N.A.	N.A.	✓
Thung Kha Bay-Savi Bay	5,204	National Park	N.A.	N.A.
Pak Phanang Bay	13,597	N.A.	✓	N.A.
<b>Viet Nam</b>				
Balat Estuary	26,397	National Park and National Nature Reserve	N.A.	N.A.
Tien River Estuary	100,691	Than Phu Nature Reserve – small part of the estuary	N.A.	✓
Dong Nai River Estuary	49,711	Can Gio Biosphere Reserve	N.A.	✓
Van Uc Estuary	6,990	N.A.	N.A.	✓
Bach Dang Estuary	80,358	N.A.	N.A.	✓
Tien Yen Estuary	24,738	N.A.	N.A.	✓
<b>SUBTOTAL</b>	<b>1,203,871</b>	<b>692,184</b>	<b>38,097</b>	<b>328,511 [+137,500]</b>
<b>Peat Swamps</b>				
<b>Cambodia</b>				
Prek Kampong bay in Kampot Province	16, 250	National Park	N.A.	N.A.
Prek Kampong Som Shanoukeville	10, 800	National Park	N.A.	N.A.
<b>Indonesia</b>				
Berbak NP	162,700	yes		
SM Terusan Dalam	74,750	yes		
Way Kambas NP	130,000	yes		
Sungai Merang	150,000	yes		
<b>Thailand</b>				
Wetlands in Thale Noi Wildlife Non-hunting Area	45,700	Includes RAMSAR Site	N.A.	N.A.
Phru To Daeng Wildlife Sanctuary	20,120	Wildlife Sanctuary; RAMSAR site	N.A.	N.A.
Wetlands in Thale Sap Wildlife Non-hunting Area	36,467	Non-hunting Area		N.A.
Phru Kan Tulee	140	N.A.	✓	N.A.
<b>SUBTOTAL</b>	<b>646,927</b>	<b>564,620</b>	<b>82,307</b>	<b>0</b>

Name of site	Area (ha)	Legal and Management Status			
		Protected – Non-use (Subsistence/commercial)	Sustainable use	Non-sustainable use	
<b>Non-peat Swamps</b>					
<b>Cambodia</b>					
Kampong Trach in Krong Kep	7,500	National Park	N.A.	N.A.	
Prek Toek Sap	21,259	National Park	N.A.	N.A.	
<b>Indonesia</b>					
Tulang Bawang	86,000	Partly			
Rawa-rawa Kubu Padang Tikar	1,499,000	-			
<b>Thailand</b>					
Khao Sam Roi Yot National Park	9,808	National Park	N.A.	N.A.	
<b>SUBTOTAL</b>	<b>1,623,567</b>	<b>38,567 [86,000]</b>	<b>0</b>	<b>[1,499,000]</b>	
<b>Lagoons</b>					
<b>Cambodia</b>					
Beoung Ka Chang	4, 503	National Park & RAMSAR site	N.A.	N.A.	
<b>China</b>					
Wenchang	218	Provincial level nature reserve	N.A.	N.A.	
<b>Viet Nam</b>					
Tam Giang-Cau Lagoon	21,600	N.A.	N.A.	✓	
Tra O Lagoon	2,000	N.A.	N.A.	✓	
Degi Lagoon (Binh Dinh Province)	1,600	N.A.	N.A.	✓	
Thi Nai lagoon (Binh Dinh Province)	5,000	N.A.	N.A.	✓	
<b>SUBTOTAL</b>	<b>34,921</b>	<b>4,721</b>	<b>0</b>	<b>30,200</b>	
<b>Inter-tidal flats</b>					
<b>Cambodia</b>					

Name of site	Area (ha)	Legal and Management Status		
		Protected – Non-use (Subsistence/commercial)	Sustainable use	Non-sustainable use
Ruer Sey Srock Toul Srav Gnamin Krong Kep	4,890	National Park	N.A.	N.A.
<b>China</b>				
Shantou	1,435	Municipal level nature reserve	N.A.	N.A.
Hepu	3,951	Municipal level nature reserve	N.A.	N.A.
Danzhou	806	Provincial level nature reverse	N.A.	N.A.
<b>Indonesia</b>				
CA Pulau Burung	200	yes		
Tanjung Datuk	25,000	-		
Tanjung Jabung	3,000	yes		
Paloh	176,548	yes		
Muara Kendawangan	150,000	yes		
CA Pulau Dua	30	yes		
Pualu Rambut	46	yes		
Muara Angke	25	yes		
CA Muara Gembong	10,481	yes		
<b>Philippines</b>				
Bayanan Bay Tidal flats	75,000	N.A.	✓	N.A.
Manila Bay Tidal Flat	30,000	N.A.	✓	N.A.
El Nido, Palawan mudflats	54,303	Protected Seascapes	N.A.	N.A.
<b>Thailand</b>				
Don Hoi Lot	2,409	RAMSAR Site	N.A.	N.A.
Wetlands in Mu Koh Chang National Park	65,000	National Park	N.A.	N.A.
Wetlands in Mu Koh Ang Thong National Park	10,200	National Park and RAMSAR Site	N.A.	N.A.
<b>Thung Kha Bay – Savi Bay</b>	5,204	National Park	N.A.	N.A.
<b>Viet Nam</b>				
Ca Mau Southwest Tidal Flat	60,711	National Park	N.A.	N.A.
Kim Son Tidal Flat	12,620	N.A.	N.A.	✓
<b>SUBTOTAL</b>	<b>691,859</b>	<b>487,323</b>	<b>161,712</b>	<b>37620</b>
<b>TOTAL</b>	<b>4,201,145</b>	<b>1,787,415</b>	<b>282,116</b>	<b>[2,032,831]</b>

405. The agreed goal of the Strategic Action Programme for wetland management and use is to:

*“Promote the sustainable use of coastal wetland resources by developing integrated management plans and enhancing conservation and restoration of coastal wetlands bordering the South China Sea and the Gulf of Thailand, specifically lagoons, estuaries, mudflats, peat swamps, and non-peat swamps.”*

406. The specific targets for wetland management outlined in the Strategic Action Programme are:

- to set up or update management plans for at least three lagoons, nine estuaries, five tidal flats, one peat swamp and one non-peat swamp in the South China Sea (See Table 28);
- to increase by at least 7 wetland areas, the number of sites or specified wetland areas with protection status (i.e. non-hunting area, nature reserves, protected areas, Ramsar Sites, etc); and
- to have a regional estuary monitoring scheme implemented in the participating countries.

**Table 28** List of sites specified in the Strategic Action Programme targets. N = no existing management plan; U= existing but outdated plans requiring amendment and updating

	Lagoons	Estuaries	Tidal mudflats	Peat swamp	Non-peat swamp
<b>Cambodia</b>		Koh Kapik-N			
<b>China</b>	Wenchang -N	Pearl river-N; Beilun river-U	Shantou-N; Hepu-N; Zhanzhou-N		
<b>Indonesia</b>		Sembilang NP-U			
<b>Philippines</b>		Malampaya sound-U; Pansipit-N	Manila Bay-N		

<b>Thailand</b>				Thale Noi non hunting area – U	Khao Sam Roi Yot National Park-U
<b>Viet Nam</b>	Tamgiang-Cauhai-N; Thi Nai-N	Tien River Estuary; Dong Nai-U; Balat-U	Southwest Ca Mau-U		
<b>Total</b>	<b>3</b>	<b>9</b>	<b>5</b>	<b>1</b>	<b>1</b>

407. As for the other coastal habitats, comprehensive site characterization information and data were compiled to establish detailed baselines for the wetland sites identified as priority locations for management within the framework of SAP implementation. These site characterisations contain geographical coordinates, information on the physical environment, environmental state information, socio-economic and resource use information, biological data, and information on the status of existing management at these sites. These baseline assessments of the sites have been made accessible online at <http://gis.unepscs.org>. A supporting meta-database of the data used to establish the baselines has also been developed as a preparatory activity. Detailed national reports on the status and trends in wetlands and wetland management were also published in preparation for SAP implementation<sup>73</sup>.

408. Activities to achieve Outcome 1.4 are focused on coastal lagoons, estuaries and mudflats and aim to improve the effectiveness of national policy, legal and institutional arrangements and co-ordination including the needed national reforms by developing and implementing management plans for at least 3 lagoons (26,818 ha), 9 estuaries (614,680 ha), 5 tidal flats (96,903 ha), 1 peat swamp (45,700 ha) and 1 non-peat swamp (9,808 ha); declaring at least 7 wetland areas with protection status (i.e. non-hunting area, nature reserves, protected areas, Ramsar Sites) including the needed management reforms and adopting a regional estuary monitoring scheme and its national implementation.

409. Further, activities are planned to strengthen the Regional Working Group on Wetlands, as the regional scientific and technical advisory body on coastal wetland management; and, by establishing linkages among wetland management institutes or agencies in the region and between and within the academic and professional communities. Activities are also planned to enhance and sustain the capacity of wetland management agencies and strengthen knowledge and public awareness on the wise use of wetlands in the region.

410. Regional training needs will also be assessed and a training programme developed that will include study tours and field visits for wetland managers, community representatives, students, and NGO members. Supporting activities further include: the production and dissemination of materials for public awareness; the development of an educational centre; the development of curricula; and the production of national newsletters. Activities directed towards improving sustainable management include: tool kits for supporting the relevant legal and institutional reforms, developing regional handbooks/manuals, and guidelines for sustainable use including restoration of estuaries and coastal lagoons; maintaining regional GIS- and meta-databases; developing and implementing a regional estuary monitoring scheme; and convening of regional meetings among countries to review the status of wetland management plans. Specific project targets for Outcome 1.4 are summarised in Table 29.

**Table 29** Baselines, targets and project indicators for Outcome 1.4

Baselines	Targets	Indicators
Population growth, and urbanisation of the coastal fringe, combined with rapid economic growth in the SCS region places tremendous pressure on coastal wetland ecosystems	1.4.1 Integrated management plans developed and under implementation for at least 3 lagoons (26,818 ha), 9 estuaries (614,680 ha), 5 tidal flats (96,903 ha), 1 peat swamp (45,700 ha) and 1 non-peat swamp (9,808 ha)	Number of integrated management plans developed  Total area (ha) of wetland under management plan for sustainable use

<sup>73</sup> Accessible online at [http://www.unepscs.org/South\\_China\\_Sea\\_National\\_Reports/](http://www.unepscs.org/South_China_Sea_National_Reports/)

The riparian states of SCS face significant pressure to convert wetlands for economic development with little focus on conservation or sustainable use	1.4.2 Declaration of at least 7 wetland areas with protection status (i.e. non-hunting area, nature reserves, protected areas, Ramsar Sites).	Number of wetlands sites assigned protection status
Management, ecological and environmental, and socio-economic indicator frameworks developed but not yet applied at priority sites	1.4.3 Adoption of a regional estuary monitoring scheme and its national implementation	Status of mechanism established for monitoring wetland management effectiveness and stress reduction

### **Outcome 1.5 National and regional level cooperation in tracking results of SAP actions for coastal habitat management**

411. The need for results-based approaches to the management of development assistance programmes and projects has received recent high-level recognition. In adopting the Paris Declaration on Aid Effectiveness in 2005, national government Ministers responsible for development from both developed and developing countries joined with Heads of multilateral and bilateral development institutions in committing to “*work together in a participatory approach to strengthen country capacities and demand for results-based management*”<sup>74</sup>.

412. This commitment was reaffirmed in the 2008 Accra Agenda for Action which called for accelerated progress on aid effectiveness by better demonstrating the results of development efforts and openly accounting for them<sup>75</sup>. The Southeast Asian region and its development partners have responded accordingly with calls for strengthened emphasis on results in planning and financing development. Similarly, the region’s multilateral and bilateral development partners and donors, including *inter alia* the Global Environment Facility, the European Commission, and the development aid agencies of Australia, New Zealand and the United States of America are guided by their own results-based management policies.

413. The South China Sea Strategic Action Programme defined indicators and results frameworks for use in monitoring and evaluating the effectiveness of SAP implementation. This component of the project aims to facilitate national and regional level cooperation in tracking results of SAP actions for coastal habitat management. Specific indicators of sustainability to be tracked relate to: the enabling environments for sustainable management; improvements to ecological and environmental state; and socio-economic impacts. Activities are designed to reach agreement on standardized methods and guidelines for habitat inventory and assessment, leading to the achievement of regional-level agreement on a harmonized results framework and analytical tool for tracking and reporting on sustainability of habitat management systems in the SCS basin.

414. Additionally, an online ‘results’ portal will be developed to support regional-level capacity building in results-oriented planning and management of coastal habitats, as well as the routine online sharing and syndication of SAP implementation results. The latter will involve online geospatial presentation of results linked to related initiatives of the GEF IW:LEARN and GEF LME:LEARN initiatives. Similarly, performance of this component with respect to indicators defined in the GEF IW tracking tool will be documented and communicated annually; effort will also be made to align the agreed reporting systems with national reporting requirements to various International conventions.

415. A key constraint in the development of this work is that there presently exists no regional fora for reporting on SAP implementation across the coastal biomes addressed by Component 1 of this project. Supporting activities will involve revitalizing regional networks of coastal habitat scientists and managers established through the SCS project. To support the uptake of best management practices, effort will be made to periodically convene meetings of habitat specialists and community

<sup>74</sup> OCED, 2005. Paris Declaration on Aid Effectiveness, page 8, para 46

<sup>75</sup> OCED, 2008. Accra Agenda for Action, page 16, para 10

leaders. Additionally, the information and data collated on the status of coastal habitats and their management will be used to update the national reports on mangroves, coral reefs, seagrass and wetlands produced as part of Strategic Action Programme formulation. The specific project targets for Outcome 1.5 are summarised in Table 30. A framework for identifying and prioritising management actions as a basis for establishment of results frameworks presented in Information Box 1 below.

**Table 30** Baselines, targets and project indicators for Outcome 1.5

Baselines	Targets	Indicators
No existing fora at national and regional level in the SCS to network coastal habitat scientists and management specialists	1.5.1 National committees and regional networks of habitat specialists established under the SCS project revitalized and functioning	Extent and continuity of participation in regional fora for coastal habitat management Scope and uptake of joint management and planning decisions
Results frameworks for the management of mangroves, coral reefs, seagrass and wetlands of the SCS developed and agreed through national and regional consultative process but has not yet been applied	1.5.2 Mechanism to monitor and evaluate the impacts of SAP implementation and achievement of habitat targets operational [including agreement on standardized methods and guidelines for inventory and assessment]	Status and extent of uptake by national Inter-Ministry committees of SAP implementation results reporting Level of congruence of national and regional indicator sets with the proposed targets and outcomes of the SAP
Limited engagement of community-based governance mechanisms in planning coastal habitat management  Low level mobilization of civil society, community groups and the private sector in habitat management	1.5.3 Community leaders and local government from priority habitat sites networked via national and regional round-table meetings to foster cooperation and knowledge sharing on achievements and best practices	Extent and continuity of local leader and local government participation in community round-table meetings Improved local relevance of SAP implementation initiatives
Baseline national habitat reports developed and require periodic uptake	1.5.4 Biennial state of coastal habitat reports published and applied in national and regional action planning	Published state of coastal habitat reports

**Information Box 1: Framework process for identifying intervention priorities at SAP coastal habitat sites**

1. Identification of issues and problems causing environmental degradation	<ul style="list-style-type: none"> <li>Identify compromises of, and threats to, aquatic uses, resources and amenities, associated hazards to human health and legitimate uses of the aquatic environment, as well as associated limitations on traditional and cultural activities</li> <li>Scientifically evaluate the aquatic environmental issues and problems (e.g., types and volume/magnitude of pollutants entering the system; rates of loss of coastal habitats/ecosystems; changes in species composition and catch per unit effort in fisheries; increases in sedimentation and algal density)</li> </ul>
2. Quantification of the compromises to environmental quality	<ul style="list-style-type: none"> <li>Conduct social and economic evaluation of the aquatic environmental issues and problems (e.g., economic costs of environmental impacts; social costs of the issues such as adverse effects on human health and welfare).</li> </ul>
3. Initial prioritization of problems	<ul style="list-style-type: none"> <li>Based on the system description, identify and quantify compromises (steps one to three above) and threats, and produce an</li> </ul>

	initial prioritization of the compromises, hazards and limitations to legitimate uses and activities
4. Identification and characterization of immediate, secondary, and higher level causes of habitat degradation (“causal chain analysis”)	<ul style="list-style-type: none"> <li>Determine and describe the immediate causes of identified issues</li> <li>Determine and describe of the secondary causes of identified issues</li> <li>Determine and describe the tertiary...to penultimate causes of identified issues</li> </ul>
5. Identification and characterization of ultimate (root) causes of habitat degradation and loss	<ul style="list-style-type: none"> <li>Determine and describe the ultimate/root causes of identified issues</li> </ul>
6. Identification and characterization of options for intervention	<ul style="list-style-type: none"> <li>Identify and then describe options for intervention, with emphasis on potential interventions at the most fundamental levels of cause (however, potential options at all levels should be characterized where possible)</li> </ul>
7. Analysis of options for intervention	<ul style="list-style-type: none"> <li>Examine options for intervention for commonalities and crosstalk/conflicts</li> <li>Establish criteria for net benefit analyses of options</li> </ul>
8. Determination of comparative net benefit of options for intervention	<ul style="list-style-type: none"> <li>Establish costs of intervention, potential benefits of intervention (preferably in monetary terms) taking account of feedback loops/conflicts to determine the most effective options for intervention</li> </ul>
9. Identification of priority options for intervention	<ul style="list-style-type: none"> <li>Identify, characterize and specify any conditions that should be imposed upon priority options for intervention based on the magnitude of their net benefit and ability to resolve/ameliorate multiple issues</li> </ul>

## **Component 2. Strengthening knowledge-based action planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea**

416. This component will result in: an enhanced information-base for coastal habitat management and action planning; effective integration of regional science in the management of land-based pollution; strengthened and harmonized national policies and laws, and supporting financial mechanism, for the management of land-based sources of pollution; improved national and regional values for the Total Economic Values of coastal habitats for use in development planning and decision-making; regionally appropriate tools and mechanisms to guide the development of sustainable management systems for coastal habitats and land-based pollution; and an updated and Ministerially adopted Transboundary Diagnostic Analysis and Strategic Action Programme, including prioritization of national management actions to address climate variability and change. Each of the outcomes to be delivered via Component 2 of the project are outlined below.

### **Outcome 2.1 Enhanced information-base for coastal habitat management and action planning**

417. The science-based planning for coastal habitat management fostered by the SCS project relied on the extensive compilation, review and analysis of information and data relating to specific habitat sites. This involved the development of comparable national data and information sets relating to, inter alia, the distribution and diversity of coastal habitats, the species richness and hotspots of biodiversity, present threats and the status of management. Much of this information was synthesised and published as the national reports on coastal habitats that provides a permanent record of the information used as the basis for planning. This information was also used to prepare detailed site characterisations for more than 135 habitat sites in the basin. These characterisations provide the best available information relating to the ecology and management of individual sites in a regionally comparable format.

418. Activities of this project will build on the knowledge-based action planning for the management of the marine and coastal environment of the SCS achieved during SAP formulation. Importantly, activities are designed to support consensus building on the information and data to be used in planning and implementing the required local, national and regional reforms required to address the degradation of coastal habitats, land-based pollution, and the adoption of stronger and more formal arrangements for regional co-operation in the management of the marine and coastal environment of the South China Sea.

419. Given the geopolitical sensitivities characterizing the SCS region, such a consensual approach is deemed necessary in: tracking and reporting on results of SAP implementation; generating agreement among the region's scientists and policy makers on the analytical approaches used to prioritize options and reforms required to address environmental problems; fostering strengthened multi-lateral cooperation; and planning interventions that deliver both local results for beneficiary communities and high transboundary impacts.

420. For example, recent and rapid advancements in aerial visual survey techniques and remote sensing of inter-tidal and shallow water biomes have potential to greatly enhance coastal habitat management planning in the SCS marine basin. Algorithms for the interpretation of remotely sensed information and data on coastal habitat associations and zonation will be developed and applied, and will involve production and publication of a regional report on methodologies and procedures for the application of aerial visual survey and remotely sensed data in coastal habitat management in the SCS marine basin.

421. Similarly, an extensive regional GIS and meta-database of SCS coastal habitat information was developed as part of SAP formulation but has not been updated due to lack of a regional mechanism for collation and exchange of data. These mechanisms will be revitalized and will build on the objective approach to coastal habitat area site characterisation initiated by the SCS project by constructing an objective and scientifically sound procedure for site characterization that is: fully transparent and comprehensible to all parties, both technical and political; based as far as possible on objective quantifiable criteria and indicators, that also reflect the importance of the sites from the perspectives of the range of biological, environmental and socio-economic conditions at both national and regional levels, and from the perspective of vulnerabilities associated with disaster risk, climate variability, and extremes in weather.

422. Coastal communities of the South China Sea riparian countries live in and continuously adapt to dynamic and often difficult climatic environments. Shallow tropical marine environments such as the coastal areas of the South China Sea are inherently vulnerable to the extremes of climate variability, and this vulnerability has compelled East Asia's coastal communities over time to build a level of resilience to extreme weather events. However today, population growth and social changes have created a situation where many communities are far less prepared for the floods, extended droughts, and storms that remain an ongoing feature of the region.

423. In this regard, the uncertainty and extremes of climate variability compound and exacerbate the social and economic challenges faced by coastal communities of East Asia. Large-scale features such as the Inter-tropical Convergence Zone and the West Pacific Monsoon drive the seasonal variations in rainfall experienced by Pacific Island Countries, including wet and dry seasons. Together, they influence rainfall, winds, tropical cyclones, ocean currents and other aspects of the weather and climate. While these features drive the wet and dry seasons experienced annually in most of the riparian countries of the South China, the single greatest factor affecting climate variability from year to year is the El Niño/La Niña Southern Oscillation, or ENSO. This cycle of warming and cooling of sea surface temperatures of the Western Pacific has a profound effect on the hydrological cycle of East Asian countries, driving periods of drought and elevated rainfall across the region.

424. The effects of the ENSO cycle are not restricted to drought. It is also a driver of periods of elevated rainfall and rainfall intensity, and plays a role in both suppressing and stimulating the propagation and severity of tropical cyclones, all of which have significant impacts on the people and economies of coastal communities. However, while regional understanding of climate variability and change has improved considerably over the past years, this improvement has not translated into a corresponding increase in community resilience. Recognising this, activities of this project will focus on the issue of climate variability and change, including the related matter of sea level rise, in the context of national planning and the update of the TDA and SAP for the South China Sea. Similar efforts will be made to ensure a better reflection of the role of coastal habitats of the South China Sea basin in carbon sequestration and storage in development planning.

425. Importantly, these enhancements to the information-base for coastal habitat management and action planning will be used to guide the preparation of updated National Action Plans, including institutional reform and sustainable financing strategies, for coastal habitats and the development and enactment of supporting legislation where required. Importantly, the National Action Plans will foster cross-sectorial and multi-stakeholder involvement in addressing the multiple threats to coastal habitats and their resources. To facilitate this, the roles and responsibilities of involved agencies and stakeholders will be negotiated and defined, and importantly the supporting strengthening of institutional and legislative frameworks will target multiple sectors where required. The latter will facilitate the mainstreaming of common goals and agreed actions for coastal habitat and marine environmental management in the operations of relevant sectorial agencies. The specific project targets for Outcome 2.1 are summarised in Table 31.

**Table 31** Baselines, targets and project indicators for Outcome 2.1

Baselines	Targets	Indicators
Rapid advancements in aerial visual survey techniques and remote sensing of inter-tidal and shallow water biomes have potential to greatly enhance coastal habitat management planning in the SCS marine basin	2.1.1 Algorithms for the interpretation of remotely sensed information and data on coastal habitat associations and zonation developed and applied in national and regional action planning	Volume of remotely sensed information interpreted and made available for planning Extent of uptake of remotely sensed coastal habitat information and data in management planning and action
Regional GIS and meta-database of SCS coastal habitat information developed but not updated due to lack of a regional mechanism for collation and exchange of data	2.1.2 Mechanism for collection and exchange of regional coastal habitat information and data established	Number and completeness of regionally comparable coastal habitat site characterisations for 134 sites Number of datasets for 134 coastal habitat sites accessible online in centralised repository
Lack of SCS specific information on carbon sequestration by coastal habitats constrains resource managers in making political case for better resourcing of mgmt.	2.1.3 Role of coastal habitats of the South China Sea in the sequestration and storage of carbon quantified and communicated to stakeholders, and applied in national and regional action planning	Volume of CO2 captured and stored by SCS habitats defined Extent of uptake of information on carbon sequestration and storage used in mgmt. planning
Sea level rise, climate variability and change, and episodic natural disasters in SC identified as threats to sustainable management of coastal habitats	2.1.4 Review of the potential impacts of sea level rise, climate change, and episodic events on coastal habitats of the South China Sea applied in national action planning and update of the SCS TDA	Independent peer acceptance of review Extent of uptake of review and its recommendations in updating national action plans and diagnostic analyses

National Action Plans for mangroves, coral reefs, seagrass and wetlands developed and implemented during period 2002-2008	2.1.5 Updated and adopted National Action Plans for mangroves, coral reefs, seagrass and wetlands, including institutional reform and sustainable financing strategies, and the enactment of supporting legislation where required	Number of updated National Action Plans, including institutional reform and sustainable financing strategies, adopted Number of laws and regulations adopted to enable action plan implementation
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## **Outcome 2.2 Effective integration of regional science in the management of land-based pollution**

426. The ultimate causes of land-based pollution in the South China Sea are: increases in coastal population densities (populations of the basin's coastal zones currently exceed 270 million or 5 percent of the world's population); increased food production in the agricultural sector; and increased industrialization. The proximate causes include inadequate waste-water treatment whilst intermediate causes include inadequate standards and lack of capacity to monitor, regulate and control pollution discharges. A major contributing factor is the lack of financial resources to invest in actions addressing the proximate cause, i.e., the issue of strengthening waste treatment capacity, which is presently being addressed via partnerships with development banks, several of which rely on GEF support to PEMSEA and which are operated within a board Integrated Coastal Management framework.

427. Excessive nutrient loads and suspended solids are among the most common problems in coastal waters of countries bordering the South China Sea. High concentrations of suspended solids largely result from poor land-use practices, including logging activities and conversion of forests in upland areas. On the other hand, high nutrient loads mainly result from untreated domestic wastes that are directly discharged into the receiving water bodies. Both contaminants impact the ecological functioning of coastal ecosystems. In addition, heavy metals such mercury (Hg), Arsenic (As) and lead (Pb) have tended to increase in both biota and sediments in coastal waters of the South China Sea during the last decade. These heavy metals have potential negative impact on the health of marine living resources and humans who consume seafood products.

428. A total of 17 pollution hot spots were characterised in formulation of the land-based pollution component Strategic Action Programme. It was identified that present pollutant and contaminant discharges may have transboundary consequences in some of the identified "hot spots" and sensitive areas in terms of increasing the rate of habitat degradation in those coastal ecosystems. While pollution control departments of the participating countries are among the best resourced in the environment sector of Southeast Asian governments, action is typically focused on monitoring and regulatory functions with little effort directed toward the management of pollution hotspots or reform of national policy and investment planning. Accordingly, it was identified during SAP formulation that the purpose of SAP activities relating to land-based pollution is not to finance interventions that directly reduce the load of contaminants reaching the marine environment from land-based sources but to support the integration of regional science with national-level policy making and planning for the management of land-based pollution.

429. Accordingly, the over-arching goal of the land-based pollution component of the SAP was agreed as follows:

*"To foster regional co-operation in the identification of sensitive ecosystems, land-based contamination problems, evaluation of their significance and development of standards for national level adoption within a regional context in order to develop an appropriate precautionary approach to discharges to the South China Sea marine basin"*

430. It was further agreed that the purpose of the related targets was to set and periodically review region-wide water quality standards and water quality objectives which will assist in maintaining the health of the coastal ecosystems of the South China Sea marine basin. The specific targets are to:

1. estimate total contaminant loading to the South China Sea;
2. agree and adopt regional criteria for contaminants in sediment and biota;
3. characterise and prioritise all hot spots surrounding the South China Sea;
4. review and prepare recommendations for application in amending national/provincial, legislation/regulations in support of all Land-based Pollution targets of the SAP; and
5. to meet ASEAN seawater quality (14 parameters) criteria (except pollutants from scientifically identified natural sources, if any) for:
  - 90% of monitoring stations in the 17 hot spots characterised during SAP formulation;
  - 80% of other monitoring stations (more than 400 at present) in coastal waters of the South China Sea.

431. Accordingly, activities of Component 2 will result in estimates of total contaminant loading and carrying capacity of the SCS via application of quantitative modeling and GIS-based techniques for seven heavy metals (Hg, Cd, Pb, Cu, Cr, As, Zn). This builds on work of the SAP formulation project to model the carrying capacity of the South China Sea marine basin with respect to nutrients. The project will expand on this modeling via an activity to quantify the impacts of estimated heavy metal contaminant loadings for use in national and regional planning. Methodologies and procedures will also be established through the project for the characterization of heavy metal pollution hotspots, including the conduct of diagnostic analyses to identify priority actions to remediate environmental compromises at these locations. Innovatively, this work will be replicated during the project cycle to quantify effluent volumes and contaminant loadings from coastal aquaculture operations. The specific project targets for Outcome 2.2 are summarized in Table 32.

**Table 32** Baselines, targets and project indicators for Outcome 2.2

Baselines	Targets	Indicators
Carrying capacity of the SCS open shelf system based on its natural capacity to assimilate contaminants, in particular nutrient inputs from land, has been modelled although findings not well known by decision-makers	2.2.1 Nutrient carrying capacity model for the SCS marine basin used to communicate with decision-makers and to inform management planning about the localized v. transboundary impacts of land-based pollution in the SCS	Nutrient carrying capacity accessible online  Communications products available for regional and global sharing  1 * IW Experience Note
Need for simple model of pollution impacts under different development scenarios, specifically as they relate to heavy metal contaminant loadings	2.2.2 Total contaminant loading and carrying capacity of the SCS estimated via application of quantitative modeling and GIS-based techniques for seven heavy metals (Hg, Cd, Pb, Cu, Cr, As, Zn) applied in national and regional planning	Extent of decision-maker awareness of SCS open shelf carrying capacity for heavy metal contaminants  Extent of use of model outputs in revising the Strategic Action Programme for the SCS
Framework procedures for estimating the impacts of heavy metal contamination in SCS have been developed although not yet applied	2.2.3 Impacts of estimated heavy metal contaminant loadings defined, quantified and communicated to decision-makers	Status of initiative to quantify heavy metal contaminant impacts on: (a) water quality; (b) reproductive capacity of living resources; (c) contamination of human food sources; and (d) bio-accumulation.
Lack of regionally comparable information and data on heavy metal contaminated hotspots	2.2.4 Characterization of heavy metal pollution hotspots	Number of heavy metal pollution hotspots characterised

Effluent from aquaculture and mariculture operations identified as key threat to dominant coastal biomes	2.2.5 Quantification of effluent volumes and contaminant loadings from coastal aquaculture to the SCS marine basin	Published methodology and procedures for estimating aquaculture pollution loadings and impacts 1 * IW Experience Note
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### **Outcome 2.3 Strengthened and harmonized national policies and laws, and supporting financial mechanism, for the management of land-based sources of pollution**

432. Each of the participating countries have environmental laws or acts under which environmental standards are in place with mechanisms for approved enforcement procedures to ensure compliance. In order to meet with standards and regulations stipulated under the law, structural facilities like waste water treatment plants are one way to treat waste water before discharging it to the environment. In addition to enforcement of existing laws and regulations only and building treatment facilities, environment planning, a part of the development process may prevent and mitigate potential impacts. In line with this, most countries in the region have Environmental Impact Assessment (EIA) prior to development. Countries are also working on environmental awareness, communication and education to enhance public understanding of pollution problem and practices at the individual level that may reduce contaminant loads to the environment. In addition, monitoring of pollution sites and water quality is currently undertaken by all countries while some countries include monitoring programmes for sediment quality and bio-parameters as well.

433. Although these management practices are in place in most countries, there are many problems in their implementation. Some countries lack the capacity to enforce the Environmental Acts due to limited budgets and lack of collaboration with waste producers. The waste producers, are not equipped with the necessary treatment facilities or have limited facilities resulting in low levels of compliance with regard to the standards stipulated under the law. Although environment assessment is incorporated into development planning in most of the participating countries, the effectiveness of the plans is questionable. Monitoring programmes for some countries although extensive as regards the number of sites, and the data collected, are not used effectively in pollution management. The data is often only used for the publication and dissemination of annual and environment quality reports. In some countries, the data obtained from the monitoring programmes are not reliable for decision making. The following regional challenges were identified during project preparation:

- High population pressure and industrialization causing increased contaminant load;
- Lack of treatment facilities;
- Lack of cooperation and coordination among related sectors at the national level and weak linkage between central and lower levels of the governments;
- Lack of appropriate legislation and weak law enforcement;
- Low public awareness and lack of (responsible) committed of citizens;
- Lack of government commitment in balancing economic growth and environmental protection and low priority given to environment protection;
- Lack of research and monitoring resources (man power, facilities);
- Lack of regionally comparable monitoring and analytical methodology; and
- Lack of criteria for sediment quality.

434. National level activities will support: reviews of legislative and institutional frameworks for land-based pollution management in participating countries; harmonization of national Standard Operating Procedures for land-based pollution control and management, including agreed sediment, biota, and water quality criteria; revision of national/provincial policies; development, enactment and implementation of supporting regulations for land-based pollution; and the updating and adoption of

National Action Plans, including institutional reform and sustainable financing strategies, for land-based pollution management in the SCS. A regional financial mechanism for land-based pollution management will also be established. The development of the latter will be undertaken as part of the national and regional consultative process followed to update the Strategic Action Programme for the South China Sea. Importantly, this financial mechanism will also be based on the outcomes of partnership forums aimed at facilitating agreement on private sector and donor investment in implementation of the land-based pollution elements of the updated SAP. This will also be supported at the regional level by COBSEAs broader resource mobilisation efforts as part of the implementation of its revised strategy. In preparation for this work, each of the participating countries have developed national reports on land-based pollution management in areas of their South China Sea coastlines. Additional regional supporting activities are designed to: improve mechanisms for information exchange; support the development, improvement and dissemination of regional public awareness and educational materials; prepare marine environment quality guidelines and tools for dissemination and adoption in the region; and the development of common methodologies that will generate comparable data among participating countries. The specific project targets for Outcome 2.3 are summarized in Table 33.

**Table 33** Baselines, targets and project indicators for Outcome 2.3

Baselines	Targets	Indicators
Lesson learned in community-based wastewater mgmt. in Batam, Indonesia documented and shared regionally although other examples from East Asian seas region largely focus on broad scale ICM planning	2.3.1 National best practices in waste water management, law enforcement, and community and industry participation in managing land-based sources of pollution documented and shared	Number of best practice technologies and measures tested, documented and shared
Effectiveness of existing legal and institutional frameworks limited by predominantly single sector approaches	2.3.2 Review of legislative and institutional frameworks for land-based pollution management in participating countries	Number of countries with demonstrable harmonization of sectoral governance frameworks achieved as a result of review findings
Lack of Standard Operating Procedures for land-based pollution management	2.3.3 Harmonized national Standard Operating Procedures for land-based pollution control and management [including agreed sediment, biota, & water quality criteria]	Number of countries with demonstrable adoption of harmonized, regionally comparable SOPs
Absence of clear and effective policies, laws, and regulations relating to control of land-based pollution	2.3.4 Revised national/provincial policies and supporting regulations for land-based pollution developed, enacted and implemented by Yr 5	Number of countries with endorsed national policies and enacted laws and regulations for land-based pollution control
Guidelines for assessing the economic impacts of land-based pollution developed but not yet applied as part of benefit-cost analysis of pollution mgmt. in the SCS	2.3.5 Updated and adopted National Action Plans, including institutional reform and sustainable financing strategies, for land-based pollution management in the SCS [Yr 5]	Number of countries with endorsed National Action Plans, including institutional reform and sustainable financing strategies, for land-based pollution
Lack of sustainable mechanism to finance regional support actions including M&E	2.3.6 Regional financial mechanism for land-based pollution management [Yr 5]	Status of agreement among participating countries on a sustainable financing approach for regional actions

#### **Outcome 2.4 Improved national and regional values for the Total Economic Values of coastal habitats for use in development planning and decision-making**

435. Today's society uses and is heavily dependent on the environment as a source of a range of services and resources, that is, natural capital. At the same time, society uses (or abuses) and depends heavily upon the environment as a "sink" or repository for its pollution and waste. The source and sink services are in scarce supply and are continually being degraded and limited by economic activities. This requires the adoption of more conservative patterns of use that will increase the base of environmental assets over time, which is related to sustainability of the environments capacity to provide continued goods and services.

436. Economic valuation is defined as the attempt to assign quantitative or monetary values to the goods and services provided by environmental resources, whether or not market prices are available to assist in the process (Barbier and Aylward, 1996; Bateman et al., 2002). The National Research Council (1995) defines economic valuation as an attempt to provide an empirical account of the value of the services and amenities or of the benefits and costs of proposed action (project or policies) that would modify the flow of services and amenities. Both definitions are in agreement regarding the quantification of goods and services that provide information about the environmental resources.

437. Valuation forms a key exercise in economic analysis and provides important information for the sustainable use of any habitat. The basic aim of valuation is to determine people's preferences – how much they are willing to pay for, and how much better or worse off they would consider themselves to be as a result of changes in the supply of different goods and services. Valuation provides a means of quantifying the benefits that people receive from habitats, the costs associated with their loss, and the relative profitability of land and resource uses which are compatible with habitat conservation *vis-à-vis* those economic activities that contribute to habitat degradation. Valuation helps to predict and understand the consequences of economic decisions and economic activities which impact on the integrity and status of habitats.

438. Valuation in the context of habitat management is generally used to indicate the overall economic efficiency of the various competing uses of habitats and resources. That is, the underlying assumption is that habitat resources should be allocated to those uses that yield an overall net gain to society, as measured through valuation in terms of the economic benefits of each use, less its' costs. However, the valuation should be based on reasonably well-founded methodology and speculative assumptions will not contribute to decision-making (Munasinghe, 1995<sup>76</sup>).

439. "Valuing" an ecosystem is essentially valuing the characteristics of a system. Costanza<sup>77</sup> et al. (1997) have made a comprehensive list of ecosystem functions and services and defined ecosystem services as "flows of materials, energy and information from natural capital stocks which combine with manufactured and human capital services to produce human welfare".

440. The concept of Total Economic Value (TEV) provides a framework for valuing natural systems and is used to identify and estimate the monetary value of all economic benefits that a society derives from a particular ecosystem. In some countries this method has been used to improve forest policy, planning, and management decisions by accounting for all short- and long-term benefits to society from forests, including alternative options. TEV accounts for a wide variety of market and non-market functions and services provided by the habitat.

441. As outlined in the background and situational analysis section of this Project Document, South China Sea SAP formulation resulted in significant advancements in the determination of national and

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<sup>76</sup> Munasinghe, M. (1995). Applicability of techniques of cost-benefit analysis to climate change. In global climate change, economic and policy issues. Edited by Mohan Munasinghe. World Bank Environment Paper Number 12. The World Bank, Washington D.C.

<sup>77</sup> Costanza, R., d'Arge, R. de Groot, R., Farber, S., Grasso, M., Hannon, B. Limburg, K., Naeem, S., O'Neill, R.B., Paruelo, J., Raskin, R.G., Sutton, P. and van den Belt, M. (1997). The Value of the world's ecosystem services and natural capital. Nature 387 (6630) 253-260

regionally applicable TEVs that were used to value the cost of action versus non-action within the framework of SAP implementation. Despite these advancements, several challenges exist in the application of economic valuation in decision-making for transboundary water resource management in the South China Sea; indeed the issues of economic valuation of ecosystem goods and services in development planning remains a challenge facing the entire portfolio of GEF investments in procuring the goods and services of the global environment, particularly in its International Waters focal area.

442. Better economic valuation of the South China Sea's resources is critical for decision making that will lead to sustainable use. The values determined through the previous SCS project are incomplete since not all known goods or services from individual coastal ecosystems have been valued. One area of current weakness is that comparatively few existing values for the service provided by habitats as nursery areas for off-shore fish and crustaceans are included. This is known to be a significant and major service provided by mangrove and seagrass habitats and work will be undertaken to establish the economic values of these services.

443. It is anticipated that actions at the national and regional level to implement the SAP will generate more extensive datasets at the national level, which if included in the regional dataset will greatly enhance the utility of the regional dataset in determining regional priorities for action and intervention. One additional area of identified need that the project will address is in the determination of economic losses of coastal ecosystem goods and services consequent upon coastal shipping accidents and land-based pollution damage. Component 2 therefore aims to improve the national and regional values for the Total Economic Values of coastal habitats for use in development planning and decision-making, and will make substantive contributions to the conduct of cost-benefit analyses of management options undertaken as part of national action planning for coastal habitats and land-based pollution, as well as in updating the SCS TDA and SAP. Communications products will also be developed to raise awareness among stakeholders and policy makers of the socio-cultural significance of the South China Sea marine basin and its resources. This will include the innovative use of social media to communicate about the importance of ecosystem goods and services in terms of food security, livelihood opportunities, storm protection, carbon sequestration, recreation and tourism opportunities, and quality of life.

444. The economic valuation work of this component will also build on preliminary work of the SCS project to value the economic impacts of land-based pollution from local, national and transboundary perspectives and will contribute to the planning of a mechanism for the sustainable financing of land-based pollution activities of a revised SAP. The specific project targets for Outcome 2.4 are summarized in Table 34.

**Table 34** Baselines, targets and project indicators for Outcome 2.4

Baselines	Targets	Indicators
Values determined for SCS are incomplete as not all known goods and services from individual biomes have been valued	2.4.1 Expanded datasets of economic valuation information on the goods and services of SCS coastal habitats	Completeness of value information compiled for coastal biome goods and services
Comparatively few existing values for the services provided by habitats as nursery areas for coastal living resources	2.4.2 Estimates of the value for the service provided by coastal habitats as nursery areas for coastal fish and crustaceans	Status of initiative to develop national and regional estimates economic linkages between habitats and coastal fish production
No existing information linking shipping accidents to loss of economic benefits associated coastal biomes in the SCS	2.4.3 Estimates of economic losses of coastal ecosystem goods and services consequent upon coastal shipping accidents and pollution damage	Status of initiative to value economic costs of coastal shipping accidents and pollution damage
Economic valuation of coastal habitats used in cost benefit	2.4.4 Updated estimates of Total Economic Values for coastal	Status of initiative to update estimates of total economic values

analysis of endorsed Strategic Action Programme actions based on 2005 CPI	habitats of the SCS and converted to 2017 value by means of the consumer price index	of coastal biomes
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### **Outcome 2.5 Regionally appropriate tools and mechanisms to guide the development of sustainable management systems for coastal habitats and land-based pollution**

445. Global experience in integrated natural resource and environmental management has shown that efforts in transboundary water resource management are initially vulnerable fledglings when introduced at national and sub-national units of government, and as such, at the mercy of the bureaucratic pecking order. In order for efforts to survive and grow, national-level leaders of such processes need to be able to effectively communicate the benefits of such integrated approaches across a broad range of government agencies and local institutions in order to convince government and community leaders that it is in their self-interest to voluntarily coordinate across areas such as: policy and development planning; investment in efforts to reduce stress on natural resources and improve environmental state; and in strengthening community engagement in management.

446. Communications and the effective use of the media was identified by the terminal evaluation of the SCS project as a critical element of efforts to raise awareness, to stimulate support for necessary policy and legal reforms, and for global outreach with donors and other initiatives of the GEF International Waters focal area. That review also identified the communications and media initiatives of the SCS project as being essential in ensuring that best practices generated through national demonstration projects and national policy development processes were captured, shared and effectively communicated to guide the longer-term sustainability and scaling-up of investments. This component builds on these achievements through development of national and regional platforms for managing information and sharing best practices and lessons learned from efforts of this project to test the implement the South China Sea SAP.

447. Specifically, a regional SAP implementation communications strategy will be developed and opportunities for public-private partnerships with the media explored to strengthen the role of communications and the media in SAP implementation. These efforts will place emphasis on capacity development for natural resource managers and media professionals and sets out activities to be executed through the partnership to include inter alia:

- Training of young media professionals in coastal and marine environmental management in the SCS
- Mentoring of natural resource managers on communications and media issues
- Targeted television broadcasting of coastal and marine resource management media products
- Preparation of short film, documentary and other awareness materials for outreach purposes
- Design of awareness materials and use of web-based technologies for communications
- Liaison with national and regional media outlets for broad syndication of media products
- Development of multi-media products in support of regional and national coordination initiatives
- Capture and regional sharing of national experiences in project execution
- Planning of communications strategies in support of region-wide scaling-up of SAP innovations

448. This will be complemented via the establishment and operation of web-based ‘SCS Network’ to strengthen cross-sectoral and multi-lateral communication and knowledge management and a programme of study tours and exchanges aimed at government officials, community leaders, and habitat and pollution managers. Additionally, sustainable management indicator matrices were developed for dominant coastal habitats during the SAP formulation process but have not yet applied and tested in the framework of SAP implementation. This project will draw upon the GEF supported Transboundary Waters Assessment Programme methodology to: develop regionally applicable

standards and criteria for defining the sustainability of coastal habitat management systems; and to document models of sustainable use to guide the initiative's replication and scaling-up strategy. Specific targets for Outcome 2.5 are outlined in Table 35.

**Table 35** Baselines, targets and project indicators for Outcome 2.5

Baselines	Targets	Indicators
Sustainable management indicator matrices developed for dominant coastal habitats but not yet applied and tested in framework of SAP implementation	2.5.1 Regionally applicable standards and criteria for defining the sustainability of coastal habitat management systems, including documented models of sustainable use	Status of initiative to develop and apply standards and criteria, including the TWAP methodology, for determining the sustainability of coastal management systems
Lessons learned and best practices in coastal habitat management from 23 demonstration sites documented and published in peer reviewed article	2.5.2 Online catalogue of best practice management measures and technologies for sustainable use of SCS coastal habitats and land-based pollution management	Number of best practice management measures and technologies documented, codified, and accessible via online catalogue
Limited engagement of community-based governance mechanisms in national policy and planning  Low level mobilization of civil society, community organisation and the private sector in environmental investment planning	2.5.3 Government officials, community leaders, and habitat and pollution managers exposed to ongoing practices in rehabilitation, management , and pollution control and treatment via programme of study tours and exchange	Extent and continuity of local leader and local government participation in study tour and exchange initiatives  Level of improved local relevance of national policy and planning efforts for reducing environmental degradation in the SCS
Public awareness materials developed via TDA/SAP project compiled and accessible via SCS website	2.5.4 Expanded South China Sea online public awareness centre, including awareness packages for local adoption	Number of public awareness products accessible online  Extent of local uptake and use of awareness products

#### **Outcome 2.6 Updated and Ministerially adopted Transboundary Diagnostic Analysis and Strategic Action Programme, including prioritization of national management actions to address climate variability and change**

449. Activities to undertake a more contemporary Transboundary Diagnostic Analysis for the SCS basin, and linked actions to prepare an updated Strategic Action Programme for the SCS, will draw on information generated via the abovementioned activities and the recently published (December, 2013) special issue of the peer-reviewed journal 'Ocean and Coastal Management' on the outcomes of the SCS project. The latter contains updated information and data related to the status and trends in coastal habitats, land-based pollution management, and links to related initiatives in the integration of fisheries and habitat management. Key activities will include: facilitation of consultative processes to reach national and regional level consensus on contemporary issues and problems in the SCS, including the quantification of environmental compromises and the prioritization of problems; preparation of guidelines and mobilization of technical support to assist with the characterization of the immediate and ultimate root causes of the problems identified and to reach consensus on priorities for intervention, including the assessment of the comparative net benefit of options based on revised economic valuation information; and efforts to prepare an updated SAP which will including a prioritization of national management actions to address climate variability and change for subsequent incorporation into national marine and coastal policies and plans.

450. The purpose of a TDA is to assess the relative importance of all environmental disturbances and threats in the water body concerned, identify their causes and specify potential preventative and remedial actions. A TDA thus provides the basis for the formulation of a Strategic Action Program

(SAP) embodying specific actions, or interventions that can be adopted nationally, usually within a harmonized multinational context, to restore, or protect from further degradation, a specific international waters area. An implicit intention in the preparation of a TDA in the GEF context is to identify the priority issues that have their origins or consequences beyond the boundaries of the individual state jurisdictions. Although such analyses can be conducted by, and within, single countries, the need to identify transboundary effects and causes makes it desirable that the analyses be conducted on a multilateral basis involving all riparian states bordering an international water body.

451. In simple terms, a TDA is a scientific and technical assessment of the environmental issues and problems associated with a particular shared water body. The TDA identifies and quantifies the environmental issues and problems in the area and identifies their immediate, intermediate and fundamental causes (the latter sometimes referred to in GEF documents as “root causes”). Such an analysis involves an identification of the causes and impacts of environmental disturbances and/or threats and assesses the scale and distribution of those impacts at national, regional and global scales. Impacts are predominantly evaluated in socio-economic terms. The identification of causes results in the specification of practices, sources, locations and sectors of human activity from which environmental degradation arises or is threatened.

452. The revised TDA will yield the following: a comprehensive listing of environmental issues and threats; a quantification of the scope and scale of each issue and threat; prioritization of the issues and threats in an international waters area, based on their relative significance; identification of the causes and the jurisdictional origins of those causes for each issue and threat (i.e., identification of which issues and threats are purely national and which are transboundary); and identification and evaluation of options for intervention, primarily to address the causes of environmental degradation and threats. This will be expanded upon through evaluation of potential interventions (i.e., the options for intervention) within a benefit-cost framework drawing on the economic valuation information compiled as part the work of this component of the project. This will form the basis for formulation of the revised SAP which will integrate outcomes of the review of the potential impacts of sea level rise, climate change, and episodic events on coastal habitats of the South China Sea. Specific targets for Outcome 2.6 are outlined in Table 36.

**Table 36** Baselines, targets and project indicators for Outcome 2.6

Baselines	Targets	Indicators
TDA for SCS published in 2000 Special Issue of Ocean and Coastal Management on South China Sea published in 2013	2.6.1 National and regional level consensus on contemporary issues and problems, including the quantification of environmental compromises and the prioritization of problems (Yr 2)	Status of national and regional level consensus on contemporary issues of transboundary significance with respect to coastal habitat and land-based pollution management
Strategic Action Programme endorsed in 2008 outlines priorities for management Established methodology for cost of action versus non-action in the context of SCS SAP implementation	2.6.2 The immediate and ultimate root causes of the problems identified and consensus reached on priorities for intervention, including comparative analysis of the net benefits of alternative options (Yr 3)	Status of national and regional level consensus reached on priority actions for intervention Status of cost benefit analysis of comparative net benefits of alternative options for management
Strategic Action Programme for the South China Sea endorsed inter-governmentally in 2008	2.6.3 National and regional consultative process to develop updated Strategic Action Programme SAP for adoption by appropriate Ministers (Yr 5)	Status of =adoption by appropriate Ministers of an updated Strategic Action Programme for the South China Sea
Evolving understanding of sea level rise, climate change, and	2.6.4 Prioritization of national management actions to address	Level up demonstrable use of the regional review on sea level rise,

episodic events in East Asia but not applied in context of transboundary planning in the South China Sea	climate variability and change for incorporation into national policies and plans	climate change, and episodic events in SAP formulation
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### **Component 3 Facilitating regional and national level integration and cooperation for implementation of the South China Sea Strategic Action Programme**

453. This component will result in: regional and sub-regional co-operation in the integration of scientific knowledge and research outputs with management and policy making; capacity for civil society and community organization participation in SAP implementation strengthened via operational partnership with GEF SGP; relationships between central and local governments and the private sector strengthened and formalized; revitalization of regional mechanisms for communications, knowledge exchange, and information and data management and sharing; and agreed arrangements for strengthened regional cooperation in the management of the marine and coastal environment of the South China Sea. Each of the outcomes to be delivered via Component 3 of the project are outlined below.

#### **Outcomes 3.1 Regional and sub-regional co-operation in the integration of scientific knowledge and research outputs with management and policy making**

454. The SAP includes a number of agreed mechanisms for effective cooperation. These mechanisms include the operation of a high level scientific and technical body that serves as a forum for reconciling both sectorial and national interests and priorities, and to foster the incorporation of sound science into decision-making. Outcome 3.1 “Regional and sub-regional co-operation in the integration of scientific knowledge and research outputs with management and policy making” will meet this agreed need via operation of a Regional Scientific and Technical Committee that will act as a source of independent scientific and technical advice to policy-makers. To support the uptake of regionally accumulated scientific knowledge in policy-making and planning, the project will facilitate exchanges between government and the scientific community via biennial Regional Scientific Conferences. This will be complemented via the development and operation of a network of local government officials and operational level managers, including annual Mayors’ Round-table meetings, to share experiences and best practices in the application of science in the management of coastal habitats and land-based pollution.

455. A further expected outcome of this component is sub-regional cooperation in the integration of scientific knowledge and research outputs in two priority transboundary areas. The latter builds on a key innovation of the SCS project involving the generation of bilateral cooperation between Cambodia and Viet Nam which led to the signing of a Memorandum of Understanding between the Provincial Governors of Kampot (Cambodia) and Kien Giang (Viet Nam) (which was subsequently formalized by the central governments of these countries) for the joint management of the environment and coastal resources of their shared transboundary water area. Activities under this component will strengthen this formal transboundary cooperation and facilitate its replication in an additional two transboundary areas.

456. Importantly this component will establish mechanisms for the capture and exchange of best practices and lessons learned from the related UNEP/GEF fisheries *refugia* management project. Activities will also be implemented to ensure that these best practices and lessons learned be used to inform the update of the Strategic Action Programme for the South China Sea and the National Action Plans for coastal habitats and land-based pollution management to be undertaken as part of this SAP implementation project. As part of best practice and lessons learned exchange, this component will also establish an operational award program on best practices in coastal habitat and land-based pollution management for communities, local governments and industry. Specific targets for Outcome 3.1 are presented in Table 37.

**Table 37** Baselines, targets and project indicators for Outcome 3.1

<b>Baselines</b>	<b>Targets</b>	<b>Indicators</b>
Lack of a formal mechanism for the sharing of science and technical knowledge relating to the South China Sea SAP implementation	3.1.1 Regional Scientific and Technical Committee of the SCS project functioning as a bridge between the scientific community and decision-makers [annual meetings]	Status of the RSTC and the uptake of the scientific and technical advice it provides Continuity of participation of RSTC members in annual meetings
Limited application of evidence-based approaches by central and provincial government agencies	3.1.2 Knowledge exchanges between government and scientific community through biennial Regional Scientific Conferences	Number of central and provincial government agencies with demonstrable use of scientific knowledge exchanged during biennial conferences
Four Mayors Round-Table meetings convened during period 2005-2008 and documented as a key innovation for improving local relevance of action planning and M&E	3.1.3 Best practice exchanges between local government officials and coastal managers on science-based management via annual Mayor's Round-Table meetings	Number of Mayor's Round-Table meetings convened Number, scope & reach of communications to raise local official awareness of best practices
Bilateral cooperation between Cambodia and Vietnam initiated during the period 2007-2008 although this has stagnated as a result of a lack of regional coordination support	3.1.4 Memoranda of Agreement for joint collaboration of 2 priority transboundary water areas agreed & implemented	Status of bilateral cooperation for transboundary resource management between (a) Cambodia and Vietnam and (b) Cambodia and Thailand Status of signature of Memoranda of Agreement
Execution of the UNEP/GEF Fisheries Refugia project to commence in Q3 of 2016 through SEAFEDC and national fisheries agencies	3.1.5 Cooperation with the GEF fisheries refugia project and other relevant regional initiatives established	Extent of joint planning by both projects Number of best practices and lessons learned captured from the fisheries refugia project
Lack of mechanism to formally recognize and award communities, local governments and industry for innovation and generation of best practices for environmental management of the South China Sea	3.1.6 Operational award program on best practices in coastal habitat and land-based pollution management for communities, local governments and industry [annual]	Number of best practices identified Number of community organisations, local governments and industry receiving awards

### **Outcome 3.2 Capacity for civil society and community organization participation in SAP implementation strengthened via operational partnership with GEF SGP**

457. Although not foreseen in the design of the SCS project, once the SCS project had prioritized sites for the establishment of demonstrations in habitat management, liaison was established with the GEF Small Grants Programme to investigate if there was likely to be a synergistic opportunity for creating, funding and managing these demonstration activities. On the one hand, while the SCS project had the entire South China Sea and Gulf of Thailand as its focus, the SGP invariably focused on smaller scale interventions in individual countries. Furthermore, it frequently lacked the scientific underpinning for the strategic and tactical aspects on its interventions.

458. On the other hand, the SGP had a tried and tested mechanism for funding and managing its smaller scale interventions, which the SCS project at its inception did not. The SGP has funded 811 international waters projects at the community level totaling \$19 million GEF funding and \$34 million co-financing. Of these projects, 139 had been funded in one country of the SCS region, Thailand. Despite management encouragement to strengthen this focal area, the SGP-IW portfolio remains

under-developed, accounting for a small percentage of the entire portfolio. Once it became clear that there were resource limitations to the number and type of demonstrations that could be created under the SCS project, cooperation with the SGP was seen as offering substantial benefit.

459. Prior to the partnership, the SCS project had initiated 14 demonstration sites through the local and provincial governments of the seven participating countries. The subsequent collaboration between the SCS project and the SGP enabled a total of 31 projects in six countries to be executed rather than the much smaller number possible under the aegis of the SCS project alone. The benefits associated with this initiative have been documented and published by Chen et al., (2013). Outcome 3.2 will build on the intra-country and inter-country consultation and cooperation fostered by the SCS project via efforts to strengthen civil society and community organization engagement in SAP implementation and revision. Specifically, capacity for civil society and community organization participation in SAP implementation will be strengthened via an operational partnership with GEF SGP. An additional package of SGP projects will also developed to support implementation of the revised SAP. The SGP project proponents, to be engaged in supporting community-based actions at the priority mangrove, coral reef, seagrass and coral reef sites being brought under management through Component 1, will benefit from technical support by the Specialized Executing Agencies leading the national packages of habitat management interventions, as well as monitoring and evaluation support from the National Technical Working Groups. Specific targets for Outcome 3.2 are presented in Table 38.

**Table 38** Baselines, targets and project indicators for Outcome 3.2

Baselines	Targets	Indicators
Need for strengthened mobilization of civil society and community organizations in SAP implementation	3.2.1 Cooperation with GEF SGP in the commissioning and implementation of 12 community-based projects for SAP implementation	Number of GEF Small Grants Programme projects commissioned and implemented in support SAP implementation
Need for CSO and CO inputs to planning of an SCS-SGP partnership	3.2.2 CSO & CO inputs elicited for planning and M&E of the SCS-SGP partnership via annual NGO forums	Extent and scope of inputs from CSOs and COs Number of NGO forums convened
Limited civil society and community organisation experience and capacity for coastal habitat and land-based pollution management	3.2.3 Training program on science and management of SCS coastal habitats and resources for SGP proponents	Number of SGP proponents trained to implement local actions in support of the achievement of SAP targets

### **Outcome 3.3 Relationships between central and local governments and the private sector strengthened and formalized**

460. Policy makers of the East Asian countries increasingly recognise the importance of the private sector in the sustainable development of national economies, particularly the need for commercially viable activities that simultaneously deliver local and global development and environmental benefits. While it is acknowledged that priorities of the public and private sectors are often quite different, activities of this project are designed to promote the development of public-private partnerships aimed at leveraging their respective interests for innovation and impact. This is considered central to the financial sustainability of the SAP approach fostered by the GEF International Waters focal area. Particularly from the perspective of coordinated investments in SAP implementation. A consultative approach to identifying opportunities for private sector investment will be adopted, including national and regional investment forums to facilitate cooperation with the private sector and donors on investment in the implementation of the revised SAP.

461. Significant commercial enterprise is conducted in waters of the South China Sea, particularly in the areas of oil and gas, fisheries and tourism. Preparation of this present project identified that while many private sector organisations operate corporate social and environmental responsibility programmes, these are rarely aligned with coastal and marine environmental management. Accordingly, supporting activities will be implemented to review past and ongoing public-private partnerships for coastal management in SCS region and identify opportunities for private sector investment (e.g. oil and gas, fisheries, tourism) in implementation of the updated SAP. These preparatory activities will feed into the abovementioned partnership forums to facilitate cooperation with the private sector on implementation of the updated SAP. Specific targets for Outcome 3.3 are outlined in Table 39.

**Table 39** Baselines, targets and project indicators for Outcome 3.3

Baselines	Targets	Indicators
Many private sector organisations operate corporate social and environmental responsibility programmes but they are not aligned with SAP implementation	3.3.1 Review of past and ongoing public-private partnerships for coastal management in SCS region	Number of public-private partnerships identified and documented
Significant commercial enterprise is conducted in waters of the South China Sea, particularly in the areas of oil and gas, fisheries and tourism	3.3.2 Identification of opportunities for private sector investment (e.g. oil and gas, fisheries, tourism) in implementation of the updated SAP	Number of opportunities for private sector investment in SAP implementation identified
Low-level mobilization of the private sector in environmental investment planning in the South China Sea	3.3.3 Two partnership forums to facilitate cooperation with private sector on implementation of the updated SAP	Status of agreement on financial arrangements for private sector and donor investment in the implementation of the revised Strategic Action Programme

#### **Outcome 3.4 Revitalization of regional mechanisms for communications, knowledge exchange, and information and data management and sharing**

462. The component will also revitalize and strengthen regional mechanisms for communications, knowledge exchange, and information and data management and sharing. This will involve the development and implementation of a communications strategy for the delivery of targeted messaging to national level stakeholders, regional supporting organizations and projects, and donors on the results of SAP implementation and related efforts in strengthening regional cooperation. This is aimed at stimulating support and awareness of necessary policy and legal reforms and in ensuring that best practices generated at the national level are captured, shared and effectively communicated to guide the longer-term sustainability of investments. Regionally appropriate knowledge tools will also developed to support decision-making and planning. This component also includes the sustained operation of the SCS project web portal <[www.unepscs.org](http://www.unepscs.org)> and associated regional databases, which will also be linked to IW-Learn and other GEF Knowledge management systems. Active engagement with GEF IW:LEARN [1% of project resources], including participation in IW conferences and 3 experience notes, will also be fostered. Project activities will also result in the publication of synthesis reports on: climate variability in coastal systems; hazards and coastal area planning; blue forests and livelihoods; and land and marine tenure and use designation. Specific targets for Outcome 3.4 are outlined in Table 40.

**Table 40** Baselines, targets and project indicators for Outcome 3.4

Baselines	Targets	Indicators
The SCS project produced an extensive range of knowledge	3.4.1 A variety of multi-media information and knowledge	Number of multi-media and knowledge products produced

products, technical guides, and training and awareness materials	products based on SCS SAP implementation communications strategy	
Transboundary coastal and marine mgmt. spatial planning constrained by lack of a regionally coordinated approach to harnessing sectorial expertise and knowledge	3.4.2 Regionally appropriate knowledge tools developed to support decision-making and planning	Status of knowledge tool development to support evidence-based coastal and marine management and spatial planning
Need for media platforms and targeted communications in support of efforts to harness support for inter-ministerial coordination and policy and planning elements of SAP implementation and revision	3.4.3 The SCS project web portal < <a href="http://www.unepscs.org">www.unepscs.org</a> > and associated regional databases online, updated and linked to IW-Learn and other GEF Knowledge management systems	Number of users, volume of content accessed, and online visibility of the SCS website and associated databases
Limited regional and global sharing of information on best practices and lessons learned from investments in the SCS despite for example publication of a complete Special Issue of an international journal on the progress to date	3.4.4 Active engagement with GEF IW:LEARN [1% of project resources] including participation in IW conferences and 3 experience notes	Number of IW:LEARN experience notes published

### **Outcome 3.5 Agreed arrangements for strengthened regional cooperation in the management of the marine and coastal environment of the South China Sea**

463. Activities in support of the achievement of Outcome 3.5 involve the review and assessment of regional and national institutional frameworks and the formulation of appropriate recommendations for strengthened regional coordination in the implementation of the SAP for the management of the marine and coastal environment of the South China Sea that fosters the wise use of natural, human and financial resources whilst conforming to the ethos and culture of the region. Supporting activities include: biannual meetings of the Regional Task Force on Legal Matters to review the proposed policy, legal and institutional strengthening recommendations in support of SAP implementation; the establishment and operation of National Working Groups on matters to be decided by the countries to support national and provincial level discussion and agreement on policy, legal and institutional reforms; and reviews and evaluation of existing arrangements for cooperation.

464. The activities undertaken in this sub-component will be the direct responsibility of a Regional Task Force on Legal matters (RTF-L) that will execute the relevant regional activities working in close consultation with National Working Groups on Legal Matters (NWG-L) established in each country. The NWG-L shall have responsibility for executing the national level actions. Activities under this sub-component are intended to lead to the adoption of stronger, long-lasting and more formal arrangements for regional co-operation in the management of the marine and coastal environment of the South China Sea including the long-term implementation of the SAP. The sub-component is envisaged as being operated in six stages over the five years of project implementation as follows:

- Setting parameters: an organisational phase that involves the adoption of a statement of intent, or terms of reference; sets parameters for the work; identifies the parties involved; establishes broad time-frames; and co-ordination mechanisms between the regional and national bodies involved.
- Drafting the instrument: a preparation and information gathering phase. Acting in accordance with information gathered from the national and any regional activities, the general parameters in Stage 1 can be clarified and amended, providing a more specific direction or resulting in further activities to clarify issues. General issues can be refined, and areas of consensus and

disagreement and overlaps and constraints can be identified. Essentially, this phase determines the work schedule (more specific timeframes) and objectives at both the national and regional levels.

- Preparing a framework: this phase moves the process from preparation into drafting. Based on feedback from the national and regional activities, the regional body should draft a ‘framework’ instrument – titles and headings for provisions in the instrument, not unlike a comprehensive table of contents. It may contain basic provisions to be fleshed out in due course.
- Drafting an agreement in principle: this stage will involve drafting the substance of the agreement in accordance with feedback from national and regional consultations. It will be sent to the national level for review by the appropriate national bodies, and to other institutions, as deemed fit. Expert scientists should review it to ensure that provisions are scientifically sound.
- Finalisation: the final drafting stage where legal and technical issues are resolved and the text finalised.
- Adoption: at this stage the instrument is submitted to the relevant national ministries for signature.

465. Specific targets for Outcome 3.5 are outlined in Table 41.

**Table 41** Baselines, targets and project indicators for Outcome 3.5

Baselines	Targets	Indicators
Regional Task Force on Legal Matters established through SCS project but presently not functioning	3.5.1 Biannual meetings of the Regional Task Force on Legal Matters	Number of Regional Task Force meetings Continuity of participation of nationally nominated members
National Working Groups on Legal Matters established through SCS project but presently not functioning	3.5.2 National Working Groups on Legal Matters revitalised and functional	Number of National Working Group meetings Continuity of participation of nationally nominated members
Framework process developed but requires national and regional consultation	3.5.3 Process for development of a proposed arrangement for regional cooperation defined and planned	Status of agreement on identified process
SAP formulation benefit from an emphasis on consensual planning and decision making	3.5.4 National stakeholder inputs to drafting of instrument for strengthened regional cooperation facilitated via national consultations	Extent of national stakeholder input to drafting phase of instrument for cooperation
Participating countries agreed in the SAP, and in endorsing the PIF for this project, to explore the development of an instrument for strengthened regional cooperation	3.5.5 Adopted instrument for strengthened regional cooperation	Status of adoption of the instrument

### 3.4. Intervention logic and key assumptions

466. This project represents a step in the logical progression of GEF support to countries that share a common river basin or Large Marine Ecosystem, as laid out in the original International Waters Operational Programmes and further elaborated in the current GEF Strategic Programmes. The GEF

seeks to initially encourage countries bordering shared LMEs or river basins to work together in determining the priority issues and problems through the preparation of a TDA. This is followed by the development of a costed and targeted programme of priority interventions in the form of a Strategic Action Programme, which is then implemented. In the case of the seven participating countries the development of the TDA took place between 1996 and 1999; which was then followed by the elaboration of the SAP; implementation of the first phase of the SAP is envisaged to run for five years from the present. The present project therefore represents a SAP implementation project during which it is anticipated the countries will jointly and severally agree on more formal arrangements for the conduct of future regional collaboration in the management of the marine environment of the South China Sea.

467. The key assumptions are that sufficient political support can be mobilized in all countries to secure agreement on the future mechanisms for SAP implementation beyond the life of the present project and that, governments will agree to finance these operations at a level adequate to ensure continued action at the regional and national levels to reverse environmental degradation trends in order to provide global, regional and national environmental benefits. The fact that the countries have discussed the SAP internally and approved it at the intergovernmental level, and all endorsed the Project Identification Form for the development of this project, indicates that sufficient political support exists at present to initiate the process of SAP implementation and to enter into discussions of future arrangements for its continued and independent implementation.

### **3.5. Risk analysis and risk management measures**

468. Any multi-lateral programme or project carries with it an inherent series of risks reflecting the varying internal political, economic, social and cultural conditions of each of the participating states. A major risk is that problems arising from countries not proceeding at the same pace with project implementation may lead to the rate of progress being determined by the slowest country. This risk can be addressed by the presence of a strong competent implementation unit that is prepared to spend time with each participating country resolving their individual difficulties and problems. Experience with the SCS project has shown that close communication between the implementing unit and the executing entities at the national level can enhance participation and resolve individual country issues and problems as they arise.

469. Changes and turnover of staff acting as focal points for project activities at the national level is a risk that may impede project implementation leading to a “stop-start” situation within one country or component, again experience within the SCS Project suggests that this can be overcome (but not entirely removed) by the implementing unit building a personal linkage with the individuals at the national level, that can be “inherited” by the incoming staff member. In addition, the incorporation of feedback loops in the management framework that, allow multiple routes of communication both vertically within countries and horizontally between countries will help to bring new-comers up to speed.

470. Failures of coordination at both the national and regional levels pose varying degrees of risk. If the implementing unit is staffed by competent, committed, and professional staff members having knowledge or experience in more than one discipline and with an ability to communicate well at a personal level with national focal points, then the risks of coordination failure at a regional level are minimised. At the national level the responsibility for coordination lies with the focal ministry and past experience has shown that the success of this coordination varies both between countries and across years. This risk can only be mitigated by establishing good relationships between the implementing unit and the focal ministries concerned.

471. Risks are also apparent where the potential for political considerations to interfere with the scientific process arise, as for example in deciding where scarce resources should be allocated both between and within countries. These risks can be addressed through a clear separation of the processes

of scientific and political decision making with the ultimate decisions being made on the basis of sound scientific advice. Mitigating this risk requires that the science is indeed sound and that scientific and technical recommendations are prepared independently of the political decision making process. This problem did not arise in the SCS project where the regional scientific and technical committee prepared recommendations based on scientific and technical considerations and the project steering committee made the decisions regarding which alternatives were acted upon. A summary of the risks and assumptions identified during project preparation is provided in Table 42 below. A risk log identifying risk management measures for identified risks of medium-high likelihood or impact severity is provided in Table 43.

**Table 42** Risks and assumptions identified during the preparation phase of the South China Sea SAP implementation project

**Component 1.** Reducing habitat degradation and loss via national and local reforms to achieve Strategic Action Programme targets for coastal habitat management in the South China Sea

<b>Appropriate forms of sustainable management established for 860,000 ha of mangrove by Yr 5</b>
<ul style="list-style-type: none"> <li>• Adequate joint government and community commitment to manage mangrove on a protected area basis</li> <li>• Adequate local cooperation to agree boundaries and compile and analyse information to identify threats and agree management actions</li> <li>• National and provincial/local government commitment to adopt governance reforms that reflect local needs</li> <li>• Landowner commitment to convert present land-use to mangrove forest</li> <li>• Appropriate selection of enrichment planting sites to minimise risks associated with: chronic pollution from shrimp farming operations; charcoal production; and storm surge inundation</li> </ul>
<b>153,000 ha of coral reef at 82 priority sites managed sustainably by Yr 5, including a reduction in the decadal rate of degradation in live coral cover from 16 to 5%</b>
<ul style="list-style-type: none"> <li>• Management capacity initiatives are sufficiently well planned to accommodate biodiversity conservation and livelihood/food security needs at coral reef sites</li> <li>• Existing tensions between coral reef resource users and governments may limit community participation</li> <li>• Commitment of central and local governments, as well as resource users, to jointly develop and apply management tools governing coral reef resource use</li> <li>• Capacity of provincial and local level resource managers to collate nationally and regionally comparable information and data</li> </ul>
<b>Conservation, management and sustainable use of 25,900 ha of known seagrass area in the South China Sea by Yr 5</b>
<ul style="list-style-type: none"> <li>• Central and local government commitment to enact laws for seagrass management in light of development pressures</li> <li>• Adequate local cooperation, as well as satisfaction with existing MPA management, to agree priority seagrass management actions</li> <li>• Adequate joint government and community commitment to manage seagrass on a protected area basis</li> <li>• Capacity of provincial and local level resource managers to collate nationally and regionally comparable information and data</li> </ul>
<b>Integrated management of 783,900 ha of coastal wetland at 19 sites, including habitat restoration and protection strengthened at priority locations</b>
<ul style="list-style-type: none"> <li>• Adequate local cooperation to agree boundaries and compile and analyse information to identify threats and agree management actions</li> <li>• Development pressures may result in adoption or revision of land-use policies which compromise efforts to conserve priority wetland sites</li> <li>• Capacity of provincial and local level resource managers to collate nationally and regionally comparable information and data</li> </ul>
<b>National and regional level cooperation in tracking results of SAP actions for coastal habitat management</b>

- Consultative processes may not elicit adequate stakeholder input and support from national participants
- Sustained commitment of senior officials with responsibility for SAP implementation to develop and operate a harmonized results monitoring and reporting system for coastal habitat management
- Existing tensions between land-owners and government agencies may limit community leader participation
- Internal tensions between community organisations may be exacerbated by discussions about community priorities
- Adequate national and regional mechanisms for the step-wise review of information and data used in reporting

**Component 2.** Strengthening knowledge-based action planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea

<b>Enhanced information-base for coastal habitat management and action planning</b>
<ul style="list-style-type: none"> <li>• Adequate national and local capacity to ground-truth and conduct rapid assessments for validation of remotely sensed information and data</li> <li>• Engaging appropriate expertise to facilitate consensus on the selection of physical, biological and socio-economic variables to be used in characterising coastal habitat sites, as well as willingness of data holders to share</li> <li>• Appropriate selection of in-situ monitoring sites to minimise risks associated with: typhoon; emerging development pressures; and storm surge inundation</li> <li>• Engaging appropriate breadth of expertise in conducting review to facilitate consensus building at both national and regional levels on findings and recommendations</li> <li>• Ministerial level commitment to adopt updated management plans and enact supporting legislation</li> </ul>
<b>Effective integration of regional science in the management of land-based pollution</b>
<ul style="list-style-type: none"> <li>• Communication strategy and products sufficiently well designed to achieve desired reach and impact</li> <li>• That modelling may be carried out on a 2-dimensional basis and making the assumption that the surface, mixed layer is vertically homogeneous</li> <li>• Characterisations of pollution hotspots provide adequate information regarding heavy metal contaminants and threats to environmental and public health</li> <li>• Sufficient national and local capacity, including laboratory facilities, to compile regionally comparable site characterisations</li> <li>• Willingness of private sector to engage and cooperate in efforts to determine environmental impact of operations</li> </ul>
<b>Strengthened and harmonized national policies and laws, and supporting financial mechanism, for the management of land-based sources of pollution</b>
<ul style="list-style-type: none"> <li>• Challenges and costs associated with demonstrating stress reduction benefits may constrain replication and up-scaling</li> <li>• Uptake of best practices may also be constrained if the publicizing of the benefits is inadequate</li> <li>• Willingness of sector agencies to participate in review of national policies and laws</li> <li>• Harmonization of governance frameworks may take longer than the period of the project</li> <li>• Willingness of sectoral agencies to participate in the development of Standard Operating Procedures</li> <li>• National and provincial government commitment to reform</li> <li>• Availability of information and data to enable comparison of cost of action versus cost of inaction as part of investment planning approach</li> <li>• Level of commitment of participating countries, development partners, and donors to invest in coordinated action</li> </ul>
<b>Improved national and regional values for the Total Economic Values of coastal habitats for use in development planning and decision-making</b>
<ul style="list-style-type: none"> <li>• Application of regionally consistent methodology in the collection and review of information and data</li> </ul>
<b>Regionally appropriate tools and mechanisms to guide the development of sustainable management systems for coastal habitats and land-based pollution</b>

- Supporting communication approach and facilitation of consultative processes are sufficiently well designed to ensure stakeholder engagement and participation
- Internet connectivity and in provincial and local offices of environment and natural resource agencies adequate to support effective online knowledge sharing
- Existing tensions between local leaders, land owners, and government agencies may limit community leader or government official participation
- Study tours and exchange initiatives are sufficiently well designed to guide uptake of best practice at provincial/community levels
- Awareness materials are sufficiently well designed and shared with stakeholders to ensure uptake and desired local impact

**Updated and Ministerially adopted Transboundary Diagnostic Analysis and Strategic Action Programme, including prioritization of national management actions to address climate variability and change**

- Securing adequate and consistent inputs of expertise may be compromised if incentives for national and regional specialists to participate in work are inadequate
- Minister-level commitment to adopt and sign the revised SAP
- Engaging appropriate technical expertise to identify priority national actions that achieve local benefit as well as high transboundary impact

**Component 3** Facilitating regional and national level integration and cooperation for implementation of the South China Sea Strategic Action Programme

<b>Regional and sub-regional co-operation in the integration of scientific knowledge and research outputs with management and policy making</b>
<ul style="list-style-type: none"> <li>• Harnessing sufficient scientific and technical expertise across disciplines including coastal habitats, ecology, economic valuation, oceanography, land-based pollution and its impacts</li> <li>• Strong and consistent support from government agencies to actively participate in scientific fora</li> <li>• Strong and consistent support from local government officials to actively participate in fora aimed at stimulating knowledge sharing on best practice management approaches and technologies</li> <li>• Commitment of central governments, provincial governments, and resources users to participate in consultative processes relating to the joint management of transboundary resources</li> <li>• Commitment of SEAFDEC and UNEP to actively and constructively cooperate on identifying and sharing best practices between projects</li> <li>• Communities, local governments and industry initiatives result in innovative approaches</li> <li>• Interest of stakeholders to participate in such a programme</li> </ul>
<b>Capacity for civil society and community organization participation in SAP implementation strengthened via operational partnership with GEF SGP</b>
<ul style="list-style-type: none"> <li>• There will be sufficient number of civil society and community based organisations to act as GEF SGP proponents in support of SAP implementation</li> <li>• That linked capacity building initiatives are sufficiently well designed to build capacity of CSOs and COs for planning</li> <li>• Training materials are sufficiently well planned and presented in local languages to meet needs of the staff of SGP proponent organisations</li> </ul>
<b>Relationships between central and local governments and the private sector strengthened and formalized</b>
<ul style="list-style-type: none"> <li>• Engaging appropriate expertise to link information on corporate social responsibility to SAP targets and implementation priorities</li> <li>• Communications and engagement strategies sufficiently well planned to establish interest among private sector entities in SAP implementation</li> <li>• Limited private sector interest or alignment of donor investment strategies with revised SAP targets and actions</li> </ul>
<b>Revitalization of regional mechanisms for communications, knowledge exchange, and information and data management and sharing</b>
<ul style="list-style-type: none"> <li>• Sufficient creative input can be harnessed to produce products that have high impact on stakeholders</li> </ul>

- Limited scientific understanding of the role climate variability and anthropogenic induced change on the SCS marine basin may result in climate issues dominating scientific & technical discussions
- Internet connectivity in national and regional offices is adequate to support the efficient online compilation and sharing of information and data
- Retention of national and regional level staff required to resource the documentation of experiences and lessons learned as IW:LEARN experience notes

**Agreed arrangements for strengthened regional cooperation in the management of the marine and coastal environment of the South China Sea**

- National government commitment to ensure continuity of participation of nominated members
- Adequate incentive structures are in place nationally to secure adequate expertise to consider matters relating to cooperation
- Adequate planning and facilitation to support consensus building
- Adequate planning and facilitation to elicit national inputs required to support consensus building
- Government commitment to cooperate on matters relating to coastal and marine environmental management in the South China Sea basin

**Table 43** Risks and proposed management strategies and safeguards for the UNEP/GEF SCS SAP implementation project

Risk Description	Category	Impact Severity	Likelihood	Risk Management Strategy and Safeguards	By When/Whom?
Inadequate joint government and community commitment to sustainably manage priority coastal habitat sites (includes mangroves, coral reefs, seagrass and wetlands)	Political	High	Low	<p>It is acknowledged that tensions often exist between levels of government regarding issues of jurisdiction, resourcing and priority setting. Experience from the 23 demonstration sites and lessons learned documented in preparation of this project indicate however, that there is sufficient government commitment to address priority coastal habitat management issues. The signing of the Memorandum of Understanding on cooperation in the implementation of the SAP by all participating countries indicates that the likelihood of this risk impacting on the project is low.</p> <p>The risk is further mitigated by the fact that no project activities will be undertaken in areas of jurisdictional dispute. There is however a need for this ‘community to cabinet’ type integration to take place within well-structured national and regional consultative processes that provide opportunities for different stakeholders to understand each other’s perspectives and needs, and for the step-wise review of decision-making from national to regional levels and vice versa. This has been addressed as part of the design of the present project via the planning of targeted actions to strengthen regional and national level integration and cooperation, including revitalization of national coordination mechanisms and the operation of Mayors’ Round-Table meetings and related, interlinked fora for NGOs CSOs and COs.</p>	<ul style="list-style-type: none"> <li>• Initiated during project inception period</li> <li>• National Lead Agencies</li> <li>• National Inter-Ministry Committees</li> <li>• SAP Implementation Committee</li> </ul>
Adequate local cooperation to analyse information to identify threats and agree management actions at priority coastal habitat sites	Organisational	High	Low-medium	<p>Stakeholder participation in local planning processes is often constrained by existing tensions between competing interests, e.g., difficulties fisherfolk and environmental NGOs experience in reaching agreement on matters relating to balancing food/nutritional security needs with aspirations for biodiversity conservation. In overcoming these barriers, such processes need to ensure that approaches for the identification of key threats or environmental compromises, and the identification, evaluation and prioritization of proposed management actions, are clearly understood by all participants and are sufficiently well designed to accommodate local needs and interests. The causal chain analysis approach to characterizing threats and management actions tested as part of SAP formulation has been identified by various evaluations of that initiative, and during the identification of lessons learned and best practices during the preparation of this project, as a successful tool for engaging and communicating with community stakeholders about planning environmental and natural resource management actions. Accordingly, this project will employ this tool, and others proven successful in consensus building (e.g. Delphi-type exercises) to foster local cooperation in the area of threat identification and action planning.</p>	<ul style="list-style-type: none"> <li>• Initiated during project inception period and sustained for project duration</li> <li>• National Inter-Ministry Committees</li> <li>• National Lead Agencies</li> <li>• National Specialized Executing Agencies</li> </ul>

<b>Risk Description</b>	<b>Category</b>	<b>Impact Severity</b>	<b>Likelihood</b>	<b>Risk Management Strategy and Safeguards</b>	<b>By When/Whom?</b>
National and provincial/local government commitment to adopt governance reforms for coastal habitat and land-based pollution management that reflect local needs	Political	High	Medium	Political acceptance of the need for reform for coastal habitat management and other issues relating to reversing environmental degradation in the South China Sea is in a large part evidenced by the inter-governmental adoption of the Strategic Action Programme which encompasses such actions. This is further supported by the formulation and adoption of supporting National Action Plans. Design of the strategy for this project emphasizes the need for the establishment and operation of mechanisms to ensure that local needs are appropriately reflected in such reforms. This will be facilitated through the work of various bodies and fora from ‘Community to Cabinet’ for which detailed Terms of Reference have been developed and agreed. Supporting activities included in the costed project work plan include the conduct of reviews of local governance arrangements at the priority sites and the incorporation of these in the broader planning of policy, planning and regulatory reforms for coastal habitat and land-based pollution management. Despite these mechanisms, and given the 60 month timeframe of the project, this is an area of the project that will require priority attention of the SAP Implementation Unit and must form an integral part of national and regional reporting and monitoring and evaluation.	<ul style="list-style-type: none"> <li>Initiated during project inception and sustained for project duration</li> <li>National Inter-Ministry Committees</li> <li>National Lead Agencies</li> <li>SAP Implementation Committee</li> <li>SAP Implementation Unit</li> </ul>
Appropriate selection of sites for testing innovative management approaches, or for use of in-situ monitoring sites, to minimise risks associated with: typhoon; emerging development pressures; and storm surge inundation	Technical	High	Low-Medium	This presents a significant risk, particularly given emphasis of project Component 1, on the establishment and operation of a regional monitoring system for evaluating the effectiveness of SAP implementation in areas of environmental stress reduction and improvements in environmental state. The latter while in large part is aimed at responding to calls by the region’s political leaders for more results-orientated approaches to environmental and natural resource management initiatives in the Southeast Asian region, it also aims to accommodate the recommendation of the GEF evaluation of the impacts of its investments in the South China Sea which relates to the strengthening of mechanisms for the longer-term monitoring of local and global environmental benefits. Accordingly, activities of the project’s costed work plan include the development of objective and scientifically sound methods and procedures for identifying locations for activities including <i>inter alia</i> : priority areas for mangrove reforestation and enrichment planting; establishment of seagrass MPAs; and the selection of sites for longer-term monitoring of environmental and socio-economic conditions in priority coastal areas. Experience of the SCS formulation project, particularly in development of an objective and scientifically sound procedure for the identification of priority sites for habitat demonstration projects, suggests that this is achievable and that this risk can be adequately mitigated via the above strategies.	<ul style="list-style-type: none"> <li>Initiated during project inception and sustained for project duration</li> <li>National Technical Working Groups</li> <li>National Specialized Executing Agencies</li> <li>Regional Working Groups</li> <li>Regional Scientific and Technical Committee</li> <li>Support from SAP Implementation Unit</li> </ul>
Limited local capacity for the	Technical	High	Low - medium	Informing the coastal habitat results reporting system, specifically identification of stress reduction and changes in environmental state, will require that procedures and	<ul style="list-style-type: none"> <li>Initiated during project inception</li> </ul>

Risk Description	Category	Impact Severity	Likelihood	Risk Management Strategy and Safeguards	By When/Whom?
collation of regionally comparable data to inform the operation of a coastal habitat/SAP implementation results reporting system				methods for the collation of information and data result in the compilation, sharing and analysis of regionally comparable data. Experience from the SAP formulation project, particularly in regard to the routine collection and update of information and data habitat and pollution hotspot site characterizations by national focal points for various project components suggests that this achievable. Results of the past SAP formulation initiative, and as documented in the background section of this project document, also indicate a willingness of countries to share expertise and technical staff to facilitate south-south exchange to ensure inter-country consistency in approaches to resource assessment and monitoring. This risk is further mitigated by the fact that the majority of technical agencies that act as national executing entities for the present project were engaged in the development of resource assessment and monitoring guidelines and training in their application. These methods and procedures have in many instances been mainstreamed into the operations of the agencies. This mainstreaming has resulted in further capacity having been built for the application of these resource assessment techniques in recent years.	<p>and sustained for project duration</p> <ul style="list-style-type: none"> <li>• National Technical Working Groups</li> <li>• National Specialized Executing Agencies</li> <li>• Regional Working Groups</li> <li>• Regional Scientific and Technical Committee</li> <li>• Support from SAP Implementation Unit</li> </ul>
Engaging appropriate expertise to facilitate consensus on the selection of physical, biological and socio-economic variables to be used in characterising coastal habitat sites, as well as willingness of data holders to share	Organisational	Medium	Medium	As outlined in the background section of this document, the national executing agencies possess highly qualified scientists and resource managers experienced in matters relating to the South China Sea, the TDA/SAP formulation processes, and the implementation of on-the-ground activities. A key issue is that many of these practitioners participate in regional fora where the language used, English, is often their second or third language. Experience of the SAP formulation project indicates that this can be overcome by ensuring that meeting discussion documents are prepared well in advance and circulated to responsible individuals in the participating countries well in advance of meetings and workshops, and that concise summaries of data and the issues that decisions need to be taken on are communicated clearly to country representatives before and during meetings. Additionally, the SAP formulation project indicates that all entities are willing to share national and provincial data holdings relating to environmental issues. This is evidenced by the large volumes of national information and data shared during SAP formulation and project preparation. The extent of this willingness to share data has been extended to permission for it to be used in regional publications and in publically accessible online GIS and meta-databases.	<ul style="list-style-type: none"> <li>• Initiated during project inception period and sustained for project duration</li> <li>• National Inter-Ministry Committees</li> <li>• National Technical Working Groups</li> <li>• Regional Working Groups</li> <li>• Regional Scientific and Technical Committee</li> <li>• Support from SAP-IU</li> </ul>
Insufficient Ministerial level commitment to	Political	High	Medium	In endorsing the South China Sea SAP, and the PIF for this project, the Ministries responsible for environment agreed to institute reforms for coastal and marine environmental management in the South China Sea. This commitment was confirmed	<ul style="list-style-type: none"> <li>• Initiated during project inception period and</li> </ul>

<b>Risk Description</b>	<b>Category</b>	<b>Impact Severity</b>	<b>Likelihood</b>	<b>Risk Management Strategy and Safeguards</b>	<b>By When/Whom?</b>
adopt updated management plans and enact supporting legislation				during the project preparation phase and is reflected in the project strategy, results framework, and work plan. This risk will be further mitigated by the structured approach this project will follow in facilitating multi-stakeholder and multi-sector inputs to the planning of reforms. This structured approach is aimed at ensuring adequate cross-sectoral consultation to improve the understanding of the need and scope of reforms at the level of Cabinet and other higher-level government bodies. These efforts will be supported by implementation of the initiatives communications strategy, a key focus of which will be aimed at decision-makers and politicians.	<ul style="list-style-type: none"> <li>sustained for project duration</li> <li>• Inter-Ministry Committees</li> <li>• SAP Implementation Committee</li> </ul>
That characterization of pollution hotspots provide adequate information regarding heavy metal contaminants and threats to environmental and public health	Technical	Medium	Medium	Mechanisms established during SAP formulation for the compilation of information from pollution monitoring stations in the South China Sea will be built upon to facilitate the update of national and regional databases of land-based pollution loading information. Additionally, activities are planned to ensure that guidelines for the compilation of regionally comparable data are developed and followed by the participating countries. The foundational work to model the carrying capacity of the South China Sea with respect to nutrients will be built on to demonstrate the threats to environmental and public health under various heavy metal loading scenarios. This risk is further mitigated by the fact that a detailed framework for evaluating the impacts of land-based pollution was developed and agreed upon at the regional level during SAP formulation. This framework will be used as the basis for evaluating the impacts of heavy metal contaminants as part of this project.	<ul style="list-style-type: none"> <li>• Initiated during project inception</li> <li>• National Technical Working Groups</li> <li>• National LbP Committees</li> <li>• RWG-LbP</li> <li>• Regional Scientific and Technical Committee</li> <li>• Regional technical support from the SAP-IU</li> </ul>
Willingness of private sector to engage and cooperate in efforts to determine environmental impact of operations on coastal habitats and land-based pollution loadings	Organisational	Medium	Medium	As noted in the background section of this Project Document, sources of land-based pollution in the South China Sea are many, including non-point and point sources. These include: domestic sources; industrial sources; port and harbour sources; agricultural sources; mining sources; and aquaculture sources. It was recognized during project preparation that while it would be unrealistic to engage private sector entities across the multitude of the abovementioned sources, this project would focus on engaging the aquaculture sector in quantifying effluent loads from coastal aquaculture. This decision was made in large part due to the fact that other pollution sources are being addressed via other GEF financed, e.g., PEMSEA and World Bank initiatives. The decision also reflects the emerging realization among coastal aquaculture operators of the need for environmental best practice to ensure appropriate water and environmental quality to sustain the high and increasing production from their operations. Mitigating the risk of a lack of willingness of coastal aquaculture managers to engage in project activities will rely on appropriately designed and implemented communications and engagement strategies. It is planned	<ul style="list-style-type: none"> <li>• Initiated during project inception</li> <li>• National Inter-Ministry Committees</li> <li>• National LbP Committees</li> <li>• RWG-LbP</li> <li>• Regional Scientific and Technical Committee</li> <li>• SAP Implementation Committee</li> <li>• Regional technical</li> </ul>

<b>Risk Description</b>	<b>Category</b>	<b>Impact Severity</b>	<b>Likelihood</b>	<b>Risk Management Strategy and Safeguards</b>	<b>By When/Whom?</b>
				that these strategies will be developed during project inception by the SAP Implementation Unit as a key mitigation response to this risk.	support from the SAP-IU
Harmonization of governance frameworks for land-based pollution management may take longer than the period of the project	Political	High	Medium-High	The GEF International Waters strategy has long recognized the timeframes involved in securing joint commitments in transboundary water resource management. Given the multitude of sources of land-based sources of pollution in one of the most intensively used shared water bodies globally, harmonizing governance frameworks is not an insignificant undertaking. This risk is high and mitigation measures include the planning of a project Year 1 activity to further define the scope of harmonization that can be reasonably expected during the 60 months of project implementation. Additionally, detailed Terms of Reference for national committees and a Regional Working Group on land-based pollution have been developed and agreed with an emphasis on facilitating the timely review of governance frameworks, formulation of recommendations, and drafting of required policy and regulatory reforms. Technical backstopping will also be provided through the Regional Working Group on Land-based Pollution, the Regional Scientific and Technical Committee, and SAP-IU.	<ul style="list-style-type: none"> <li>• Initiated during project inception</li> <li>• National Inter-Ministry Committees</li> <li>• National LbP Committees</li> <li>• RWG-LbP</li> <li>• Regional Scientific and Technical Committee</li> <li>• Technical Support from SAP-IU</li> </ul>
Availability of information and data to enable comparison of cost of action versus cost of inaction as part of land-based pollution management investment planning approach	Technical	Medium	Medium	This risk is mitigated by the fact that a framework for valuing the impacts of land-based pollution was developed and agreed at the regional level during SAP formulation. This project will use this as the foundation for undertaking the economic valuation of impacts, and will draw on interlinked activities to: (1) enhance regional understanding of the carrying capacity of the South China Sea with respect to nutrients and heavy metals under various loading scenarios; and (2) improve regional economic valuation of the goods and services of the South China Seas coastal ecotones. A parallel activity to value the economic impacts of environmental degradation consequent upon shipping accidents will enable cross-fertilisation of approaches. Similar exchange in approaches will be facilitated with UNEP's GPA-LbP. Technical backstopping will also be provided through the Regional Working Group on Land-based Pollution, the Regional Task Force on Economic Valuation, the Regional Scientific and Technical Committee, and SAP-IU.	<ul style="list-style-type: none"> <li>• Initiated during project inception</li> <li>• National Inter-Ministry Committees</li> <li>• National LbP Committees</li> <li>• RWG-LbP</li> <li>• Regional Scientific and Technical Committee</li> <li>• Technical Support from SAP-IU</li> </ul>
Application of regionally consistent methodology in the collection and review of information and data for	Technical	Medium	Low-Medium	This risk is mitigated by the fact that regional guidelines on the economic valuation of coastal habitats were developed during SAP formulation and agreed upon at the regional level. Additionally, a cadre of professionals within the national executing agencies for this project were trained in the field of economic valuation during SAP formulation, and the background information and training materials used in that regional training programme remain accessible via the SCS website and have in most instances been translated into local languages by national governments. These guidelines will be employed by the present project to ensure regionally consistent	<ul style="list-style-type: none"> <li>• Initiated during project inception</li> <li>• National Technical Working Groups</li> <li>• National Committees - EV</li> <li>• RTF-Economic Valuation</li> </ul>

<b>Risk Description</b>	<b>Category</b>	<b>Impact Severity</b>	<b>Likelihood</b>	<b>Risk Management Strategy and Safeguards</b>	<b>By When/Whom?</b>
improving the economic valuation of coastal habitats				methodology in the collection and review of information data, as well as its analysis and incorporation into regional data sets.	<ul style="list-style-type: none"> <li>• Regional Scientific &amp; Technical Committee</li> </ul>
Sufficient Ministerial-level commitment to adopt and sign a revised Strategic Action Programme for the SCS	Political	High	Low-Medium	The Ministers responsible for the environment have previously formally endorsed a Strategic Action Programme for the South China Sea. A revised SAP was listed as a key outcome in the PIF for the present project, and national government commitment to implement and update the SAP was confirmed during project preparation. The risk of possibly not being able to secure the signature of the revised SAP is mitigated through inclusion of actions in the agreed Terms of Reference for the national Inter-Ministry Committees and National Focal Points for this project which direct effort towards regular communication and updating of relevant Ministers with respect to SAP revision and timelines for its finalization, adoption and signature.	<ul style="list-style-type: none"> <li>• Initiated during Project Yr 2</li> <li>• National Inter-Ministerial Committees</li> <li>• SCS SAP Implementation Committee</li> </ul>
Commitment of SEAFDEC to actively and constructively cooperate on identifying and sharing best practices between the fisheries refugia and SAP implementation projects	Organisational	Medium	Low	This risk is mitigated by the fact that UNEP is the implementing agency for both projects and sits on the Project Steering Committees for both initiatives. This mechanism will be used to ensure that experiences and lessons learned are shared between both projects and that best practices generated by the SEAFDEC-UNEP-GEF fisheries refugia project are incorporated in the revised SAP and supporting National Action Plans where appropriate. The extent of exchange to be achieved depends on the dates of endorsement of the present project. The fisheries <i>refugia</i> project, a 4 year initiative entered its inception phase in Quarter 2 of 2016 and will be concluded during the first half of 2020. In contrast, this project if endorsed in 2016 will likely not close until 2022. Accordingly, to ensure that lessons from the fisheries refugia initiative are not lost, the Terms of Reference for both the Regional Scientific and Technical Committee and the SCS SAP Implementation Unit include actions relating to the capture and regional sharing of lessons learned and best practices emanating from the fisheries refugia project.	<ul style="list-style-type: none"> <li>• Initiated during project inception</li> <li>• National Inter-Ministry Committees</li> <li>• Regional Scientific and Technical Committee</li> <li>• SCS SAP Implementation Committee</li> <li>• Coordination support by SCS SAP-IU</li> </ul>

### **3.6. Consistency with national priorities or plans**

472. All countries have developed and adopted National Action Plans (NAPs) for habitats and land-based pollution, indeed the targets and priority actions outlined in the Strategic Action Programme were based on these. In Cambodia, the NAPs focus on the provision of guidance for the sustainable use of coastal resources. Decentralisation of responsibilities to the four coastal provinces in implementing projects for environment and resource management, including Integrated Coastal Management (ICM) and community-based management, have followed good practices established in the SCS project. NAPs were also completed and adopted in China.

473. In Indonesia, coastal habitat NAPs were developed with recommended actions incorporated into government strategic planning and recurrent budgets. The Philippines finalised NAPs for all components with the view that coastal and marine management in the Philippines would follow the multi-disciplinary and ecosystem-based approaches to coastal habitat management promoted in the NAPs. In Thailand, the NAP components were combined with the National Biodiversity Strategy and Action Plan approved by the Cabinet. Priority sites have been identified by the national consultation for implementing the habitat NAPs focussing on: the protection of biodiversity, enhancement of sustainable use, mitigation of threats, public awareness and the promotion of international cooperation.

474. In Viet Nam, NAPs for all components were developed. The priorities identified in these NAPs have, to some extent, been integrated into national policy and programmes. For example, the programme for vulnerability assessment of coastal resources and environment and the government programme regarding international co-operation on marine issues are also in the draft Biodiversity Law. A further important step was the establishment of the Viet Nam Administration of Seas and Islands that contributes to NAP implementation.

### **3.7. Incremental cost reasoning**

#### **3.7.1. Baseline**

475. The South China Sea is a strategic body of water surrounded by nations that are currently at the helm of industrialization and rapid economic growth in the Asia-Pacific region. Bordered by the People's Republic of China to the north, the Republic of the Philippines to the east; Malaysia, the Republic of Singapore, the Republic of Indonesia and the Sultanate of Brunei Darussalam to the south, and the Kingdoms of Thailand and Cambodia, and the Socialist Republic of Viet Nam to the west, the South China Sea has always been central to issues of economic and political stability in Southeast Asia and adjacent regions. Today, it is central to defining environmental sustainability and food security for its coastal nations. The coastal sub-regions of these nations are home to 270 000 000 people or 5% of the world's population. About 122 major rivers drain  $2.5 \times 10^6 \text{ km}^2$  of catchments and deliver materials, including suspended sediments, nutrients and pollutants, to the South China Sea.

476. The Indo-West Pacific marine biogeographic province has long been recognized as the global centre of marine tropical biodiversity. Forty-five mangrove species out of a global total of 51; 50 of 70 coral genera); 20 of 50 seagrass species; and 7 of 9 giant clam species are found in the nearshore areas of the South China Sea. Compared to the Atlantic, the tropical Indo-West Pacific is highly diverse. Only 5 mangrove species and some 35 coral species are found in the Atlantic compared with the 45 mangrove species and 450 coral species recorded from the South China Sea. Like most tropical coastlines worldwide, the dominant coastal ecosystems of the South China Sea marine basin are mangroves, coral reefs and seagrass meadows. Significant other coastal ecosystems include coastal lagoons, a common coastal landform in Viet Nam, and extensive inter-tidal unvegetated mudflats that are found in many places around the South China Sea.

477. Although action aimed at reducing the rate of loss of coastal habitats has been implemented by countries bordering the South China Sea, the decadal rate of loss of such habitats remains high, e.g., seagrass beds (30 percent), mangroves (16 percent, and coral reefs (16 percent). This high and continued decline in the total area of habitat and associated biodiversity has raised serious concerns for the long-term sustainability of fisheries and coastal and marine ecosystems. Socio-economically, culturally and aesthetically, the South China Sea (SCS), the Gulf of Thailand (GoT) and regional river basins and bays form part of the common heritage of the people of the Southeast Asian region. The region's expanding population relies on the SCS for nutrition, recreation and economic pursuits (e.g., tourism), energy (e.g., oil and gas), aquaculture, pharmaceuticals, ornamental fish trade, construction materials and ports and shipping.

478. This degradation and loss of habitats is a result of a multitude of persistent and emerging threats that were evaluated by the SCS project and described above. Of particular note are the contemporary causes of the loss of mangrove that include: reclamation and infrastructure development; pollution from shrimp farming; conversion to industrial uses; and charcoal production. The physical removal of mangrove associated with the construction of ponds for shrimp culture is currently not the dominant threat that it had been during previous decades. Overfishing and the use of destructive fishing gears such as push nets and trawls have been confirmed as the dominant threats to coral reefs and seagrass. The Strategic Action Programme for the South China outlines an agreed common vision on priority locations and approaches for future habitat management actions. It is imperative that commitment to implement the SAP be sustained. The national and local capacity built and the vast repositories of management information created by the SCS project provide a solid foundation for SAP implementation, future planning, and monitoring and evaluation of management interventions.

### **3.7.2. Business-as-usual scenario**

479. The environment of the South China Sea continues to degrade despite actions taken at the national, sub-regional and regional levels. Part of the problem stems from the transboundary marine problems in the region and their impact on the ecosystems and resources of the South China Sea. This provides the ecological impetus for co-operation that is also based on the fact that the region is a large marine ecosystem with intrinsic integrity and inter-connections between all trophic levels. Fish and other migratory species do not recognise national boundaries, and the loss of endangered species in one area has not only regional but global significance. Due to the inherent conflict between the boundaries of the ecological system and man-made, national boundaries, cooperative approaches must be embraced to meet the challenges to managing and sustainably using the shared ecological system. It is unlikely that, without concerted and sustained action to implement the SAP, the degradation of the coastal and marine environment of the South China Sea will continue and most likely accelerate as population pressures and demands on coastal resources grow.

### **3.7.3. Incremental reasoning**

480. Implementation of the Strategic Action Programme will result in significant environmental stress reduction and process and environmental state benefits. The design of the SAP aligns squarely with the GEF theory of change via implementing strategies, strengthening institutional capacity via the reform of policy, regulatory and planning frameworks, and through knowledge and information activities aimed at improving information sharing and access, awareness raising, skills building, and monitoring and evaluation. Importantly, successful implementation of the SAP will result in: appropriate forms of sustainable management established for 860,000 ha of mangrove; 153,000 ha of coral reef at 82 priority sites managed sustainably, including a reduction in the decadal rate of degradation in live coral cover from 16 to 5%; conservation, management and sustainable use of 25,900 ha of known seagrass area in the South China Sea; and integrated management of 783,900 ha of coastal wetland at 19 sites, including habitat restoration and protection strengthened at priority

locations. Without the support of this project and the regional coordination, guidance and technical assistance it will provide, it is unlikely that these critically important SAP targets will be met.

481. Importantly, the project will also make substantial contributions towards the achievement of the Sustainable Development Goals, specifically: (a) Goal 1: End poverty in all its forms everywhere – by ensuring that all men and women, in particular the poor and the vulnerable, have equal rights to natural resources, and by building the resilience of the poor and those in vulnerable situations via reducing their vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters; (b) Goal 12. Ensure sustainable consumption and production patterns – by contributing to the achievement of the sustainable management and efficient use of natural resources, and by supporting developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production; and (c) Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development – by efforts aimed at sustainably managing and protecting marine and coastal ecosystems, conserving at least 10 per cent of coastal and marine areas, and by enhancing the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of ‘The Future We Want’.

### **3.8. Sustainability**

482. This project directly addresses the issue of sustainability as the regional coordination mechanism for SAP implementation and lays out a series of steps intended to result in a regional agreement on the manner in which sustainability will be ensured beyond the life of the project. In addition through the provision of appropriate training and technical assistance to the institutions and organisations at the national level, and their active participation in the implementation of the SAP, it is anticipated that the institutional capacity to implement the updated NAPs and a revised SAP will be enhanced.

483. It is anticipated that project activities will result in significant positive ecological sustainability benefits. Specifically the project will develop the scientific, institutional and policy basis required to reduce the rates of loss of the South China Sea’s globally significant habitats and biodiversity due to the multitude of threats they face. This is considered important because of the given the global significance of this shallow-water marine basin and the benefits associated with effective coastal and marine environmental management at the local level, which is particularly important in the case of Southeast Asia due to the continuing importance of the goods and services derived from coastal habitats in terms of nutritional security and the maintenance of livelihoods. The coastal communities bordering the South China Sea face the highest risk globally associated with the degradation of coastal and marine environments.

484. At the local-level, national project activities will contribute to ecological sustainability via incorporation of rules and activities in the proposed management plans for coastal areas to be brought under management that ensure: key threats and environmental compromises are effectively managed and remediated; the resource base and related species are sustained at levels that do not foreclose future options; and that act to maintain or enhance the resilience and overall health of coastal and marine ecosystems. These management plans will also reflect needs to maintain or enhance overall socio-economic sustainability by focusing on the generation of sustainable net benefits and the equitable distribution of those benefits among community (men and women). The latter will involve an emphasis on sustainable livelihoods and food security. Management plans will also include a focus on institutional sustainability by enhancing financial, administrative and organizational capacity of the site-based management board established for the sites.

485. As noted above, this project focuses sustainability at the ‘macro’ level, i.e., on maintaining or enhancing overall long-term socio-economic welfare. This socio-economic welfare is based on a blend

of relevant economic and social indicators, focusing essentially on the generation of sustainable net benefits, a reasonable distribution of those benefits among members of the beneficiary communities, and maintenance of the systems overall viability within local and global economies. The work of the project on enhancing the use of information and data on the economic values of the goods and services of coastal habitats, and the valuing costs of action versus non-action within the framework of efforts to update the SAP is central to building the longer-term socio-economic sustainability of project initiatives. This project will also emphasize the need for action at the ‘micro’ level in order to guide community sustainability. This will be achieved, for example, via mechanisms to ensure that local communities are incorporated into environmental management and development planning.

486. The project also addresses institutional sustainability via efforts to explore and support the development of longer-term financial, administrative and organizational capabilities. Institutional sustainability includes the sets of management rules that will be established at the priority sites, and the adoption of viable national and provincial policies, plans and legal frameworks for management. This will in large part be addressed via the conduct of a contemporary Transboundary Diagnostic Analysis for the South China Sea which will be used to inform the update of the Strategic Action Programme for this basin. Supporting activities of the latter include the development and adoption of National Action Plans for habitats and land-based pollution (including institutional reform and sustainable financing strategies), the alignment of recurrent national and provincial government budget support with National Action Plan implementation, formulation and agreement of a regional financial mechanism for regional actions in support of national actions to address land-based pollution, and the development of plans to ensure the longer-term financial sustainability of important regional management organs such as the Regional Scientific and Technical Committee.

487. Institutional sustainability of project activities will also be fostered via the development of municipal and provincial level capacity for cross-sectorial planning and management of the coastal and marine environment and resources. Reform of local policies and laws, including the development and enactment of municipal by-laws and ordinances for coastal habitat management, and the harmonization of arrangements for land-based pollution management, will result in the regulatory framework required to guide longer-term sustainability. Sustainability analyses will be conducted at the priority coastal habitat sites during project Year 1, with key outputs of this work being site-level sustainability plans that will be revisited annually and used in the preparation of sustainable financing strategies as part of National Action Plan development and the revision of the Strategic Action Programme. Table 44 presents a provisional checklist that will be elaborated during project inception for use in screening the sustainability aspects of site-level interventions. A regional sustainability strategy will also be developed during Year 1 and updated annually for endorsement by the SCS SAP Implementation Committee.

**Table 44** Provisional site-level sustainability checklist

*Ecological sustainability*

1. Are impacts on the ecosystems reasonably understood to the extent required to ensure sustainability?
2. Are alternative systems of management and/or utilization available so that pressures from any increased demands placed on the system do not increase beyond management capabilities?
3. Are imposed stresses and rates of change likely to be within the bounds of ecosystem resilience?

*Socioeconomic sustainability*

1. Will the activity sustain or increase the aggregate long-term rate of employment?
2. Will the activity enhance economic viability in the local and regional systems?
3. Is resource depreciation, and changes in natural capital, including economic valuation information, incorporated into local and site-based planning and management practices?
4. Are the current and projected levels of distributional equity in the system sufficient?
5. Will long-term nutritional and livelihood security be maintained or increased, as measured in both

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average and minimal terms?

*Community sustainability*

1. Are activities likely to maintain or increase the long-term stability of affected communities?
2. Is the local community integrated in planning and management, with traditional management approaches utilized to the extent possible?
3. Are traditional value systems of importance to the community maintained?
4. Are local socio-cultural factors (such as tradition, community decision-making structure, etc.) incorporated?
5. Are traditional resource and environmental management methods utilized to the extent possible?
6. Are there any adverse impacts, at any level or in any component of the system, that unduly affect particular components of the community (e.g., gender-related impacts, youth, particular religious groups)?

*Institutional sustainability*

1. Will the long-term capabilities of corresponding institutions be increased?
  2. Can provincial and local government recurrent budgets be aligned with the implementation of priority stress reduction priorities for habitat and land-based pollution management?
  3. Do opportunities exist for private sector and donor investment in site-based activities?
  4. Is financial viability likely in the longer-term, or does the intrinsic importance of the system justify ongoing support from society regardless?
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### **3.9. Replication, scaling-up and mainstreaming**

488. The concepts of “replication”, “scaling-up” and “mainstreaming” are being increasingly promoted as important elements of environment and natural resource development projects. Interpretation of the meaning of these concepts is often blurred however, by inconsistent application of their use in mostly “supply driven” guidelines and planning documents of donors and development organisations. Similarly, inadequate consideration of what the terms mean with respect to initiatives aimed at fostering integrated approaches to coastal and marine environmental management, have the potential to lead to confusion amongst national and local beneficiaries about expectations.

489. The definitions of “replicate” contained in the Cambridge and Oxford dictionaries are “to make or do something again in exactly the same way” and “to copy something exactly”, respectively. Interpretation of these definitions in the context of this project may include for example the application of a copy of a successful management model, approach, strategy, technology, or communications tool within a particular target site or at another location. Accordingly, replication is defined in the context of national activities of this SAP implementation project as “The activity of copying the specific features of a management approach that made it successful in one setting and re-applying these as part of the activities at the same or another setting”. Examples may include, inter alia, using the structure and Terms of Reference for a site-based management board at one site and applying it to another, or using a seasonal closure or zoning tool that was successful in reducing the rate of live coral cover at one site and applying at another site.

490. Regarding scaling-up, definitions of “scale” contained in the Cambridge and Oxford dictionaries are “the size or level of something” and “the size or extent of something, especially when compared with something else”, respectively. Interpretation of the these definitions in the context of this project, may include for example increasing the institutional scale of a SAP implementation activity by applying an activity involving a small subset of community at the whole community level, or increasing the geographical scale of activities by applying a best practice generated at one coastal habitat site to all known sites in a municipality, province or region. Accordingly, scaling-up is defined for the purpose of this project as “The activity of increasing the impacts of successful approaches to SAP implementation via their application at broader geographic and institutional scales as part of the process of reversing environmental degradation trends in the South China Sea”.

491. The above definitions of replication and scaling-up lend themselves to ease of application in SAP implementation in the participating countries. The high risks that coastal communities face as a result of the degradation of the coastal and marine environment creates a high need for the generation of best practices that can be replicated and scaled-up. Communicated effectively, it is anticipated that success stories can create a demand driven approach whereby communities actively seek opportunities to apply proven technologies and management models in their communities. The high profile of nutritional security issues in many coastal communities, coupled with the limited policy and legal frameworks for effective coastal and marine environmental and natural resource managements, creates significant opportunities for the successful uptake of best practices and lessons learned.

492. This project will result in a large number of innovations particularly those relating to enhancing the information-base for coastal habitat management and action planning. Efforts to develop and apply algorithms for the interpretation of remotely sensed information and data on coastal habitat associations and zonation will not only be applicable in the SCS marine basin, but also in adjacent areas such as the Sulu-Sulawesi marine ecoregion and in the nearby Pacific Islands where similar needs exist within the framework of the GEF Pacific Ridge to Reef Programme. Significantly, the methodologies and procedures developed to better understand habitat associations and zonation will enable more accurate identification of the impacts of the compression of the terrestrial/marine interface anticipated as a result of rising sea levels. Linked activities and related approaches to quantify the role of habitats in the sequestration and storage of carbon, and identification of the potential impacts of sea level rise, climate change, and episodic events on coastal habitats of the South China Sea have potential for application in other shallow water tropical marine ecosystems.

493. Similarly, the development of objective and scientifically sound methods and procedures for identifying priority areas for mangrove reforestation, identifying priority areas for enrichment planting, identifying priority sites for seagrass MPAs, and the development of a regional estuary monitoring scheme at the national level have high potential for publication and the internationally peer-reviewed international literature. These tools will not only contribute to the development of the package of best practice examples in coastal habitat management in the South China Sea but also have potential for application elsewhere. The information and data generated via planned activities to conduct in situ monitoring at enrichment planting sites, for example, will enhance region-wide understanding of the biodiversity benefits of these approaches. The production of regional guidelines on identification for priority sites for mangrove reforestation will aid the broader mainstreaming of these approaches into national and provincial government agencies. It will also assist in overcoming the broader decline in the use of science in coastal and marine policy and planning in South East Asia, examples of which are legion in the broader East Asian Seas region and adjacent Pacific Islands. This is a problem that has long been recognized globally and plagues both developed and developing regions alike (see Bewers, 1995).

494. Efforts to integrate regional science in the management of land-based pollution also have high potential for replication, scaling-up and mainstreaming. Importantly the project will communicate with decision-makers about the localized versus transboundary impacts of land-based pollution in the SCS to mainstream knowledge about the carrying capacity of the SCS marine basin with respect to nutrient carrying capacity into national and provincial development and waste management planning. Similarly, the project will determine the total contaminant loading and carrying capacity of the SCS via application of quantitative modeling and GIS-based techniques for seven heavy metals (Hg, Cd, Pb, Cu, Cr, As, Zn). Drawing on the agreed regional framework for valuing the impacts of land-based contaminants on coastal ecosystems, the impacts of the estimated heavy metal contaminant loadings will be defined, quantified and communicated to decision-makers to mainstream this information in related project activities to develop National Investment Plans for land-based pollution in the SCS areas of the participating countries. The quantification of effluent volumes and contaminant loadings from coastal aquaculture to the SCS marine basin is also a key innovation and is regionally and

globally significant given the fact that waste disposal from coastal aquaculture activities is among the key contemporary threats to habitats and contributing to issues including the increasing dwarfism in mangroves. Each of the above project innovations have potential for application other transboundary water areas including the Yellow Sea, the Bay of Bengal, the Sulu-Sulawesi and other areas of the so called coral triangle.

495. An innovation of major significance, and it is presented here to be of high relevance to the entire portfolio of GEF International Waters projects, are the significant advancements achieved during SAP formulation in the determination of national and regionally applicable Total Economic Values for coastal habitats that were used to value the cost of action versus non-action within the framework of SAP implementation. Despite these advancements, several challenges exist in the application of economic valuation in decision-making for transboundary water resource management in the South China Sea; indeed the issues of economic valuation of ecosystem goods and services in development planning remains a challenge facing the entire portfolio of GEF investments in procuring the goods and services of the global environment, particularly in its International Waters focal area. The values determined through SAP formulation are incomplete since not all known goods or services from individual coastal ecosystems have been valued. One area of current weakness is that comparatively few existing values for the service provided by habitats as nursery areas for off-shore fish and crustaceans are included. This is known to be a significant and major service provided by mangrove and seagrass habitats and a key innovation of the present project includes establishing the economic values of these services. One additional area of identified need that the project will address is in the determination of economic losses of coastal ecosystem goods and services consequent upon coastal shipping accidents and land-based pollution damage. The approach, strengthened dataset, and applications of this work on economic valuation and its application in determining the cost-effectiveness of management actions has a high degree of potential for wide replication elsewhere. The preparation of GEF International Waters Knowledge Document on these developments will be used as a communications tool for the global sharing of the outcomes of this work.

496. The replication and scaling-up of the SAP SCS – GEF SGP partnership is a key innovation that has potential for replication elsewhere. As noted by Chen et al. (2013), large-scale international waters management projects usually focus on fostering formal inter-governmental cooperation processes, which often lead to limited on-the-ground impact. In contrast, community-based international waters projects are often local, individualistic and stand-alone projects, lacking regional linkages and perspectives. Linking regional processes with local actions not only enhances the effectiveness of local action in addressing international waters issues but also strengthens regional frameworks. The present project builds on this via network community leaders and local government from priority habitat sites networked via national and regional round-table meetings to foster cooperation and knowledge sharing on achievements and best practices in community based approaches. Mechanisms are also in place to elicit CSO & CO inputs to planning, and the monitoring and evaluation, of the SCS-SGP partnership via annual NGO forums. A training program on the science and management of SCS coastal habitats and resources will also be developed and operated for SGP proponents. Experiences from these activities, and the various support tools to be developed, have significant potential for application elsewhere.

497. The South China Sea Strategic Action Programme defined indicators and results frameworks for use in monitoring and evaluating the effectiveness of SAP implementation. This project will facilitate national and regional level cooperation in tracking the results of SAP actions for coastal habitat management. Specific indicators of sustainability to be tracked relate to: the enabling environments for sustainable management; improvements to ecological and environmental state; and socio-economic impacts. Key project innovations in this area relate to the development of standardized methods and guidelines for habitat inventory and assessment, leading to the achievement of regional-level agreement on a harmonized results framework and analytical tool for tracking and reporting on

sustainability of habitat management systems in the SCS basin. The alignment of these reporting frameworks with those of International Conventions, including the Aichi targets and SDGs for example, has high potential for scaling-up elsewhere. It also has potential to stimulate south-south exchange on results-based management, an obvious starting point for which would be exchanges with the GEF programme in the Pacific Islands which is presently initiating the development of a harmonized multi-focal area results reporting system for the 14 participating countries in that initiative. Additionally, an online ‘results’ portal will be developed to support regional-level capacity building in results-oriented planning and management of coastal habitats, as well as the routine online sharing and syndication of SAP implementation results. The latter will involve online geospatial presentation of results linked to related initiatives of the GEF IW:LEARN and GEF LME:LEARN initiatives. The online applications developed to support this results reporting have high potential for ‘plug and play’ type application by other GEF LME projects.

498. In that this project is a SAP Implementation Project in the GEF sense it is itself a replicate of actions fostered by the GEF in the Mediterranean, Black Sea, Caspian and elsewhere. It builds upon the achievements of the SCS Project and hence it will replicate successful models and practices developed and adopted during the implementation of that project. In particular the models and practices for cross-sectoral management; community participation, business planning, identification and fostering of alternative livelihoods, and public awareness will be used in on-the-ground management interventions during SAP implementation. The present project will generate further models, guidelines and practices, particularly relating to the sustainable use of coastal habitats, alternative livelihoods and community involvement in resource management that can be replicated both within and outside the region as appropriate. Successful and unsuccessful practices and models will be published via the South China Sea website and the periodic Regional Scientific Conferences, Mayor’s Round Tables, and Non-Governmental Organisations Fora will all serve as venues through which successful models and practices can be publicised and hence as a platform for replication. Replication and scaling-up strategies will be developed during project Year 1 and updated annually. A matrix for use in planning replication and scaling-up strategies is presented in Table 44.

### **3.10. Public awareness and communications strategy**

499. All components of the project involve activities centred on public awareness and the communication and exchange of data and information both within and beyond the network partners. A wide range of public awareness materials (posters, brochures, video shorts and other materials) have already been produced in the seven national languages and copies are lodged on the existing SCS project website from which they can be downloaded and reproduced or edited and altered as required. It is intended in one component at least to build a network of local journalists interested in environmental issues and stories and to provide them with scientifically sound materials that can be adapted to various forms of mass communication. Central to the communication strategy will be the continued operation of the South China Sea website as a valuable resource and repository of data, information and tools relating to environmental management and sustainable use of coastal resources. This website allows network partners to up-load scientific data and information directly to the regional databases and up-load information from ongoing activities at the national level to dedicated pages.

500. A majority of the outputs of the SCS project were used as inputs to the development of SAP goals, targets, and activities and will be important references for individuals and organisations involved in SAP implementation and in gauging the efficacy of SAP interventions. From the perspective of regional co-ordination and execution of SAP activities, the existing SCS website will act as a platform for ensuring ease of access to and downloading of SCS project outputs. The large number and wide range of outputs generated through the operation of large multi-lateral, intergovernmental projects creates a need for the maintenance of repositories that provide for the efficient online storage, searching, and download of outputs. Increasingly, ensuring ease of accessibility to outputs is becoming an expectation of donors, and certainly the experience of the SCS

project suggests that it may assist in increasing the accountability, transparency, and legitimacy of project work. The repositories of projects documents, training materials, multi-media outputs, and public communication materials developed as part of the SCS project will be built on by the present project. The present project will also revitalise the SCS partnership with Google Earth<sup>78</sup> to facilitate effective global outreach. Table 45 summarises the objectives, features, required inputs, and technical needs for the SCS website identified during project preparation to best ensure the use of online technologies in support of project implementation and communications.

501. Additionally, project communications strategy will be elaborated during the inception phase. This will reflect the nine key guiding principles of the project and its alignment with the achievement of the SAP targets, Aichi targets and Sustainable Development Goals. This document will give strategic direction to communications activities of the project in areas relating to: (1) the development and conduct of a baseline assessment and audit of communications needs and priorities; (2) the development of appropriate communications and knowledge management platforms for the project website and operation of an online Community of Practice; (3) the project's branding and style brief; (4) media relations, including the establishment of public relations protocols and development of partnerships with regional and national media outlets; (5) representation of the project at key global, regional and national political and scientific events; (6) the use of social media in syndicating project news and information and creating awareness of SAP implementation and priority issues; (7) costed plans for the development of multi-media communications products and knowledge exchange tools; and the (8) capacity development of national stakeholders on effective use of the media in support of the achievement of SAP targets. The strategy will also contain a comprehensive project FAQs section and listing, including contacts, of all priority media outlets.

### **3.11. Environmental and social safeguards**

502. The priority sites for action within the framework of SAP implementation are becoming increasingly densely populated coastal areas wherein natural and social systems are characterised by multiple compromises as a result of the threats reviewed in Section 2 of this document. A screening of the potential environmental and social impacts of national level activities of this project was undertaken during the Project Preparation Phase. Specific elements of the project design assessed included the proposed locations of activities, possible environmental impacts, and social considerations. No adverse impacts as a result of the execution of the project activities were identified. The screening report is appended to this document as Appendix 16.

503. It is anticipated that project activities will result in significant positive environmental and social benefits. Specifically the project will develop the scientific, institutional and policy basis required to reduce the rates of loss of the South China Sea's globally significant habitats and associated biodiversity. This is of the highest global significance given the large proportion of the world's population that live within the coastal areas of the South China Sea and depend upon its ecosystem goods and services for nutrition and livelihoods.

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<sup>78</sup> Background on this partnership is summarised in Paterson, 2008. Connecting GEF Projects with a Global Audience: Outreach Initiatives of the South China Sea Project. GEF International Waters Experience Note, 2008-1. 9p.

**Table 44** Provisional framework for the planning of replication and scaling-up strategies

Lesson Learned and/or Best Practice	Audience(s)	Scale	Applicability of Lesson	Replication/Scaling-up Tool(s)	Timeframes	Cost
Stakeholder engagement						
Cross-sectoral coordination						
Use of environmental stress reduction measures						
Results-based planning and monitoring and evaluation						
Evidence-based planning						
Reforms of national policies, plans and legal frameworks						
Economic valuation						
National investment and action planning						
Revising the Transboundary Diagnostic Analysis						
Strategic Action Programme update and endorsement						
Communications and awareness raising						
Political Commitment						

**Table 45** Objectives, features, required inputs, and technical needs for the South China Sea website identified during project preparation with respect to the appropriate use of online technologies in support of SAP implementation and communications

Requirements	Website Objectives	Features to Maintain and Develop	Required Inputs (Content)	Technical Needs (Regional)
<ul style="list-style-type: none"> <li>• Ease of access to and downloading of outputs from SCS SAP formulation and implementation (e.g. documents and publications; data; lessons learned; training; multi-media/awareness materials).</li> <li>• Online database of contact details for individuals and organisations involved in SAP implementation.</li> <li>• Online network of information resources (e.g. donor, implementing/executing orgs, partner orgs., environment agreement websites).</li> <li>• Information web pages on SAP implementation (e.g. funding, background, co-ordination, committees, interventions).</li> <li>• Results-based management portal (training and results dashboarding)</li> <li>• Online calendar of project events (regional/national).</li> <li>• Repositories for SAP implementation project outputs.</li> <li>• SCS databases accessible and updateable online (GIS, meta-data, projects, economic values databases).</li> <li>• Web pages for regional, national, and site level project news and mechanisms for syndication of project news.</li> <li>• Tools for dissemination of project information and outputs (outreach).</li> <li>• User-friendly tools for the on-site sharing of information.</li> <li>• Tools and mechanisms for resource mobilisation/financing (e.g. PayPal donations).</li> </ul>	<ol style="list-style-type: none"> <li>1. Ensure that all regional level and key national level outputs of SAP formulation and implementation continue to be accessible online, and be easily searched and downloaded;</li> <li>2. Maintain and continuously update the database of contact details for all individuals and organisations involved in SAP implementation;</li> <li>3. Maintain and expand the online network of institutional websites relevant to SCS SAP implementation;</li> <li>4. Establish and regularly update information pages about SAP implementation, projects, and interventions;</li> <li>5. Use online technologies to build capacity on a results-based approach to SAP implementation</li> <li>6. Provide timely information to project partners about upcoming project events and meetings;</li> <li>7. Create and regularly update repositories of outputs from SAP implementation activities;</li> <li>8. Extend and ensure syndication of regional, national, and site level news to project partners;</li> <li>9. Increase the online sharing of information between/among project network members;</li> <li>10. Enhance the online visibility of SAP project activities and outputs (inc. links to IW:LEARN); and to</li> <li>11. Attract donations and contributions of information/data.</li> </ol>	<p><b>Information/Data</b></p> <ul style="list-style-type: none"> <li>• Project information pages</li> <li>• Document Repository</li> <li>• Meta-Database</li> <li>• Google Earth SCS GIS</li> <li>• Nutrient Model</li> <li>• Projects Database</li> <li>• Multi-Media Section</li> <li>• Fisheries Refugia Portal</li> <li>• Online Results-Based Mgmt. Training Course</li> <li>• Dashboard Feature for Presentation of Results</li> <li>• Repository of Training &amp; Awareness Materials</li> <li>• Economic Valuation Database</li> <li>• Lessons learned</li> </ul> <p><b>Project News</b></p> <ul style="list-style-type: none"> <li>• Newsflash section</li> <li>• SCS “Blog”</li> <li>• SCS E-Newsletter</li> <li>• SCS RSS Feeds</li> </ul> <p><b>Online Communication</b></p> <ul style="list-style-type: none"> <li>• Partner network contacts database</li> <li>• SCS E-Forum</li> <li>• SCS Blog</li> <li>• Online “helpdesk”</li> </ul> <p><b>Outreach</b></p> <ul style="list-style-type: none"> <li>• Search engine friendly URLs</li> <li>• SCS Google Earth layer</li> </ul> <p><b>Online Donations</b></p> <ul style="list-style-type: none"> <li>• Mechanisms for online donations</li> </ul>	<p><b>Regional Co-ordination</b></p> <ul style="list-style-type: none"> <li>• Optimisation/uploading of documentation and other project outputs</li> <li>• Regional news and screening of national news contributions</li> <li>• Periodic update (monthly) of partner contacts database and e-mailing lists</li> <li>• Update of project events calendar</li> <li>• Publish and e-mail e-newsletter (monthly)</li> <li>• Periodic (monthly) update of regional information repositories (documents, multi-media, training, awareness)</li> <li>• Stimulation of e-fora discussions</li> </ul> <p><b>National Execution</b></p> <ul style="list-style-type: none"> <li>• Establish and maintain links from websites of national orgs to South China Sea website</li> <li>• Contributions of project news, information, outputs direct to website</li> </ul> <p><b>Individual Focal Points</b></p> <ul style="list-style-type: none"> <li>• Upload of new data (GIS, meta-data, projects, economic valuation data, and results reporting) directly to website</li> </ul> <p><b>Support/Capacity Building</b></p> <ul style="list-style-type: none"> <li>• Update user manuals and conduct training as required.</li> <li>• Assist web users online.</li> </ul>	

## **SECTION 4: INSTITUTIONAL FRAMEWORK AND IMPLEMENTATION ARRANGEMENTS**

### **4.1 Regional mechanisms**

#### ***Background***

504. At inception, to ensure adequate separation between the project oversight (Implementing Agency) and execution responsibilities and further the alignment with the GEF funded project looking at the establishment of 14 Fisheries Refugia in the South China Sea executed by Southeast Asian Fisheries Development Center (SEAFDEC), the project implementation arrangement was strengthened as follows. The Southeast Asian Fisheries Development Center (SEAFDEC) will house the regional Project Implementation Unit (PIU) thereby facilitating synergies with the Fisheries Refugia Project Coordination Unit, whereas for strengthened compliance with the GEF preferred external execution modality and for accountability purpose, the United Nations Office of Project Services (UNOPS) has been identified to engage implementing partners at the national level as well as for coordinating the recruitment of the regional Project Implementation Unit (PIU) staff. The project technical coordination will take place through the PIU. The COBSEA will continue in its role of inter-governmental convening platform on the Seas of East Asia.

505. UNOPS is the operational arm of the United Nations and presently acts as the Executing Entity for a large number of GEF projects globally and in the East Asian region, including the GEF International Waters project in the Yellow Sea Large Marine Ecosystem. UNOPS possesses extensive expertise and experience in human resource management and contract management, and will take responsibility, in close consultation with United Nations Environment for the hiring of the professional personnel of the regional Project Implementation Unit (PIU) and for the engagement of approximately 41 implementing partners (the Focal Ministries and National Institutions) executing activities at the national level in the six participating countries. As an external Executing agency for UN Environment, UNOPS would be contractually obligated to United Nations Environment and the participating countries and, would ensure the timely engagement of the implementing partners including the processing of fund transfers to national entities under appropriate contractual modalities under the project and to meet the high-level business standards required to ensure the efficient operation of a complex project of this magnitude. In executing the project UNOPS will apply its administrative framework.

506. Having the Fisheries Refugia project and South China Sea SAP implementation Unit co-hosted by SEAFDEC will have the additional benefit of fostering synergy and complementarity between the two GEF projects as envisaged under the Strategic Action Programme. The regional Project Implementation Unit (PIU) will advise the SCS SAP Implementation Committee (i.e. Project Steering Committee) with substantive oversight from the responsible Task Manager at UN Environment; it will not take any instruction from SEAFDEC.

507. The proposed strengthened arrangement will help distance project execution from the UN Environment and therefore comply with the GEF's External Execution policy, while also ensuring a rapprochement with the Fisheries Refugia project. It constitutes a pragmatic course of action in response to current circumstances. COBSEA will continue to play its role as an intergovernmental platform where the South China Sea project progress and other matters will be shared biennially for uptake regionally as successfully done during the previous phase which resulted in the formulation of the Strategic Action Programme.

#### ***Regional decision-making and planning***

508. The PIU hosted by SEAFDEC will have responsibility for the day-to-day management of project activities, and oversight of SAP implementation, including liaison with the National Focal

Ministries (ministries responsible for environmental matters), the Specialised Executing Agencies at national level and other partners involved in SAP implementation. The work of the PIU shall be directed by the South China Sea Strategic Action Programme Implementation Committee (SAP-IC) which shall meet annually and have overall responsibility for the implementation of the SAP and decisions regarding project work plans, timetables, budgets and expenditure<sup>79</sup>. The SAP-IC shall receive advice and recommendations on scientific and technical matters from a Regional Scientific and Technical Committee (RSTC) composed of National Technical Focal Points, the Chairpersons of the regional working groups and task forces together with up to six experts resident in the region. The RSTC in turn shall receive advice and recommendations from the participating countries and the regional bodies and endeavour to secure consensus on scientific and technical matters before advising the SAP-IC on future courses of action.

509. The SAP-IC's role will be to provide managerial and governance advice to the project, and to guide the SAP-IU in the implementation and monitoring of the overall regional project. The SCS-SAP Implementation Committee (SAP-IC) will also provide a regional forum for reviewing and resolving national concerns, reviewing and approving annual work plans and budgets, and provide a regional forum for stakeholder participation. One of the first activities during full project implementation will be to reconfirm and/or reconstitute the membership of the SAP-IC, agree on meeting procedures, and finalise Terms of Reference for the SAP-IC.

510. The SCS-SAP Implementation Committee will meet on an annual basis during the operational phase of the project to guide the timely execution of project activities. In addition to the review and approval of reports from the SAP-IU regarding the outputs and outcomes of project activities, the SAP-IC assist the SAP-IU in ensuring co-ordination among national site-based activities and other national level activities to further enhance national capacity to achieve the targets of the Strategic Action Programme for the South China Sea. It will also review stakeholder involvement in project activities and take action where necessary to ensure appropriate levels of government, NGO, community, and private sector engagement; ensure compatibility between the activities of site and other national level activities; approve annual progress reports to be shared with the Implementing Agency UNEP and the GEF Secretariat and for transmission to the Intergovernmental Meetings of COBSEA; assist the SAP Implementation Unit in leveraging required project co-financing and additional funds that may be required from time to time; and work with the SAP-IU and National Lead Agencies in mainstreaming best practices and the replication of project successes at the national level.

511. Full members of the SAP-IC shall consist solely of representatives of all participating countries in the project. Each country shall designate two members: one member shall be the Chairperson of the policy-level, Inter-Ministry Committee; the other shall be the Chairperson of the National Technical Working Group. The UN Environment Task Manager will participate in SAP-IC meetings and the Regional Project Coordinator shall act as Secretary to the meetings of the Committee. The SAP-IU shall convene regular annual meetings of the SAP-IC immediately following the Regional Scientific and Technical Committee meeting when the latter is convened at an appropriate time. The Committee shall operate and take decisions on the basis of consensus, regarding any matter relating to project execution that has regional significance.

#### ***Regional consolidation of scientific and technical knowledge for planning***

512. A Regional Scientific and Technical Committee (RSTC) will be established with responsibility for overseeing the scientific and technical elements of the project; ensuring effective implementation of activities undertaken during project execution; and providing sound scientific and technical advice to the SCS-SAP Implementation Committee. The RSTC will also be responsible for

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<sup>79</sup> In this regard the SAP-Implementation Committee will function in a manner comparable to a GEF Project Steering Committee with responsibility for the conduct and execution of Project activities.

ensuring that scientific and technical aspects of SCS-SAP Implementation project meet international standards. Specifically, it will review the substantive activities of the project to: (1) reduce habitat degradation and loss via national and local reforms to achieve Strategic Action Programme targets for coastal habitat management in the South China Sea; (2) strengthen knowledge-based planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea; and (3) facilitate regional and national level integration and cooperation for implementation of the South China Sea Strategic Action Programme.

513. The RSTC will receive and review reports, data and information from national level activities of the project and oversee the regional syntheses of this information to identify overall needs and priorities for strengthening scientific and technical support to Strategic Action Programme implementation. It will also comment on drafts of national policies and/or action frameworks and advise the SAP-IU and National Technical Focal Points of the need for public awareness and information materials concerning efforts to reverse environmental degradation trends in the South China Sea. The RSTC shall consist of the Chairpersons of the National Technical Working Groups (NTWGs); the Chairpersons of the Regional Working Groups (RWGs) and Regional Task Forces (RTFs); up to 5 selected regional experts; and the Regional Project Coordinator of SCS-SAP Implementation Unit. The SCS-SAP Implementation Unit, in consultation with National Technical Focal Points, shall nominate no more than 5 regional experts to ensure a balance of expertise and specialisation consistent with the mandate of the Committee. The RSTC will operate and take decisions on the basis of consensus, regarding any matter relating to project execution that has regional significance.

#### ***Generating regional scientific and technical knowledge***

514. To facilitate the achievement of the Strategic Action Programme targets a Regional Working Group on Mangroves (RWG-M), Regional Working Group on Coral Reefs (RWG-CR), Regional Working Group on Seagrass, Regional Working Group on Wetlands (RWG-W) and Regional Working Group on Land-based Pollution (RWG-LbP) shall be established with overall responsibility for: co-ordinating the work of the respective Specialized Executing Agency established in each of the participating countries; ensuring effective implementation of project activities undertaken in the context of the achievement of the SAP targets of the project; and to provide a mechanism for exchange of information and experience of scientific and technical activities in each country relevant to the specific coastal habitats and land-based pollution.

515. Examples of the work to be undertaken by the Regional Working Groups on coastal habitats include: the update, in collaboration with national organs of the project, the regional SCS meta-database and GIS, including meta-data on biodiversity and the results of research pertaining to this project; the provision of guidance on the development of public awareness and information materials concerning the national and regional importance of such ecosystems; the update of regional data sets relating to the economic valuation of coastal habitat goods and services with a view to incorporation of such valuations in national economic and development planning; the review of reports, data and information from the national committees and compile regional syntheses regarding habitat management needs and priorities; develop guidelines regarding best practices for sustainable coastal habitat management for adoption and application at national level in participating countries; the formulation of recommendations, for adoption by the RSTC, the proposed targets and timelines that may be included in a revised Strategic Action programme in order to achieve, sustainable management of coastal habitats of the South China Sea in the longer-term.

516. Examples of the work of the RWG-LbP include: guiding research efforts of the project to quantify the impacts of estimated heavy metal contaminant loadings to the South China Sea and ensure that this information is communicated to decision-makers in a timely and engaging manner; collaborating with the national committees to quantify effluent volumes and contaminant loadings

from coastal aquaculture to the SCS marine basin and communicate this information to decision-makers; and the provision of regional guidance on options for strengthening and harmonizing national policies and laws, and supporting financial mechanisms, for the management of land-based sources of pollution. It will also co-ordinating the work of the National Land-Based Pollution Committees established in each of the participating countries; for ensuring effective implementation of project activities undertaken in the context of the achievement of the land-based pollution management targets of the project; and to provide a mechanism for exchange of information and experience of land-based pollution management activities in each country.

517. The Regional Task Force on Economic Valuation (RTF-E) will be re-established with the primary objective of advising and supporting the national committees and regional working groups by providing the appropriate expertise and assistance in completing the envisaged economic valuations and cost-benefit analyses. It is anticipated that the operation of the RTF-E will contribute significantly to the achievement of the following targets: expanded datasets of economic valuation information on the goods and services of SCS coastal habitats; computation of estimates of the value for the service provided by coastal habitats as nursery areas for coastal fish and crustaceans; estimating economic losses of coastal ecosystem goods and services consequent upon coastal shipping accidents and pollution damage; and formulating updated estimates of Total Economic Values for coastal habitats of the SCS and conversion of these to 2018 value by means of the consumer price index. The RTF-E will be comprised of: one environmental or resource economist, nominated by each of the participating countries; and two regional, environmental economic experts; all of whom will serve as members in their personal capacity. The RTF-L will also be operated to facilitate decision-making with regards to the adoption of an instrument for strengthened cooperation.

## 4.2 National mechanisms

### *Inter-Ministry Committees*

518. The National Inter-Ministry Committees (IMCs) shall assume overarching responsibility for the execution of national level activities of this project in each country. The IMCs will review and approve reports from the National Technical Working Groups and national committees for mangroves, coral reefs, seagrass, wetlands, land-based pollution, and economic valuation regarding the outputs and outcomes of efforts to achieve Strategic Action Programme targets. IMCs will meet on a biannual basis during the operational phase of the project to guide the timely execution of project activities, particularly activities at the site level, and to consider, amend and endorse quarterly work-plans, narrative progress and financial reports for submission to the regional SAP-IU.

519. The IMCs will also provide direction and strategic guidance to the National Technical Working Groups and National Committees for mangroves, coral reefs, seagrass, wetlands, land-based pollution, and economic valuation on the national and local reforms to achieve SAP targets and mainstream best practices in natural resource and environmental management of the South China Sea marine basin. They will also review planned and ongoing coastal and marine environment projects being operated along the South China Sea coast with the aim of minimising duplication of efforts, and to identify opportunities for cooperation and the sharing of examples of best practices in reversing environmental degradation trends. Importantly these committees will be responsible for assessing stakeholder involvement in national level execution of the SCS SAP Implementation project and take action where necessary to ensure appropriate levels of government, civil society and community organisation, environmental NGOs, Women's groups, and private sector engagement in project activities. They will ensure compatibility between site-based activities of the SCS SAP Implementation project and other National, provincial and municipal activities in coastal and marine environmental management, including for example PEMSEA's ICM initiative. IMCs will also review and approve annual progress reports for transmission to the SAP-IU, SAP-IC, COBSEA Intergovernmental Meetings, UN Environment and the GEF Secretariat as relevant.

### ***National Technical Working Groups***

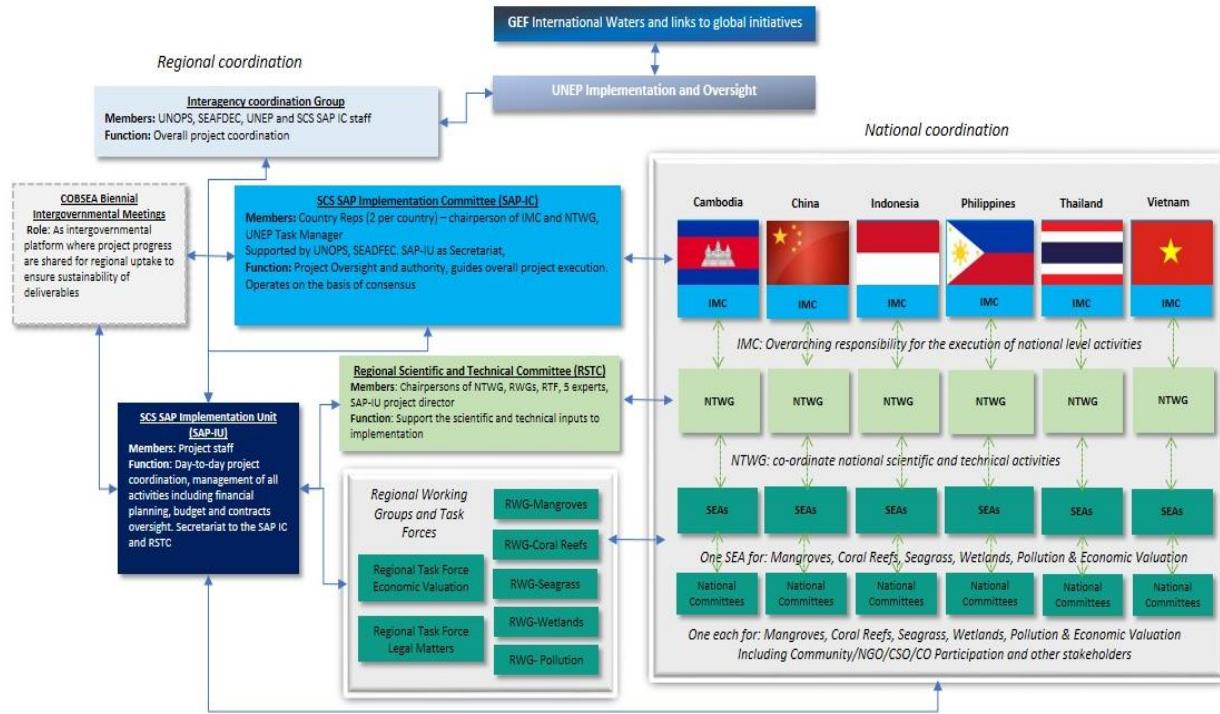
520. National Technical Working Groups (NTWG's) will review and co-ordinate national scientific and technical activities of the project in each country. They will review and evaluate, from a scientific and technical perspective, progress in the achievement of Strategic Action Programme targets, and provide guidance for improvement when necessary. The NTWGs will provide the IMCs with: recommendations on proposed national and site-based activities, work plans, and budgets; technical guidance and suggestions to improve project activities where necessary, including the reform of policy, legislation and institutional arrangements; facilitate co-operation with relevant national and provincial organisations and projects to enhance the information and science base for use in achieving Strategic Action Programme targets and in preparing updated National Action Plans and a revised Strategic Action Programme in their respective country; and compile and evaluate national level sources of information and data for sharing at the regional level.

### ***National Specialized Executing Agencies***

521. National Specialized Executing Agencies (SEAs) will be engaged by the SAP-IU and assume overall responsibility for the execution of the national-level activities in their respective areas of expertise for this project in accordance with the project results framework. The SEAs will convene quarterly meetings of national committees for mangroves, coral reefs, seagrass, wetlands, land-based pollution, and economic valuation, and will nominate a National Focal Point to: (a) act as the main point of contact with the SCS SAP-IU and UN Environment; (b) act as Chair of the his/her respective National Committee; (c) act as a member of NTWG; and (d) act as a member of the respective Regional Working Group or Task Force. The SEAs will also plan and implement activities based on the results framework, work plan and timetable contained in this document aimed at achieving the national-level goals and targets of the project and the Strategic Action Programme for the South China Sea. In doing so, the SEAs will engage with national networks to the fullest extent possible and establish institutional linkages with provincial and local governments and communities.

522. SEAs will also be responsible for submitting endorsed national costed work plans to the Regional Project Coordinator of the SAP-IU and, for preparing and submitting quarterly progress reports, expenditure reports, and cash advance requests for endorsement by the National Inter-Ministry Committee and subsequent submission to the Project Director of the SAP-IU. SEAs will also prepare annual progress reports on national-level activities and results of efforts to meet SAP targets; maintain accurate and up-to-date records and documents in respect of all expenditures incurred with the funds made available to ensure that all expenditures are in conformity with the provisions of the endorsed costed work plans. For each disbursement, proper supporting documentation shall be maintained by the SEAs, including original invoices, bills, and receipts pertinent to the transaction. The SEAs will also provide the SAP-IU with certified periodic financial statements, an annual audit of the financial statements relating to the status of project funds advanced to the SEA, and ensure the proper custody, maintenance and care of all equipment purchased for use at the national level.

Figure 5 summarises the above in an organogram.



**Figure 5** Project Management Framework (IMC = Inter-Ministry Committee; NTWG = National Technical Working Group; SEA = Specialized Executing Agency; RWG = Regional Working Group)

## SECTION 5: STAKEHOLDER PARTICIPATION

523. The primary level stakeholders in the implementation of the Strategic Action Programme are the central governments of the seven participating countries since these are the entities that must agree on, and oversee the co-ordination of actions at the regional level and support the achievement of the regional targets through the implementation of the national plans of action in each country. Other stakeholders at the national level include NGOs, the academic and research community that is in some countries organised through national organisations such as academies of science or professional societies. At the provincial and local levels stakeholders include the provincial and local government units, community groups and local associations or co-operatives of farmers, fishermen and others groups dependent upon coastal space and resources such as aquaculture producers and processing groups which are often controlled and operated by women.

524. The importance of different stakeholder groups at any one location reflects differences in the types of resources, and the human activities of exploitation and processing, characteristic of each area. In mangrove areas for example gleaning and catching crabs and village level processing of the catch may be undertaken by women's groups, whilst canoe based net and trap fishing may be undertaken predominantly by men. The project aims to provide appropriate fora in which scientists and government officials may periodically interact and exchange knowledge and experience regarding scientifically sound approaches to managing coastal resources (regional scientific conferences); together with fora designed to allow interaction between more operationally involved managers, government officers and community leaders (the Mayor's Round Tables).

525. In terms of the reform of laws and regulations for the sustainable use of 602,800 ha of mangrove forest, the development and implementation of management tools (licensing and permit systems, seasonal closures, zoning) at 82 priority coral reef sites, the design and enactment of

supporting laws and regulations for the sustainable management of 25,900 ha of seagrass at 21 sites, stakeholder participation will be enabled via a number of mechanisms. Firstly, members of the national committees for each of the habitat sub-components, with Secretariat support from their respective national specialized executing agencies, will be engaged in the conduct of causal chain analyses to identify priority management actions, the update of baseline reviews of policy and legal arrangements, and the formulation of recommendations on reforms.

526. Members of the National Technical Working Groups and Inter-Ministry Committees will be engaged in the cross-sectorial level review and comment on recommendations. Participation of provincial and municipal governments, as well as community representatives, will be facilitated via consultative processes aimed at eliciting the input of local knowledge in refining the revised legal and regulatory frameworks to be adopted and implemented at national and provincial levels. From the transboundary basin-level perspective, opportunities for multilateral review of progress and feedback will be facilitated via operation of the respective regional working groups and the Regional Scientific and Technical Committee.

527. Similar mechanisms for stakeholder participation have been agreed for activities aimed at strengthening and harmonizing national policies and laws, and supporting financial mechanism, for the management of land-based sources of pollution. Members of the national committees for land-based pollution, which include representatives from provincial governments, will participate in efforts to: document and share national best practices in waste water management, law enforcement, and community and industry participation in managing land-based sources of pollution; review legislative and institutional frameworks for land-based pollution management in participating countries; harmonize national Standard Operating Procedures for land-based pollution control and management (including agreed sediment, biota, & water quality criteria); develop, enact, and implement national/provincial policies and supporting regulations for land-based pollution; and update and adopt National Investment Plans for land-based pollution management in the SCS.

528. The effective cross-sectorial engagement of members of the national Inter-Ministry Committees, National Technical Working Groups, and national habitat committees, as well as the active participation of provincial government leaders, will be an important element of efforts to declare 57,400 ha of mangrove as National Parks and Protected Areas, the designation of 7 new Marine Protected Areas focusing on seagrass areas, and the declaration of at least 7 wetland areas with protection status (i.e. non-hunting area, nature reserves, protected areas, Ramsar Sites). National specialists engaged in the national committees and National Technical Working Group will, through their regular meetings, participate in documenting land and marine tenure and local governance, mapping agreed values of the sites to be retained via protection, and the conduct assessments of environmental and social impacts of declaring sites as protected areas. The latter will involve intensive participation of local stakeholders in consultations focused on reaching agreement on boundaries and the programming and alignment of provincial and local government resources with the operational management of the sites. Members of the Regional Working Groups and the Regional Scientific and Technical Committee will also participate in these processes through, for example, their engagement in related activities to develop and apply objective and scientifically sound procedures to confirm the priority seagrass sites to be designated as MPAs.

529. The project work plan emphasizes a high degree of provincial/local government in community participation in: the development of plans for the management of 166,600 ha of mangrove as non-conversion, sustainable use areas; the amendment of management plans for 7 existing MPAs with significant seagrass areas, to include specific seagrass-related management actions; the establishment of integrated, community-based, multiple use management frameworks at the priority coral reef sites. This will involve community participation in the identification of Terms of Reference and membership for community-based management committees at the sites where management plans will be developed and implemented. Key CSO, COs and NGOs include: Cambodia (the Coastal Community Fisheries

Khan Stung Hav in Sihanoukville, the Environmental Protection and Development Organization, the Kampong Samaki Community Fisheries Coastal Resources Protection organization, and the Potsar and Champey Community Fisheries Federation); China (the Guangdong Ecological Society, the Zhuhai Biological Society, the Leizhou Peninsula Coastal Ecological Conservation and Education Society, Guangxi Biodiversity Research and Conservation Association, the Fangchenggang Mangrove Protection Association, the Hainan South China Sea Institute of Tropical Marine Biology and Disease, and the Beihai Civil Volunteers Association); Indonesia (Indonesian Institute of Mangrove Research and Development, WWF Indonesia, Wetland Indonesia, Komunitas Sahabat Alam, Koperasi Panter, Yayasan Karya Banua Pulanggana, Kelompok Peduli Lingkungan Belitung, Komunitas Sahabat Alam, Lembaga Pengelola Sumberdaya Terumbu Karang (LPSTK) Desa BENAN, Lembaga Swadaya Masyarakat Pelita Alam, Belukap and Yayasan Gema Lingkungan Indonesia); Philippines (the provincial Fisheries and Aquatic Resources Management Councils, the Association of Resort Owners and Tourism Establishments, the Peoples' Organizations Anak ng Dagat, and Amahan at Ugnayan ng Pangisdaan ng Orion); Thailand (Prednai Mangrove Development and Conservation Group; fisherfolk associations; the Six-Tambol (Sub-district) Network for Collective Coastal Management in Trat Province; the Thai Nature Study Centre; the Ao Baan Don Conservation Network; the Traditional Knowledge Protection Network; the Songkhla Community Natural Resources and Environment Protection Volunteer; the Wetland Conservation Group Baan Bangnokork; the Pattani Small-scale Fisher Network; the Phatthalung Provincial Environment Network; and the Community Natural Resources Development Institute); and Vietnam (district level farmers' associations, ward level women's associations, provincial unions of science and technology associations, provincial level fisheries associations, town level youth unions, and provincial forestry clubs). Intensive consultation processes will also be undertaken with the abovementioned stakeholders to identify key threats at priority areas, agree upon management measures, and to facilitate high-levels of provincial/local government and community stakeholder ownership of management plan development and formal endorsement. In support of local implementation of the management plans, national committees and National Technical Working Groups will be engaged in supporting governments and communities in the design of awareness programmes, development of local networks of management practitioners, and capturing and sharing information about the results and best practices generated at these sites.

530. In support of efforts to facilitate national and regional level cooperation in tracking the results of SAP actions for coastal habitat management, revitalization of committees and regional networks of habitat specialists will enable a wide range of stakeholders input to: the development of mechanisms to monitor and evaluate the impacts of SAP implementation and achievement of habitat targets, including the development and agreement on standardized methods and guidelines for inventory and assessment; and the production of knowledge products such as biennial state of coastal habitat reports. Community leaders and local government from priority habitat sites will also be engaged in these processes via their networking during national and regional round-table meetings to foster cooperation and knowledge sharing on achievements and best practices.

531. A range of other mechanisms to facilitate stakeholder input and participation are included in the project design. These include: the operation of consultative processes in support of the updating and Ministerial adoption of a revised Transboundary Diagnostic Analysis and Strategic Action Programme for the SCS marine basin, including prioritization of national management actions to address climate variability and change; knowledge exchanges between government and scientific community through biennial Regional Scientific Conferences; best practice exchanges between local government officials and coastal managers on science-based management via annual Mayor's Round-Table meetings; consultative processes to enable agreement and implementation of Memoranda of Agreement for joint management of 2 priority transboundary water areas; coordination with the UNEP/GEF fisheries refugia initiative and other GEF-financed initiatives operating in the East Asian Seas, including PEMSEA; and the operation of an award program on best practices in coastal habitat and land-based pollution management for communities, local governments and industry.

532. Mechanisms to further facilitate NGO, CSO, and CO participation in the programme include: the revitalization of cooperative arrangements with GEF SGP in the commissioning and implementation of community-level initiatives in support of the achievement of SAP targets, including those relating to reforestation and enrichment planting at priority mangrove sites. Annual NGO forums will also be convened to elicit CSO and CO inputs to planning, and monitoring and evaluation, of the SCS-SGP partnership. Similar processes will be operated to engage the private sector in identify opportunities for private sector investment (e.g. oil and gas, fisheries, tourism) in implementation of the updated SAP. The planning of cooperation between governments and the private sector for the implementation of the updated SAP will be facilitated via two partnership forums. Importantly, the Terms of Reference for the SCS-SAP Implementation Committee (the regional Project Steering Committee) and the national Inter-Ministry Committees task these bodies with the review of stakeholder involvement in project activities and with taking action where necessary to ensure appropriate levels of government, NGO, community, and private sector engagement (refer to Appendix 11). In addition to the plans for engagement of CSO's, COs and NGOs in site-based activities of the project as outlined above, these organisations will be represented in the national committees for the various habitat sub-components and land-based pollution according to their various areas of expertise and interest. The Chairpersons of the national SGP committees will also be included as members of the Inter-Ministry Committees to ensure CSO, CO and NGO involvement in national project planning and decision-making.

533. National stakeholder engagement strategies will be developed and will be deliverables of the project inception phase. The broad anticipated benefits from the development and implementation of these strategies include: enhanced community confidence in operations of SAP implementation; more targeted delivery of support services that may be required by project stakeholders; improving understanding of and access to information about emerging issues at the levels of national, provincial and municipal government, and within target communities; greater legitimization of project decision-making; timely identification of opportunities for mutual learning; increased levels of stakeholder 'ownership'; avoiding negative publicity or perceptions by focusing on positive communication and being proactive about communicating with stakeholders; and enabling the development of a culture of innovation.

534. Gender mainstreaming will be central to stakeholder participation planning and engagement at all levels. Gender in the context of development projects is generally associated with unequal power and access to choices and resources. It has become increasingly accepted that women should play an important role in land, water and coastal management and that this role could be enhanced via gender mainstreaming. Gender mainstreaming is the concept of valuing the differing implications for women and men of a project intended outcomes. It is also about integrating the diverse needs of these groups into the planning and implementation of a project to better reflect the whole community's development aspirations as well as to increase the sustainability of a project.

535. Both UNEP and the GEF are dedicated to the improvement of gender equality and through the Policy on Gender Mainstreaming adopted by the GEF in 2012, the GEF has committed itself and partner agencies to this end. The GEF recognizes that gender equality is an important goal in the context of the projects that it finances because it advances both the GEF's goals for attaining global environmental benefits and the goal of gender equity and social inclusion. The GEF's Policy on Gender Mainstreaming Policy that "...the GEF Secretariat and GEF Partner Agencies shall strive to attain the goal of gender equality, the equal treatment of women and men, including the equal access to resources and services through its operations" and that "...the GEF Secretariat and GEF Partner Agencies shall mainstream gender into their operations, including efforts to analyze systematically and address the specific needs of both women and men in GEF projects" (GEF, 2012). Accordingly, the design and implementation of stakeholder engagement plans will ensure that both women and men (a) receive culturally compatible social and economic benefits, (b) do not suffer adverse effects during the

development process, and that (c) full respect for their dignity and human rights is fostered as a result of project implementation. All routine monitoring and evaluation of stakeholder participation will ensure the collation of sex-disaggregated data which will be analyzed and presented as part of routine reporting at national, regional and global levels.

536. In implementing the demonstration site activities of the South China Sea Project each responsible organisation was required to establish a cross-sectorial management board Chaired by the Mayor or Provincial Governor or their Deputy. Membership of the board included representatives from all sectors of government involved in the use of coastal space, local stakeholder groups including the community, and where appropriate non-governmental and scientific organisations. Almost without exception this proved to be extremely valuable in mobilising additional and unplanned actions and resources and the model has now been adopted by several government agencies as the standard model for project management.

## **SECTION 6: MONITORING AND EVALUATION PLAN**

537. The project will follow UNEP standard monitoring, reporting and evaluation processes and procedures. Substantive and financial project reporting requirements are summarized in Appendix 4. Reporting requirements and templates are an integral part of the UNEP legal instrument to be signed by the executing agency and UNEP.

538. The project M&E plan is consistent with the GEF Monitoring and Evaluation policy. The Project Results Framework presented in Appendix 4 includes SMART indicators for each expected outcome as well as mid-term and end-of-project targets. These indicators along with the key deliverables and benchmarks included in Appendix 6 will be the main tools for assessing project implementation progress and whether project results are being achieved. The means of verification and the costs associated with obtaining the information to track the indicators are summarized in Appendix 7. Other M&E related costs are also presented in the Costed M&E Plan and are fully integrated in the overall project budget.

539. The M&E plan will be reviewed and revised as necessary during the project inception workshop to ensure project stakeholders understand their roles and responsibilities vis-à-vis project monitoring and evaluation. Indicators and their means of verification may also be fine-tuned at the inception workshop. Day-to-day project monitoring is the responsibility of the project management team but other project partners will have responsibilities to collect specific information to track the indicators. It is the responsibility of the Project Manager to inform UNEP of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely fashion.

540. The project Steering Committee will receive periodic reports on progress and will make recommendations to UNEP concerning the need to revise any aspects of the Results Framework or the M&E plan. Project oversight to ensure that the project meets UNEP and GEF policies and procedures is the responsibility to the Task Manager in UNEP-GEF. The Task Manager will also review the quality of draft project outputs, provide feedback to the project partners, and establish peer review procedures to ensure adequate quality of scientific and technical outputs and publications.

541. At the time of project approval 85 percent of baseline data is available. Baseline data gaps will be addressed during the first year of project implementation. A plan for collecting the necessary baseline data is presented in Appendix 5. The main aspects for which additional information are needed are updated site characterisations and information relating to legal and regulatory frameworks.

542. Project supervision will take an adaptive management approach. The Task Manager will develop a project supervision plan at the inception of the project which will be communicated to the project partners during the inception workshop. The emphasis of the Task Manager supervision will be on outcome monitoring but without neglecting project financial management and implementation

monitoring. Progress vis-à-vis delivering the agreed project global environmental benefits will be assessed with the Steering Committee at agreed intervals. Project risks and assumptions will be regularly monitored both by project partners and UNEP. Risk assessment and rating is an integral part of the Project Implementation Review (PIR). The quality of project monitoring and evaluation will also be reviewed and rated as part of the PIR. Key financial parameters will be monitored quarterly to ensure cost-effective use of financial resources.

543. A mid-term management review or evaluation will take place during the first half of 2019 as indicated in the project milestones. The review will include all parameters recommended by the GEF Evaluation Office for terminal evaluations and will verify information gathered through the GEF tracking tools, as relevant. The review will be carried out using a participatory approach whereby parties that may benefit or be affected by the project will be consulted. Such parties were identified during the stakeholder analysis (see section 2.5 of the project document). The project Steering Committee will participate in the mid-term review and develop a management response to the evaluation recommendations along with an implementation plan. It is the responsibility of the UNEP Task Manager to monitor whether the agreed recommendations are being implemented.

544. An independent terminal evaluation will take place at the end of project implementation. The Evaluation Office of UNEP will manage the terminal evaluation process. A review of the quality of the evaluation report will be done by EOU and submitted along with the report to the GEF Evaluation Office not later than 6 months after the completion of the evaluation. The standard terms of reference for the terminal evaluation are included in Appendix 9. These will be adjusted to the special needs of the project.

545. The GEF tracking tools are attached as Appendix 15. These will be updated at mid-term and at the end of the project and will be made available to the GEF Secretariat along with the project PIR report. As mentioned above the mid-term and terminal evaluation will verify the information of the tracking tool.

## **SECTION 7: PROJECT FINANCING AND BUDGET**

### **7.1. Overall project budget**

546. The overall budget for the project is US\$98,451,948 of which US\$15,000,000 will be financed by the GEF Trust Fund through the GEF International Waters focal area.

### **7.2. Project co-financing**

547. The agency direct in-kind co-financing value for this project is estimated at approximately US\$500,000 over the project period and will be provided through various UNEP divisions (DEPI, DEWA, and ROAP). In-kind co-financing of US\$1,854,363 will also be provided by COBSEA.

548. The majority of the co-financing comes from the participating countries with a combined total in-kind co-financing of US\$81,097,585. The total co-financing of this project is therefore US\$83,451,948.

### **7.3. Project cost-effectiveness**

549. The Strategic Action Programme for the South China Sea encompasses an integrated, cross-sectorial environmental and natural resource management approach that is ideally suited to the unique scale of challenges facing the South China Sea marine basin while simultaneously providing a cost-effective delivery mechanism in a rapidly developing region. Through the project management framework designed for this project, synergies with existing and emerging projects at regional, sub-regional, national and local levels can be achieved and a more cost-effective and expansive engagement with stakeholders assured. This management approach will also reduce duplication and overlap thereby increasing project value. Additionally, the individual national work plans and budgets emphasize the sub-contracting of supporting national organisations rather than individual consultants.

The former has been demonstrated to result in the more cost-effective delivery of high quality project outputs and result in greater national ownership of project results in the East Asian region. The project also has structures in place for the coordination of reporting and the sharing of lessons learned. This is deemed necessary to enable the cost-effective transfer of knowledge required to guide the replication and scaling-up of best practices.

## **SECTION 8: REFERENCES**

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## **APPENDICES**

**Appendix 1: Budget by project components and UNEP budget lines [EXCEL SHEETS]**

**Appendix 2: Co-financing by source and UNEP budget lines [EXCEL SHEETS]**

### **Appendix 3: Incremental cost analysis**

#### **Baseline**

The South China Sea is a strategic body of water surrounded by nations that are currently at the helm of industrialization and rapid economic growth in the Asia-Pacific region. Bordered by the People's Republic of China to the north, the Republic of the Philippines to the east; Malaysia, the Republic of Singapore, the Republic of Indonesia and the Sultanate of Brunei Darussalam to the south, and the Kingdoms of Thailand and Cambodia, and the Socialist Republic of Viet Nam to the west, the South China Sea has always been central to issues of economic and political stability in Southeast Asia and adjacent regions. Today, it is central to defining environmental sustainability and food security for its coastal nations. The coastal sub-regions of these nations are home to 270 000 000 people or 5% of the world's population. About 122 major rivers drain  $2.5 \times 10^6$  km<sup>2</sup> of catchments and deliver materials, including suspended sediments, nutrients and pollutants, to the South China Sea.

The Indo-West Pacific marine biogeographic province has long been recognized as the global centre of marine tropical biodiversity. Forty-five mangrove species out of a global total of 51; 50 of 70 coral genera; 20 of 50 seagrass species; and 7 of 9 giant clam species are found in the nearshore areas of the South China Sea. Compared to the Atlantic, the tropical Indo-West Pacific is highly diverse. Only 5 mangrove species and some 35 coral species are found in the Atlantic compared with the 45 mangrove species and 450 coral species recorded from the South China Sea. Like most tropical coastlines worldwide, the dominant coastal ecosystems of the South China Sea marine basin are mangroves, coral reefs and seagrass meadows. Significant other coastal ecosystems include coastal lagoons, a common coastal landform in Viet Nam, and extensive inter-tidal unvegetated mudflats that are found in many places around the South China Sea.

Although action aimed at reducing the rate of loss of coastal habitats has been implemented by countries bordering the South China Sea, the decadal rate of loss of such habitats remains high, e.g., seagrass beds (30 percent), mangroves (16 percent, and coral reefs (16 percent). This high and continued decline in the total area of habitat and associated biodiversity has raised serious concerns for the long-term sustainability of fisheries and coastal and marine ecosystems. Socio-economically, culturally and aesthetically, the South China Sea (SCS), the Gulf of Thailand (GoT) and regional river basins and bays form part of the common heritage of the people of the Southeast Asian region. The region's expanding population relies on the SCS for nutrition, recreation and economic pursuits (e.g., tourism), energy (e.g., oil and gas), aquaculture, pharmaceuticals, ornamental fish trade, construction materials and ports and shipping.

This degradation and loss of habitats is a result of a multitude of persistent and emerging threats that were evaluated by the SCS project and described above. Of particular note are the contemporary causes of the loss of mangrove that include: reclamation and infrastructure development; pollution from shrimp farming; conversion to industrial uses; and charcoal production. The physical removal of mangrove associated with the construction of ponds for shrimp culture is currently not the dominant threat that it had been during previous decades. Overfishing and the use of destructive fishing gears such as push nets and trawls have been confirmed as the dominant threats to coral reefs and seagrass. The Strategic Action Programme for the South China outlines an agreed common vision on priority locations and approaches for future habitat management actions. It is imperative that commitment to implement the SAP be sustained. The national and local capacity built and the vast repositories of management information created by the SCS project provide a solid foundation for SAP implementation, future planning, and monitoring and evaluation of management interventions.

#### **Business-as-usual scenario**

The environment of the South China Sea continues to degrade despite actions taken at the national, sub-regional and regional levels. Part of the problem stems from the transboundary marine problems

in the region and their impact on the ecosystems and resources of the South China Sea. This provides the ecological impetus for co-operation that is also based on the fact that the region is a large marine ecosystem with intrinsic integrity and inter-connections between all trophic levels. Fish and other migratory species do not recognise national boundaries, and the loss of endangered species in one area has not only regional but global significance. Due to the inherent conflict between the boundaries of the ecological system and man-made, national boundaries, cooperative approaches must be embraced to meet the challenges to managing and sustainably using the shared ecological system. It is unlikely that, without concerted and sustained action to implement the SAP, the degradation of the coastal and marine environment of the South China Sea will continue and most likely accelerate as population pressures and demands on coastal resources grow.

### **Incremental reasoning**

Implementation of the Strategic Action Programme will result in significant environmental stress reduction and process and environmental state benefits. The design of the SAP aligns squarely with the GEF theory of change via implementing strategies, strengthening institutional capacity via the reform of policy, regulatory and planning frameworks, and through knowledge and information activities aimed at improving information sharing and access, awareness raising, skills building, and monitoring and evaluation. Importantly, successful implementation of the SAP will result in: appropriate forms of sustainable management established for 860,000 ha of mangrove; 153,000 ha of coral reef at 82 priority sites managed sustainably, including a reduction in the decadal rate of degradation in live coral cover from 16 to 5%; conservation, management and sustainable use of 25,900 ha of known seagrass area in the South China Sea; and integrated management of 783,900 ha of coastal wetland at 19 sites, including habitat restoration and protection strengthened at priority locations. Without the support of this project and the regional coordination, guidance and technical assistance it will provide, it is unlikely that these critically important SAP targets will be met.

Importantly, the project will also make substantial contributions towards the achievement of the Sustainable Development Goals, specifically: (a) Goal 1: End poverty in all its forms everywhere – by ensuring that all men and women, in particular the poor and the vulnerable, have equal rights to natural resources, and by building the resilience of the poor and those in vulnerable situations via reducing their vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters; (b) Goal 12. Ensure sustainable consumption and production patterns – by contributing to the achievement of the sustainable management and efficient use of natural resources, and by supporting developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production; and (c) Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development – by efforts aimed at sustainably managing and protecting marine and coastal ecosystems, conserving at least 10 per cent of coastal and marine areas, and by enhancing the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of ‘The Future We Want’.

## Appendix 4: Results Framework

**Table 1** Results framework for project component 1

Component	Outcomes	Indicator(s)	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
1. Reducing habitat degradation and loss via national and local reforms to achieve Strategic Action Programme targets for coastal habitat management in the South China Sea		Total area (ha) of mangrove designated as national park or protected area	14 percent (246,122 ha) of mangrove area in SCS presently managed as national park or protected area	1.1.1 Declaration of 57,400 ha of mangrove as National Parks and Protected Areas	Official proclamations, executive orders, and ordinances establishing mangrove parks and protected areas	Adequate joint government and community commitment to manage mangrove on a protected area basis
	1.1 Appropriate forms of sustainable management established for 860,000 ha of mangrove by Yr 5	Status of endorsement of management plans	13 percent (225,512 ha) of mangrove area in SCS presently managed as non-conversion, extractive resource use areas (fish, crabs etc.)	1.1.2 Designation and plans for the management of 166,600 ha of mangrove as non-conversion, sustainable use areas	Maps and site characterisations for priority mangrove sites	Adequate local cooperation to agree boundaries and compile and analyse information to identify threats and agree management actions
		Total area (ha) of mangrove under management plan for sustainable use		Endorsed management plans for mangrove sites		
		Total area (ha) of presently unmanaged mangrove for which regulations/ordinances are adopted to enable sustainable management	Legal frameworks to enable sustainable management of 56 percent of mangrove area in the SCS	1.1.3 Reform of laws and regulations for the sustainable use of 602,800 ha of mangrove forest	Endorsed policies, executive orders, provincial/local government ordinances and by-laws	National and provincial/local government commitment to adopt governance reforms that reflect local needs
		Total area (ha) of deforested mangrove land rehabilitated	Decadal rate of loss of total mangrove area from SCS is estimated at 16 percent	1.1.4 Replanting of 21,000 ha of deforested mangrove land	Maps and aerial imagery of rehabilitated mangrove areas	Landowner commitment to convert present land-use to mangrove forest
		Measures of ecological & environmental indicators at enrichment planting sites: forest cover; number and diversity of true mangrove species; and size and abundance of <i>Scylla</i> spp and <i>Sesarma</i> spp	Predominantly single-species mangrove reforestation initiatives over recent decades have compromised biodiversity and hazard risk reduction potential of rehabilitated mangrove areas	1.1.5 Biodiversity increased for 11,200 ha of mangrove forest via enrichment planting	Updated site characterisations for enrichment planting sites, including ecological and socio-economic data	Appropriate selection of enrichment planting sites to minimise risks associated with: chronic pollution from shrimp farming operations; charcoal production; and storm surge inundation
	1.2 153,000 ha of coral reef at 82 priority sites managed	Status of management capacity, including:	13 of 82 priority coral reef sites in the SCS characterised as being	1.2.1 Management capacity built for 82 coral reef sites	Assessment of government and civil society organisation	Management capacity initiatives are sufficiently well

<b>Component</b>	<b>Outcomes</b>	<b>Indicator(s)</b>	<b>Baseline</b>	<b>Targets End of Project</b>	<b>Source of Verification</b>	<b>Risks and Assumptions</b>
1.2 Strengthening management capacity and institutional reform for coral reef management	sustainably by Yr 5, including a reduction in the decadal rate of degradation in live coral cover from 16 to 5%	• Human resource capacity; • Facilities and equipment; and • Sustainable financing	sustainably management due to management capacity constraints		competencies and mgmt. capacity developments needs  Reports of capacity building initiatives	planned to accommodate biodiversity conservation and livelihood/food security needs at coral reef sites
		Status of institutional reform for multi-sectorial, community-based and multiple use coral reef management	Predominantly single sector (environment) and centralised approach to coral reef management	1.2.2 Management approaches (integrated, community-based, multiple use) improved at 82 coral reef sites	Reports of cross-sectorial, multi-stakeholder coral reef management bodies	Existing tensions between coral reef resource users and governments may limit community participation
		Number of management tools developed, adopted and applied at priority coral reef sites	Coral reef management largely focused on awareness raising with limited use of management tools to address threats to coral reef sites	1.2.3 Management tools (licensing and permit systems, seasonal closures, zoning) developed and utilized to address key threats at priority sites	Endorsed policies and executive orders provincial/local ordinances and by-laws for coral reef management	Commitment of central and local governments, as well as resource users, to jointly develop and apply management tools governing coral reef resource use
		Status of mechanism established for monitoring coral reef management effectiveness and stress reduction	Management, ecological and environmental, and socio-economic indicator frameworks developed but not yet applied at priority sites	1.2.4 Established mechanism for the monitoring of management, ecological and socio-economic indicators at 82 sites	Annual results reports on coral reef management at priority sites	Capacity of provincial and local level resource managers to collate nationally and regionally comparable information and data
	1.3 Conservation, management and sustainable use of 25,900 ha of known seagrass area in the South China Sea by Yr 5	Number of sites under sustainable management	Majority of seagrass areas in the SCS are unmanaged, or managed ineffectively, due to lack of enabling environment for zoning/regulation	1.3.1 Twenty-one seagrass areas totalling 25,900 ha under sustainable management with supporting laws and regulations	Annual country reports on seagrass mgmt  Laws and regulations enacted for seagrass management	Central and local government commitment to enact laws for seagrass management in light of development pressures
		Number of seagrass sites for which management regulations exist	Sustainable use and management of seagrass and related resources is rarely addressed in	1.3.2 Amended management plans for 7 existing MPAs with significant seagrass areas, to include	Amended MPA management plans	Adequate local cooperation, as well as satisfaction with existing MPA management, to agree
		Number of MPA management plans containing seagrass-related management actions				

<b>Component</b>	<b>Outcomes</b>	<b>Indicator(s)</b>	<b>Baseline</b>	<b>Targets End of Project</b>	<b>Source of Verification</b>	<b>Risks and Assumptions</b>
			management plans for MPAs in the SCS	specific seagrass-related management actions		priority seagrass management actions
		Number of newly established MPAs focused on seagrass management	MPA management in SCS predominantly focuses on strict protection of coral reef areas	1.3.3 Designation of 7 new Marine Protected Areas focusing on seagrass areas	Official proclamations, executive orders, and ordinances establishing MPAs for significant seagrass sites	Adequate joint government and community commitment to manage seagrass on a protected area basis
		Status of mechanism established for monitoring seagrass management effectiveness and stress reduction	Management, ecological and environmental, and socio-economic indicator frameworks developed but not yet applied at priority sites	1.3.4 Established mechanism for monitoring management, ecological and socio-economic indicators at 21 sites	Annual results reports on seagrass management at priority sites	Capacity of provincial and local level resource managers to collate nationally and regionally comparable information and data
	1.4 Integrated management of 783,900 ha of coastal wetland at 19 sites, including habitat restoration and protection strengthened at priority locations	Number of integrated management plans developed	Population growth, and urbanisation of the coastal fringe, combined with rapid economic growth in the SCS region places tremendous pressure on coastal wetland ecosystems	1.4.1 Integrated management plans developed and under implementation for at least 3 lagoons (26,818 ha), 9 estuaries (614,680 ha), 5 tidal flats (96,903 ha), 1 peat swamp (45,700 ha) and 1 non-peat swamp (9,808 ha)	Adopted integrated management plans Annual implementation reports, including results of environmental stress reduction initiatives	Adequate local cooperation to agree boundaries and compile and analyse information to identify threats and agree management actions
		Number of wetlands sites assigned protection status	The riparian states of SCS face significant pressure to convert wetlands for economic development with little focus on conservation or sustainable use	1.4.2 Declaration of at least 7 wetland areas with protection status (i.e. non-hunting area, nature reserves, protected areas, Ramsar Sites).	Official proclamations, executive orders, and ordinances establishing protection status for wetland sites	Development pressures may result in adoption or revision of land-use policies which compromise efforts to conserve priority wetland sites
		Status of mechanism established for monitoring wetland management effectiveness and stress	Management, ecological and environmental, and socio-economic indicator frameworks	1.4.3 Adoption of a regional estuary monitoring scheme and its national implementation	Annual results reports on wetland management at priority sites	Capacity of provincial and local level resource managers to collate nationally and regionally comparable

<b>Component</b>	<b>Outcomes</b>	<b>Indicator(s)</b>	<b>Baseline</b>	<b>Targets End of Project</b>	<b>Source of Verification</b>	<b>Risks and Assumptions</b>
		reduction	developed but not yet applied at priority sites			information and data
	1.5 National and regional level cooperation in tracking results of SAP actions for coastal habitat management	Extent and continuity of participation in regional fora for coastal habitat management  Scope and uptake of joint management and planning decisions	No existing fora at national and regional level in the SCS to network coastal habitat scientists and management specialists	1.5.1 National committees and regional networks of habitat specialists established under the SCS project revitalized and functioning	Meeting reports of periodic national habitat committees and regional working groups	Consultative processes may not elicit adequate stakeholder input and support from national participants
		Status and extent of uptake by national Inter-Ministry committees of SAP implementation results reporting  Level of congruence of national and regional indicator sets with the proposed targets and outcomes of the SAP	Results frameworks for the management of mangroves, coral reefs, seagrass and wetlands of the SCS developed through national and regional consultative process but has not yet been applied	1.5.2 Mechanism to monitor and evaluate the impacts of SAP implementation and achievement of habitat targets operational [including agreement on standardized methods and guidelines for inventory and assessment]	Approved SAP results framework online  Approved national and regional reporting templates published  Annual national and regional results reports published and disseminated	Sustained commitment of senior officials with responsibility for SAP implementation to develop and operate a harmonized results monitoring and reporting system for coastal habitat management
		Extent and continuity of local leader and local government participation in community round-table meetings  Improved local relevance of SAP implementation initiatives	Limited engagement of community-based governance mechanisms in planning coastal habitat management  Low level mobilization of civil society, community groups and the private sector in habitat management	1.5.3 Community leaders and local government from priority habitat sites networked via national and regional round-table meetings to foster cooperation and knowledge sharing on achievements and best practices	Meeting reports of round-table meetings (including records of joint management decisions and participant lists)  Annual reports of best practice examples of community-led SAP implementation	Existing tensions between land-owners and government agencies may limit community leader participation  Internal tensions between community organisations may be exacerbated by discussions about community priorities
		Demonstrable use of state of coastal habitat reports in national and regional planning	Baseline national habitat reports developed and require periodic uptake	1.5.4 Biennial state of coastal habitat reports published and applied in national and regional action	Published state of coastal habitat reports	Adequate national and regional mechanisms for the step-wise review of information and data used in

<b>Component</b>	<b>Outcomes</b>	<b>Indicator(s)</b>	<b>Baseline</b>	<b>Targets End of Project</b>	<b>Source of Verification</b>	<b>Risks and Assumptions</b>
				planning		reporting

**Table 2** Results framework for project component 2

Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
2. Strengthening knowledge-based action planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea	2.1 Enhanced information-base for coastal habitat management and action planning	Volume of remotely sensed information interpreted and made available for planning	Rapid advancements in aerial visual survey techniques and remote sensing of inter-tidal and shallow water biomes have potential to greatly enhance coastal habitat management planning in the SCS marine basin	2.1.1 Algorithms for the interpretation of remotely sensed information and data on coastal habitat associations and zonation developed and applied in national and regional action planning	Regional report on methodologies and procedures for the application of aerial visual survey and remotely sensed data in coastal habitat management in the SCS marine basin published and accessible online	Adequate national and local capacity to ground-truth and conduct rapid assessments for validation of remotely sensed information and data
		Extent of uptake of remotely sensed coastal habitat information and data in management planning and action				
	Number and completeness of regionally comparable coastal habitat site characterisations for 134 sites	Number and completeness of regionally comparable coastal habitat site characterisations for 134 sites	Regional GIS and meta-database of SCS coastal habitat information developed but not updated since 2008 due to lack of a regional mechanism for collation and exchange of data	2.1.2 Mechanism for collection and exchange of regional coastal habitat information and data established	Agreed site characterisation forms for the compilation of regionally comparable coastal habitat information and data	Engaging appropriate expertise to facilitate consensus on the selection of physical, biological and socio-economic variables to be used in characterising coastal habitat sites, as well as willingness of data holders to share
		Number of datasets for 134 coastal habitat sites accessible online in centralised repository			GIS and meta-database online and routinely updated by SAP implementation partners	
	Volume of CO <sub>2</sub> captured and stored by SCS habitats defined	Lack of SCS specific information on carbon sequestration by coastal habitats constrains resource managers in making political case for better resourcing	2.1.3 Role of coastal habitats of the South China Sea in the sequestration and storage of carbon quantified, communicated to stakeholders, and applied in national and regional action planning	Published report on the capture and storage of carbon by coastal habitats, including national and regional strategic planning recommendations, shared online	Appropriate selection of in-situ monitoring sites to minimise risks associated with: typhoon; emerging development pressures; and storm surge inundation	
	Independent peer acceptance of review	Sea level rise, climate variability and change, and episodic natural	2.1.4 Review of the potential impacts of sea level rise, climate change, and episodic	Review report published and shared regionally	Engaging appropriate breadth of expertise in conducting review to facilitate consensus	
	Extent of uptake of					

Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
		review and its recommendations in updating national action plans and diagnostic analyses	disasters in SC identified as threats to sustainable management of coastal habitats	events on coastal habitats of the South China Sea applied in national action planning and update of the SCS TDA	Communications on review outcomes published by media outlets and syndicated via GEF:LME LEARN	building at both national and regional levels on findings and recommendations
		Number of updated National Action Plans, including institutional reform and sustainable financing strategies, adopted  Number of policies, laws and regulations adopted to enable action plan implementation	National Action Plans for mangroves, coral reefs, seagrass and wetlands developed and implemented during period 2002-2008	2.1.5 Updated and adopted National Action Plans for mangroves, coral reefs, seagrass and wetlands, including institutional reform and sustainable financing strategies, and the enactment of supporting legislation where required	Adopted National Action Plans and sustainable financing strategies accessible online  Executive orders, provincial/local ordinances and by-laws	Ministerial level commitment to adopt updated management plans and enact supporting legislation
	2.2 Effective integration of regional science in the management of land-based pollution	Extent of decision-maker awareness of localised v. transboundary impacts of land-based pollution in the SCS  Extent of use of model outputs in revising the Strategic Action Programme for the SCS	Carrying capacity of the SCS open shelf system based on its natural capacity to assimilate contaminants, in particular nutrient inputs from land, has been modelled although findings not well known by decision-makers	2.2.1 Nutrient carrying capacity model for the SCS marine basin used to communicate with decision-makers and to inform management planning about the localized v. transboundary impacts of land-based pollution in the SCS	Nutrient carrying capacity accessible online  Communications products available for regional and global sharing  1 * IW Experience Note	Communication strategy and products sufficiently well designed to achieve desired reach and impact
		Extent of decision-maker awareness of SCS open shelf carrying capacity for heavy metal contaminants  Extent of use of model outputs in revising the Strategic Action Programme for the	Need for simple model of pollution impacts under different development scenarios, specifically as they relate to heavy metal contaminant loadings	2.2.2 Total contaminant loading and carrying capacity of the SCS estimated via application of quantitative modeling and GIS-based techniques for seven heavy metals (Hg, Cd, Pb, Cu, Cr, As, Zn) and applied in national and	GIS-based model of SCS carrying capacity for heavy metal contamination developed & online  Communications products available for regional and global sharing	That modelling may be carried out on a 2-dimensional basis and making the assumption that the surface, mixed layer is vertically homogeneous

Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
		SCS		regional planning	1 * IW Experience Note	
		Status of initiative to quantify heavy metal contaminant impacts on: (a) water quality; (b) reproductive capacity of living resources; (c) contamination of human food sources; and (d) bio-accumulation.	Framework procedures for estimating the impacts of heavy metal contamination in SCS have been developed although not yet applied	2.2.3 Impacts of estimated heavy metal contaminant loadings defined, quantified and communicated to decision-makers	Published report shared nationally and regionally, including national language translation where appropriate  1 * IW Experience Note	Characterisations of pollution hotspots provide adequate information regarding heavy metal contaminants and threats to environmental and public health
		Number of heavy metal pollution hotspots characterised	Lack of regionally comparable information and data on heavy metal contaminated hotspots	2.2.4 Characterization of heavy metal pollution hotspots	Pollution hotspot site characterisation templates developed  Hotspot information accessible online	Sufficient national and local capacity, including laboratory facilities, to compile regionally comparable site characterisations
		Number of aquaculture sites for which effluent and contaminant loadings estimated	Effluent from aquaculture and mariculture operations identified as key threat to dominant coastal biomes	2.2.5 Quantification of effluent volumes and contaminant loadings from coastal aquaculture to the SCS marine basin	Published methodology and procedures for estimating aquaculture pollution loadings and impacts  1 * IW Experience Note	Willingness of private sector to engage and cooperate in efforts to determine environmental impact of operations
	2.3 Strengthened and harmonized national policies and laws, and supporting financial mechanism, for the management of land-based sources of pollution	Number of best practice technologies and measures tested, documented and shared	Lesson learned in community-based wastewater mgmt. in Batam, Indonesia documented and shared regionally although other examples from East Asian seas region largely focus on broad scale ICM planning	2.3.1 National best practices in waste water management, law enforcement, and community and industry participation in managing land-based sources of pollution documented and shared	Catalogue of best practice technologies and management approaches for land-based pollution published and accessible online	Challenges and costs associated with demonstrating stress reduction benefits may constrain replication and upscaling  Uptake of best practices may also be constrained if the publicizing of the benefits is inadequate
		Number of countries with demonstrable harmonization of	Effectiveness of existing legal and institutional	2.3.2 Review of legislative and institutional	Review published and shared regionally	Willingness of sector agencies to participate in review

Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
		sectoral governance frameworks achieved as a result of review findings	frameworks limited by predominantly single sector approaches	frameworks for land-based pollution management in participating countries		Harmonization of governance frameworks may take longer than the period of the project
		Number of countries with demonstrable adoption of harmonized, regionally comparable SOPs	Lack of Standard Operating Procedures for land-based pollution management	2.3.3 Harmonized national Standard Operating Procedures for land-based pollution control and management [including agreed sediment, biota, & water quality criteria]	Regional guidelines on Standard Operating Procedures published Adopted National Standard Operating Procedures available online	Willingness of sectoral agencies to participate in the development of Standard Operating Procedures
		Number of countries with endorsed national policies and enacted laws and regulations for land-based pollution control	Absence of clear and effective policies, laws, and regulations relating to control of land-based pollution	2.3.4 Revised national/provincial policies and supporting regulations for land-based pollution developed, enacted and implemented by Yr 5	6 national reports on policy and legal aspects of land-based pollution management Endorsed policy and executive orders, provincial/local ordinances and by-laws	National and provincial government commitment to reform
		Number of countries with endorsed National Action Plans, including institutional reform and sustainable financing strategies	Guidelines for assessing the economic impacts of land-based pollution developed but not yet applied as part of benefit-cost analysis of pollution mgmt. in the SCS	2.3.5 Updated and adopted National Action Plans, including institutional reform and sustainable financing strategies, for land-based pollution management in the SCS [Yr 5]	6 endorsed National Investment Plans published and disseminated nationally and regionally	Availability of information and data to enable comparison of cost of action versus cost of inaction as part of investment planning approach
		Status of agreement among participating countries on a sustainable financing approach for regional actions	Lack of sustainable mechanism to finance regional support actions including M&E	2.3.6 Regional financial mechanism for land-based pollution management [Yr 5]	Endorsed regional report on sustainable financing of regional actions for land-based pollution in the SCS	Level of commitment of participating countries, development partners, and donors to invest in coordinated action
	2.4 Improved national and regional values for	Completeness of value information compiled	Values determined for SCS are	2.4.1 Expanded datasets of economic	6 national reports on economic valuation of	Application of regionally consistent

<b>Components</b>	<b>Outcomes</b>	<b>Indicator</b>	<b>Baseline</b>	<b>Targets End of Project</b>	<b>Source of Verification</b>	<b>Risks and Assumptions</b>
	the Total Economic Values of coastal habitats for use in development planning and decision-making	for coastal biome goods and services	incomplete as not all known goods and services from individual biomes have been valued	valuation information on the goods and services of SCS coastal habitats	coastal biomes, including tabulated data and reference material, published	methodology in the collection and review of information and data
		Status of initiative to develop national and regional estimates economic linkages between habitats and coastal fish production	Comparatively few existing values for the services provided by habitats as nursery areas for coastal living resources	2.4.2 Estimates of the value for the service provided by coastal habitats as nursery areas for coastal fish and crustaceans	6 national and 1 regional report on the economic contribution of coastal habitats to coastal fisheries production in the SCS, including tabulated data and reference material, published	Application of regionally consistent methodology in the collection, review and analysis of information and data
		Status of initiative to value economic costs of coastal shipping accidents and pollution damage	No existing information linking shipping accidents to loss of economic benefits associated coastal biomes in the SCS	2.4.3 Estimates of economic losses of coastal ecosystem goods and services consequent upon coastal shipping accidents and pollution damage	1 regional report on the economic losses consequent upon coastal shipping accidents and pollution damage	Application of regionally consistent methodology in the collection, review and analysis of information and data
		Status of initiative to update estimates of total economic values of coastal biomes	Economic valuation of coastal habitats used in cost benefit analysis of endorsed Strategic Action Programme actions in 2008	2.4.4 Updated estimates of Total Economic Values for coastal habitats of the SCS and converted to 2017 value by means of the consumer price index	1 regional report on updated Total Economic Values for coastal habitats published and online	Application of regionally consistent methodology in the collection, review and analysis of information and data
	2.5 Regionally appropriate tools and mechanisms to guide the development of sustainable management systems for coastal habitats and land-based pollution	Status of initiative to develop and apply standards and criteria, including TWAP methodology, for determining the sustainability of coastal management systems	Sustainable management indicator matrices developed for dominant coastal habitats but not yet applied and tested in framework of SAP implementation	2.5.1 Regionally applicable standards and criteria for defining the sustainability of coastal habitat management systems, including documented models of sustainable use	1 regional report documenting sustainability of management systems developed and applied at priority coastal habitat sites	Supporting communication approach and facilitation of consultative processes are sufficiently well design to ensure stakeholder engagement and participation
		Number of best practice management	Lessons learned and best practices in	2.5.2 Online catalogue of best practice	Catalogue of best practices accessible	Internet connectivity and in provincial and

Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
		measures and technologies documented, codified, and accessible via online catalogue	coastal habitat management from 23 demonstration sites documented and published in peer reviewed article	management measures and technologies for sustainable use of SCS coastal habitats and land-based pollution management	online  Communications products on best practices produced and syndicated online	local offices of environment and natural resource agencies adequate to support effective online knowledge sharing
		Extent and continuity of local leader and local government participation in study tour and exchange initiatives  Level of improved local relevance of national policy and planning efforts for reducing environmental degradation in the SCS	Limited engagement of community-based governance mechanisms in national policy and planning  Low level mobilization of civil society, community organisation and the private sector in environmental investment planning	2.5.3 Government officials, community leaders, and habitat and pollution managers exposed to on-going practices in rehabilitation, management, and pollution control and treatment via programme of study tours and exchange	Reports of study tour and exchange initiatives  Annual reports of best practice examples of community level inputs to SAP implementation initiatives	Existing tensions between local leaders, land owners, and government agencies may limit community leader or government official participation  Study tours and exchange initiatives are sufficiently well designed to guide uptake of best practice at provincial/community levels
		Number of public awareness products accessible online  Extent of local uptake and use of awareness products	Public awareness materials developed via TDA/SAP project compiled and accessible via SCS website	2.5.4 Expanded South China Sea online public awareness centre, including awareness packages for local adoption	Awareness packages accessible online via a SCS SAP implementation website	Awareness materials are sufficiently well designed and shared with stakeholders to ensure uptake and desire local impact
	2.6 Updated and Ministerially adopted Transboundary Diagnostic Analysis and Strategic Action Programme, including prioritization of national management actions to address climate variability and change	Status of national and regional level consensus on contemporary issues of transboundary significance with respect to coastal habitat and land-based pollution management	TDA for SCS published in 2000  Special Issue of Ocean and Coastal Management on South China Sea published in 2013	2.6.1 National and regional level consensus on contemporary issues and problems, including the quantification of environmental compromises and the prioritization of problems (Yr 2)	Updated and regionally endorsed Transboundary Diagnostic Analysis for the SCS marine basin published and disseminated at national and regional levels	Securing adequate and consistent inputs of expertise may be compromised if incentives for national and regional specialists to participate in work are inadequate

<b>Components</b>	<b>Outcomes</b>	<b>Indicator</b>	<b>Baseline</b>	<b>Targets End of Project</b>	<b>Source of Verification</b>	<b>Risks and Assumptions</b>
		Status of national and regional level consensus reached on priority actions for intervention  Status of cost benefit analysis of comparative net benefits of alternative options for management	Strategic Action Programme endorsed in 2008 outlines priorities for management  Established methodology for cost of action versus non-action in the context of SCS SAP implementation	2.6.2 The immediate and ultimate root causes of the problems identified and consensus reached on priorities for intervention, including comparative analysis of the net benefits of alternative options (Yr 3)	Updated and regionally endorsed prioritisation of options for management intervention in the SCS  Published cost benefit analysis of alternative options for coastal habitat and land-based pollution interventions	Securing adequate and consistent inputs of expertise may be compromised if incentives for national and regional specialists to participate in work are inadequate
		Status of adoption by appropriate Ministers of an updated Strategic Action Programme for the South China Sea	Strategic Action Programme for the South China Sea endorsed inter-governently in 2008	2.6.3 National and regional consultative process to develop updated Strategic Action Programme SAP for adoption by appropriate Ministers (Yr 5)	Endorsed Strategic Action Programme published	Minister-level commitment to adopt and sign the revised SAP
		Level of demonstrable use of the regional review on sea level rise, climate change, and episodic events in SAP formulation	Evolving understanding of sea level rise, climate change, and episodic events in East Asia but not applied in context of transboundary planning in the South China Sea	2.6.4 Prioritization of national management actions to address climate variability and change for incorporation into national policies and plans	Report of priority actions  National policies and plans with demonstrable uptake of priority actions	Engaging appropriate technical expertise to identify priority national actions that achieve local benefit as well as high transboundary impact

**Table 3** Results framework for project component 3

Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
3. Facilitating regional and national level integration and cooperation for implementation of the South China Sea Strategic Action Programme	3.1 Regional and sub-regional co-operation in the integration of scientific knowledge and research outputs with management and policy making	Status of the RSTC and the uptake of the scientific and technical advice it provides  Continuity of participation of RSTC members in annual meetings	Lack of a formal mechanism for the sharing of science and technical knowledge relating to the South China Sea SAP implementation	3.1.1 Regional Scientific and Technical Committee of the SCS project functioning as a bridge between the scientific community and decision-makers [annual meetings]	RSTC Terms of Reference  Annual meeting reports (documenting scientific and technical advice and participant lists)	Harnessing sufficient scientific and technical expertise across disciplines in coastal habitats, ecology, economic valuation, oceanography, land-based pollution and its impacts
		Number of central and provincial government agencies demonstrating use of scientific knowledge exchanged during biennial conferences	Limited application of evidence-based approaches by central and provincial government agencies	3.1.2 Knowledge exchanges between government and scientific community through biennial Regional Scientific Conferences	Published reports of the Regional Scientific Conferences  Report on the uptake and use of regionally accumulated science	Strong and consistent support from government agencies to actively participate in scientific fora
		Number of Mayor's Round-Table meetings convened  Number, scope & reach of communications to raise local official awareness of best practices	Four Mayors Round-Table meetings convened during period 2005-2008 and documented as a key innovation for improving local relevance of action planning and M&E	3.1.3 Best practice exchanges between local government officials and coastal managers on science-based management via annual Mayor's Round-Table meetings	Reports of Mayor's Round-Table Meetings, including documented evidence of behaviour change as a result of exposure to best practice guidance	Strong and consistent support from local government officials to actively participate in fora aimed at stimulating knowledge sharing on best practice management approaches and technologies
		Status of bilateral cooperation for transboundary resource management between (a) Cambodia and Vietnam and (b) Cambodia and Thailand  Status of signature of	Bilateral cooperation between Cambodia and Vietnam initiated during the period 2007-2008 although this has stagnated as a result of a lack of regional coordination support	3.1.4 Memoranda of Agreement for joint management of 2 priority transboundary water areas agreed & implemented	Signed Memoranda of Agreement outlining agreed joint actions for transboundary coastal resource management	Commitment of central governments, provincial governments, and resources users to participate in consultative processes relating to the joint management of transboundary

<b>Components</b>	<b>Outcomes</b>	<b>Indicator</b>	<b>Baseline</b>	<b>Targets End of Project</b>	<b>Source of Verification</b>	<b>Risks and Assumptions</b>
		Memoranda of Agreement				resources
		Extent of joint planning by both projects	Execution of the UNEP/GEF Fisheries Refugia project to commence in Q3 of 2016 through SEAFDEC and national fisheries agencies	3.1.5 Cooperation with the GEF fisheries refugia project and other relevant regional initiatives	Reports of joint planning meeting  Published revised NAPs and SAP containing section on lessons from fisheries refugia project	Commitment of SEAFDEC and UNEP to actively and constructively cooperate on identifying and sharing best practices between projects
		Number of best practices and lessons learned captured from the fisheries refugia project				
		Number of best practices identified	Lack of mechanism to formally recognize and award communities, local governments and industry for innovation and generation of best practices for environmental management of the South China Sea	3.1.6 Operational award program on best practices in coastal habitat and land-based pollution management for communities, local governments and industry [annual]	Documented examples of innovation and best practice by communities, local governments and industry  Annual report of award project	Communities, local governments and industry initiatives result in innovative approaches  Interest of stakeholders to participate in such a programme
	3.2 Capacity for civil society and community organization participation in SAP implementation strengthened via operational partnership with GEF SGP	Number of GEF Small Grants Programme projects commissioned and implemented in support of SAP implementation	Need for strengthened mobilization of civil society and community organizations in SAP implementation	3.2.1 Cooperation with GEF SGP in the commissioning and implementation of an additional 12 community-based projects for SAP implementation	5 annual reports of SGP-SAP implementation partnership	There will be sufficient number of civil society and community based organisations to act as GEF SGP proponents in support of SAP implementation
		Extent and scope of inputs from CSOs and COs	Need for CSO and CO inputs to planning of an SCS-SGP partnership	3.2.2 CSO & CO inputs elicited for planning and M&E of the SCS-SGP partnership via annual NGO forums	Reports of NGO forum meetings	That linked capacity building initiatives are sufficiently well designed to build capacity of CSOs and COs for planning
		Number of NGO forums convened				
		Number of SGP proponents trained to implement local actions in support of	Limited civil society and community organisation experience and	3.2.3 Training program on science and management of SCS coastal habitats and	Training modules for SGP proponents developed and accessible online	Training materials are sufficiently well planned and presented in local languages to

<b>Components</b>	<b>Outcomes</b>	<b>Indicator</b>	<b>Baseline</b>	<b>Targets End of Project</b>	<b>Source of Verification</b>	<b>Risks and Assumptions</b>
		the achievement of SAP targets	capacity for coastal habitat and land-based pollution management	resources for SGP proponents		meet needs of the staff of SGP proponent organisations
	3.3 Relationships between central and local governments and the private sector strengthened and formalized	Number of public-private partnerships identified and documented	Many private sector organisations operate corporate social and environmental responsibility programmes but they are not aligned with SAP implementation	3.3.1 Review of past and ongoing public-private partnerships for coastal management in SCS region	Review of report on public-private partnerships published	Engaging appropriate expertise to link information on corporate social responsibility to SAP targets and implementation priorities
		Number of opportunities for private sector investment in SAP implementation identified	Significant commercial enterprise is conducted in waters of the South China Sea, particularly in the areas of oil and gas, fisheries and tourism	3.3.2 Identification of opportunities for private sector investment (e.g. oil and gas, fisheries, tourism) in implementation of the updated SAP	Letters of commitment from private sector entities with regards to support for SAP implementation	Communications and engagement strategies sufficiently well planned to establish interest among private sector entities in SAP implementation
		Status of agreement on financial arrangements for private sector and donor investment in the implementation of the revised Strategic Action Programme	Low-level mobilization of the private sector in environmental investment planning in the South China Sea	3.3.3 Two partnership forums to facilitate cooperation with private sector on implementation of the updated SAP	Letters of investment commitment from private sector partners and donors	Limited private sector interest or alignment of donor investment strategies with revised SAP targets and actions
	3.4 Revitalization of regional mechanisms for communications, knowledge exchange, and information and data management and sharing	Number of multi-media and knowledge products produced	The SCS project produced an extensive range of knowledge products, technical guides, and training and awareness materials	3.4.1 A variety of multi-media information and knowledge products based on SCS SAP implementation communications strategy	Multi-media information and knowledge products published and accessible online	Sufficient creative input can be harnessed to produce products that have high impact on stakeholders
		Status of knowledge tool development to support evidence-based coastal and marine management and spatial planning	Transboundary coastal and marine mgmt. spatial planning constrained by lack of a regionally coordinated approach	3.4.2 Regionally appropriate knowledge tools developed to support decision-making and planning	Published synthesis reports on: climate variability in coastal systems; hazards and coastal area planning; blue forests and	Limited scientific understanding of the role climate variability and anthropogenic induced change on the SCS marine basin may

<b>Components</b>	<b>Outcomes</b>	<b>Indicator</b>	<b>Baseline</b>	<b>Targets End of Project</b>	<b>Source of Verification</b>	<b>Risks and Assumptions</b>
			to harnessing sectorial expertise and knowledge		livelihoods; and land and marine tenure and use designation	result in climate issues dominating scientific & technical discussions
		Number of users, volume of content accessed, and online visibility of the SCS website and associated databases	Need for media platforms and targeted communications in support of efforts to harness support for inter-ministerial coordination and policy and planning elements of SAP implementation and revision	3.4.3 The SCS project web portal < <a href="http://www.unepscs.org">www.unepscs.org</a> > and associated regional databases online, updated and linked to IW-Learn and other GEF Knowledge management systems	Regional and national portals, GIS and meta-databases, repository of best practices, lessons learned and results accessible online via < <a href="http://www.unepscs.org">www.unepscs.org</a> >	Internet connectivity in national and regional offices is adequate to support the efficient online compilation and sharing of information and data
		Number of IW:LEARN experience notes published	Limited regional and global sharing of information on best practices and lessons learned from investments in the SCS despite for example publication of a complete Special Issue of an academic journal on the progress to date	3.4.4 Active engagement with GEF IW:LEARN [1% of project resources] including participation in IW conferences and 3 experience notes	Published experience notes	Retention of national and regional level staff required to resource the documentation of experiences and lessons learned as IW:LEARN experience notes
	3.5 Agreed arrangements for strengthened regional cooperation in the management of the marine and coastal environment of the South China Sea	Number of Regional Task Force meetings Continuity of participation of nationally nominated members	Regional Task Force on Legal Matters established through SCS project but presently not functioning	3.5.1 Biannual meetings of the Regional Task Force on Legal Matters	Reports of the meetings of the Regional Task Force on Legal Matters	National government commitment to ensure continuity of participation of nominated members
		Number of National Working Group meetings Continuity of participation of nationally nominated members	National Working Groups established through SCS project but presently not functioning	3.5.2 National Working Groups on established and functional	Reports of the meetings of National Working Groups	Adequate incentive structures are in place nationally to secure adequate expertise to consider matters relating to cooperation
		Status of agreement	Framework process	3.5.3 Process for	Report outlining agreed	Adequate planning

<b>Components</b>	<b>Outcomes</b>	<b>Indicator</b>	<b>Baseline</b>	<b>Targets End of Project</b>	<b>Source of Verification</b>	<b>Risks and Assumptions</b>
		on identified process	developed but requires national and regional consultation	development of a proposed arrangement for regional cooperation defined and planned	process	and facilitation to support consensus building
		Extent of national stakeholder input to drafting phase of instrument for cooperation	SAP formulation benefited from an emphasis on consensual planning and decision making	3.5.4 National stakeholder inputs to drafting of instrument for strengthened regional cooperation facilitated via national consultations	Reports of national stakeholder consultation process	Adequate planning and facilitation to elicit national inputs required to support consensus building
		Status of adoption of the instrument	Participating countries agreed in the SAP, and in endorsing the PIF for this project, to explore the development of an instrument for strengthened regional cooperation	3.5.5 Adopted instrument for strengthened regional cooperation	Adopted instrument	Government commitment to cooperate on matters relating to coastal and marine environmental management in the South China Sea basin

## Appendix 5: Workplan and timetable

	Activity Description	Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>COMPONENT 1: Reducing habitat degradation and loss via national and local reforms to achieve SAP targets for coastal habitat management in the South China Sea</b>																					
<b>1.1</b>	<b>Establishing appropriate forms of sustainable management for 860,000 ha of mangrove by Yr 5</b>																				
<b>1.1.1</b>	<b>Declaration of 57,400 ha of mangrove as National Parks and Protected Areas</b>																				
1.1.1.1	Using assembled baseline data, operate national consultations process to confirm priority sites																				
1.1.1.2	Document land and marine tenure and local governance systems at priority sites																				
1.1.1.3	Prepare GIS maps for priority sites depicting the agreed values to be retained via protection																				
1.1.1.4	Conduct assessments of environmental and social impacts of declaration of protection status																				
1.1.1.5	Operate local consultation processes to seek stakeholder input to boundary delineation																				
1.1.1.6	Secure formal government declaration of sites as national parks and protected areas																				
<b>1.1.2</b>	<b>Designation and development of plans for the management of 166,600 ha of mangrove as non-conversion, sustainable use areas</b>																				
1.1.2.1	Using assembled baseline data, operate national consultations process to confirm priority sites																				
1.1.2.2	Consultations to identify key threats at priority areas and identify management measures																				
1.1.2.3	Prepare GIS maps for priority sites depicting the agreed values to be retained via protection																				
1.1.2.4	Develop management plans for sustainable use areas through community-based consultations																				
1.1.2.5	Regulations/rules required for sustainable use management drafted with local stakeholders																				
1.1.2.6	Management plans adopted and																				

		Year 1				Year 2				Year 3				Year 4				Year 5							
	<b>Activity Description</b>	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	implemented by local authorities and regulatory reforms enacted																								
<b>1.1.3</b>	<b>Reform of laws and regulations for the sustainable use of 602,800 ha of mangrove forest</b>																								
1.1.3.1	Review policy and legal aspects of mangrove management (terminology, procedures, recommended reforms) in the 6 countries																								
1.1.3.2	Formulate recommendations on policy and legal reforms to support sustainable use management of priority mangrove areas in the 6 countries																								
1.1.3.3	National expert consultations to formulate agreed recommendations for legal/regulatory reforms for sustainable use management																								
1.1.3.4	Draft required policy and legal reforms to support mangrove management in 6 countries																								
1.1.3.5	Facilitate approval, formal adoption and enforcement of reforms by authorities at national and provincial levels for priority mangrove areas of SCS																								
<b>1.1.4</b>	<b>Replanting of 21,000 ha of deforested mangrove land</b>																								
1.1.4.1	Develop an objective and scientifically sound method and procedure for identifying priority areas for mangrove reforestation																								
1.1.4.2	Identify priority sites for reforestation to meet reforestation targets of the SAP																								
1.1.4.3	Procure technical and nursery services to ensure timely and efficient reforestation of priority sites																								
1.1.4.4	Produce regional guidelines on identification of priority sites for mangrove reforestation																								
<b>1.1.5</b>	<b>Biodiversity increased for 11,200 ha of mangrove forest via enrichment planting</b>																								
1.1.5.1	Using assembled baseline data, develop an objective and scientifically sound method and procedure for identifying priority areas for enrichment planting																								

		Year 1				Year 2				Year 3				Year 4				Year 5							
	<b>Activity Description</b>	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1.1.5.2	Conduct site surveys to ground-truth compiled information and data and conduct rapid biodiversity assessments at priority sites																								
1.1.5.3	Procure technical nursery surveys to ensure timely and efficient enrichment planting																								
1.1.5.4	Conduct in situ monitoring at enrichment planting sites and report on biodiversity benefits																								
<b>1.2</b>	<b>153,000 ha of coral reef at 82 priority sites managed sustainably by Yr 5, including a reduction in the decadal rate of degradation in live coral cover from 16 to 5%</b>																								
<b>1.2.1</b>	<b>Management capacity built for 82 coral reef sites</b>																								
1.2.1.1	Engage consortium of international recognized educational institutes to deliver a cost-effective post-graduate training course on coral reef mgmt																								
1.2.1.2	Develop an agreed curricula and regional appropriate training materials and strategies																								
1.2.1.3	Benchmark and track management, coordination, technical and financial capacity for mgmt..																								
1.2.1.4	Implement targeted annual capacity building programmes at the 82 priority sites																								
1.2.1.5	Establish agreements with bilateral Aid agencies and universities for the placement of volunteer workers, young professionals and development workers in national agencies and at sites																								
<b>1.2.2</b>	<b>Management approaches (integrated, community-based, multiple use) improved at 82 coral reef sites</b>																								
1.2.2.1	Review governance arrangements at 82 sites to identify needs for strengthened mgmt																								
1.2.2.2	Identify ToR and membership of community-based management committees for 82 sites																								
1.2.2.3	Procure technical & managerial services to ensure timely & efficient management of 82 sites																								
1.2.2.4	Develop and conduct training for site-based committees on results-oriented																								

	<b>Activity Description</b>	Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	management																				
1.2.2.5	Develop locally appropriate learning materials and strategies to facilitate knowledge exchange on best practice coral reef mgmt approaches																				
<b>1.2.3</b>	<b>Management tools (licensing and permit systems, seasonal closures, zoning) developed and utilized to address key threats at priority sites</b>																				
1.2.3.1	Conduct causal chain analyses at the 82 priority sites and identify priority management measures																				
1.2.3.2	Draft regulations/rules to strengthen operational management at the 82 priority sites																				
1.2.3.3	Amend/develop management plans for sites, including adoption by local authorities and enactment of regulatory reforms																				
1.2.3.4	Establish management teams and site-based volunteer networks for application of tools																				
1.2.3.5	Coordinate annual training and awareness activities at the 82 sites																				
1.2.3.6	Develop and implement collaborative observer and enforcement programmes at the 82 sites																				
<b>1.2.4</b>	<b>Established mechanism for the monitoring of management, ecological and socio-economic indicators at 82 sites</b>																				
1.2.4.1	Develop coral reef management results framework and associated indicator sets																				
1.2.4.2	Establish network of coral reef scientists for collation of regionally comparable data																				
1.2.4.3	Develop guidelines and conduct annual training on the collection of indicator data																				
1.2.4.4	Annual reporting on management effectiveness to Regional Working Group on Coral Reefs																				
<b>1.3</b>	<b>Conservation, management and sustainable use of 25,900 ha of known seagrass area in the South China Sea by Yr 5</b>																				
<b>1.3.1</b>	<b>Twenty-one seagrass areas totalling 25,900 ha under sustainable management with supporting laws and regulations</b>																				
1.3.1.1	Review policy and legal aspects of seagrass management (terminology, procedures, recommended reforms) in the 6 countries																				
1.3.1.2	Formulate recommendations on policy and legal reforms to support sustainable use																				

		Year 1				Year 2				Year 3				Year 4				Year 5							
	<b>Activity Description</b>	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	management of priority seagrass areas in the 6 countries																								
1.3.1.3	National expert consultations to formulate agreed recommendations for legal/regulatory reforms for sustainable use management																								
1.3.1.4	Draft required policy and legal reforms to support seagrass management in 6 countries																								
1.3.1.5	Facilitate approval, formal adoption and enforcement of reforms by authorities at national and provincial levels for priority seagrass areas of SCS																								
<b>1.3.2</b>	<b>Amended management plans for 7 existing MPAs with significant seagrass areas, to include specific seagrass-related management actions</b>																								
1.3.2.1	Review management plans for SCS MPAs to identify need for seagrass specific actions																								
1.3.2.2	Using assembled baseline data, develop an objective and scientifically sound procedure for identifying 7 priority MPA plans for revision																								
1.3.2.3	Conduct causal chain analyses at 7 selected MPA sites to identify key threats to seagrass and priorities for management																								
1.2.3.4	Conduct consultative processes at each MPA site to secure adoption of mgmtt plan amendments																								
<b>1.3.3</b>	<b>Designation of 7 new Marine Protected Areas focusing on seagrass areas</b>																								
1.3.3.1	Using assembled baseline data, develop an objective and scientifically sound procedure for identifying priority sites for seagrass MPAs																								
1.3.3.2	Conduct consultations to identify key threats to seagrass at priority MPA sites and determine MPA category (IUCN system) for each																								
1.3.3.3	Develop, secure endorsement of, and support local agency implementation of management plans at each of the priority sites																								
<b>1.3.4</b>	<b>Established mechanism for monitoring management, ecological and socio-economic indicators at 21 sites</b>																								

	<b>Activity Description</b>	Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1.3.4.1	Develop seagrass management results framework and associated indicator sets																				
1.3.4.2	Establish network of seagrass scientists for collation of regionally comparable data																				
1.3.4.3	Develop guidelines and conduct annual training on the collection of indicator data																				
1.3.4.4	Annual reporting on management effectiveness to Regional Working Group on Seagrass																				
<b>1.4</b>	<b>Integrated management of 783,900 ha of coastal wetland at 19 sites, including habitat restoration and protection strengthened at priority locations</b>																				
1.4.1	Develop and implement integrated management plans for 3 lagoons (26,818 ha), 9 estuaries (614,680 ha), 5 tidal flats (96,903 ha), 1 peat swamp (45,700 ha) and 1 non-peat swamp (9,808 ha)																				
1.4.2	Declare at least 7 wetland areas with protection status (i.e. non-hunting area, nature reserves, protected areas, Ramsar Sites).																				
1.4.3	Develop, adopt and implement a regional estuary monitoring scheme at the national level																				
<b>1.5</b>	<b>National and regional level cooperation in tracking results of SAP actions for coastal habitat management</b>																				
1.5.1	Revitalize national committees and regional networks of habitat specialists established under the SCS project																				
1.5.2	Develop mechanism to monitor and evaluate the impacts of SAP implementation and achievement of habitat targets operational [including agreement on standardized methods and guidelines for inventory and assessment]																				
1.5.3	Network community leaders and local government from priority habitat sites networked via national and regional round-table meetings to foster cooperation and knowledge sharing on achievements and best practices																				
1.5.4	Publish biennial state of coastal habitat reports																				

	Activity Description	Year 1				Year 2				Year 3				Year 4				Year 5				
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
<b>COMPONENT 2: Strengthening knowledge-based action planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea</b>																						
<b>2.1</b>	<b>Enhanced information-base for coastal habitat management and action planning</b>																					
2.1.1	Develop and apply algorithms for the interpretation of remotely sensed information and data on coastal habitat associations and zonation																					
2.1.2	Establish mechanism for collection and exchange of regional coastal habitat information and data																					
2.1.3	Quantify the role of coastal habitats of the South China Sea in the sequestration and storage of carbon																					
2.1.4	Review the potential impacts of sea level rise, climate change, and episodic events on coastal habitats of the South China Sea																					
2.1.5	Update and adopt National Action Plans for mangroves, coral reefs, seagrass and wetlands, including enactment of supporting legislation where required																					
<b>2.2</b>	<b>Effective integration of regional science in the management of land-based pollution</b>																					
2.2.1	Nutrient carrying capacity model for the SCS marine basin used to communicate with decision-makers about the localized v. transboundary impacts of land-based pollution in the SCS																					
2.2.2	Total contaminant loading and carrying capacity of the SCS estimated via application of quantitative modeling and GIS-based techniques for seven heavy metals (Hg, Cd, Pb, Cu, Cr, As, Zn)																					
2.2.3	Impacts of estimated heavy metal contaminant loadings defined, quantified and communicated to decision-makers																					
2.2.4	Characterization of heavy metal pollution hotspots																					
2.2.5	Quantification of effluent volumes and contaminant loadings from coastal aquaculture to the SCS marine basin																					
<b>2.3</b>	<b>Strengthened and harmonized national policies and laws, and supporting financial mechanism, for the management of land-based sources of pollution</b>																					

	<b>Activity Description</b>	Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
2.3.1	Document and share national best practices in waste water management, law enforcement, and community and industry participation in managing land-based sources of pollution																				
2.3.2	Review legislative and institutional frameworks for land-based pollution management in participating countries																				
2.3.3	Harmonize national Standard Operating Procedures for land-based pollution control and management [including agreed sediment, biota, & water quality criteria]																				
2.3.4	Develop, enact, and implement national/provincial policies and supporting regulations for land-based pollution																				
2.3.5	Update and adopt National Investment Plans for land-based pollution management in the SCS																				
2.3.6	Develop and agree regional financial mechanism for land-based pollution management																				
<b>2.4</b>	<b>Improved national and regional values for the Total Economic Values of coastal habitats for use in development planning and decision-making</b>																				
2.4.1	Expand datasets of economic valuation information on the goods and services of SCS coastal habitats																				
2.4.2	Estimate the value for the service provided by coastal habitats as nursery areas for coastal fish and crustaceans																				
2.4.3	Estimate economic losses of coastal ecosystem goods and services consequent upon coastal shipping accidents and pollution damage																				
2.4.4	Update estimates of Total Economic Values for coastal habitats of the SCS and converted to 2017 value by means of the consumer price index produce regional guidelines on identification of priority sites for mangrove reforestation																				
<b>2.5</b>	<b>Regionally appropriate tools and mechanisms to guide the development of sustainable management systems for coastal habitats and land-based pollution</b>																				
2.5.1	Develop regionally applicable standards and criteria for defining the sustainability of																				

	<b>Activity Description</b>	Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	coastal habitat management systems, including documented models of sustainable use																				
2.5.2	Develop an online catalogue of best practice management measures and technologies for sustainable use of SCS coastal habitats and land-based pollution management																				
2.5.3	Operate a programme of study tours and exchanges to expose government officials, community leaders, and habitat and pollution managers best practices in rehabilitation, management, and pollution control																				
2.5.4	Expand the South China Sea online public awareness centre, including awareness packages for local adoption																				
2.6	<b>Update and secure Ministerial adoption of a revised Transboundary Diagnostic Analysis and Strategic Action Programme, including prioritization of national management actions to address climate variability and change</b>																				
2.6.1	Operate consultative process to facilitate national and regional level consensus on contemporary issues and problems, including the quantification of environmental compromises and the prioritization of problems in the SCS																				
2.6.2	Identify the immediate and ultimate root causes of the problems identified and facilitate consensus building on the priorities for intervention, including comparative analysis of the net benefits of alternative options																				
2.6.3	Operate national and regional consultative processes to develop an updated Strategic Action Programme for adoption at the Ministerial level																				
2.6.4	Identify priority national management actions to address climate variability and change for incorporation into national policies and plans																				

	Activity Description	Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>COMPONENT 3: Facilitating regional and national level integration and cooperation for implementation of the South China Sea Strategic Action Programme</b>																					
<b>3.1</b>	<b>Regional and sub-regional co-operation in the integration of scientific knowledge and research outputs with management and policy making</b>																				
3.1.1	Convene meetings of the Regional Scientific and Technical Committee [annual meetings]																				
3.1.2	Facilitate knowledge exchanges between government and scientific community through biennial Regional Scientific Conferences																				
3.1.3	Facilitate best practice exchanges between local government officials and coastal managers on science-based management via annual Mayor's Round-Table meetings																				
3.1.4	Operate consultative processes to enable agreement and implementation of Memoranda of Agreement for joint management of 2 priority transboundary water areas																				
3.1.5	Establish cooperative arrangements with the GEF fisheries refugia project and other relevant regional initiatives such as PEMSEA																				
3.1.6	Establish and operate an award program on best practices in coastal habitat and land-based pollution management for communities, local governments and industry [annual]																				
<b>3.2</b>	<b>Capacity for civil society and community organization participation in SAP implementation strengthened via operational partnership with GEF SGP</b>																				
3.2.1	Establish cooperative arrangements with GEF SGP in the commissioning and implementation of an additional [#] of community-based projects for SAP implementation																				
3.2.2	Elicit CSO & CO inputs to planning and M&E of the SCS-SGP partnership via annual NGO forums																				
3.2.3	Develop and operate a training program on the science and management of SCS coastal habitats and resources for SGP proponents																				
<b>3.3</b>	<b>Relationships between central and local governments and the private sector strengthened and formalized</b>																				

	<b>Activity Description</b>	Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
3.3.1	Conduct review of past and ongoing public-private partnerships for coastal management in SCS region																				
3.3.2	Identify opportunities for private sector investment (e.g. oil and gas, fisheries, tourism) in implementation of the updated SAP																				
3.3.3	Facilitate cooperation with private sector on implementation of the updated SAP via two partnership forums																				
<b>3.4</b>	<b>Revitalization of regional mechanisms for communications, knowledge exchange, and information and data management and sharing</b>																				
3.4.1	Produce a variety of multi-media information and knowledge products based on SCS SAP implementation communications strategy																				
3.4.2	Develop synthesis reports on: climate variability in coastal systems; hazards and coastal area planning; blue forests and livelihoods; and land and marine tenure and use designation																				
3.4.3	Secure technical resources to ensure the SCS project web portal < <a href="http://www.unepscs.org">www.unepscs.org</a> > and associated regional databases are online, updated and linked to IW-Learn and other GEF Knowledge management system																				
3.4.4	Actively engage with GEF IW:LEARN [1% of project resources] including participation in IW conferences and 3 experience notes																				
<b>3.5</b>	<b>Agreed arrangements for strengthened regional cooperation in the management of the marine and coastal environment of the South China Sea</b>																				
3.5.1	Convene biannual meetings of the Regional Task Force on Legal Matters																				
3.5.2	Establish and operate National Working Groups on matters relating to cooperation																				
3.5.3	Implement a consultative process aimed at development of a proposed arrangement for regional cooperation																				
3.5.4	Convene consultations to elicit National stakeholder inputs to drafting of instrument for strengthened regional cooperation																				

	<b>Activity Description</b>	Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
3.5.5	Support the participating countries in considering for adoption an instrument for strengthened regional cooperation																				

## Appendix 6: Key deliverables and benchmarks

**Table 1** Key deliverables and benchmarks for project component 1

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>Component I: – Reducing habitat degradation and loss via national and local reforms to achieve Strategic Action Programme targets for coastal habitat management in the South China Sea</b>				
<b>1.1 Appropriate forms of sustainable management established for 860,000 ha of mangrove by Yr 5</b>				
1.1.1: Official proclamations, executive orders, and ordinances establishing mangrove parks and protected areas	Total area (ha) of mangrove designated as national park or protected area	14 percent (246,122 ha) of mangrove area in SCS presently managed as national park or protected area	Equivalent to end-of-project target	Declaration of 57,400 ha of mangrove as National Parks and Protected Areas
1.1.2(a): Maps and site characterisations for priority mangrove sites 1.1.2 (b): Endorsed management plans for mangrove sites	Status of endorsement of management plans Total area (ha) of mangrove under management plan for sustainable use	13 percent (225,512 ha) of mangrove area in SCS presently managed as non-conversion, extractive resource use areas (fish, crabs etc.)	Key threats to priority sites identified Draft management plans	Designation and plans for the management of 166,600 ha of mangrove as non-conversion, sustainable use areas
1.1.3: Endorsed policies, executive orders, provincial/local ordinances and by-laws	Total area (ha) of presently unmanaged mangrove for which regulations/ordinances are adopted to enable sustainable management	Legal frameworks to enable sustainable management of 56 percent of mangrove area in the SCS	National expert consultations undertaken to agree priority needs for reform	Reform of laws and regulations for the sustainable use of 602,800 ha of mangrove forest.
1.1.4: Maps and aerial imagery of rehabilitated mangrove areas	Total area (ha) of deforested mangrove land rehabilitated	Decadal rate of loss of total mangrove area from SCS is estimated at 16 percent	Procedure developed and agreed for identifying priority areas for rehabilitation	Replanting of 21,000 ha of deforested mangrove land
1.1.5: Updated site characterisations for enrichment planting sites, including ecological and socio-economic data	Measures of ecological & environmental indicators at enrichment planting sites: forest cover; number and diversity of true mangrove species; and size and abundance of Scylla spp and Sesarma spp	Predominantly single-species mangrove reforestation initiatives over recent decades have compromised biodiversity and hazard risk reduction potential of rehabilitated mangrove areas	Procedure developed and agreed for identifying priority areas for enrichment planting	Biodiversity increased for 11,200 ha of mangrove forest via enrichment planting
<b>1.2 153,000 ha of coral reef at 82 priority sites managed sustainably by Yr 5, including a reduction in the decadal rate of degradation in live coral cover from 16 to 5%</b>				

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>Component I: – Reducing habitat degradation and loss via national and local reforms to achieve Strategic Action Programme targets for coastal habitat management in the South China Sea</b>				
1.2.1(a): Assessment of government and civil society organisation competencies and mgmt. capacity developments needs 1.2.1(b): Report of capacity building initiative	Status of management capacity, including: <ul style="list-style-type: none"><li>• Human resource capacity;</li><li>• Facilities and equipment; and</li><li>• Sustainable financing</li></ul>	13 of 82 priority coral reef sites in the SCS characterised as being sustainably management due to management capacity constraints	Training programme syllabus developed by international consortium of educational institutes, including agreed programme of capacity building activities at the 82 sites	Management capacity built for 82 coral reef sites
1.2.2: Reports of cross-sectorial, multi-stakeholder coral reef management bodies	Status of institutional reform for multi-sectorial, community-based and multiple use coral reef management	Predominantly single sector (environment) and centralised approach to coral reef management	Governance structures and institutional frameworks defined for each site	Management approaches (integrated, community-based, multiple use) improved at 82 coral reef sites
1.2.3: Endorsed policies and executive orders provincial/local ordinances and by-laws for coral reef management	Number of management tools developed, adopted and applied at priority coral reef sites	Coral reef management largely focused on awareness raising with limited use of management tools to address threats to coral reef sites	Causal chain analyses completed at each of the 82 sites to identify needs for application of management approaches and tools	Management tools (licensing and permit systems, seasonal closures, zoning) developed and utilized to address key threats at priority sites
1.2.4: Annual results reports on coral reef management at priority sites	Status of mechanism established for monitoring coral reef management effectiveness and stress reduction	Management, ecological and environmental, and socio-economic indicator frameworks developed but not yet applied at priority sites	Indicator sets agreed and capacity needs of national scientists to compile regionally comparable data identified	Established mechanism for the monitoring of management, ecological and socio-economic indicators at 82 sites
<b>1.3 Conservation, management and sustainable use of 25,900 ha of known seagrass area in the South China Sea by Yr 5</b>				
1.3.1(a): Annual country reports on seagrass mgmt 1.3.1(b): Laws and regulations enacted for seagrass management	Number of sites under sustainable management  Number of seagrass sites for which management regulations exist	Majority of seagrass areas in the SCS are unmanaged, or managed ineffectively, due to lack of enabling environment for zoning/regulation	National and local consultation process completed to identify needs for legal reforms (based on causal chain analyses)	Twenty-one seagrass areas totalling 25,900 ha under sustainable management with supporting laws and regulations
1.3.2: Seven (7) amended MPA management plans	Number of MPA management plans containing seagrass-related management actions	Sustainable use and management of seagrass and related resources is rarely addressed in management plans for MPAs in the SCS	Procedure for identifying priority MPA sites for seagrass management action developed and applied	Amended management plans for 7 existing MPAs with significant seagrass areas, to include specific seagrass-related management actions

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>Component I: – Reducing habitat degradation and loss via national and local reforms to achieve Strategic Action Programme targets for coastal habitat management in the South China Sea</b>				
1.3.3: Official proclamations, executive orders, and ordinances establishing MPAs for seven (7) significant seagrass sites	Number of newly established MPAs focused on seagrass management	MPA management in SCS predominantly focuses on strict protection of coral reef areas	Procedure for identification of priority seagrass sites for designation as MPAs developed and applied	Designation of 7 new Marine Protected Areas focusing on seagrass areas
1.3.4: Annual results reports on seagrass management at priority sites	Status of mechanism established for monitoring seagrass management effectiveness and stress reduction	Management, ecological and environmental, and socio-economic indicator frameworks developed but not yet applied at priority sites	Indicator sets agreed and capacity needs of national scientists to compile regionally comparable data identified	Established mechanism for monitoring management, ecological and socio-economic indicators at 21 sites
<b>1.4 Integrated management of 783,900 ha of coastal wetland at 19 sites, including habitat restoration and protection strengthened at priority locations</b>				
1.4.1(a): Adopted integrated management plans 1.4.1(b) Annual implementation reports, including results of environmental stress reduction initiatives	Number of integrated management plans developed  Total area (ha) of wetland under management plan for sustainable use	Population growth, and urbanisation of the coastal fringe, combined with rapid economic growth in the SCS region places tremendous pressure on coastal wetland ecosystems	Consultative processes at each location completed to ensure adequate local cooperation to agree boundaries and compile and analyse information to identify threats and agree management actions	Integrated management plans developed and under implementation for at least 3 lagoons (26,818 ha), 9 estuaries (614,680 ha), 5 tidal flats (96,903 ha), 1 peat swamp (45,700 ha) and 1 non-peat swamp (9,808 ha)
1.4.2: Official proclamations, executive orders, and ordinances establishing protection status for wetland sites	Number of wetlands sites assigned protection status	The riparian states of SCS face significant pressure to convert wetlands for economic development with little focus on conservation or sustainable use	Consultative processes at each location completed to ensure adequate local cooperation to agree on designation and rules and regulations pertaining to protection	Declaration of at least 7 wetland areas with protection status (i.e. non-hunting area, nature reserves, protected areas, Ramsar Sites)
1.4.3: Annual results reports on wetland management at priority sites	Status of mechanism established for monitoring wetland management effectiveness and stress reduction	Management, ecological and environmental, and socio-economic indicator frameworks developed but not yet applied at priority sites	Indicator sets agreed and capacity needs of national scientists to compile regionally comparable data identified	Adoption of a regional estuary monitoring scheme and its national implementation
<b>1.5 National and regional level cooperation in tracking results of SAP actions for coastal habitat management</b>				

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>Component I: – Reducing habitat degradation and loss via national and local reforms to achieve Strategic Action Programme targets for coastal habitat management in the South China Sea</b>				
1.5.1: Meeting reports of periodic national habitat committees and regional working groups	Extent and continuity of participation in regional fora for coastal habitat management Scope and uptake of joint management and planning decisions	No existing fora at national and regional level in the SCS to network coastal habitat scientists and management specialists	Terms of Reference, membership lists, and work plans of national committees and regional networks developed, agreed, and under implementation	National committees and regional networks of habitat specialists established under the SCS project revitalized and functioning
1.5.2(a): Approved SAP results framework online 1.5.2(b): Approved national and regional reporting templates published 1.5.3(c): Annual national and regional results reports published and disseminated	Status and extent of uptake by national Inter-Ministry committees of SAP implementation results reporting Level of congruence of national and regional indicator sets with the proposed targets and outcomes of the SAP	Results frameworks for the management of mangroves, coral reefs, seagrass and wetlands of the SCS developed through national and regional consultative process but has not yet been applied	Consultative process to identify and agree indicator sets and reporting approach completed and supporting information and data for indicators being compiled routinely	Mechanism to monitor and evaluate the impacts of SAP implementation and achievement of habitat targets operational [including agreement on standardized methods and guidelines for inventory and assessment]
1.5.3(a): Meeting reports of round-table meetings (including records of joint management decisions and participant lists)  1.5.3(b): Annual reports of best practice examples of community-led SAP implementation	Extent and continuity of local leader and local government participation in community round-table meetings  Extent of improved local relevance of SAP implementation initiatives	Limited engagement of community-based governance mechanisms in planning coastal habitat management  Low level mobilization of civil society, community groups and the private sector in habitat management	Consultation process with agreement on: govt agencies and community leaders that will be target participants/champions for knowledge exchange in support of SAP implementation	Community leaders and local government from priority habitat sites networked via national and regional round-table meetings to foster cooperation and knowledge sharing on achievements and best practices
1.5.4: Published state of coastal habitat reports	Demonstrable use of state of coastal habitat reports in national and regional planning	Baseline national habitat reports developed and require periodic uptake	First biennial state of coastal habitat reports published	Biennial state of coastal habitat reports published

**Table 2** Key deliverables and benchmarks for project component 2

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>Component II: – Strengthening knowledge-based action planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea</b>				
<b>2.1 Enhanced information-base for coastal habitat management and action planning</b>				

<b>Project Outputs</b>	<b>Description of indicator</b>	<b>Baseline level</b>	<b>Mid-term target</b>	<b>End-of-project target</b>
<b>Component II: – Strengthening knowledge-based action planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea</b>				
2.1.1: Regional report on methodologies and procedures for the application of aerial visual survey and remotely sensed data in coastal habitat management in the SCS marine basin published and accessible online	Volume of remotely sensed information interpreted and made available for planning  Extent of uptake of remotely sensed coastal habitat information and data in management planning and action	Rapid advancements in aerial visual survey techniques and remote sensing of inter-tidal and shallow water biomes have potential to greatly enhance coastal habitat management planning in the SCS marine basin	Mechanisms established for the collation of remotely sensed information and data, including guidelines and protocols developed for use of aerial visual survey techniques	Algorithms for the interpretation of remotely sensed information and data on coastal habitat associations and zonation developed and applied
2.1.2(a): Agreed site characterisation forms for the compilation of regionally comparable coastal habitat information and data  2.1.2(b): GIS and meta-database online and routinely updated by SAP implementation partners	Number and completeness of regionally comparable coastal habitat site characterisations  Number of datasets for coastal habitat sites accessible online in centralised repository	Regional GIS and meta-database of SCS coastal habitat information developed but not updated since 2008 due to lack of a regional mechanism for collation and exchange of data	Site characterisation forms revisited, revised where necessary, and national scientists engaged in the collation of regionally comparable data	Mechanism for collection and exchange of regional coastal habitat information and data established
2.1.3: Published report on the capture and storage of carbon by coastal habitats, including national and regional strategic planning recommendations, shared online	Volume of CO2 captured and stored by SCS habitats defined  Extent of uptake of information on carbon sequestration and storage used in mgmt. planning	Lack of SCS specific information on carbon sequestration by coastal habitats constrains resource managers in making political case for better resourcing	Sites selected for in-situ monitoring that have minimal risks associated with: typhoon; emerging development pressures; and storm surge inundation	Role of coastal habitats of the South China Sea in the sequestration and storage of carbon quantified
2.1.4(a): Review report published and shared regionally  2.1.4(b): Communications on review outcomes published by media outlets and syndicated via GEF:LME LEARN	Independent peer acceptance of review  Extent of uptake of review and its recommendations in updating national action plans and diagnostic analyses	Sea level rise, climate variability and change, and episodic natural disasters in SC identified as threats to sustainable management of coastal habitats	Appropriate breadth of expertise identified and engaged to conduct review to facilitate consensus building at both national and regional levels	Review of the potential impacts of sea level rise, climate change, and episodic events on coastal habitats of the South China Sea
2.1.5(a): Adopted National Action Plans accessible online  2.1.5(b): Executive orders, provincial/local ordinances and	Number of updated National Action Plans adopted  Number of laws and regulations adopted to enable action plan	National Action Plans for mangroves, coral reefs, seagrass and wetlands developed and implemented during period 2002-2008	Outdated National Action Plans assessed and contemporary priority issues for management planning identified	Updated and adopted National Action Plans for mangroves, coral reefs, seagrass and wetlands, including enactment of supporting

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>Component II: – Strengthening knowledge-based action planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea</b>				
by-laws	implementation			legislation where required
<b>2.2 Effective integration of regional science in the management of land-based pollution</b>				
2.2.1(a): Nutrient carrying capacity accessible online 2.2.1(b): Communications products available for regional and global sharing 2.2.1(c): 1 * IW Experience Note	Extent of decision-maker awareness of localised v. transboundary impacts of land-based pollution in the SCS  Extent of use of model outputs in revising the Strategic Action Programme for the SCS	Carrying capacity of the SCS open shelf system based on its natural capacity to assimilate contaminants, in particular nutrient inputs from land, has been modelled although findings not well known by decision-makers	Communication strategy development and under implementation, including online dissemination of user-friendly scientific communications	Nutrient carrying capacity model for the SCS marine basin used to communicate with decision-makers about the localized v. transboundary impacts of land-based pollution in the SCS
2.2.2(a): GIS-based model of SCS carrying capacity for heavy metal contamination developed & online 2.2.2(b): Communications products available for regional and global sharing 2.2.2(c): 1 * IW Experience Note	Extent of decision-maker awareness of SCS open shelf carrying capacity for heavy metal contaminants  Extent of use of model outputs in revising the Strategic Action Programme for the SCS	Need for simple model of pollution impacts under different development scenarios, specifically as they relate to heavy metal contaminant loadings	Model parameters defined, tested, and that data and information from heavy metal hotspots are being collated to support running the model under various loading scenarios	Management approaches (integrated, community-based, multiple use) improved at 82 coral reef sites
2.2.3: Published report shared nationally and regionally, including national language translation where appropriate	Status of initiative to quantify heavy metal contaminant impacts on: (a) water quality; (b) reproductive capacity of living resources; (c) contamination of human food sources; and (d) bio-accumulation.	Framework procedures for estimating the impacts of heavy metal contamination in SCS have been developed although not yet applied	Approach for the characterisation of heavy metal pollution hotspots agreed and templates being used nationally to compile regionally comparable information and data	Impacts of estimated heavy metal contaminant loadings defined, quantified and communicated to decision-makers
2.2.4(a): Pollution hotspot site characterisation templates developed 2.2.4(b): Hotspot information accessible online	Number of heavy metal pollution hotspots characterised	Lack of regionally comparable information and data on heavy metal contaminated hotspots	Hotspot site characterisation templates agreed and national staff trained in their use	Characterization of heavy metal pollution hotspots
2.2.5(a): Published methodology and procedures for estimating	Number of aquaculture sites for which effluent and contaminant loadings	Effluent from aquaculture and mariculture operations identified	Consultations with private sector completed and their cooperate in efforts to determine	Quantification of effluent volumes and contaminant loadings from coastal

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>Component II: – Strengthening knowledge-based action planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea</b>				
aquaculture pollution loadings and impacts 2.2.5(b): 1 * IW Experience Note	estimated	as key threat to dominant coastal biomes	environmental impact of operations secured	aquaculture to the SCS marine basin
<b>2.3. Strengthened and harmonized national policies and laws, and supporting financial mechanism, for the management of land-based sources of pollution</b>				
2.3.1: Catalogue of best practice technologies and management approaches for land-based pollution published and accessible online	Number of best practice technologies and measures tested, documented and shared	Lesson learned in community-based wastewater mgmt. in Batam, Indonesia documented and shared regionally although other examples from East Asian seas region largely focus on broad scale ICM planning	Template for the collation of best practice information developed and being used to prepare best practice examples	National best practices in waste water management, law enforcement, and community and industry participation in managing land-based sources of pollution documented and shared
2.3.2: Review published and shared regionally	Extent of harmonization of sectoral governance frameworks achieved as a result of review findings	Effectiveness of existing legal and institutional frameworks limited by predominantly single sector approaches	National legislation compiled and descriptors of institutional frameworks prepared	Review of legislative and institutional frameworks for land-based pollution management in participating countries
2.3.3(a): Regional guidelines on Standard Operating Procedures published 2.3.3(b): Adopted National Standard Operating Procedures available online	Number of countries participating and adopting harmonized, regionally comparable SOPs	Lack of Standard Operating Procedures for land-based pollution management	Guidelines developed and agreed via regional and national consultations	Harmonized national Standard Operating Procedures for land-based pollution control and management [including agreed sediment, biota, & water quality criteria]
2.3.4(a): 6 national reports on policy and legal aspects of land-based pollution management 2.3.4(b): Endorsed policy and executive orders, provincial/local ordinances and by-laws	Status of endorsement of national policies and enactment of laws and regulations for land-based pollution control	Absence of clear and effective policies, laws, and regulations relating to control of land-based pollution	Draft national reports completed	Revised national/provincial policies and supporting regulations for land-based pollution developed, enacted and implemented by Yr 5
2.3.4: 6 endorsed National Investment Plans published and disseminated nationally and regionally	Status of endorsement of National Investment Plans	Guidelines for assessing the economic impacts of land-based pollution developed but not yet applied as part of	Framework investment plan developed and shared with participating countries for comment	Updated and adopted National Investment Plans for land-based pollution management in the SCS [Yr 5]

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>Component II: – Strengthening knowledge-based action planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea</b>				
	Number of participating countries adopting National Investment Plans	benefit-cost analysis of pollution mgmt. in the SCS		
2.3.5: Endorsed regional report on sustainable financing of regional actions for land-based pollution in the SCS	Status of agreement among participating countries on a sustainable financing approach for regional actions	Lack of sustainable mechanism to finance regional support actions including M&E	Consultations completed to secure commitment of countries, development partners, and donors to invest in coordinated action	Regional financial mechanism for land-based pollution management [Yr 5]
<b>2.4 Improved national and regional values for the Total Economic Values of coastal habitats for use in development planning and decision-making</b>				
2.4.1: 6 national reports on economic valuation of coastal biomes, including tabulated data and reference material, published	Completeness of value information compiled for coastal biome goods and services	Values determined for SCS are incomplete as not all known goods and services from individual biomes have been valued	Data collection programme in place and information and data regarding goods and services being compiled	Expanded datasets of economic valuation information on the goods and services of SCS coastal habitats
2.4.2: 6 national and 1 regional report on the economic contribution of coastal habitats to coastal fisheries production in the SCS, including tabulated data and reference material, published	Status of initiative to develop national and regional estimates economic linkages between habitats and coastal fish production	Comparatively few existing values for the services provided by habitats as nursery areas for coastal living resources	Regionally consistent methodology for the collection, review and analysis of information and data developed and agreed	Estimates of the value for the service provided by coastal habitats as nursery areas for coastal fish and crustaceans
2.4.3: 1 regional report on the economic losses consequent upon coastal shipping accidents and pollution damage	Status of initiative to value economic costs of coastal shipping accidents and pollution damage	No existing information linking shipping accidents to loss of economic benefits associated coastal biomes in the SCS	Regionally consistent methodology for the collection, review and analysis of information and data developed and agreed	Estimates of economic losses of coastal ecosystem goods and services consequent upon coastal shipping accidents and pollution damage
2.4.4: 1 regional report on updated Total Economic Values for coastal habitats published and online	Status of initiative to update estimates of total economic values of coastal biomes	Economic valuation of coastal habitats used in cost benefit analysis of endorsed Strategic Action Programme actions in 2008	Application of regionally consistent methodology in the collection, review and analysis of information and data	Updated estimates of Total Economic Values for coastal habitats of the SCS and converted to 2017 value by means of the consumer price index
<b>2.5 Regionally appropriate tools and mechanisms to guide the development of sustainable management systems for coastal habitats and land-based pollution</b>				

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>Component II: – Strengthening knowledge-based action planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea</b>				
2.5.1: 1 regional report documenting sustainability of management systems developed and applied at priority coastal habitat sites	Status of initiative to develop and apply standards and criteria for determining the sustainability of coastal habitat management systems	Sustainable management indicator matrices developed for dominant coastal habitats but not yet applied and tested in framework of SAP implementation	Consultative processes have been undertaken to secure stakeholder engagement and participation	Regionally applicable standards and criteria for defining the sustainability of coastal habitat management systems, including documented models of sustainable use
2.5.2(a): Catalogue of best practices accessible online  2.5.2(b): Communications products on best practices produced and syndicated online	Number of best practice management measures and technologies documented, codified, and accessible via online catalogue	Lessons learned and best practices in coastal habitat management from 23 demonstration sites documented and published in peer reviewed article	Template for the collation of best practice information developed and being used to prepare best practice examples	Online catalogue of best practice management measures and technologies for sustainable use of SCS coastal habitats and land-based pollution management
2.5.3(a): Reports of study tour and exchange initiatives  2.5.3(b): Annual reports of best practice examples of community level inputs to SAP implementation initiatives	Extent and continuity of local leader and local government participation in study tour and exchange initiatives  Level of improved local relevance of national policy and planning efforts for reducing environmental degradation in the SCS	Limited engagement of community-based governance mechanisms in planning coastal habitat management  Low level mobilization of civil society, community groups and the private sector in habitat management	Study tour and exchange programme developed and approved by the Project Steering Committee for implementation	Government officials, community leaders, and habitat and pollution managers exposed to on-going practices in rehabilitation, management , and pollution control and treatment via programme of study tours and exchange
2.5.4: Awareness packages accessible online via a SCS SAP implementation website	Number of public awareness products accessible online  Extent of local uptake and use of awareness products	Public awareness materials developed via TDA/SAP project compiled and accessible via SCS website	Web platforms operational and data management systems in place	Expanded South China Sea online public awareness centre, including awareness packages for local adoption
<b>2.6 Updated and Ministerially adopted Transboundary Diagnostic Analysis and Strategic Action Programme, including prioritization of national management actions to address climate variability and change</b>				
2.6.1. Updated and regionally endorsed Transboundary Diagnostic Analysis for the SCS marine basin published and disseminated at national and regional levels	Status of national and regional level consensus on contemporary issues of transboundary significance with respect to coastal habitat and land-based pollution	TDA for SCS published in 2000  Special Issue of Ocean and Coastal Management on South China Sea published in 2013	Same as end-of-project target	National and regional level consensus on contemporary issues and problems, including the quantification of environmental compromises and the prioritization of

<b>Project Outputs</b>	<b>Description of indicator</b>	<b>Baseline level</b>	<b>Mid-term target</b>	<b>End-of-project target</b>
<b>Component II: – Strengthening knowledge-based action planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea</b>				
	management			problems (Yr 2)
2.6.2(a): Updated and regionally endorsed prioritisation of options for management intervention in the SCS 2.6.2(b): Published cost benefit analysis of alternative options for coastal habitat and land-based pollution interventions	Status of national and regional level consensus reached on priority actions for intervention Status of cost benefit analysis of comparative net benefits of alternative options for management	Strategic Action Programme endorsed in 2008 outlines priorities for management Established methodology for cost of action versus non-action in the context of SCS SAP implementation	Appropriate expertise engaged and draft reports circulated for regional and national review	The immediate and ultimate root causes of the problems identified and consensus reached on priorities for intervention, including comparative analysis of the net benefits of alternative options (Yr 3)
2.6.3: Endorsed Strategic Action Programme published	Status of Ministerial adoption of an updated Strategic Action Programme for the South China Sea	Strategic Action Programme for the South China Sea endorsed inter-governmentally in 2008	Consultation process initiated to secure Ministerial level commitment to SAP revision and adoption	National and regional consultative process to develop updated Strategic Action Programme SAP for adoption at the Ministerial level (Yr 5)
2.6.4(a): Report of priority actions 2.6.4(b): National policies and plans with demonstrable uptake of priority actions	Level of demonstrable use of the regional review on sea level rise, climate change, and episodic events in East Asia but not applied in context of transboundary planning in the South China Sea	Evolving understanding of sea level rise, climate change, and episodic events in East Asia but not applied in context of transboundary planning in the South China Sea	Appropriate expertise engaged to identify priority national actions that achieve local benefit as well as high transboundary impact	Prioritization of national management actions to address climate variability and change for incorporation into national policies and plans

**Table 3** Key deliverables and benchmarks for project component 3

<b>Project Outputs</b>	<b>Description of indicator</b>	<b>Baseline level</b>	<b>Mid-term target</b>	<b>End-of-project target</b>
<b>Component III: Facilitating regional and national level integration and cooperation for the implementation of the South China Sea Strategic Action Programme</b>				
<b>3.1 Regional and sub-regional co-operation in the integration of scientific knowledge and research outputs with management and policy making</b>				
3.1.1(a): RSTC Terms of Reference 3.1.1(b) Annual meeting reports (documenting scientific and	Status of the RSTC and the uptake of the scientific and technical advice it provides Continuity of	Lack of a formal mechanism for the sharing of science and technical knowledge relating to the South China Sea SAP implementation	Same as end-of-project target	Regional Scientific and Technical Committee of the SCS project functioning as a bridge between the scientific community and decision-makers

<b>Project Outputs</b>	<b>Description of indicator</b>	<b>Baseline level</b>	<b>Mid-term target</b>	<b>End-of-project target</b>
<b>Component III: Facilitating regional and national level integration and cooperation for the implementation of the South China Sea Strategic Action Programme</b>				
technical advice and participant lists)	participation of RSTC members in annual meetings			[annual meetings]
3.1.2(a): Published reports of the Regional Scientific Conferences  3.1.2(b) Report on the uptake and use of regionally accumulated science	Extent of demonstrable use of scientific knowledge exchanged during biennial conferences by central and provincial government agencies	Limited application of evidence-based approaches by central and provincial government agencies	First biennial Regional Scientific Conference convened	Knowledge exchanges between government and scientific community through biennial Regional Scientific Conferences
3.1.3: Reports of Mayor's Round-Table Meetings, including documented evidence of behaviour change as a result of exposure to best practice guidance	Number of Mayor's Round-Table meetings convened  Number, scope & reach of communications to raise local official awareness of best practices	Four Mayors Round-Table meetings convened during period 2005-2008 and documented as a key innovation for improving local relevance of action planning and M&E	Two (2) annual Mayor's Round-Table meetings convened	Best practice exchanges between local government officials and coastal managers on science-based management via annual Mayor's Round-Table meetings
3.1.4: Signed Memoranda of Agreement outlining agreed joint actions for transboundary coastal resource management	Status of bilateral cooperation for transboundary resource management between (a) Cambodia and Vietnam and (b) Cambodia and Thailand	Bilateral cooperation between Cambodia and Vietnam initiated during the period 2007-2008 although this has stagnated as a result of a lack of regional coordination support	Consultative processes initiated	Memoranda of Agreement for joint management of 2 priority transboundary water areas agreed & implemented
3.1.5(a): Reports of joint planning meeting  3.1.5(b): Published revised NAPs and SAP containing section on lessons from fisheries refugia project	Extent of joint planning by both projects  Number of best practices and lessons learned captured from the fisheries refugia project	Execution of the UNEP/GEF Fisheries Refugia project to commence in Q3 of 2016 through SEAFEDC and national fisheries agencies	Annual joint planning exercises initiated and resulting in demonstrable sharing of best practices and lessons learned	Cooperation with the GEF fisheries refugia project and other relevant regional initiatives
3.1.6(a): Documented examples of innovation and best practice by communities, local governments and industry	Number of best practices identified  Number of community organisations, local governments and industry receiving	Lack of mechanism to formally recognize and award communities, local governments and industry for innovation and generation of best practices for	Two(2) annual award programmes operated and lessons learned documented	Operational award programme on best practices in coastal habitat and land-based pollution management for communities, local governments and industry [annual]

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>Component III: Facilitating regional and national level integration and cooperation for the implementation of the South China Sea Strategic Action Programme</b>				
3.1.6(b): Annual report of award project	awarrds	environmental management of the South China Sea		
<b>3.2 Capacity for civil society and community organization participation in SAP implementation strengthened via operational partnership with GEF SGP</b>				
3.2.1: 5 annual reports of SGP-SAP implementation partnership	Number of GEF Small Grants Programme projects commissioned and implemented in support SAP implementation	Need for strengthened mobilization of civil society and community organizations in SAP implementation	2 annual reports on outcomes and results of cooperative programme	Cooperation with GEF SGP in the commissioning and implementation of an additional [#] of community-based projects for SAP implementation
3.2.2: Reports of NGO forum meetings	Extent and scope of inputs from CSOs and COs Number of NGO forums convened Extent of capacity built among SGP proponents to implement local actions in support of the achievement of SAP targets	Need for CSO and CO inputs to planning of an SCS-SGP partnership  Limited civil society and community organisation experience and capacity for coastal habitat and land-based pollution management	Two (2) annual reports of NGO forum meetings	CSO & CO inputs elicited for planning and M&E of the SCS-SGP partnership via annual NGO forums
3.2.3: Training modules for SGP proponents developed and accessible online	Extent of capacity built among SGP proponents to implement local actions in support of the achievement of SAP targets	Limited civil society and community organisation experience and capacity for coastal habitat and land-based pollution management	Training syllabus and materials prepared , with inputs from national and regional training providers	Training program on science and management of SCS coastal habitats and resources for SGP proponents
<b>3.3. Relationships between central and local governments and the private sector strengthened and formalized</b>				
3.3.1: Review of report on public-private partnerships published	Number of public-private partnerships identified and documented	Many private sector organisations operate corporate social and environmental responsibility programmes but they are not aligned with SAP implementation	Same as end-of-project target	Review of past and ongoing public-private partnerships for coastal management in SCS region
3.3.2: Letters of commitment from private sector entities with regards to support for SAP	Number of opportunities for private sector investment in SAP implementation	Significant commercial enterprise is conducted in waters of the South China	Communications and engagement strategies developed with aim of establishing interest	Identification of opportunities for private sector investment (e.g. oil and gas, fisheries,

<b>Project Outputs</b>	<b>Description of indicator</b>	<b>Baseline level</b>	<b>Mid-term target</b>	<b>End-of-project target</b>
<b>Component III: Facilitating regional and national level integration and cooperation for the implementation of the South China Sea Strategic Action Programme</b>				
implementation	identified	Sea, particularly in the areas of oil and gas, fisheries and tourism	among private sector entities in SAP implementation	tourism) in implementation of the updated SAP
3.3.3: Letters of investment commitment from private sector partners and donors	Status of agreement on financial arrangements for private sector and donor investment in the implementation of the revised Strategic Action Programme	Low-level mobilization of the private sector in environmental investment planning in the South China Sea	One (1) partnership forum convened	Two partnership forums to facilitate cooperation with private sector on implementation of the updated SAP
<b>3.4 Revitalization of regional mechanisms for communications, knowledge exchange, and information and data management and sharing</b>				
3.4.1: Multi-media information and knowledge products published and accessible online	Number of multi-media and knowledge products produced	The SCS project produced an extensive range of knowledge products, technical guides, and training and awareness materials	Same as end-of-project target	A variety of multi-media information and knowledge products based on SCS SAP implementation communications strategy
3.4.2: Published synthesis reports on: climate variability in coastal systems; hazards and coastal area planning; blue forests and livelihoods; and land and marine tenure and use designation	Status of knowledge tool development to support evidence-based coastal and marine management and spatial planning	Transboundary coastal and marine mgmt. spatial planning constrained by lack of a regionally coordinated approach to harnessing sectorial expertise and knowledge	Appropriate technical expertise engaged and participating in preparation of synthesis reports	Regionally appropriate knowledge tools developed to support decision-making and planning
3.4.3: Regional and national portals, GIS and meta-databases, repository of best practices, lessons learned and results accessible online via < <a href="http://www.unepscs.org">www.unepscs.org</a> >	Number of users, volume of content accessed, and online visibility of the SCS website and associated databases	Need for media platforms and targeted communications in support of efforts to harness support for inter-ministerial coordination and policy and planning elements of SAP implementation and revision	Same as end-of-project target	The SCS project web portal < <a href="http://www.unepscs.org">www.unepscs.org</a> > and associated regional databases online, updated and linked to IW-Learn and other GEF Knowledge management systems
3.4.4: Published GEF IW experience notes [three]	Number of IW:LEARN experience notes published	Limited regional and global sharing of information on best practices and lessons learned from investments in the	Scope and required content of experience notes agreed by RSTC	Active engagement with GEF IW:LEARN [1% of project resources] including participation in IW

<b>Project Outputs</b>	<b>Description of indicator</b>	<b>Baseline level</b>	<b>Mid-term target</b>	<b>End-of-project target</b>
<b>Component III: Facilitating regional and national level integration and cooperation for the implementation of the South China Sea Strategic Action Programme</b>				
	SCS despite for example publication of a complete Special Issue of an academic journal on the progress to date			conferences and 3 experience notes
<b>3.5 Agreed arrangements for strengthened regional cooperation in the management of the marine and coastal environment of the South China Sea</b>				
3.5.1: Reports of the meetings of the Regional Task Force on Legal Matters	Number of Regional Task Force meetings  Continuity of participation of nationally nominated members	Regional Task Force on Legal Matters established through SCS project but presently not functioning	Three (3) meetings of the Regional Task Force on Legal Matters	Biannual meetings of the Regional Task Force on Legal Matters
3.5.2: Reports of the meetings of National Working Groups	Number of National Working Group meetings  Continuity of participation of nationally nominated members	National Working Groups established through SCS project but presently not functioning	Same as end-of-project target	National Working Groups on established and functional
3.5.3: Report outlining agreed process	Status of agreement on identified process	Framework process developed but requires national and regional consultation	Consultations initiated to agree process	Process for development of a proposed arrangement for regional cooperation defined and planned
3.5.4: Reports of national stakeholder consultation process	Extent of national stakeholder input to drafting phase of instrument for cooperation	SAP formulation benefited from an emphasis on consensual planning and decision making	Stakeholder consultations initiated	National stakeholder inputs to drafting of instrument for strengthened regional cooperation facilitated via national consultations
3.5.5: Adopted instrument	Status of adoption of the instrument	Participating countries agreed in the SAP, and in endorsing the PIF for this project, to explore the development of an instrument for strengthened regional cooperation	National consultation processes initiated	Adopted instrument for strengthened regional cooperation

## Appendix 7: Costed M&E plan

Outcome	Objective level indicator	Baseline Conditions	Mid-point Target (as relevant)	End of Project Target	Means of Verification	Monitoring / sampling (frequency / size)	Location / Group	Responsibility	Time frame	Budget <sup>80</sup> (Object of expenditure & cost)
1.1: Appropriate forms of sustainable management established for 860,000 ha of mangrove by Yr 5	Total area (ha) of mangrove designated as national park or protected area	14 percent (246,122 ha) of mangrove area in SCS presently managed as national park or protected area	Equivalent to end-of-project target	Declaration of 57,400 ha of mangrove as National Parks and Protected Areas	Official proclamations , executive orders, and ordinances establishing mangrove parks and protected areas	Quarterly  Biannually  Annually	Site-level  National-level  National - level	• National Mangrove Committees • National Technical Working Groups • Inter-Ministry Committees	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Status of endorsement of management plans	13 percent (225,512 ha) of mangrove area in SCS presently managed as non-conversion, extractive resource use areas (fish, crabs etc.)	Key threats to priority sites identified	Designation and plans for the management of 166,600 ha of mangrove as non-conversion, sustainable use areas	Maps and site characterisations for priority mangrove sites  Endorsed management plans for mangrove sites	Quarterly  Biannually  Annually	Site-level  National-level  National - level	• National Mangrove Committees • National Technical Working Groups • Inter-Ministry Committees	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Total area (ha) of presently unmanaged mangrove for which	Legal frameworks to enable sustainable management of 56 percent	National expert consultations undertaken to agree	Reform of laws and regulations for the sustainable use of 602,800 ha of	Endorsed policies, executive orders, provincial/local ordinances	Quarterly  Biannually	Site-level  National-level	• National Mangrove Committees • National Technical Working	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)

<sup>80</sup> Responsibility for monitoring and evaluation in the context of this project, other than that for the independent mid-term and terminal evaluation, has been assigned to the national and regional-level coordination and scientific/technical bodies to be established and operated in support of the achievement of project results. Resourcing, both GEF grant and national and regional-level co-financing, for the operation of these bodies, including the performance of M&E functions, has been programmed under project component 3 relating to national and regional cooperation and coordination (UNEP budget line series 3300).

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
	regulations/or dinances are adopted to enable sustainable management	of mangrove area in the SCS	priority needs for reform	mangrove forest.	and by-laws	Annually	National - level	Groups • Inter-Ministry Committees		
	Total area (ha) of deforested mangrove land rehabilitated	Decadal rate of loss of total mangrove area from SCS is estimated at 16 percent	Procedure developed and agreed for identifying priority areas for rehabilitation	Replanting of 21,000 ha of deforested mangrove land	Maps and aerial imagery of rehabilitated mangrove areas	Quarterly Biannually Annually	Site-level National-level National - level	• National Mangrove Committees • National Technical Working Groups • Inter-Ministry Committees	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Measures of ecological & environmental indicators at enrichment planting sites: forest cover; number and diversity of true mangrove species; and size and abundance of Scylla spp and Sesarma spp	Predominantly single-species mangrove reforestation initiatives over recent decades have compromised biodiversity and hazard risk reduction potential of rehabilitated mangrove areas	Procedure developed and agreed for identifying priority areas for enrichment planting	Biodiversity increased for 11,200 ha of mangrove forest via enrichment planting	Updated site characterisations for enrichment planting sites, including ecological and socio-economic data	Quarterly Biannually Annually	Site-level National-level National - level	• National Mangrove Committees • National Technical Working Groups • Inter-Ministry Committees	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
1.2: 153,000 ha of coral reef at 82 priority sites managed sustainably by Yr 5, including	Status of management capacity, including: • Human resource	13 of 82 priority coral reef sites in the SCS characterised as being	Training programme syllabus developed by internationa	Management capacity built for 82 coral reef sites	Assessment of government and civil society organisation competencies	Quarterly Biannually	Site-level National-level	• National Coral Reef Committees • National Technical Working	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
a reduction in the decadal rate of degradation in live coral cover from 16 to 5%	capacity; <ul style="list-style-type: none"> <li>Facilities and equipment; and</li> <li>Sustainable financing</li> </ul>	sustainably management due to management capacity constraints	1 consortium of educational institutes, including agreed programme of capacity building activities at the 82 sites		and mgmt. capacity developments needs Report of capacity building initiatives	Annually	National - level	Groups <ul style="list-style-type: none"> <li>Inter-Ministry Committees</li> </ul>		
	Status of institutional reform for multi-sectorial, community-based and multiple use coral reef management	Predominantly single sector (environment) and centralised approach to coral reef management	Governance structures and institutional frameworks defined for each site	Management approaches (integrated, community-based, multiple use) improved at 82 coral reef sites	Reports of cross-sectorial, multi-stakeholder coral reef management bodies	Quarterly Biannually Annually	Site-level National-level National - level	<ul style="list-style-type: none"> <li>National Coral Reef Committees</li> <li>National Technical Working Groups</li> <li>Inter-Ministry Committees</li> </ul>	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Number of management tools developed, adopted and applied at priority coral reef sites	Coral reef management largely focused on awareness raising with limited use of management tools to address threats to coral reef sites	Causal chain analyses completed at each of the 82 sites to identify needs for application of management approaches and tools	Management tools (licensing and permit systems, seasonal closures, zoning) developed and utilized to address key threats at priority sites	Endorsed policies and executive orders provincial/local ordinances and by-laws for coral reef management	Quarterly Biannually Annually	Site-level National-level National - level	<ul style="list-style-type: none"> <li>National Coral Reef Committees</li> <li>National Technical Working Groups</li> <li>Inter-Ministry Committees</li> </ul>	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Status of mechanism established	Management, ecological and environmental	Indicator sets agreed and	Established mechanism for the monitoring	Annual results reports on coral reef	Quarterly	Site-level	<ul style="list-style-type: none"> <li>National Coral Reef Committees</li> </ul>	Yr 1-5	National and Regional Coordination

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
1.3: Conservation, management and sustainable use of 25,900 ha of known seagrass area in the South China Sea by Yr 5	for monitoring coral reef management effectiveness and stress reduction	, and socio-economic indicator frameworks developed but not yet applied at priority sites	capacity needs of national scientists to compile regionally comparable data identified	of management, ecological and socio-economic indicators at 82 sites	management at priority sites	Biannually  Annually	National-level  National -level	• National Technical Working Groups • Inter-Ministry Committees		Meetings (budget line 3300)
	Number of sites under sustainable management Number of seagrass sites for which management regulations exist	Majority of seagrass areas in the SCS are unmanaged, or managed ineffectively, due to lack of enabling environment for zoning/regulation	National and local consultation process completed to identify needs for legal reforms (based on causal chain analyses)	Twenty-one seagrass areas totalling 25,900 ha under sustainable management with supporting laws and regulations	Annual country reports on seagrass mgmt  Laws and regulations enacted for seagrass management	Quarterly  Biannually  Annually	Site-level  National-level  National -level	• National Seagrass Committees • National Technical Working Groups • Inter-Ministry Committees	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Number of MPA management plans containing seagrass-related management actions	Sustainable use and management of seagrass and related resources is rarely addressed in management plans for MPAs in the SCS	Procedure for identifying priority MPA sites for seagrass management action developed and applied	Amended management plans for 7 existing MPAs with significant seagrass areas, to include specific seagrass-related management actions	Seven (7) amended MPA management plans	Quarterly  Biannually  Annually	Site-level  National-level  National -level	• National Seagrass Committees • National Technical Working Groups • Inter-Ministry Committees	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Number of newly established MPAs	MPA management in SCS predominantly	Procedure for identification of priority seagrass	Designation of 7 new Marine Protected Areas	Official proclamations, executive orders, and	Quarterly  Biannually	Site-level  National-level	• National Seagrass Committees • National Technical	Yr 1-5	National and Regional Coordination Meetings (budget line

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
1.4: Integrated management of 783,900 ha of coastal wetland at 19 sites, including habitat restoration and protection strengthened at priority locations	focused on seagrass management	focuses on strict protection of coral reef areas	sites for designation as MPAs developed and applied	focusing on seagrass areas	ordinances establishing MPAs for seven (7) significant seagrass sites	Annually	National - level	Working Groups • Inter-Ministry Committees		3300)
	Status of mechanism established for monitoring seagrass management effectiveness and stress reduction	Management, ecological and environmental , and socio-economic indicator frameworks developed but not yet applied at priority sites	Indicator sets agreed and capacity needs of national scientists to compile regionally comparable data identified	Established mechanism for monitoring management, ecological and socio-economic indicators at 21 sites	Annual results reports on seagrass management at priority sites	Quarterly Biannually Annually	Site-level National-level National - level	• National Seagrass Committees • National Technical Working Groups • Inter-Ministry Committees	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Number of integrated management plans developed	Population growth, and urbanisation of the coastal fringe, combined with rapid economic growth in the SCS region places tremendous pressure on coastal wetland ecosystems	Consultative processes at each location completed to ensure adequate local cooperation to agree boundaries and compile and analyse information to identify threats and agree management actions	Integrated management plans developed and under implementation for at least 3 lagoons (26,818 ha), 9 estuaries (614,680 ha), 5 tidal flats (96,903 ha), 1 peat swamp (45,700 ha) and 1 non-peat swamp (9,808 ha)	Adopted integrated management plans Annual implementation reports, including results of environmental stress reduction initiatives	Quarterly Biannually Annually	Site-level National-level National - level	• National Wetland Committees • National Technical Working Groups • Inter-Ministry Committees	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Number of wetlands sites	The riparian states of SCS	Consultative processes	Declaration of at least 7	Official proclamations	Quarterly	Site-level	• National Wetland	Yr 1-5	National and Regional

Outcome	Objective level indicator	Baseline Conditions	Mid-point Target (as relevant)	End of Project Target	Means of Verification	Monitoring / sampling (frequency / size)	Location / Group	Responsibility	Time frame	Budget <sup>80</sup> (Object of expenditure & cost)
	assigned protection status	face significant pressure to convert wetlands for economic development with little focus on conservation or sustainable use	at each location completed to ensure adequate local cooperation to agree on designation and rules and regulations pertaining to protection	wetland areas with protection status (i.e. non-hunting area, nature reserves, protected areas, Ramsar Sites)	, executive orders, and ordinances establishing protection status for wetland sites	Biannually  Annually	National-level  National - level	Committees <ul style="list-style-type: none"><li>• National Technical Working Groups</li><li>• Inter-Ministry Committees</li></ul>		Coordination Meetings (budget line 3300)
	Status of mechanism established for monitoring wetland management effectiveness and stress reduction	Management, ecological and environmental, and socio-economic indicator frameworks developed but not yet applied at priority sites	Indicator sets agreed and capacity needs of national scientists to compile regionally comparable data identified	Adoption of a regional estuary monitoring scheme and its national implementation	Annual results reports on wetland management at priority sites	Quarterly  Biannually  Annually	Site-level  National-level  National - level	<ul style="list-style-type: none"><li>• National Wetland Committees</li><li>• National Technical Working Groups</li><li>• Inter-Ministry Committees</li></ul>	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
1.5: National and regional level cooperation in tracking results of SAP actions for coastal habitat management	Extent and continuity of participation in regional fora for coastal habitat management Scope and uptake of joint management and planning decisions	No existing fora at national and regional level in the SCS to network coastal habitat scientists and management specialists	Terms of Reference, membership lists, and work plans of national committees and regional networks developed, agreed, and	National committees and regional networks of habitat specialists established under the SCS project revitalized and functioning	Meeting reports of periodic national habitat committees and regional working groups	Quarterly  Biannually  Biannually	National-level  National-level  Regional-level	<ul style="list-style-type: none"><li>• National Habitat Committees</li><li>• National Technical Working Grops</li><li>• Regional Working Groups</li></ul>	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)

Outcome	Objective level indicator	Baseline Conditions	Mid-point Target (as relevant)	End of Project Target	Means of Verification	Monitoring / sampling (frequency / size)	Location / Group	Responsibility	Time frame	Budget <sup>80</sup> (Object of expenditure & cost)
			under implementation							
	Status and extent of uptake by national Inter-Ministry committees of SAP implementation results reporting Level of congruence of national and regional indicator sets with the proposed targets and outcomes of the SAP	Results frameworks for the management of mangroves, coral reefs, seagrass and wetlands of the SCS developed through national and regional consultative process but has not yet been applied	Consultative process to identify and agree indicator sets and reporting approach completed and supporting information and data for indicators being compiled routinely	Mechanism to monitor and evaluate the impacts of SAP implementation and achievement of habitat targets operational [including agreement on standardized methods and guidelines for inventory and assessment]	Approved SAP results framework online Approved national and regional reporting templates published Annual national and regional results reports published and disseminated	Quarterly  Biannually  Biannually  Biannually	National-level  National-level  Regional-level  Regional-level	• National Habitat Committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Extent and continuity of local leader and local government participation in community round-table meetings Extent of improved local relevance of SAP	Limited engagement of community-based governance mechanisms in planning coastal habitat management  Low level mobilization of civil society,	Consultation process with agreement on: govt agencies and community leaders that will be target participants/champions for knowledge exchange in	Community leaders and local government from priority habitat sites networked via national and regional round-table meetings to foster cooperation and knowledge sharing on	Meeting reports of round-table meetings (including records of joint management decisions and participant lists)  Annual reports of best practice	Annually  Annually  Annually  Annually	National-level  National-level  Regional-level  Regional-	• National habitat and land-based pollution committees • National Technical Working Groups • Regional habitat and land-based pollution working groups	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
2.1: Enhanced information-base for coastal habitat management and action planning	implementation initiatives	community groups and the private sector in habitat management	support of SAP implementation	achievements and best practices	examples of community-led SAP implementation		level	• Regional Scientific and Technical Committee		
	Demonstrable use of state of coastal habitat reports in national and regional planning	Baseline national habitat reports developed and require periodic uptake	First biennial state of coastal habitat reports published	Biennial state of coastal habitat reports published	Published state of coastal habitat reports	Biennially	National	• National Technical Working Groups • Regional habitat working groups	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Volume of remotely sensed information interpreted and made available for planning	Rapid advancements in aerial visual survey techniques and remote sensing of inter-tidal and shallow water biomes have potential to greatly enhance coastal habitat management planning in the SCS marine basin	Mechanism established for the collation of remotely sensed information and data, including guidelines and protocols developed for use of aerial visual survey techniques	Algorithms for the interpretation of remotely sensed information and data on coastal habitat associations and zonation developed and applied	Regional report on methodologies and procedures for the application of aerial visual survey and remotely sensed data in coastal habitat management in the SCS marine basin published and accessible online	Quarterly  Biannually  Biannually  Bianually	National-level  National-level  Regional-level  Regional-level	• National Habitat Committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Extent of uptake of remotely sensed coastal habitat information and data in management planning and action	Number and completeness of regionally comparable coastal habitat	Regional GIS and meta-database of SCS coastal habitat	Site characterisation forms revisited, revised	Mechanism for collection and exchange of regional coastal habitat	Agreed site characterisation forms for the compilation	Quarterly  Biannually	National-level  National-level	Yr 1-5	National and Regional Coordination Meetings (budget line

Outcome	Objective level indicator	Baseline Conditions	Mid-point Target (as relevant)	End of Project Target	Means of Verification	Monitoring / sampling (frequency / size)	Location / Group	Responsibility	Time frame	Budget <sup>80</sup> (Object of expenditure & cost)
	site characterisations	information developed but not updated since 2008 due to lack of a regional mechanism for collation and exchange of data	where necessary, and national scientists engaged in the collation of regionally comparable data	information and data established	of regionally comparable coastal habitat information and data GIS and meta-database online and routinely updated by SAP implementation partners	Biannually Bianually	Regional-level Regional-level	Working Groups • Regional Working Groups • Regional Scientific and Technical Committee		3300)
	Volume of CO2 captured and stored by SCS habitats defined	Lack of SCS specific information on carbon sequestration by coastal habitats constrains resource managers in making political case for better resourcing	Sites selected for in-situ monitoring that have minimal risks associated with: typhoon; emerging development pressures; and storm surge inundation	Role of coastal habitats of the South China Sea in the sequestration and storage of carbon quantified	Published report on the capture and storage of carbon by coastal habitats, including national and regional strategic planning recommendations, shared online	Annually Annually Annually Annually	National-level National-level Regional-level Regional-level	• National Habitat Committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Independent peer acceptance of review	Sea level rise, climate variability and change, and episodic natural disasters in SC identified as threats to sustainable	Appropriate breadth of expertise identified and engaged to conduct review to facilitate consensus	Review of the potential impacts of sea level rise, climate change, and episodic events on coastal habitats of the	Review report published and shared regionally Communications on review outcomes published by media outlets	Annually Annually Annually	National-level National-level Regional-level	• National Habitat Committees • National Technical Working Groups • Regional Working Groups	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)

Outcome	Objective level indicator	Baseline Conditions	Mid-point Target (as relevant)	End of Project Target	Means of Verification	Monitoring / sampling (frequency / size)	Location / Group	Responsibility	Time frame	Budget <sup>80</sup> (Object of expenditure & cost)
2.2: Effective integration of regional science in the management of land-based pollution	ons in updating national action plans and diagnostic analyses	management of coastal habitats	building at both national and regional levels	South China Sea	and syndicated via GEF:LME LEARN	Annually	Regional-level	• Regional Scientific and Technical Committee		
	Number of updated National Action Plans adopted	National Action Plans for mangroves, coral reefs, seagrass and wetlands developed and implemented during period 2002-2008	Outdated National Action Plans assessed and contemporary priority issues for management planning identified	Updated and adopted National Action Plans for mangroves, coral reefs, seagrass and wetlands, including enactment of supporting legislation where required	Adopted National Action Plans accessible online Executive orders, provincial/local ordinances and by-laws	Quarterly Biannually	National-level National-level	• National Habitat Committees • National Technical Working Groups	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Number of laws and regulations adopted to enable action plan implementation				Biannually Biannually	Regional-level Regional-level	• Regional Working Groups • Regional Scientific and Technical Committee			
2.2: Effective integration of regional science in the management of land-based pollution	Extent of decision-maker awareness of localised v. transboundary impacts of land-based pollution in the SCS	Carrying capacity of the SCS open shelf system based on its natural capacity to assimilate contaminants, in particular nutrient inputs from land, has been modelled although findings not well known by decision-	Communication strategy development and under implementation, including online dissemination of user-friendly scientific communications	Nutrient carrying capacity model for the SCS marine basin used to communicate with decision-makers about the localized v. transboundary impacts of land-based pollution in the SCS	Nutrient carrying capacity accessible online Communications products available for regional and global sharing 1 * IW Experience Note	Quarterly Biannually Biannually Biannually	National-level National-level Regional-level Regional-level	• National Land-based Pollution committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)

Outcome	Objective level indicator	Baseline Conditions	Mid-point Target (as relevant)	End of Project Target	Means of Verification	Monitoring / sampling (frequency / size)	Location / Group	Responsibility	Time frame	Budget <sup>80</sup> (Object of expenditure & cost)
	for the SCS	makers								
	Extent of decision-maker awareness of SCS open shelf carrying capacity for heavy metal contaminants	Need for simple model of pollution impacts under different development scenarios, specifically as they relate to heavy metal contaminant loadings	Model parameters defined, tested, and that data and information from heavy metal hotspots are being collated to support running the model under various loading scenarios	Management approaches (integrated, community-based, multiple use) improved at 82 coral reef sites	GIS-based model of SCS carrying capacity for heavy metal contamination developed & online Communications products available for regional and global sharing 1 * IW Experience Note	Quarterly  Biannually  Biannually  Biannually	National-level  National-level  Regional-level  Regional-level	• National Land-based Pollution committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Status of initiative to quantify heavy metal contaminant impacts on: (a) water quality; (b) reproductive capacity of living resources; (c) contamination of human food sources; and (d) bio-	Framework procedures for estimating the impacts of heavy metal contamination in SCS have been developed although not yet applied	Approach for the characterisation of heavy metal pollution hotspots agreed and templates being used nationally to compile regionally comparable information and data	Impacts of estimated heavy metal contaminant loadings defined, quantified and communicated to decision-makers	Published report shared nationally and regionally, including national language translation where appropriate	Quarterly  Biannually  Biannually  Biannually	National-level  National-level  Regional-level  Regional-level	• National Land-based Pollution committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
	accumulation.									
	Number of heavy metal pollution hotspots characterised	Lack of regionally comparable information and data on heavy metal contaminated hotspots	Hotspot site characterisation templates agreed and national staff trained in their use	Characterization of heavy metal pollution hotspots	Pollution hotspot site characterisation templates developed Hotspot information accessible online	Quarterly  Biannually  Biannually  Biannually	National-level  National-level  Regional-level  Regional-level	• National Land-based Pollution committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Number of aquaculture sites for which effluent and contaminant loadings estimated	Effluent from aquaculture and mariculture operations identified as key threat to dominant coastal biomes	Consultations with private sector completed and their cooperate in efforts to determine environmental impact of operations secured	Quantification of effluent volumes and contaminant loadings from coastal aquaculture to the SCS marine basin	Published methodology and procedures for estimating aquaculture pollution loadings and impacts 1 * IW Experience Note	Quarterly  Biannually  Biannually  Biannually	National-level  National-level  Regional-level  Regional-level	• National Land-based Pollution committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
2.3: Strengthened and harmonized national policies and laws, and supporting	Number of best practice technologies and measures tested, documented and shared	Lesson learned in community-based wastewater mgmt. in Batam,	Template for the collation of best practice information developed and being	National best practices in waste water management, law enforcement, and	Catalogue of best practice technologies and management approaches for land-based	Quarterly  Biannually	National-level  National-level	• National Land-based Pollution committees • National Technical Working	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
financial mechanism, for the management of land-based sources of pollution		Indonesia documented and shared regionally although other examples from East Asian seas region largely focus on broad scale ICM planning	used to prepare best practice examples	community and industry participation in managing land-based sources of pollution documented and shared	pollution published and accessible online	Biannually Biannually	Regional-level Regional-level	Groups • Regional Working Groups • Regional Scientific and Technical Committee		
	Extent of harmonization of sectoral governance frameworks achieved as a result of review findings	Effectiveness of existing legal and institutional frameworks limited by predominantly single sector approaches	National legislation compiled and descriptors of institutional frameworks prepared	Review of legislative and institutional frameworks for land-based pollution management in participating countries	Review published and shared regionally	Quarterly Biannually Biannually	National-level National-level Regional-level	• National Land-based Pollution committees • National Technical Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Number of countries participating and adopting harmonized, regionally comparable SOPs	Lack of Standard Operating Procedures for land-based pollution management	Guidelines developed and agreed via regional and national consultations	Harmonized national Standard Operating Procedures for land-based pollution control and management [including agreed sediment, biota, & water quality criteria]	Regional guidelines on Standard Operating Procedures published Adopted National Standard Operating Procedures available online	Quarterly Biannually Biannually Biannually	National-level National-level Regional-level Regional-level	• National Land-based Pollution committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
	Status of endorsement of national policies and enactment of laws and regulations for land-based pollution control	Absence of clear and effective policies, laws, and regulations relating to control of land-based pollution	Draft national reports completed	Revised national/provincial policies and supporting regulations for land-based pollution management developed, enacted and implemented by Yr 5	6 * national reports on policy and legal aspects of land-based pollution management Endorsed policy and executive orders, provincial/local ordinances and by-laws	Quarterly  Biannually  Biannually  Biannually	National-level  National-level  Regional-level  Regional-level	• National Land-based Pollution committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Status of endorsement of National Investment Plans  Number of participating countries adopting National Investment Plans	Guidelines for assessing the economic impacts of land-based pollution developed but not yet applied as part of benefit-cost analysis of pollution mgmt. in the SCS	Framework investment plan developed and shared with participating countries for comment	Updated and adopted National Investment Plans for land-based pollution management in the SCS [Yr 5]	6 * endorsed National Investment Plans published and disseminated nationally and regionally	Quarterly  Biannually  Biannually  Biannually	National-level  National-level  Regional-level  Regional-level	• National Land-based Pollution committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
2.4 Improved national and regional values for the Total Economic Values of coastal habitats for use in	Completeness of value information compiled for coastal biome goods and services	Values determined for SCS are incomplete as not all known goods and services from individual	Data collection programme in place and information and data regarding goods and services	Expanded datasets of economic valuation information on the goods and services of SCS coastal	6 * national reports on economic valuation of coastal biomes, including tabulated data			•		National and Regional Coordination Meetings (budget line 3300)

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
development planning and decision-making		biomes have been valued	being compiled	habitats	and reference material, published					
	Status of initiative to develop national and regional estimates economic linkages between habitats and coastal fish production	Comparatively few existing values for the services provided by habitats as nursery areas for coastal living resources	Regionally consistent methodology for the collection, review and analysis of information and data developed and agreed	Estimates of the value for the service provided by coastal habitats as nursery areas for coastal fish and crustaceans	6 * national and 1 *regional report on the economic contribution of coastal habitats to coastal fisheries production in the SCS, including tabulated data and reference material, published	Quarterly  Biannually  Biannually  Biannually	National-level  National-level  Regional-level  Regional-level	• National Habitat Committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Status of initiative to value economic costs of coastal shipping accidents and pollution damage	No existing information linking shipping accidents to loss of economic benefits associated coastal biomes in the SCS	Regionally consistent methodology for the collection, review and analysis of information and data developed and agreed	Estimates of economic losses of coastal ecosystem goods and services consequent upon coastal shipping accidents and pollution damage	1 * regional report on the economic losses consequent upon coastal shipping accidents and pollution damage	Quarterly  Biannually  Biannually  Biannually	National-level  National-level  Regional-level  Regional-level	• National Habitat Committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Status of initiative to update estimates of	Economic valuation of coastal habitats used	Application of regionally consistent methodology	Updated estimates of Total Economic	1 * regional report on updated Total Economic	Quarterly  Biannually	National-level  National-level	• National Habitat Committees • National	Yr 1-5	National and Regional Coordination Meetings (budget line

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
	total economic values of coastal biomes	in cost benefit analysis of endorsed Strategic Action Programme actions in 2008	y in the collection, review and analysis of information and data	Values for coastal habitats of the SCS and converted to 2017 value by means of the consumer price index	Values for coastal habitats published and online	Biannually	Regional-level	Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee		3300)
2.5 Regionally appropriate tools and mechanisms to guide the development of sustainable management systems for coastal habitats and land-based pollution	Status of initiative to develop and apply standards and criteria for determining the sustainability of coastal habitat management systems	Sustainable management indicator matrices developed for dominant coastal habitats but not yet applied and tested in framework of SAP implementation	Consultative processes have been undertaken to secure stakeholder engagement and participation	Regionally applicable standards and criteria for defining the sustainability of coastal habitat management systems, developed and applied at priority coastal habitat sites	1 * regional report documenting sustainability of management systems developed and applied at priority coastal habitat sites	Quarterly  Biannually  Biannually  Biannually	National-level  National-level  Regional-level  Regional-level	• National Habitat Committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Number of best practice management measures and technologies documented, codified, and accessible via online catalogue	Lessons learned and best practices in coastal habitat management from 23 demonstration sites documented and published in peer reviewed article	Template for the collation of best practice information developed and being used to prepare best practice examples	Online catalogue of best practice management measures and technologies for sustainable use of SCS coastal habitats and land-based pollution management	Catalogue of best practices accessible online  Communications products on best practices produced and syndicated online	Quarterly  Biannually  Biannually  Biannually	National-level  National-level  Regional-level  Regional-level	• National Habitat/Lb-P Committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
2.6 Updated and Ministerially	Extent and continuity of local leader and local government participation in study tour and exchange initiatives	Limited engagement of community-based governance mechanisms in planning coastal habitat management	Study tour and exchange programme developed and approved by the Project Steering Committee for implementation	Government officials, community leaders, and habitat and pollution managers exposed to ongoing practices in rehabilitation, management, and pollution control and treatment via programme of study tours and exchange	Reports of study tour and exchange initiatives  Annual reports of best practice examples of community level inputs to SAP implementation initiatives	Quarterly  Biannually	National-level  National-level	• National Habitat/Lb-P Committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Level of improved local relevance of national policy and planning efforts for reducing environmental degradation in the SCS	Low level mobilization of civil society, community groups and the private sector in habitat management				Biannually  Biannually	Regional-level  Regional-level			
	Number of public awareness products accessible online	Public awareness materials developed via TDA/SAP project compiled and accessible via SCS website	Web platforms operational and data management systems in place	Expanded South China Sea online public awareness centre, including awareness packages for local adoption	Awareness packages accessible online via a SCS SAP implementation website	Quarterly  Biannually  Biannually	National-level  National-level  Regional-level	• National Habitat/Lb-P Committees • National Technical Working Groups • Regional Working Groups • Regional Scientific and Technical Committee	Yr 1-5	
	Extent of local uptake and use of awareness products					Biannually	Regional-level			
2.6 Updated and Ministerially	Status of national and regional level	TDA for SCS published in 2000	Same as end-of-project	National and regional level consensus on	Updated and regionally endorsed	Quarterly  Biannually	National-level  National	• National Committees • National	Yr 1-2	National and Regional Coordination

Outcome	Objective level indicator	Baseline Conditions	Mid-point Target (as relevant)	End of Project Target	Means of Verification	Monitoring / sampling (frequency / size)	Location / Group	Responsibility	Time frame	Budget <sup>80</sup> (Object of expenditure & cost)
adopted Transboundary Diagnostic Analysis and Strategic Action Programme, including prioritization of national management actions to address climate variability and change	consensus on contemporary issues of transboundary significance with respect to coastal habitat and land-based pollution management	Special Issue of Ocean and Coastal Management on South China Sea published in 2013	target	contemporary issues and problems, including the quantification of environmental compromises and the prioritization of problems (Yr 2)	Transboundary Diagnostic Analysis for the SCS marine basin published and disseminated at national and regional levels	Biannually Biannually Annually	level Regional-level Regional-level	Inter-Ministry Committees • Regional Working Groups • Regional Scientific and Technical Committee • Project Steering Committee		Meetings (budget line 3300)
	Status of national and regional level consensus reached on priority actions for intervention	Strategic Action Programme endorsed in 2008 outlines priorities for management	Appropriate expertise engaged and draft reports circulated for regional and national review	The immediate and ultimate root causes of the problems identified and consensus reached on priorities for intervention in the SCS	Updated and regionally endorsed prioritisation of options for management intervention in the SCS	Quarterly Biannually Biannually Biannually Annually	National-level National-level Regional-level Regional-level Regional-level	• National Committees • National Inter-Ministry Committees • Regional Working Groups • Regional Scientific and Technical Committee • Project Steering Committee	Yr 1-3	National and Regional Coordination Meetings (budget line 3300)
	Status of cost benefit analysis of comparative net benefits of alternative options for management	Established methodology for cost of action versus non-action in the context of SCS SAP implementation		Published cost benefit analysis of alternative options for coastal habitat and land-based pollution interventions						
	Status of Ministerial adoption of an updated Strategic Action Programme for the South	Strategic Action Programme for the South China Sea endorsed inter-governmentally	Consultation process initiated to secure Ministerial level commitment to SAP revision and	National and regional consultative process to develop updated Strategic Action	Endorsed Strategic Action Programme published	Quarterly Biannually Biannually Biannually	National-level National-level Regional-level Regional-	• National Committees • National Inter-Ministry Committees • Regional Working Groups	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)

Outcome	Objective level indicator	Baseline Conditions	Mid-point Target (as relevant)	End of Project Target	Means of Verification	Monitoring / sampling (frequency / size)	Location / Group	Responsibility	Time frame	Budget <sup>80</sup> (Object of expenditure & cost)
	China Sea	by 2008	adoption	Programme SAP for adoption at the Ministerial level (Yr 5)		Annually	level Regional-level	• Regional Scientific and Technical Committee • Project Steering Committee		
	Level of demonstrable use of the regional review on sea level rise, climate change, and episodic events in SAP formulation	Evolving understanding of sea level rise, climate change, and episodic events in East Asia but not applied in context of transboundary planning in the South China Sea	Appropriate expertise engaged to identify priority national actions that achieve local benefit as well as high transboundary impact	Prioritization of national management actions to address climate variability and change for incorporation into national policies and plans	Report of priority actions National policies and plans with demonstrable uptake of priority actions	Quarterly Biannually Biannually Biannually Biannually Annually	National-level National-level Regional-level Regional-level Regional-level Regional-level	• National Committees • National Inter-Ministry Committees • Regional Working Groups • Regional Scientific and Technical Committee • Project Steering Committee	Yr 1-3	National and Regional Coordination Meetings (budget line 3300)
3.1 Regional and sub-regional co-operation in the integration of scientific knowledge and research outputs with management and policy making	Status of the RSTC and the uptake of the scientific and technical advice it provides	Lack of a formal mechanism for the sharing of science and technical knowledge relating to the South China Sea SAP implementation	Same as end-of-project target	Regional Scientific and Technical Committee of the SCS project functioning as a bridge between the scientific community and decision-makers [annual meetings]	RSTC Terms of Reference Annual meeting reports (documenting scientific and technical advice and participant lists)	Annually Annually	National-level Regional-level	• Inter-Ministry Committees • Project Steering Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Continuity of participation of RSTC members in annual meetings									
	Extent of	Limited	First	Knowledge	Published	Biennially	National-	• Inter-	Yr 1-5	National and

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
	demonstrable use of scientific knowledge exchanged during biennial conferences by central and provincial government agencies	application of evidence-based approaches by central and provincial government agencies	biennial Regional Scientific Conference convened	exchanges between government and scientific community through biennial Regional Scientific Conferences	reports of the Regional Scientific Conferences  Report on the uptake and use of regionally accumulated science	Biennially  Biennially	level  Regional-level	Ministry Committees • Regional Scientific and Technical Committee • Project Steering Committee		Regional Coordination Meetings (budget line 3300)
	Number of Mayor's Round-Table meetings convened  Number, scope & reach of communications to raise local official awareness of best practices	Four Mayors Round-Table meetings convened during period 2005-2008 and documented as a key innovation for improving local relevance of action planning and M&E	Two (2) annual Mayor's Round-Table meetings convened	Best practice exchanges between local government officials and coastal managers on science-based management via annual Mayor's Round-Table meetings	Reports of Mayor's Round-Table Meetings, including documented evidence of behaviour change as a result of exposure to best practice guidance	Annually  Annually  Annually	National-level  Regional-level  Regional-level	• Inter-Ministry Committees • Regional Scientific and Technical Committee • Project Steering Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Status of bilateral cooperation for transboundary resource management between (a) Cambodia and Vietnam and (b) Cambodia	Bilateral cooperation between Cambodia and Vietnam initiated during the period 2007-2008 although this has stagnated as a	Consultative processes initiated	Memoranda of Agreement for joint management of 2 priority transboundary water areas agreed & implemented	Signed Memoranda of Agreement outlining agreed joint actions for transboundary coastal resource management	Annually  Annually  Annually	National-level  Regional-level  Regional-level	• Inter-Ministry Committees • Regional Scientific and Technical Committee • Project Steering Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
	and Thailand	result of a lack of regional coordination support								
	Extent of joint planning by both projects  Number of best practices and lessons learned captured from the fisheries refugia project	Execution of the UNEP/GEF Fisheries Refugia project to commence in Q3 of 2016 through SEAFEDC and national fisheries agencies	Annual joint planning exercises initiated and resulting in demonstrable sharing of best practices and lessons learned	Cooperation with the GEF fisheries refugia project and other relevant regional initiatives	Reports of joint planning meeting  Published revised NAPs and SAP containing section on lessons from fisheries refugia project	Annually  Annually  Annually	National-level  Regional-level  Regional-level	• Inter-Ministry Committees • Regional Scientific and Technical Committee • Project Steering Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Number of best practices identified  Number of community organisations, local governments and industry receiving awards	Lack of mechanism to formally recognize and award communities, local governments and industry for innovation and generation of best practices for environmental management of the South China Sea	Two(2) annual award programme operated and lessons learned documented	Operational award programme on best practices in coastal habitat and land-based pollution management for communities, local governments and industry [annual]	Documented examples of innovation and best practice by communities, local governments and industry  Annual report of award programme	Annually  Annually  Annually	National-level  National-level  Regional-level  Regional-level	• National Technical Working Groups • Inter-Ministry Committees • Regional Scientific and Technical Committee • Project Steering Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
3.2 Capacity for civil	Number of GEF Small	Need for strengthened	2 annual reports on	Cooperation with GEF	5 annual reports of	Annually	National-level	• National Technical	Yr 1-5	National and Regional

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
society and community organization participation in SAP implementation strengthened via operational partnership with GEF SGP	Grants Programme projects commissioned and implemented in support SAP implementation	mobilization of civil society and community organizations in SAP implementation	outcomes and results of cooperative programme	SGP in the commissioning and implementation of an additional [#] of community-based projects for SAP implementation	SGP-SAP implementation partnership	Annually Annually Annually	National-level Regional-level Regional-level	Working Groups <ul style="list-style-type: none"><li>• Inter-Ministry Committees</li><li>• Regional Scientific and Technical Committee</li><li>• Project Steering Committee</li></ul>		Coordination Meetings (budget line 3300)
	Extent and scope of inputs from CSOs and COs Number of NGO forums convened Extent of capacity built among SGP proponents to implement local actions in support of the achievement of SAP targets	Need for CSO and CO inputs to planning of an SCS-SGP partnership Limited civil society and community organisation experience and capacity for coastal habitat and land-based pollution management	Two (2) annual reports of NGO forum meetings	CSO & CO inputs elicited for planning and M&E of the SCS-SGP partnership via annual NGO forums	Reports of NGO forum meetings	Annually Annually Annually Annually	National-level National-level Regional-level Regional-level	<ul style="list-style-type: none"><li>• National Technical Working Groups</li><li>• Inter-Ministry Committees</li><li>• Regional Scientific and Technical Committee</li><li>• Project Steering Committee</li></ul>	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Extent of capacity built among SGP proponents to implement local actions in support of the	Limited civil society and community organisation experience and capacity for coastal habitat and	Training syllabus and materials prepared , with inputs from national and	Training program on science and management of SCS coastal habitats and resources for SGP	Training modules for SGP proponents developed and accessible online	Annually Annually Annually	National-level National-level Regional-	<ul style="list-style-type: none"><li>• National Technical Working Groups</li><li>• Inter-Ministry Committees</li><li>• Regional</li></ul>	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
	achievement of SAP targets	land-based pollution management	regional training providers	proponents		Annually	level Regional-level	Scientific and Technical Committee • Project Steering Committee		
3.3: Relationships between central and local governments and the private sector strengthened and formalized	Number of public-private partnerships identified and documented	Many private sector organisations operate corporate social and environmental responsibility programmes but they are not aligned with SAP implementation	Same as end-of-project target	Review of past and ongoing public-private partnerships for coastal management in SCS region	Review report on public-private partnerships published	Annually Annually Annually	National-level National-level Regional-level	• National Technical Working Groups • Inter-Ministry Committees • Regional Scientific and Technical Committee • Project Steering Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Number of opportunities for private sector investment in SAP implementation identified	Significant commercial enterprise is conducted in waters of the South China Sea, particularly in the areas of oil and gas, fisheries and tourism	Communications and engagement strategies developed with aim of establishing interest among private sector entities in SAP implementation	Identification of opportunities for private sector investment (e.g. oil and gas, fisheries, tourism) in implementation of the updated SAP	Letters of commitment from private sector entities with regards to support for SAP implementation	Annually Annually Annually Annually	National-level National-level Regional-level Regional-level	• National Technical Working Groups • Inter-Ministry Committees • Regional Scientific and Technical Committee • Project Steering Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Status of agreement on financial arrangements	Low-level mobilization of the private sector in	One (1) partnership forum convened	Two partnership forums to facilitate	Letters of investment commitment from private	Annually	National-level	• National Technical Working Groups	Yr 1-5	National and Regional Coordination Meetings

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
	for private sector and donor investment in the implementation of the revised Strategic Action Programme	environmental investment planning in the South China Sea		cooperation with private sector on implementation of the updated SAP	sector partners and donors	Annually Annually Annually	National-level Regional-level Regional-level	• Inter-Ministry Committees • Regional Scientific and Technical Committee • Project Steering Committee		(budget line 3300)
3.4: Revitalization of regional mechanisms for communications, knowledge exchange, and information and data management and sharing	Number of multi-media and knowledge products produced	The SCS project produced an extensive range of knowledge products, technical guides, and training and awareness materials	Same as end-of-project target	A variety of multi-media information and knowledge products based on SCS SAP implementation communications strategy	Multi-media information and knowledge products published and accessible online	Annually Annually	National-level Regional-level	• National Technical Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Status of knowledge tool development to support evidence-based coastal and marine management and spatial planning	Transboundary coastal and marine mgmt. spatial planning constrained by lack of a regionally coordinated approach to harnessing sectorial expertise and knowledge	Appropriate technical expertise engaged and participating in preparation of synthesis reports	Regionally appropriate knowledge tools developed to support decision-making and planning	Published synthesis reports on: climate variability in coastal systems; hazards and coastal area planning; blue forests and livelihoods; and land and marine tenure and use designation	Annually Annually	National-level Regional-level	• National Technical Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
	Number of users, volume of content accessed, and online visibility of the SCS website and associated databases	Need for media platforms and targeted communications in support of efforts to harness support for inter-ministerial coordination and policy and planning elements of SAP implementation and revision	Same as end-of-project target	The SCS project web portal < <a href="http://www.unepscs.org">www.unepscs.org</a> > and associated regional databases online, updated and linked to IW-Learn and other GEF Knowledge management systems	Regional and national portals, GIS and meta-databases, repository of best practices, lessons learned and results accessible online via < <a href="http://www.unepscs.org">www.unepscs.org</a> >	Annually Annually	National-level Regional-level	• National Technical Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Number of IW:LEARN experience notes published	Limited regional and global sharing of information on best practices and lessons learned from investments in the SCS despite for example publication of a complete Special Issue of an academic journal on the progress to date	Scope and required content of experience notes agreed by RSTC	Active engagement with GEF IW:LEARN [1% of project resources] including participation in IW conferences and 3 experience notes	Published GEF IW experience notes [three]	Annually Annually	National-level Regional-level	• National Technical Working Groups • Regional Scientific and Technical Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
3.5: Agreed	Number of	Regional Task	Three (3)	Biannual	Reports of the	Annually	National-	• Inter-	Yr 1-5	National and

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
arrangements for strengthened regional cooperation in the management of the marine and coastal environment of the South China Sea	Regional Task Force meetings	Force on Legal Matters established through SCS project but presently not functioning	meetings of the Regional Task Force on Legal Matters	meetings of the Regional Task Force on Legal Matters	meetings of the Regional Task Force on Legal Matters	Annually	level Regional-level	Ministry Committees • Regional Scientific and Technical Committee • Project Steering Committee		Regional Coordination Meetings (budget line 3300)
	Continuity of participation of nationally nominated members					Annually	Regional-level			
	Number of National Working Group meetings	National Working Groups established through SCS project but presently not functioning	Same as end-of-project target	National Working Groups on established and functional	Reports of the meetings of National Working Groups	Annually Annually Annually Annually	National-level Regional-level Regional-level Regional-level	• Inter-Ministry Committees • Regional Task Force - L • Regional Scientific and Technical Committee • Project Steering Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Continuity of participation of nationally nominated members									
	Status of agreement on identified process	Framework process developed but requires national and regional consultation	Consultations initiated to agree process	Process for development of a proposed arrangement for regional cooperation defined and planned	Report outlining agreed process	Annually Annually Annually Annually	National-level Regional-level Regional-level Regional-level	• Inter-Ministry Committees • Regional Task Force - L • Regional Scientific and Technical Committee • Project Steering Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)
	Extent of national stakeholder input to drafting phase	SAP formulation benefited from an emphasis on	Stakeholder consultations initiated	National stakeholder inputs to drafting of instrument for	Reports of national stakeholder consultation process	Annually Annually	National-level Regional-level	• Inter-Ministry Committees • Regional Task Force - L	Yr 1-5	National and Regional Coordination Meetings (budget line

<b>Outcome</b>	<b>Objective level indicator</b>	<b>Baseline Conditions</b>	<b>Mid-point Target (as relevant)</b>	<b>End of Project Target</b>	<b>Means of Verification</b>	<b>Monitoring / sampling (frequency / size)</b>	<b>Location / Group</b>	<b>Responsibility</b>	<b>Time frame</b>	<b>Budget<sup>80</sup> (Object of expenditure &amp; cost)</b>
	of instrument for cooperation	consensual planning and decision making		strengthened regional cooperation facilitated via national consultations		Annually  Annually	Regional-level  Regional-level	• Regional Scientific and Technical Committee • Project Steering Committee		3300)
	Status of adoption of the instrument	Participating countries agreed in the SAP, and in endorsing the PIF for this project, to explore the development of an instrument for strengthened regional cooperation	National consultation processes initiated	Adopted instrument for strengthened regional cooperation	Adopted instrument	Annually  Annually  Annually  Annually	National-level  Regional-level  Regional-level  Regional-level	• Inter-Ministry Committees • Regional Task Force - L • Regional Scientific and Technical Committee • Project Steering Committee	Yr 1-5	National and Regional Coordination Meetings (budget line 3300)

**2. Cost of acquisition of essential baseline data during first year of project:** Nil. Extensive baseline information was collated during the TDA/SAP formulation project, much of which has been updated during the project preparation and has been available as part of this Project Document or accessible online in the various databases established for the collation and regional sharing of baseline data.

**3. Cost of project inception workshop (please include proposed location, number of participants):** It is anticipated that the project inception workshop will be convened by the SAP Implementation Unit in Bangkok, Thailand. The anticipated cost of this workshop is US\$30,000.

**4. Cost of Mid-Term Review/Evaluation:** US\$60,000

**5. Cost of Terminal Evaluation:** US\$60,000

**6. Any additional M&E costs:** Nil

## Appendix 8: Summary of reporting requirements and responsibilities

M&E COMPONENT/ ACTIVITY	RESPONSIBILITY ASSIGNMENT		MEANS OF ASSESSMENT/ MONITORING/DATA SOURCE
	INSTITUTION/ AGENCY	PROJECT/ AGENCY OFFICER	
<b>Monitoring</b>			
Preparation of the Overall Project Plan of Operations (PPO), Work-plans and Time-tables, budgets, Risk and IW indicator tables	PCU	Project Director	Project Document Resolutions of the Project Steering Committee Meetings
Preparation of individual country/regional work plans:  China (C1) Cambodia (C2) Indonesia (I) Philippines (P) Thailand (T) Vietnam (V) Regional (R)	National Agency/Regional Project Coordination Unit:  C1: Ministry of Environment C2: Ministry of Environment I: Ministry of Environment P: Department of Environment and Natural Resources T: Ministry of Natural Resources and Environment V: Ministry of Natural Resources and Environment R: PCU	National Focal Points & Project Director:  C1: Mr. Yingming YANG C2: Mr. Lohn HEAL I: Ms. Ms. LaksmiDewanthy/Mr. Karliansyah P: Ms. Analiza REBUELTA - TEH T: Dr. Kasemsun CHINNAVASO V: Dr. Mr. Nam Thang DO R: Project Director	Project Document Resolutions of the National Inter-Ministry Committee Meetings Resolutions of the Project Steering Committee Meetings
Preparation of Overall Project Progress Reports	PCU UNEP-DEWA	Project Director UNEP Task Manager	Project Coordination Unit's reports to PSC & UNON

M&E COMPONENT/ ACTIVITY	RESPONSIBILITY ASSIGNMENT		MEANS OF ASSESSMENT/ MONITORING/DATA SOURCE
	INSTITUTION/ AGENCY	PROJECT/ AGENCY OFFICER	
Preparation of country and regional component quarterly progress reports:  China (C1) Cambodia (C2) Indonesia (I) Philippines (P) Thailand (T) Vietnam (V) Regional (R)	National Agency/Regional Project Coordination Unit:  C1: Ministry of Environment C2: Ministry of Environment I: Ministry of Environment P: Department of Environment and Natural Resources T: Ministry of Natural Resources and Environment V: Ministry of Natural Resources and Environment R: PCU	National Focal Points & Project Director:  C1: Mr. Yingming YANG C2: Mr. Lohn HEAL I: Ms. LaksmiDewanthy/Mr. Karliansyah P: Ms. Analiza REBUELTA - TEH T: Dr. Kasemsun CHINNAVASO V: Dr. Mr. Nam Thang DO R: Project Director	Country and component reports to PSC and PCU
Preparation of Expenditure Statements (including co-financing):  China (C1) Cambodia (C2) Indonesia (I) Philippines (P) Thailand (T) Vietnam (V) Regional (R)	National Agency/Regional Project Coordination Unit:  C1: Ministry of Environment C2: Ministry of Environment I: Ministry of Environment P: Department of Environment and Natural Resources T: Ministry of Natural Resources and Environment V: Ministry of Natural Resources and Environment R: PCU	National Focal Points & Project Director:  C1: Mr. Yingming YANG C2: Mr. Lohn HEAL I: Ms. LaksmiDewanthy/Mr. Karliansyah P: Ms. Analiza REBUELTA - TEH T: Dr. Kasemsun CHINNAVASO V: Dr. Mr. Nam Thang DO R: Project Director	UNON-IMIS

M&E COMPONENT/ ACTIVITY	RESPONSIBILITY ASSIGNMENT		MEANS OF ASSESSMENT/ MONITORING/DATA SOURCE
	INSTITUTION/ AGENCY	PROJECT/ AGENCY OFFICER	
Preparation of counterpart contribution reports:  China (C1) Cambodia (C2) Indonesia (I) Philippines (P) Thailand (T) Vietnam (V) Regional (R)	National Agency/Regional Project Coordination Unit:  C1: Ministry of Environment C2: Ministry of Environment I: Ministry of Environment P: Department of Environment and Natural Resources T: Ministry of Natural Resources and Environment V: Ministry of Natural Resources and Environment R: PCU	National Focal Points & Project Director:  C1: Mr. Yingming YANG C2: Mr. Lohn HEAL I: Ms. Tuti Hendrawati MINTARSIH P: Ms. Analiza REBUELTA - TEH T: Mrs. Mingquan WICHAYARANGSARIDH V: Dr. Mr. Nam Thang DO R: Project Director	Reports on co-financing to the PSC
On-site supervision of Component Activities:  China (C1) Cambodia (C2) Indonesia (I) Philippines (P) Thailand (T) Vietnam (V) Regional (R)	National Agency/Regional Project Coordination Unit:  C1: Ministry of Environment C2: Ministry of Environment I: Ministry of Environment P: Department of Environment and Natural Resources T: Ministry of Natural Resources and Environment V: Ministry of Natural Resources and Environment R: PCU	National Focal Points & Project Director:  C1: Mr. Yingming YANG C2: Mr. Lohn HEAL I: Ms. LaksmiDewanthy/Mr. Karliansyah P: Ms. Analiza REBUELTA - TEH T: Dr. Kasemsun CHINNAVASO V: Dr. Mr. Nam Thang DO R: Project Director	On-site data collection
UNEP-DEWA Supervision Missions	PCU UNEP-DEWA	UNEP Task Manager	On-site data collection Mission reports

M&E COMPONENT/ ACTIVITY	RESPONSIBILITY ASSIGNMENT		MEANS OF ASSESSMENT/ MONITORING/DATA SOURCE
	INSTITUTION/ AGENCY	PROJECT/ AGENCY OFFICER	
<b>Evaluation</b>			
Meetings of the PSC	PCU (acting as Secretariat of the Committee)	Project Director UNEP Task Manager	Minutes of the meetings of the PSC
Meetings of the RSTC	PCU (acting as Secretariat of the Committee)	Project Director UNEP Task Manager	Minutes of the meetings of the RSTC
Mid-Term Management Review	UNEP-EOU in consultation with the PCU, and participating institutions and stakeholders	Independent consultant	On-site data collection Project Manager review
Final Evaluation	UNEP-EOU in consultation with the PCU, and participating institutions and stakeholders	Independent consultant	On-site data collection Consultant report
Annual Project Implementation Review (PIR)	UNEP with the assistance of participating Institutions	Project Director in consultation with UNEP Task Manager	On-site data collection PIR reports

## **Appendix 9: Standard Terminal Evaluation TOR**

### **Terminal Evaluation of the UNEP GEF project**

Implementing the Strategic Action Programme for the South China Sea and Gulf of Thailand

#### **1. PROJECT BACKGROUND AND OVERVIEW**

##### **Project rationale**

The longer-term goals of this project are to contribute to:

- to maintain an environment at the regional level, in which collaboration and partnership in addressing environmental problems of the South China Sea, between all stakeholders, and at all levels is fostered and encouraged;
- to enhance the capacity of the participating governments to integrate environmental considerations into national development planning;
- to strengthen and expand the network of scientists, government officials and civil society established under the UNEP/GEF SCS Project.

The medium term objective of the project is to assist the governments of the participating countries in meeting the targets of the approved Strategic Action Programme through the provision of technical assistance as required in implementing national activities in support of the SAP; and the provision of strong regional co-ordination of the process of SAP implementation.

*The indicators given in the project document for these stated objectives were:*

##### **Reducing habitat degradation and loss via national and local reforms to achieve Strategic Action Programme targets for coastal habitat management in the South China Sea**

- Appropriate forms of sustainable management established for 860,000 ha of mangrove;
- 153,000 ha of coral reef at 82 priority sites managed sustainably, including a reduction in the decadal rate of degradation in live coral cover from 16 to 5%;
- Conservation, management and sustainable use of 25,900 ha of known seagrass area in the South China Sea;
- Integrated management of 783,900 ha of coastal wetland at 19 sites, including habitat restoration and protection strengthened at priority locations; and
- National and regional level cooperation in tracking results of SAP actions for coastal habitat management.

##### **Strengthening knowledge-based action planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea**

- enhanced information-base for coastal habitat management and action planning;
- effective integration of regional science in the management of land-based pollution;
- strengthened and harmonized national policies and laws, and supporting financial mechanism, for the management of land-based sources of pollution;
- improved national and regional values for the Total Economic Values of coastal habitats for use in development planning and decision-making;
- regionally appropriate tools and mechanisms to guide the development of sustainable management systems for coastal habitats and land-based pollution; and
- an updated and Ministerially adopted Transboundary Diagnostic Analysis and Strategic Action Programme, including prioritization of national management actions to address climate variability and change

##### **Facilitating regional and national level integration and cooperation for implementation of the South China Sea Strategic Action Programme**

- regional and sub-regional co-operation in the integration of scientific knowledge and research outputs with management and policy making;
- capacity for civil society and community organization participation in SAP implementation strengthened via operational partnership with GEF SGP;
- relationships between central and local governments and the private sector strengthened and formalized;
- revitalization of regional mechanisms for communications, knowledge exchange, and information and data management and sharing; and
- agreed arrangements for strengthened regional cooperation in the management of the marine and coastal environment of the South China Sea.

### **Relevance to GEF Programmes**

*The project is in line with:*

GEF strategic long-term objective: Promotion of collective management of transboundary water systems

Strategic programme for GEF V: GEF-5 International Waters Strategic Priority 2:  
Catalyze multi-state cooperation

### **Executing Arrangements**

*The implementing agency for this project was UNEP and the national lead agencies were:*

*The lead national agencies in the focal countries were:*

The Ministry of Environment of Cambodia,

The Ministry of Environment, China

The Ministry of Environment and Forestry of Indonesia,

The Department of Natural Resources and Environment (Philippines),

The Ministry of Environment and Natural Resources (Thailand), and

The Ministry of Natural Resources and Environment (VAST) Viet Nam,

### **Project Activities**

The project comprised activities grouped in three components.

#### **Component 1: Reducing habitat degradation and loss via national and local reforms to achieve Strategic Action Programme targets for coastal habitat management in the South China Sea**

**Mangroves:** Regional, national and local activities under this sub-component are designed to meet the Strategic Action Programme for coastal habitat management. The key anticipated outcome is the establishment of appropriate forms of sustainable management including relevant reforms of laws and regulations for 860,000 ha of mangrove bordering the SCS basin. The project also aims to support these national actions through a regionally co-ordinated programme of technical support; the objective of which is to assist countries in effectively and sustainably managing their mangrove resources. At the national level, activities will focus on: the declaration of 57,400 ha of mangrove as National Parks and Protected Areas; the designation and plans for the management of 166,600 ha of mangrove as non-conversion, sustainable use areas; national reform of laws and regulations for the sustainable use of 602,800 ha of mangrove forest; replanting of 21,000 ha of deforested mangrove land; and biodiversity increased for 11,200 ha of mangrove forest via enrichment planting.

**Coral Reefs:** Actions proposed under this sub-component are designed to promote good environmental governance, relevant national legislative and institutional reforms and sustainable management of coral reef ecosystems. The key anticipated outcome is 153,000 ha of coral reef at 82 priority sites managed sustainably, including a reduction in the decadal rate of degradation in live

coral cover from 16 to 5 percent. At the national and coral reef site levels, activities will include: supporting building management capacity (number/levels human resources, facilities and equipment, and sustainable financing mechanisms) for 82 coral reef sites; improving management approaches (integrated, community-based, multiple use) at 82 coral reef sites; developing management tools (licensing and permit systems, seasonal closures, zoning) in support of legal and regulatory reforms to address key threats at priority sites; and establishing mechanisms for monitoring management, ecological and socio-economic indicators at 82 coral reef sites.

**Seagrass:** Activities will include: putting twenty-one seagrass areas totaling 25,900 ha under sustainable management with supporting laws and regulations; amending national management plans for 7 existing MPAs with significant seagrass areas, to include specific seagrass-related management actions; designating 7 new Marine Protected Areas focusing on seagrass areas identified in the prioritized listings of the SCS Project; and establishing mechanisms for monitoring management, ecological and socio-economic indicators at 21 sites. The key anticipated outcome is the sustainable management of 25,900 ha of seagrass at 21 priority sites in the South China Sea.

**Estuaries, Brackish Water Lagoons, and Inter-Tidal Mud Flats:** Project activities will focus on coastal lagoons, estuaries and mudflats and aim to improve the effectiveness of national policy, legal and institutional arrangements and co-ordination, including the needed national reforms, including: development and implementation of management plans for at least 3 lagoons (26,818 ha), 9 estuaries (614,680 ha), 5 tidal flats (96,903 ha), 1 peat swamp (45,700 ha) and 1 non-peat swamp (9,808 ha); declaring at least 7 wetland areas with protection status (i.e. non-hunting area, nature reserves, protected areas, Ramsar Sites) including the needed management reforms; and adopting a regional estuary monitoring scheme and its national implementation. The key anticipated outcome is the integrated management of 783,900 ha of coastal wetlands at 19 sites bordering the South China Sea marine basin, including habitat restoration and protection strengthened at priority locations and relevant legal and institutional reforms enacted.

**Tracking results of SAP actions for coastal habitat management:** Project activities will facilitate national and regional level cooperation in tracking results of Strategic Action Programme actions for coastal habitat management. Specific indicators of sustainability to be tracked relate to: the enabling environments for sustainable management; improvements to ecological and environmental state; and socio-economic impacts. Activities are designed to reach agreement on standardized methods and guidelines for habitat inventory and assessment, leading to the achievement of regional-level agreement on a harmonized results framework and analytical tool for tracking and reporting on sustainability of habitat management systems in the SCS basin. Additionally, an online ‘results’ portal will be developed to support regional-level capacity building in results-oriented planning and management of coastal habitats, as well as the routine online sharing and syndication of information regarding the results of Strategic Action Programme implementation. The latter will involve online geospatial presentation of results linked to related initiatives of the GEF IW:LEARN initiative. Similarly, performance of the project with respect to indicators defined in the GEF IW tracking tool will be documented and communicated annually; effort will also be made to align the agreed reporting systems with national reporting requirements to various International conventions and the Sustainable Development Goals.

## **Component 2: Strengthening knowledge-based action planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea**

The components of the South China Sea Strategic Action Programme addressing coastal habitat degradation, land-based pollution, and regional cooperation each highlight the need to strengthen the science and knowledge base for action planning and management. Component 2 of this project aims to build on the knowledge-based action planning for the management of the marine and coastal environment of the SCS achieved during Strategic Action Programme formulation. Activities are designed to support consensus building on the information and data to be used in planning and implementing the required local, national and regional reforms required to address the degradation of coastal habitats, land-based pollution, and the adoption of stronger and more formal arrangements for

regional co-operation in the management of the marine and coastal environment of the South China Sea.

At the national level, activities of this component both support, and build on, those implemented as part of component 1 aimed at the achievement SAP targets for habitats. For example, activities to enhance the mapping of coastal habitats through interpretation of satellite imagery, quantify the role of habitats in the sequestration and storage of carbon, and improve data sets for the economic valuation of habitat goods and services will be used to inform national and local consultative processes regarding the delineation of management area boundaries, management planning, and reform of by-laws and ordinances for coastal habitat and resource management at the site level. Additionally, the project will develop tools and mechanisms to guide the development of sustainable management systems for coastal habitats and land-based pollution. These will be used to provide regional level support to operational management at the site level and in tracking the effectiveness of interventions in achieving SAP targets. Similarly, outputs of national activities associated with delivery of component 1, including the conduct of resource inventories, reviews of national and local policies and regulations, documentation of site level governance conditions, and stakeholder analyses will be used in conjunction with regional reviews of the potential impacts of sea level rise, climate change, and episodic events on coastal habitats to inform the development of updated National Action Plans, and the enactment of supporting legislation, for mangroves, coral reefs, seagrass, and wetlands.

The purpose of the land-based pollution component of the Strategic Action Programme is not to finance interventions that directly reduce the load of contaminants reaching the marine environment from land-based sources but rather the implementation of activities to support the integration of regional science with national-level policy making and planning for the management of land-based pollution. In this connection, key outcomes of component 2 include: effective integration of regional science in the management of land-based pollution; and strengthened and harmonized national policies and laws, and supporting financial mechanism, for the management of land-based sources of pollution.

In particular, this project will develop and apply simple models of pollution impacts under different development scenarios for land-based activities to facilitate development decision-making by providing an indication of the sensitivity of specific coastal water bodies to varied heavy metal contaminant loadings. This work builds on related work of the SCS TDA/SAP project to model the nutrient carrying capacity of the SCS marine basin under various loading scenarios. National level activities will support: reviews of legislative and institutional frameworks for land-based pollution management in participating countries; harmonization of national Standard Operating Procedures for land-based pollution control and management, including agreed sediment, biota, and water quality criteria; revision of national/provincial policies; development, enactment and implementation of supporting regulations for land-based pollution; and the updating and adoption of National Investment Plans for land-based pollution management in the SCS. A regional financial mechanism for land-based pollution management will also be established.

Better economic valuation of the good and services of the South China Sea's coastal habitats is critical more sophisticated planning and in communicating with decision-makers. The values determined for coastal habitat goods and services developed the SCS TDA/SAP project are incomplete since not all known goods or services from individual coastal ecosystems have been valued. One area of current weakness is that comparatively few existing values for the service provided by habitats as nursery areas for off-shore fish and crustaceans are included. This is known to be a significant and major service provided by mangrove and seagrass habitats and this project will undertake to establish the economic values of these services. It is anticipated that actions at the national and regional level to implement the SAP will generate more extensive datasets at the national level, which if included in the regional dataset will greatly enhance the utility of the regional dataset in determining regional priorities for action and intervention. One additional area of identified need that this project will address is the determination of economic losses of coastal ecosystem goods and services consequent upon coastal shipping accidents and land-based pollution damage. Component 2 will therefore improve the national and regional values for the Total Economic Values of coastal habitats for use in development planning and decision-making, and will make substantive contributions to the conduct of cost-benefit analyses of management options undertaken as part of national action planning for coastal

habitats and land-based pollution, as well as in updating the SCS TDA and SAP. The economic valuation work of this component will also build on preliminary work of the SCS project to value the economic impacts of land-based pollution from local, national and transboundary perspectives and will contribute to the planning of a mechanism for the sustainable financing of land-based pollution activities of a revised SAP.

Activities to undertake a more contemporary Transboundary Diagnostic Analysis for the SCS basin, and linked actions to prepare an updated Strategic Action Programme for the SCS, will draw on information generated via the abovementioned activities. Key project activities include: facilitation of consultative processes to reach national and regional level consensus on contemporary issues and problems in the SCS, including the quantification of environmental compromises and the prioritization of problems; preparation of guidelines and mobilization of technical support to assist with the characterization of the immediate and ultimate root causes of the problems identified and to reach consensus on priorities for intervention, including the assessment of the comparative net benefit of options based on revised economic valuation information; and efforts to prepare an updated SAP which will include a prioritization of national management actions to address climate variability and change for subsequent incorporation into national marine and coastal policies and plans.

### **Component 3: Facilitating regional and national level integration and cooperation for implementation of the South China Sea Strategic Action Programme**

The South China Sea Strategic Action Programme acknowledged the need for strengthened regional cooperation in SAP implementation as well as the adoption of stronger, financially sustainable, and more formal arrangements for regional co-operation in the longer-term management of the marine and coastal environment of the South China Sea. Accordingly Component 3 is designed to build on the outcomes of the SCS TDAP/SAP project through facilitation of the regional and national level integration and cooperation required to generate the reforms required to reduce environmental degradation trends and guide the longer-term sustainable management of the marine and coastal environment of the South China Sea.

The SAP includes a number of agreed mechanisms for effective cooperation. These mechanisms include the operation of a high level scientific and technical body that will serve as a forum for reconciling both sectorial and national interests and priorities, and to foster the incorporation of sound science into decision-making. Component 3 will meet this agreed need via operation of a Regional Scientific and Technical Committee that will act as a source of independent scientific and technical advice to policy-makers. To support the uptake of regionally accumulated scientific knowledge in policy-making and planning, the project will facilitate exchanges between government and the scientific community via biennial Regional Scientific Conferences. This will be complemented via the development and operation of a network of local government officials and operational level managers, including annual Mayors' Round-table meetings, to share experiences and best practices in the application of science in the management of coastal habitats and land-based pollution.

A further expected outcome of this component is sub-regional cooperation in the integration of scientific knowledge and research outputs in two priority transboundary areas. The latter builds on a key innovation of the SCS TDA/SAP project which involved the generation of bilateral cooperation between Cambodia and Viet Nam which led to the signing of a Memorandum of Understanding between the Provincial Governors of Kampot (Cambodia) and Kien Giang (Viet Nam) (and which was subsequently formalized by the central governments of these countries) for the joint management of the environment and coastal resources of their shared transboundary water area. Activities under this component will strengthen this formal transboundary cooperation and facilitate its replication in an additional two transboundary areas.

An additional mechanism for cooperation emphasized by the South China Sea Strategic Action Programme includes networking at all levels and amongst all stakeholders. In this connection, project activities will build on the intra-country and inter-country consultation and cooperation fostered by the SCS TDA/SAP project via efforts to strengthen civil society, community organization, and private sector engagement in SAP implementation and revision. Specifically, capacity for civil society and community organization participation in SAP implementation will be strengthened via an operational

partnership with the GEF Small Grants Programme. Relationships between central and local governments and the private sector will also be strengthened and formalized via development of a public-private partnerships and an associated investment plan for the implementation of the updated SAP.

Component 3 will also revitalize and strengthen regional mechanisms for communications, knowledge exchange, and information and data management and sharing. This will involve the development and implementation of a communications strategy for the delivery of targeted messaging to national level stakeholders, regional supporting organizations and projects, and donors on the results of SAP implementation and related efforts in strengthening regional cooperation. This is aimed at stimulating support and awareness of necessary policy and legal reforms and in ensuring that best practices generated at the national level are captured, shared and effectively communicated to guide the longer-term sustainability of investments. Regionally appropriate knowledge tools will also developed to support decision-making and planning. This component also includes the sustained operation of the SCS project web portal <www.unepscs.org> and associated regional databases, which will also be linked to IW:LEARN and other GEF Knowledge management systems. Active engagement with GEF IW:LEARN [1% of project resources], including participation in IW conferences and preparation of 3 experience notes, will also be fostered.

Of significance is Outcome 3.5 “*Agreed arrangements for strengthened regional cooperation in the management of the marine and coastal environment of the South China Sea*” which involves the review and assessment of regional and national institutional frameworks and the formulation of appropriate recommendations for strengthened regional cooperation in the implementation of the SAP for the management of the marine and coastal environment of the South China Sea. Such cooperation will foster the wise use of natural, human and financial resources whilst conforming to the ethos and culture of the region. Supporting activities include: biannual meetings of the Regional Task Force on Legal Matters to review the proposed policy, cooperation and institutional strengthening recommendations in support of SAP implementation; the establishment and operation of National Working Groups on matters to be decided by the countries to support national and provincial level discussion and agreement on policy, cooperation and institutional reforms; and reviews and evaluation of existing arrangements for cooperation leading to adoption of an instrument to strengthen regional cooperation for coastal and marine environmental management in the South China Sea.

## **Budget**

At project inception the following budget prepared:

	<u>GEF</u>	<u>Co-funding</u>
Project preparation funds:	300,000	-
GEF full Size Grant	15,000,000	83,451,948

## **TOTAL**

**(including project preparation funds)                    15,300,000                    98,751,948**

Co-funding sources: National governments of the six participating countries, UNEP and COBSEA

Anticipated: US\$83,451,948

## **TERMS OF REFERENCE FOR THE EVALUATION**

### **1. Objective and Scope of the Evaluation**

The objective of this terminal evaluation is to examine the extent and magnitude of any project impacts to date and determine the likelihood of future impacts. The evaluation will also assess project performance and the implementation of planned project activities and planned outputs against actual results. The evaluation will focus on the following main questions:

1. Did the project help to { } among key target audiences (international conventions and initiatives, national level policy-makers, regional and local policy-makers, resource managers and practitioners).
2. Did the outputs of the project articulate options and recommendations for { }? Were these options and recommendations used? If so by whom?
3. To what extent did the project outputs produced have the weight of scientific authority and credibility necessary to influence policy makers and other key audiences?

## **Methods**

This terminal evaluation will be conducted as an in-depth evaluation using a participatory approach whereby the UNEP Task Manager, key representatives of the executing agency and national lead agencies and other relevant staff are kept informed and consulted throughout the evaluation. The consultant will liaise with the UNEP/EOU and the UNEP Task Manager on any logistic and/or methodological issues to properly conduct the review in as independent a way as possible, given the circumstances and resources offered. The draft report will be circulated to the UNEP Task Manager, the Project Director, and the National Focal Points from the lead national agencies and the UNEP/EOU. Any comments or responses to the draft report will be sent to UNEP / EOU for collation and the consultant will be advised of any necessary or suggested revisions.

The findings of the evaluation will be based on the following:

1. A desk review of project documents including, but not limited to:
  - (a) The project documents, outputs, monitoring reports (such as progress and financial reports to UNEP and GEF annual Project Implementation Review reports) and relevant correspondence.
  - (b) Reports of the Project Steering Committee and Regional Scientific and Technical Committee meetings.
  - (c) Other project-related material produced by the project staff or partners.
  - (d) Relevant material published on the project web-site: { }.
2. Interviews with project management and technical support including {NEED INPUT FROM TM HERE}
3. Interviews and Telephone interviews with intended users for the project outputs and other stakeholders involved with this project, including in the participating countries and international bodies. The Consultant shall determine whether to seek additional information and opinions from representatives of other organizations. As appropriate, these interviews could be combined with an email questionnaire.
4. Interviews with the UNEP/DEPI project task manager and Fund Management Officer, and other relevant staff in UNEP dealing with International Waters-related activities as necessary. The Consultant shall also gain broader perspectives from discussions with relevant GEF Secretariat staff.
5. Field visits<sup>81</sup> to project staff and *refugia* sites

## **Key Evaluation principles.**

In attempting to evaluate any outcomes and impacts that the project may have achieved, evaluators should remember that the project's performance should be assessed by considering the difference between the answers to two simple questions "***what happened?***" and "***what would have happened anyway?***". These questions imply that there should be consideration of the baseline conditions and

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<sup>81</sup> Evaluators should make a brief courtesy call to GEF Country Focal points during field visits if at all possible.

trends in relation to the intended project outcomes and impacts. In addition it implies that there should be plausible evidence to **attribute** such outcomes and impacts **to the actions of the project**.

Sometimes, adequate information on baseline conditions and trends is lacking. In such cases this should be clearly highlighted by the evaluator, along with any simplifying assumptions that were taken to enable the evaluator to make informed judgements about project performance.

## **2. Project Ratings**

The success of project implementation will be rated on a scale from ‘highly unsatisfactory’ to ‘highly satisfactory’. In particular the evaluation shall **assess and rate** the project with respect to the eleven categories defined below:<sup>82</sup>

### **A. Attainment of objectives and planned results:**

The evaluation should assess the extent to which the project's major relevant objectives were effectively and efficiently achieved or are expected to be achieved and their relevance.

- *Effectiveness:* Evaluate how, and to what extent, the stated project objectives have been met, taking into account the “achievement indicators”. The analysis of outcomes achieved should include, *inter alia*, an assessment of the extent to which the project has directly or indirectly assisted policy and decision-makers to apply information supplied by biodiversity indicators in their national planning and decision-making. In particular:
  - Evaluate the immediate impact of the project on international waters monitoring and in national planning and decision-making and international understanding and use of IW indicators.
  - As far as possible, also assess the potential longer-term impacts considering that the evaluation is taking place upon completion of the project and that longer term impact is expected to be seen in a few years time. Frame recommendations to enhance future project impact in this context. Which will be the major ‘channels’ for longer term impact from the project at the national and international scales?
    - *Relevance:* In retrospect, were the project’s outcomes consistent with the focal areas/operational program strategies? Ascertain the nature and significance of the contribution of the project outcomes to the wider portfolio of the GEF.
    - *Efficiency:* Was the project cost effective? Was the project the least cost option? Was the project implementation delayed and if it was, then did that affect cost-effectiveness? Assess the contribution of cash and in-kind co-financing to project implementation and to what extent the project leveraged additional resources. Did the project build on earlier initiatives, did it make effective use of available scientific and / or technical information. Wherever possible, the evaluator should also compare the cost-time vs. outcomes relationship of the project with that of other similar projects.

### **B. Sustainability:**

Sustainability is understood as the probability of continued long-term project-derived outcomes and impacts after the GEF project funding ends. The evaluation will identify and assess the key conditions or factors that are likely to contribute or undermine the persistence of benefits after the project ends. Some of these factors might be outcomes of the project, e.g. stronger institutional capacities or better informed decision-making. Other factors will include contextual circumstances or developments that are not outcomes of the project but that are relevant to the sustainability of outcomes. The evaluation should ascertain to what extent follow-up work has been initiated and how project outcomes will be sustained and enhanced over time.

Five aspects of sustainability should be addressed: financial, socio-political, institutional frameworks and governance, environmental (if applicable). The following questions provide guidance on the assessment of these aspects:

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<sup>82</sup> However, the views and comments expressed by the evaluator need not be restricted to these items.

- *Financial resources.* Are there any financial risks that may jeopardize sustenance of project outcomes? What is the likelihood that financial and economic resources will not be available once the GEF assistance ends (resources can be from multiple sources, such as the public and private sectors, income generating activities, and trends that may indicate that it is likely that in future there will be adequate financial resources for sustaining project's outcomes)? To what extent are the outcomes of the project dependent on continued financial support?
- *Socio-political:* Are there any social or political risks that may jeopardize sustenance of project outcomes? What is the risk that the level of stakeholder ownership will be insufficient to allow for the project outcomes to be sustained? Do the various key stakeholders see that it is in their interest that the project benefits continue to flow? Is there sufficient public / stakeholder awareness in support of the long term objectives of the project?
- *Institutional framework and governance.* To what extent is the sustenance of the outcomes of the project dependent on issues relating to institutional frameworks and governance? What is the likelihood that institutional and technical achievements, legal frameworks, policies and governance structures and processes will allow for, the project outcomes/benefits to be sustained? While responding to these questions consider if the required systems for accountability and transparency and the required technical know-how are in place.
- *Environmental.* Are there any environmental risks that can undermine the future flow of project environmental benefits? The TE should assess whether certain activities in the project area will pose a threat to the sustainability of the project outcomes. For example; construction of dam in a protected area could inundate a sizable area and thereby neutralize the biodiversity-related gains made by the project; or, a newly established pulp mill might jeopardise the viability of nearby protected forest areas by increasing logging pressures; or a vector control intervention may be made less effective by changes in climate and consequent alterations to the incidence and distribution of malarial mosquitoes.

**C. Achievement of outputs and activities:**

- Delivered outputs: Assessment of the project's success in producing each of the programmed outputs, both in quantity and quality as well as usefulness and timeliness.
- Assess the soundness and effectiveness of the methodologies used for developing the technical documents and related management options in the participating countries
- Assess to what extent the project outputs produced have the weight of scientific authority / credibility, necessary to influence policy and decision-makers, particularly at the national level.

**D. Catalytic Role**

Replication and catalysis. What examples are there of replication and catalytic outcomes? Replication approach, in the context of GEF projects, is defined as lessons and experiences coming out of the project that are replicated or scaled up in the design and implementation of other projects. Replication can have two aspects, replication proper (lessons and experiences are replicated in different geographic area) or scaling up (lessons and experiences are replicated within the same geographic area but funded by other sources). Specifically:

- Do the recommendations for management of coastal habitats and land-based pollution coming from the country studies have the potential for application in other countries and locations?

If no effects are identified, the evaluation will describe the catalytic or replication actions that the project carried out.

**E. Assessment monitoring and evaluation systems.**

The evaluation shall include an assessment of the quality, application and effectiveness of project monitoring and evaluation plans and tools, including an assessment of risk management based on

the assumptions and risks identified in the project document. The Terminal Evaluation will assess whether the project met the minimum requirements for ‘project design of M&E’ and ‘the application of the Project M&E plan’ (see minimum requirements 1&2 in Annex 4 to this Appendix). GEF projects must budget adequately for execution of the M&E plan, and provide adequate resources during implementation of the M&E plan. Project Directors are also expected to use the information generated by the M&E system during project implementation to adapt and improve the project.

### **M&E during project implementation**

- *M&E design.* Projects should have sound M&E plans to monitor results and track progress towards achieving project objectives. An M&E plan should include a baseline (including data, methodology, etc.), SMART indicators (see Annex 4) and data analysis systems, and evaluation studies at specific times to assess results. The time frame for various M&E activities and standards for outputs should have been specified.
- *M&E plan implementation.* A Terminal Evaluation should verify that: an M&E system was in place and facilitated timely tracking of results and progress towards projects objectives throughout the project implementation period (perhaps through use of a logframe or similar); annual project reports and Progress Implementation Review (PIR) reports were complete, accurate and with well justified ratings; that the information provided by the M&E system was used during the project to improve project performance and to adapt to changing needs; and that projects had an M&E system in place with proper training for parties responsible for M&E activities.
- *Budgeting and Funding for M&E activities.* The terminal evaluation should determine whether support for M&E was budgeted adequately and was funded in a timely fashion during implementation.

### **F. Preparation and Readiness**

Were the project’s objectives and components clear, practicable and feasible within its timeframe? Were the capacities of executing institution and counterparts properly considered when the project was designed? Were lessons from other relevant projects properly incorporated in the project design? Were the partnership arrangements properly identified and the roles and responsibilities negotiated prior to project implementation? Were counterpart resources (funding, staff, and facilities), enabling legislation, and adequate project management arrangements in place?

### **G. Country ownership / driveness:**

This is the relevance of the project to national development and environmental agendas, recipient country commitment, and regional and international agreements. The evaluation will:

- Assess the level of country ownership. Specifically, the evaluator should assess whether the project was effective in providing and communicating biodiversity information that catalyzed action in participating countries to improve decisions relating to the conservation and management of the focal ecosystem in each country.
- Assess the level of country commitment to the generation and use of biodiversity indicators for decision-making during and after the project, including in regional and international *fora*.

### **H. Stakeholder participation / public awareness:**

This consists of three related and often overlapping processes: information dissemination, consultation, and “stakeholder” participation. Stakeholders are the individuals, groups, institutions, or other bodies that have an interest or stake in the outcome of the GEF- financed project. The term also applies to those potentially adversely affected by a project. The evaluation will specifically:

- Assess the mechanisms put in place by the project for identification and engagement of stakeholders in each participating country and establish, in consultation with the stakeholders, whether this mechanism was successful, and identify its strengths and weaknesses.
- Assess the degree and effectiveness of collaboration/interactions between the various project partners and institutions during the course of implementation of the project.
- Assess the degree and effectiveness of any various public awareness activities that were undertaken during the course of implementation of the project.

**I.**

**Financial Planning**

Evaluation of financial planning requires assessment of the quality and effectiveness of financial planning and control of financial resources throughout the project's lifetime. Evaluation includes actual project costs by activities compared to budget (variances), financial management (including disbursement issues), and co-financing. The evaluation should:

- Assess the strength and utility of financial controls, including reporting, and planning to allow the project management to make informed decisions regarding the budget and allow for a proper and timely flow of funds for the payment of satisfactory project deliverables.
- Present the major findings from the financial audit if one has been conducted.
- Identify and verify the sources of co-financing as well as leveraged and associated financing (in co-operation with the IA and EA).
- Assess whether the project has applied appropriate standards of due diligence in the management of funds and financial audits.
- The evaluation should also include a breakdown of final actual costs and co-financing for the project prepared in consultation with the relevant UNEP/DEPI Fund Management Officer of the project (table attached in *Annex I* to this Appendix Co-financing and leveraged resources).

**J.**

**Implementation approach:**

This includes an analysis of the project's management framework, adaptation to changing conditions (adaptive management), partnerships in implementation arrangements, changes in project design, and overall project management. The evaluation will:

- Ascertain to what extent the project implementation mechanisms outlined in the project document have been closely followed. In particular, assess the role of the various committees established and whether the project document was clear and realistic to enable effective and efficient implementation, whether the project was executed according to the plan and how well the management was able to adapt to changes during the life of the project to enable the implementation of the project.
- Evaluate the effectiveness and efficiency and adaptability of project management and the supervision of project activities / project execution arrangements at all levels (1) policy decisions: Steering Group; (2) day to day project management in each of the country executing agencies.

## K. UNEP Supervision and Backstopping

- Assess the effectiveness of supervision and administrative and financial support provided by UNEP.
- Identify administrative, operational and/or technical problems and constraints that influenced the effective implementation of the project.

The **ratings will be presented in the form of a table**. Each of the eleven categories should be rated separately with **brief justifications** based on the findings of the main analysis. An overall rating for the project should also be given. The following rating system is to be applied:

HS	= Highly Satisfactory
S	= Satisfactory
MS	= Moderately Satisfactory
MU	= Moderately Unsatisfactory
U	= Unsatisfactory
HU	= Highly Unsatisfactory

### 3. Evaluation report format and review procedures

The report should be brief, to the point and easy to understand. It must explain; the purpose of the evaluation, exactly what was evaluated and the methods used. The report must highlight any methodological limitations, identify key concerns and present evidence-based findings, consequent conclusions, recommendations and lessons. The report should be presented in a way that makes the information accessible and comprehensible and include an executive summary that encapsulates the essence of the information contained in the report to facilitate dissemination and distillation of lessons.

**The evaluation will rate the overall implementation success of the project and provide individual ratings of the eleven implementation aspects as described in Section 1 of this TOR. The ratings will be presented in the format of a table with brief justifications based on the findings of the main analysis.**

Evidence, findings, conclusions and recommendations should be presented in a complete and balanced manner. Any dissident views in response to evaluation findings will be appended in an annex. The evaluation report shall be written in English, be of no more than 50 pages (excluding annexes), use numbered paragraphs and include:

- i) An **executive summary** (no more than 3 pages) providing a brief overview of the main conclusions and recommendations of the evaluation;
- ii) **Introduction and background** giving a brief overview of the evaluated project, for example, the objective and status of activities; The GEF Monitoring and Evaluation Policy, 2006, requires that a TE report will provide summary information on when the evaluation took place; places visited; who was involved; the key questions; and, the methodology.
- iii) **Scope, objective and methods** presenting the evaluation's purpose, the evaluation criteria used and questions to be addressed;
- iv) **Project Performance and Impact** providing *factual evidence* relevant to the questions asked by the evaluator and interpretations of such evidence. This is the main substantive section of the report. The evaluator should provide a commentary and analysis on all eleven evaluation aspects (A – K above).
- v) **Conclusions and rating** of project implementation success giving the evaluator's concluding assessments and ratings of the project against given evaluation criteria and

- standards of performance. The conclusions should provide answers to questions about whether the project is considered good or bad, and whether the results are considered positive or negative. The ratings should be provided with a brief narrative comment in a table (see *Annex 1* to this Appendix);
- vi) **Lessons (to be) learned** presenting general conclusions from the standpoint of the design and implementation of the project, based on good practices and successes or problems and mistakes. Lessons should have the potential for wider application and use. All lessons should ‘stand alone’ and should:
- Briefly describe the context from which they are derived
  - State or imply some prescriptive action;
  - Specify the contexts in which they may be applied (if possible, who when and where)
- vii) **Recommendations** suggesting *actionable* proposals for improvement of the current project. In general, Terminal Evaluations are likely to have very few (perhaps two or three) actionable recommendations.
- Prior to each recommendation*, the issue(s) or problem(s) to be addressed by the recommendation should be clearly stated.
- A high quality recommendation is an actionable proposal that is:
1. Feasible to implement within the timeframe and resources available
  2. Commensurate with the available capacities of project team and partners
  3. Specific in terms of who would do what and when
  4. Contains results-based language (i.e. a measurable performance target)
  5. Includes a trade-off analysis, when its implementation may require utilizing significant resources that would otherwise be used for other project purposes.
- viii) **Annexes** may include additional material deemed relevant by the evaluator but must include:
1. The Evaluation Terms of Reference,
  2. A list of interviewees, and evaluation timeline
  3. A list of documents reviewed / consulted
  4. Summary co-finance information and a statement of project expenditure by activity
  5. The expertise of the evaluation team. (brief CV).

TE reports will also include any response / comments from the project management team and/or the country focal point regarding the evaluation findings or conclusions as an annex to the report, however, such will be appended to the report by UNEP EOU.

Examples of UNEP GEF Terminal Evaluation Reports are available at [www.unep.org/eou](http://www.unep.org/eou)

### **Review of the Draft Evaluation Report**

Draft reports submitted to UNEP EOU are shared with the corresponding Programme or Project Officer and his or her supervisor for initial review and consultation. The Tasm Manager and senior Executing Agency staff are allowed to comment on the draft evaluation report. They may provide feedback on any errors of fact and may highlight the significance of such errors in any conclusions. The consultation also seeks feedback on the proposed recommendations. UNEP EOU collates all review comments and provides them to the evaluators for their consideration in preparing the final version of the report.

### **4. Submission of Final Terminal Evaluation Reports.**

The final report shall be submitted in electronic form in MS Word format and should be sent to the following persons:

**Mike Spilsbury D.Phil**  
Head, Evaluation Office

United Nations Environment Programme  
NOF Block 2, 3rd Floor, North Wing  
P.O. Box 30552-GPO-00100, Nairobi, Kenya  
**Tel: 254 20 7625097**  
Email: [Michael.Spilsbury@unep.org](mailto:Michael.Spilsbury@unep.org)

With a copy to:

Brennan Van Dyke  
Deputy Director, Office for Operations  
Director, Donor Partnerships, GEF Coordination and Contributions  
Email: [vandyke@un.org](mailto:vandyke@un.org)

Isabelle Van der Beck  
UNEP GEF IW Portfolio Manager  
DEPI  
900, 17th Street, N.W.  
Washington, D.C. - 20006 - USA  
Tel: +1-202-974-1314  
Email 1: [isabelle.vanderbeck@unep.org](mailto:isabelle.vanderbeck@unep.org)

The Final evaluation will also be copied to the following GEF National Focal Points.

**Mr. Yingming YANG**  
**Council Member for the constituency of China since 2014-10-15, Donor Participants (Replenishment)**  
**Deputy Director-General, International Financial Cooperation Department**  
**Ministry of Finance**  
**Sanlihe Xicheng District**  
**Beijing, 100820**  
**China**  
**Tel:+ 86 10 6855 2097**  
**Fax:011 86 10 6855 3101**  
**Email:[yingmingyang2002@yahoo.com](mailto:yingmingyang2002@yahoo.com), [yangyingminggef@163.com](mailto:yangyingminggef@163.com)**

**Cambodia**  
**Mr. Lanh HEAL**  
Operational Focal Point since 2005-01-14  
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Ministry of Environment  
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Phnom Penh,  
Cambodia  
Tel:+ 855 12 923 526/ 011 855 129 27001  
Fax:011 855 23 987 880  
Email:[heal\\_lonhmoe@yahoo.com](mailto:heal_lonhmoe@yahoo.com)

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**Ms. LaksmiDewanti**  
Operational Focal Point  
Senior Advisor to the Ministry on Industry and Trade  
ManggalaWanabakti  
Blok 1 Fl.3  
Jl. GatotSubroto  
Senayan, Jakarta Pusat

**Philippines****Ms. Analiza REBUELTA - TEH**

Operational Focal Point since 2009-05-04

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Email:analiza@denr.gov.ph, tehanna08@gmail.com, [tehanna17@yahoo.com](mailto:tehanna17@yahoo.com)**Thailand****Dr. Kasemsun CHINNAVASO**

Operational Focal Point since 2015-07-15

Permanent Secretary

Ministry of Natural Resources and Environment

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Bangkok, 10400

Thailand

Tel:662 278 8544

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**Vietnam****Dr. Mr. Nam Thang DO**

Operational Focal Point since 2014-01-15

Deputy Director General, Department of International Cooperation

Ministry of Natural Resources and Environment

10 Ton That Thuyet - Cau Giay

Hanoi, Hanoi 00

Vietnam

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Email:dnthang@monre.gov.vn, donamthang09@gmail.com

The final evaluation report will be published on the Evaluation and Oversight Unit's web-site [www.unep.org/eou](http://www.unep.org/eou) and may be printed in hard copy. Subsequently, the report will be sent to the GEF Office of Evaluation for their review, appraisal and inclusion on the GEF website.

**5. Resources and schedule of the evaluation**

This final evaluation will be undertaken by an international evaluator contracted by the Evaluation and Oversight Unit, UNEP. The contract for the evaluator will begin on ddmmmyyy and end on ddmmmyyyy (# days) spread over # weeks (# days of travel, to {country(ies)}, and # days desk study). The evaluator will submit a draft report on ddmmmyyyy to UNEP/EOU, the UNEP/DEPI Task Manager, and key representatives of the executing agencies. Any comments or responses to the draft report will be sent to UNEP / EOU for collation and the consultant will be advised of any necessary revisions. Comments to the final draft report will be sent to the consultant by ddmmmyyyy after which, the consultant will submit the final report no later than ddmmmyyyy.

The evaluator will after an initial telephone briefing with EOU the UNEP Task Manager and the SEAFDEC Project Director conduct initial desk review work and later travel to {country(ies)} and meet with project staff at the beginning of the evaluation. Furthermore, the evaluator is expected to

travel to {country(ies)} and meet with representatives of the project executing agencies and the intended users of project's outputs.

In accordance with UNEP/GEF policy, all GEF projects are evaluated by independent evaluators contracted as consultants by the EOU. The evaluator should have the following qualifications:

The evaluator should not have been associated with the design and implementation of the project in a paid capacity. The evaluator will work under the overall supervision of the Chief, Evaluation and Oversight Unit, UNEP. The evaluator should be an international expert in coastal fisheries with a sound understanding of habitat related issues. The consultant should have the following minimum qualifications: (i) experience in { } issues; (ii) experience with management and implementation of { } projects and in particular with { } targeted at policy-influence and decision-making; (iii) experience with project evaluation. Knowledge of UNEP programmes and GEF activities is desirable. Knowledge of {specify language(s)} is an advantage. Fluency in oral and written English is a must.

## **6. Schedule Of Payment**

The consultant shall select one of the following two contract options:

### **Lump-Sum Option**

The evaluator will receive an initial payment of 30% of the total amount due upon signature of the contract. A further 30% will be paid upon submission of the draft report. A final payment of 40% will be made upon satisfactory completion of work. The fee is payable under the individual Special Service Agreement (SSA) of the evaluator and is **inclusive** of all expenses such as travel, accommodation and incidental expenses.

### **Fee-only Option**

The evaluator will receive an initial payment of 40% of the total amount due upon signature of the contract. Final payment of 60% will be made upon satisfactory completion of work. The fee is payable under the individual SSAs of the evaluator and is **NOT** inclusive of all expenses such as travel, accommodation and incidental expenses. Ticket and DSA will be paid separately.

In case, the evaluator cannot provide the products in accordance with the TORs, the timeframe agreed, or his products are substandard, the payment to the evaluator could be withheld, until such a time the products are modified to meet UNEP's standard. In case the evaluator fails to submit a satisfactory final product to UNEP, the product prepared by the evaluator may not constitute the evaluation report.

*Annex 1 to Appendix 9: OVERALL RATINGS TABLE*

Criterion	Evaluator's Summary Comments	Evaluator's Rating
<b>A. Attainment of project objectives and results (overall rating)</b> <b>Sub criteria (below)</b>		
A. 1. Effectiveness		
A. 2. Relevance		
A. 3. Efficiency		
<b>B. Sustainability of Project outcomes (overall rating)</b> <b>Sub criteria (below)</b>		
B. 1. Financial		
B. 2. Socio Political		
B. 3. Institutional framework and governance		
B. 4. Ecological		
<b>C. Achievement of outputs and activities</b>		
<b>D. Monitoring and Evaluation (overall rating)</b> <b>Sub criteria (below)</b>		
D. 1. M&E Design		
D. 2. M&E Plan Implementation (use for adaptive management)		
D. 3. Budgeting and Funding for M&E activities		
<b>E. Catalytic Role</b>		
<b>F. Preparation and readiness</b>		
<b>G. Country ownership / drivenness</b>		
<b>H. Stakeholders involvement</b>		
<b>I. Financial planning</b>		
<b>J. Implementation approach</b>		
<b>K. UNEP Supervision and backstopping</b>		

### RATING OF PROJECT OBJECTIVES AND RESULTS

**Highly Satisfactory (HS):** The project had no shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

**Satisfactory (S):** The project had minor shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

**Moderately Satisfactory (MS):** The project had moderate shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

**Moderately Unsatisfactory (MU):** The project had significant shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

**Unsatisfactory (U)** The project had major shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

**Highly Unsatisfactory (HU):** The project had severe shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

**Please note:** Relevance and effectiveness will be considered as critical criteria. The overall rating of the project for achievement of objectives and results **may not be higher** than the lowest rating on either of these two criteria. Thus, to have an overall satisfactory rating for outcomes a project must have at least satisfactory ratings on both relevance and effectiveness.

## RATINGS ON SUSTAINABILITY

A. Sustainability will be understood as the probability of continued long-term outcomes and impacts after the GEF project funding ends. The Terminal evaluation will identify and assess the key conditions or factors that are likely to contribute or undermine the persistence of benefits after the project ends. Some of these factors might be outcomes of the project, i.e. stronger institutional capacities, legal frameworks, socio-economic incentives /or public awareness. Other factors will include contextual circumstances or developments that are not outcomes of the project but that are relevant to the sustainability of outcomes.

### Rating system for sustainability sub-criteria

On each of the dimensions of sustainability of the project outcomes will be rated as follows.

Likely (L): There are no risks affecting this dimension of sustainability.

Moderately Likely (ML). There are moderate risks that affect this dimension of sustainability.

Moderately Unlikely (MU): There are significant risks that affect this dimension of sustainability

Unlikely (U): There are severe risks that affect this dimension of sustainability.

According to the GEF Office of Evaluation, all the risk dimensions of sustainability are deemed critical. Therefore, overall rating for sustainability will not be higher than the rating of the dimension with lowest ratings. For example, if a project has an Unlikely rating in any of the dimensions then its overall rating cannot be higher than Unlikely, regardless of whether higher ratings in other dimensions of sustainability produce a higher average.

## RATINGS OF PROJECT M&E

Monitoring is a continuing function that uses systematic collection of data on specified indicators to provide management and the main stakeholders of an ongoing project with indications of the extent of progress and achievement of objectives and progress in the use of allocated funds. Evaluation is the systematic and objective assessment of an on-going or completed project, its design, implementation and results. Project evaluation may involve the definition of appropriate standards, the examination of performance against those standards, and an assessment of actual and expected results.

The Project monitoring and evaluation system will be rated on ‘M&E Design’, ‘M&E Plan Implementation’ and ‘Budgeting and Funding for M&E activities’ as follows:

Highly Satisfactory (HS): There were no shortcomings in the project M&E system.  
Satisfactory(S): There were minor shortcomings in the project M&E system.

Moderately Satisfactory (MS): There were moderate shortcomings in the project M&E system.

Moderately Unsatisfactory (MU): There were significant shortcomings in the project M&E system.

Unsatisfactory (U): There were major shortcomings in the project M&E system.

Highly Unsatisfactory (HU): The Project had no M&E system.

“M&E plan implementation” will be considered a critical parameter for the overall assessment of the M&E system. The overall rating for the M&E systems will not be higher than the rating on “M&E plan implementation.”

All other ratings will be on the GEF six point scale.

GEF Performance Description	Alternative description on the same scale
HS = Highly Satisfactory	Excellent
S = Satisfactory	Well above average
MS = Moderately Satisfactory	Average

MU	= Moderately Unsatisfactory	Below Average
U	= Unsatisfactory	Poor
HU	= Highly Unsatisfactory	Very poor (Appalling)

*Annex 2 to Appendix 9: Co-financing and Leveraged Resources*

Co financing (Type/Source)	IA own Financing (mill US\$)		Government (mill US\$)		Other*		Total (mill US\$)		Total Disbursement (mill US\$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
- Grants										
- Loans/Concessional (compared to market rate)										
- Credits										
- Equity investments										
- In-kind support										
- Other (*)										
-										
-										
-										
-										
<b>Totals</b>										

*Co-financing (basic data to be supplied to the consultant for verification)*

\* Other is referred to contributions mobilized for the project from other multilateral agencies, bilateral development cooperation agencies, NGOs, the private sector and beneficiaries.

**Leveraged Resources**

Leveraged resources are additional resources—beyond those committed to the project itself at the time of approval—that are mobilized later as a direct result of the project. Leveraged resources can be financial or in-kind and they may be from other donors, NGO's, foundations, governments, communities or the private sector. Please briefly describe the resources the project has leveraged since inception and indicate how these resources are contributing to the project's ultimate objective.

**Table showing final actual project expenditure by activity to be supplied by the UNEP Fund management Officer. (insert here)**

*Annex 3 to Appendix 9*

### **Review of the Draft Report**

Draft reports submitted to UNEP EOU are shared with the corresponding Programme or Project Officer and his or her supervisor for initial review and consultation. The DEPI staff and senior Executing Agency staff provide comments on the draft evaluation report. They may provide feedback on any errors of fact and may highlight the significance of such errors in any conclusions. The consultation also seeks agreement on the findings and recommendations. UNEP EOU collates the review comments and provides them to the evaluators for their consideration in preparing the final version of the report. General comments on the draft report with respect to compliance with these TOR are shared with the reviewer.

### **Quality Assessment of the Evaluation Report**

All UNEP GEF Mid Term Reports are subject to quality assessments by UNEP EOU. These apply GEF Office of Evaluation quality assessment and are used as a tool for providing structured feedback to the evaluator.

The quality of the draft evaluation report is assessed and rated against the following criteria:

<b>GEF Report Quality Criteria</b>	<b>UNEP EOU Assessment</b>	<b>Rating</b>
A. Did the report present an assessment of relevant outcomes and achievement of project objectives in the context of the focal area program indicators if applicable?		
B. Was the report consistent and the evidence complete and convincing and were the ratings substantiated when used?		
C. Did the report present a sound assessment of sustainability of outcomes?		
D. Were the lessons and recommendations supported by the evidence presented?		
E. Did the report include the actual project costs (total and per activity) and actual co-financing used?		
F. Did the report include an assessment of the quality of the project M&E system and its use for project management?		
<b>UNEP EOU additional Report Quality Criteria</b>	<b>UNEP EOU Assessment</b>	<b>Rating</b>
G. Quality of the lessons: Were lessons readily applicable in other contexts? Did they suggest prescriptive action?		
H. Quality of the recommendations: Did recommendations specify the actions necessary to correct existing conditions or improve operations ('who?' 'what?' 'where?' 'when?'). Can they be implemented? Did the recommendations specify a goal and an associated performance indicator?		
I. Was the report well written? (clear English language and grammar)		
J. Did the report structure follow EOU guidelines, were all requested Annexes included?		
K. Were all evaluation aspects specified in the TORs adequately addressed?		
L. Was the report delivered in a timely manner		

**GEF Quality of the MTE report = 0.3\*(A + B) + 0.1\*(C+D+E+F)**

**EOU assessment of MTE report = 0.3\*(G + H) + 0.1\*(I+J+K+L)**

**Combined quality Rating = (2\* ‘GEF EO’ rating + EOU rating)/3**

The Totals are rounded and converted to the scale of HS to HU

Rating system for quality of terminal evaluation reports

A number rating 1-6 is used for each criterion: Highly Satisfactory = 6, Satisfactory = 5, Moderately Satisfactory = 4, Moderately Unsatisfactory = 3, Unsatisfactory = 2, Highly Unsatisfactory = 1, and unable to assess = 0.

### ***GEF Minimum requirements for M&E***

#### ***Minimum Requirement 1: Project Design of M&E<sup>83</sup>***

All projects must include a concrete and fully budgeted monitoring and evaluation plan by the time of Work Program entry (full-sized projects) or CEO approval (medium-sized projects). This plan must contain at a minimum:

- SMART (see below) indicators for project implementation, or, if no indicators are identified, an alternative plan for monitoring that will deliver reliable and valid information to management
- SMART indicators for results (outcomes and, if applicable, impacts), and, where appropriate, corporate-level indicators
- A project baseline, with:
  - a description of the problem to address
  - indicator data
  - or, if major baseline indicators are not identified, an alternative plan for addressing this within one year of implementation
- An M&E Plan with identification of reviews and evaluations which will be undertaken, such as mid-term reviews or evaluations of activities
- An organizational setup and budgets for monitoring and evaluation.

#### ***Minimum Requirement 2: Application of Project M&E***

- Project monitoring and supervision will include implementation of the M&E plan, comprising:
- Use of SMART indicators for implementation (or provision of a reasonable explanation if not used)
- Use of SMART indicators for results (or provision of a reasonable explanation if not used)
- Fully established baseline for the project and data compiled to review progress
- Evaluations are undertaken as planned
- Operational organizational setup for M&E and budgets spent as planned.

**SMART INDICATORS** GEF projects and programs should monitor using relevant performance indicators. The monitoring system should be “SMART”:

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<sup>83</sup> <http://gefweb.org/MonitoringandEvaluation/MEPoliciesProcedures/MEPTools/meptstandards.html>

1. **Specific:** The system captures the essence of the desired result by clearly and directly relating to achieving an objective, and only that objective.
2. **Measurable:** The monitoring system and its indicators are unambiguously specified so that all parties agree on what the system covers and there are practical ways to measure the indicators and results.
3. **Achievable and Attributable:** The system identifies what changes are anticipated as a result of the intervention and whether the result(s) are realistic. Attribution requires that changes in the targeted developmental issue can be linked to the intervention.
4. **Relevant and Realistic:** The system establishes levels of performance that are likely to be achieved in a practical manner, and that reflect the expectations of stakeholders.
5. **Time-bound, Timely, Trackable, and Targeted:** The system allows progress to be tracked in a cost-effective manner at desired frequency for a set period, with clear identification of the particular stakeholder group to be impacted by the project or program.

## **Appendix 10: Decision-making flowchart and organizational chart**

### ***Regional Coordination***

A South China Sea Strategic Action Programme Implementation Unit (SAP-IU) shall be established at SEAFDEC, which serves as one of the GEF Regional Executing Agencies. The SAP-IU shall have responsibility for the day-to-day management of project activities, and oversight of SAP implementation, including liaison with the National Focal Ministries (ministries responsible for environmental matters), the Specialised Executing Agencies at national level and other partners involved in SAP implementation.

The work of the SAP-IU shall be directed by the South China Sea Strategic Action Programme, Implementation Committee (SAP-IC) which shall meet annually and have overall responsibility for the implementation of the SAP and decisions regarding project work plans, timetables, budgets and expenditure<sup>84</sup>. The SAP-IC shall receive advice and recommendations on scientific and technical matters from a Regional Scientific and Technical Committee (RSTC) composed of National Technical Focal Points, the Chairpersons of the regional working groups and task forces together with the up to six experts in the region. The RSTC in turn shall receive advice and recommendations from the participating countries and the regional bodies and endeavour to secure consensus on scientific and technical matters before advising the SAP-IC on future courses of action.

The work of each component and sub-component shall be guided by a regional working group or task force composed of the focal points from each participating country, an appropriate member of the SAP-IU and up to three experts resident in the region. The regional working groups and task forces shall advise the national committees and working groups on the content and timing of the programme of work and make recommendations to the RSTC regarding developments and outcomes from the work of the component or sub-component for which they are responsible.

### ***National Coordination***

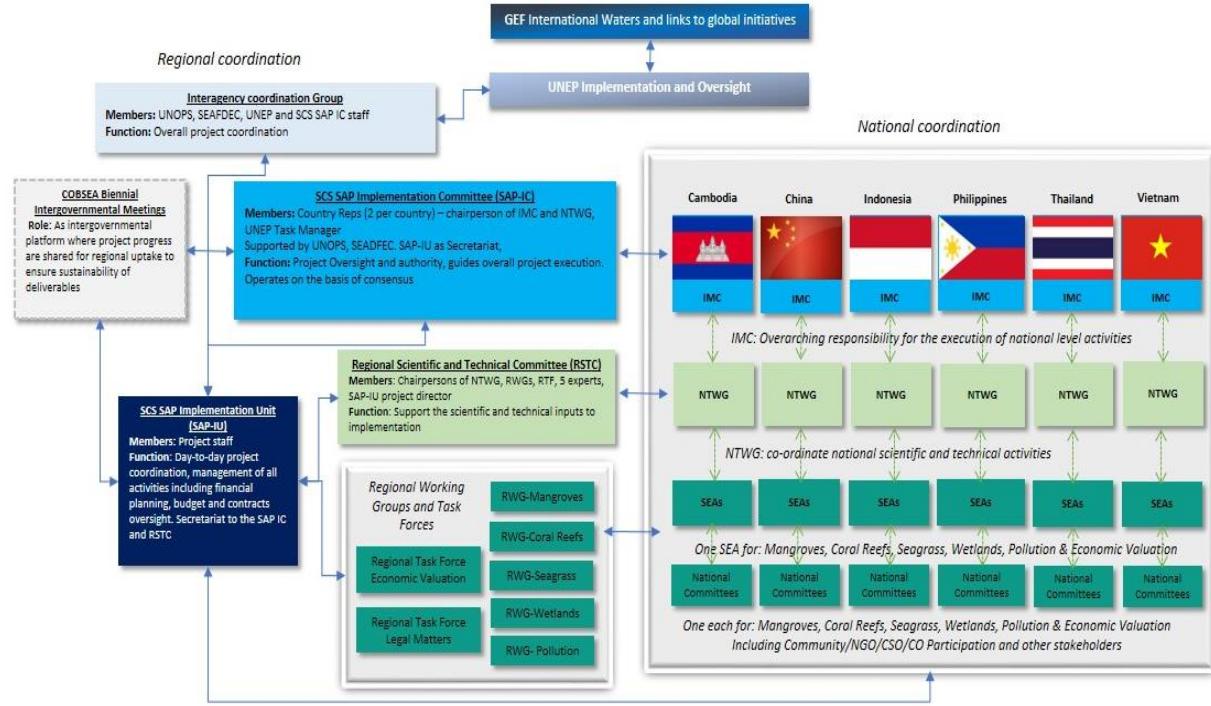
The ministry in each country responsible for environmental matters shall serve as the National Focal Ministry and the Minister concerned shall designate a high level official as the National Focal Point of the Project. In addition the Focal Ministry shall designate a National Technical Focal Point (NTFP) who shall be a senior operational level individual with comprehensive knowledge and experience in marine environmental affairs.

The National Focal Point shall convene periodic meetings of the Inter-Ministry Committee (IMC) to consider the implications of SAP implementation for ministries having interests in and responsibility for different areas of maritime affairs and to secure consensus on actions to be taken at the national level. The Inter-Ministry Committee shall receive advice and recommendations on scientific and technical matters from the National Technical Working Group (NTWG) composed of the focal points for each component and sub-component, representatives from appropriate government departments and other experts as considered necessary.

At the national level the work of each component and sub-component shall be guided by a national committee or task force chaired by the designated focal point which shall meet quarterly to: oversee the work; provide inputs to the NTWG regarding progress and the content and timing of activities; and to provide the required inputs to the regional level via the appropriate regional working group or task force.

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<sup>84</sup> In this regard the SAP-Implementation Committee will function in a manner comparable to a GEF Project Steering Committee have responsibility for the conduct and execution of Project activities.



**Figure 1** Project Management Framework (IMC = Inter-Ministry Committee; NTWG = National Technical Working Group; SEA = Specialized Executing Agency; RWG = Regional Working Group)

**Appendix 11: Terms of Reference**

**PROVISIONAL TERMS OF REFERENCE**

**FOR THE SCS-SAP IMPLEMENTATION COMMITTEE**

**1. THE SCS-SAP IMPLEMENTATION COMMITTEE: RATIONALE AND PURPOSE**

1.1 To facilitate the achievement of the goals and objectives of the UNEP/GEF project entitled “*Implementing the Strategic Action Programme for the South China Sea and Gulf of Thailand*”, a Project Steering Committee (PSC), referred to hereafter as the SCS-SAP Implementation Committee, will be established as the primary policy-making body for the project.

1.2 The SCS-SAP Implementation Committee’s role will be to provide managerial and governance advice to the project, and to guide the SAP Implementation Unit (SAP-IU), in the implementation and monitoring of the overall regional project. The SCS-SAP Implementation Committee will also provide a regional forum for reviewing and resolving national concerns, reviewing and approving annual work plans and budgets, and provide a regional forum for stakeholder participation. One of the first activities during full project implementation will be to reconfirm and/or reconstitute the membership of the SCS-SAP Implementation Committee, agree on meeting procedures, and finalise Terms of Reference for the SCS-SAP Implementation Committee.

**2. THE SCS-SAP IMPLEMENTATION COMMITTEE SHALL:**

2.1 Provide direction and strategic guidance to the SAP Implementation Unit (SAP-IU) and to National Lead Agencies regarding project implementation and execution of agreed activities over the entire period of the project;

2.2 Meet on an annual basis during the operational phase of the project to guide the timely execution of project activities;

2.3 Receive, review, and approve reports from the SAP Implementation Unit (SAP-IU) regarding the outputs and outcomes of project activities;

2.4 Assist the SAP Implementation Unit in ensuring co-ordination among national site-based activities and other national level activities to further enhance national capacity to achieve the targets of the Strategic Action Programme for the South China Sea;

2.5 Review stakeholder involvement in project activities and take action where necessary to ensure appropriate levels of government, NGO, community, and private sector engagement;

2.6 Ensure compatibility between the activities of site and other national level activities;

2.7 Approve annual progress reports for transmission to the Intergovernmental Meetings of COBSEA, the Implementing Agency UNEP and the GEF Secretariat;

2.8 Assist the SAP Implementation Unit in leveraging required project co-financing and additional funds that may be required from time to time;

2.9 Work with the SAP Implementation Unit and National Lead Agencies in mainstreaming best practices and the replication of project successes at the national level;

2.10 Agree at their first meeting: a) the membership, meeting arrangements, and terms of reference of the committee; and b) such standing orders and manner of conducting business as may be considered necessary by the committee.

**3. PROPOSED MEMBERSHIP FOR THE SCS- SAP IMPLEMENTATION COMMITTEE**

3.1 Full members of the SCS-SAP Implementation Committee shall consist solely of representatives of all participating countries in the project. Each country shall designate two members: one member shall be the Chairperson of the policy-level, Inter-Ministry Committee; the other shall be the Chairperson of the National Technical Working Group;

- 3.2 The UNEP Task Manager will participate as an observer in PSC meetings;
- 3.3 The SCS-SAP Implementation Committee shall elect a Chairperson and a Vice-Chairperson from amongst its full members with responsibility for chairing each formal meeting of the Committee and for acting as Chairperson and Vice-Chairperson of any meetings convened during the subsequent inter-sessional period; and
- 3.4 The SCS-SAP Implementation Committee may agree, by consensus at the commencement of each meeting to co-opt additional experts as observers or advisors to any meeting or meetings of the Committee or part thereof, as the committee shall deem appropriate.

#### **4. SECRETARIAT OF THE SCS-SAP IMPLEMENTATION COMMITTEE**

- 4.1 The Project Director of SCS-SAP Implementation Unit shall act as Secretary to the meetings of the Committee.
- 4.2 Other staff of the SCS-SAP Implementation Unit may provide Secretariat and technical support to the meetings of the PSC as required.

#### **5. MEETINGS OF THE SCS-SAP IMPLEMENTATION COMMITTEE**

- 5.1 The SCS-SAP Implementation Unit shall convene regular annual meetings of the SCS-SAP Implementation Committee immediately following the Regional Scientific and Technical Committee meeting when the latter is convened at an appropriate time.
- 5.2 *Ad hoc* meetings may be convened by the Chairperson: when a majority of the Committee members make a request for such a meeting to the SCS-SAP Implementation Unit; and at the request of the SCS-SAP Implementation Unit when circumstances demand.

#### **6. CONDUCT OF SCS-SAP IMPLEMENTATION COMMITTEE BUSINESS**

- 6.1 The Committee shall operate and take decisions on the basis of consensus, regarding any matter relating to project execution that has regional significance. Where full consensus cannot be achieved in reaching agreement during a full meeting of the Committee, on any matter relating to project execution that has regional significance, the Secretariat shall, in consultation with the Chairperson, facilitate negotiations during the subsequent inter sessional period with a view to seeking resolution, and will report the results of these negotiations to the Committee members.

## **PROVISIONAL TERMS OF REFERENCE FOR THE REGIONAL SCIENTIFIC AND TECHNICAL COMMITTEE**

### **1. RATIONALE AND PURPOSE OF A REGIONAL SCIENTIFIC AND TECHNICAL COMMITTEE**

1.1 To facilitate the achievement of the goals and objectives of the UNEP/GEF project entitled “*Implementing the Strategic Action Programme for the South China Sea and Gulf of Thailand*”, a Regional Scientific and Technical Committee (RSTC) will be established with responsibility for: overseeing the scientific and technical elements of the project; ensuring effective implementation of activities undertaken during project execution; and providing sound scientific and technical advice to the SCS-SAP Implementation Committee.

1.2 The RSTC will also be responsible for ensuring that scientific and technical aspects of SCS-SAP Implementation project meet International standards. Specifically, it will review the substantive activities of the project to: (1) reduce habitat degradation and loss via national and local reforms to achieve Strategic Action Programme targets for coastal habitat management in the South China Sea; (2) strengthen knowledge-based planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea; and (3) facilitate regional and national level integration and cooperation for implementation of the South China Sea Strategic Action Programme.

### **2. ROLE AND FUNCTION**

2.1 As the over-riding scientific and technical body for the project, the RSTC shall provide sound scientific and technical advice to the SCS-SAP Implementation Committee regarding matters requiring decision and shall provide direction and strategic guidance to the national level activities aimed at the achievement of Strategic Action Programme targets as required.

### **3. THE REGIONAL SCIENTIFIC AND TECHNICAL COMMITTEE SHALL:**

#### **3.1 Regional Activities**

- 3.1.1 Review and co-ordinate regional scientific and technical activities of the SCS-SAP Implementation project;
- 3.1.2 Review and evaluate, from a scientific and technical perspective, progress in achievement of Strategic Action Programme targets, and provide guidance for improvement when necessary;
- 3.1.3 Receive, and review reports, data and information from Regional Working Groups and Task Forces established under the project;
- 3.1.4 Provide the SCS-SAP Implementation Committee with recommendations on proposed regional activities, work plans, and budgets;
- 3.1.5 Provide the SCS-SAP Implementation Committee with technical guidance and suggestions to improve project activities where necessary, including reforms of national and regional policy and planning frameworks, including the update of the Transboundary Diagnostic Analysis and Strategic Action Programme for the South China Sea;
- 3.1.6 Facilitate co-operation with relevant international, regional, and national organisations and projects to enhance the effectiveness and efficiency of the SCS-SAP implementation initiative; &
- 3.1.7 Monitor the progress of the project’s regional activities and ensure the quality of outputs.

#### **3.2 National Activities**

- 3.2.1 Review and evaluate, from a scientific and technical perspective, progress in implementation of the national activities of the SCS-SAP Implementation project, and provide guidance for improvement when necessary;

- 3.2.2 Receive, and review reports, data and information from national level activities of the project and oversee the regional syntheses of this information to identify overall needs and priorities for strengthening scientific and technical support to Strategic Action Programme implementation;
- 3.2.3 Receive, review, and comment on drafts of national policies and/or action frameworks; and
- 3.2.3 Advise the regional SCS-SAP Implementation Unit and National Focal Points of the need for public awareness and information materials concerning efforts to reverse environmental degradation trends in the South China Sea.

#### **4. PROPOSED MEMBERSHIP FOR THE REGIONAL SCIENTIFIC AND TECHNICAL COMMITTEE**

4.1 The Regional Scientific and Technical Committee shall consist of: the Chairpersons of the National Technical Working Groups (NTWGs); the Chairpersons of the Regional Working Groups (RWGs) and Regional Task Forces (RTFs); up to 5 selected regional experts; and the Project Director of SCS-SAP Implementation Unit.

4.2 The SCS-SAP Implementation Unit, in consultation with National Technical Focal Points, shall nominate no more than 5 regional experts to ensure a balance of expertise and specialisation consistent with the mandate of the Committee. The membership of the RSTC shall be formally established at the first meeting of the committee.

4.3 At the commencement of each meeting the committee shall elect a Chairperson and a Vice-Chair from amongst the members. The Vice-Chair shall act as Chairperson of meetings in the absence of the Chairperson. The Chairperson and Vice-Chair shall participate in the annual meetings of the SCS-SAP Implementation Committee at which they shall present the reports and recommendations of the RSTC.

#### **5. SECRETARIAT**

5.1 The SCS-SAP Implementation Unit shall act as Secretariat to the RSTC and shall ensure that reports of the meetings are circulated to all members of the regional SCS-SAP Implementation Committee.

#### **6. MEETINGS OF THE REGIONAL SCIENTIFIC AND TECHNICAL COMMITTEE**

6.1 The SCS-SAP Implementation Unit in consultation with the Chairperson shall convene meetings of the RSTC according to an agreed schedule, which will form part of the agreed work plan and timetable for the work of the Committee.

6.2 The first meeting of the RSTC will be convened during project inception to: agree on the detailed activities, work plan and timetable for the twenty-four months leading to the project's mid-term evaluation; and to provide guidance to the project's emerging scientific and technical needs.

#### **7. CONDUCT OF REGIONAL SCIENTIFIC AND TECHNICAL COMMITTEE BUSINESS**

7.1 The Committee shall operate and take decisions on the basis of consensus, regarding any matter relating to project execution that has regional significance. Where full consensus cannot be achieved in reaching agreement during a meeting of the Committee, the Chair, Vice-Chair and Project Director shall decide on the least contentious course of action to be adopted.

#### **8. PARTICIPATION OF OBSERVERS IN REGIONAL SCIENTIFIC AND TECHNICAL COMMITTEE MEETINGS**

8.1 The RSTC may invite observers to participate in its meetings;

8.2 Upon the invitation of the Chairperson, observers may participate in the discussion of issues within their competence or scope of activities, without the right to participate in decision-making; and

8.3 Observers may, upon invitation of the Chairperson, submit written statements that shall be circulated by the Project Coordinating Unit to the members of the RSTC.

## **PROVISIONAL TERMS OF REFERENCE FOR THE REGIONAL WORKING GROUP ON MANGROVES**

### **1. RATIONALE AND PURPOSE OF A REGIONAL WORKING GROUP ON MANGROVES**

1.1 To facilitate the achievement of the Strategic Action Programme targets for mangroves, a Regional Working Group on Mangroves (RWG-M) shall be established with overall responsibility for: co-ordinating the work of the National Mangrove Committees established in each of the participating countries; for ensuring effective implementation of project activities undertaken in the context of the achievement of the mangrove management targets of the project; and to provide a mechanism for exchange of information and experience of mangrove management activities in each country.

### **2. MEMBERSHIP**

2.1 The RWG-M of the SCS-SAP Implementation Project shall consist of the Chairpersons of the National Mangrove Committees together with one member of the SCS-SAP Implementation Unit and selected regional experts. The SCS-SAP Implementation Unit in consultation with the National Technical Focal Points for the project shall nominate no more than four such experts to ensure a balance of expertise and specialisation consistent with the mandate of the working group.

2.2 The membership of the RWG-M shall be formally established at the first meeting of the Working Group, which shall elect a Chairperson and a Vice-Chair from amongst its members. The Vice-Chair shall act as Chairperson of meetings in the absence of the Chairperson. The Chairperson of the RWG-M will represent the RWG-M on the Regional Scientific and Technical Committee (RSTC) and will attend the meetings of that Committee.

### **3. SECRETARIAT**

3.1 The SCS-SAP Implementation Unit (SCS-SAP IU) shall act as Secretariat to the RWG-M, and shall ensure that reports of the meetings are circulated to all members of the working group, and are copied to the members of the Regional Scientific and Technical Committee. The National Mangrove Committees shall serve as the principal source of national scientific and technical data and information to the RWG-M.

### **4. MEETINGS OF THE COMMITTEE**

4.1 The PCU in consultation with the Chairperson shall convene meetings of the RWG-M according to an agreed schedule, which will form part of the agreed work plan and timetable for the work of the Committee. The first meeting of the RWG-M will be convened within three months of signature of the operational project document to agree on the detailed activities, workplan and timetable for the first twenty-four months of project execution leading to the project's mid-term review.

### **5. TERMS OF REFERENCE**

#### **The RWG-M shall:**

5.1 Provide direction, and strategic guidance to the National Mangrove Committees regarding the establishment of appropriate forms of sustainable management for 860,000 ha of mangrove bordering the South China Sea, including the achievement of the following targets:

- Declaration of 57,400 ha of mangrove as National Parks and Protected Areas
- Designation and development of plans for the management of 166,600 ha of mangrove as non-conversion, sustainable use areas
- Reform of laws and regulations for the sustainable use of 602,800 ha of mangrove forest
- Replanting of 21,000 ha of deforested mangrove land
- Biodiversity increased for 11,200 ha of mangrove forest via enrichment planting

5.2 Assume overall responsibility for the timely execution of project activities in support of the achievement of the abovementioned targets;

5.3 Update, in close collaboration with the National Mangrove Committees, the regional mangrove meta-database and GIS, including meta-data on biodiversity and the results of mangrove research pertaining to this project.

5.4 Develop, in close collaboration with the National Mangrove Committees, public awareness and information materials concerning the national and regional importance of such ecosystems;

5.5 Update in close collaboration with the National Mangrove Committees, regional data sets relating to the economic valuation of mangrove ecosystems with a view to incorporation of such valuations in national economic and development planning;

5.6 Receive, and review reports, data and information from the National Mangrove Committees and compile the regional syntheses regarding mangrove management needs and priorities;

5.7 Develop guidelines regarding best practices for sustainable mangrove management for adoption and application at national level in participating countries;

5.8 Develop, review and recommend for adoption by the Regional Scientific and Technical Committee the proposed targets and timelines that may be included in a revised Strategic Action programme in order to achieve, sustainable management of mangroves bordering the South China Sea in the longer-term;

5.9 Prepare a regional review of national experiences in mangrove restoration with a view to developing widely applicable guidelines concerning best practices in mangrove restoration and rehabilitation;

5.10 Review and evaluate, at the regional level, progress in implementation of the mangrove activities of the project, and provide guidance for improvement when necessary; and

5.11 Develop annual workplans and provide periodic progress reports to the Regional Scientific and Technical Committee.

## **PROVISIONAL TERMS OF REFERENCE FOR THE REGIONAL WORKING GROUP ON CORAL REEFS**

### **1. RATIONALE AND PURPOSE OF A REGIONAL WORKING GROUP ON CORAL REEFS**

1.1 To facilitate the achievement of the Strategic Action Programme targets for coral reefs, a Regional Working Group on Coral Reefs (RWG-CR) shall be established with overall responsibility for: co-ordinating the work of the National Coral Reefs Committees established in each of the participating countries; for ensuring effective implementation of project activities undertaken in the context of the achievement of the coral reef management targets of the project; and to provide a mechanism for exchange of information and experience of coral reef management activities in each country.

### **2. MEMBERSHIP**

2.1 The RWG-CR of the SCS-SAP Implementation Project shall consist of the Chairpersons of the National Coral Reef Committees together with one member of the SCS-SAP Implementation Unit and selected regional experts. The SCS-SAP Implementation Unit in consultation with the National Technical Focal Points for the project shall nominate no more than four such experts to ensure a balance of expertise and specialisation consistent with the mandate of the working group.

2.2 The membership of the RWG-CR shall be formally established at the first meeting of the Working Group, which shall elect a Chairperson and a Vice-Chair from amongst its members. The Vice-Chair shall act as Chairperson of meetings in the absence of the Chairperson. The Chairperson of the RWG-CR will represent the RWG-CR on the Regional Scientific and Technical Committee (RSTC) and will attend the meetings of that Committee.

### **3. SECRETARIAT**

3.1 The SCS-SAP Implementation Unit (SCS-SAP IU) shall act as Secretariat to the RWG-CR, and shall ensure that reports of the meetings are circulated to all members of the working group, and are copied to the members of the Regional Scientific and Technical Committee. The National Coral Reef Committees shall serve as the principal source of national scientific and technical data and information to the RWG-CR.

### **4. MEETINGS OF THE COMMITTEE**

4.1 The SCS-SAP Implementation Unit in consultation with the Chairperson shall convene meetings of the RWG-CR according to an agreed schedule, which will form part of the agreed work plan and timetable for the work of the Committee. The first meeting of the RWG-CR will be convened within three months of signature of the operational project document to agree on the detailed activities, workplan and timetable for the first twenty-four months of project execution leading to the project's mid-term review.

### **5. TERMS OF REFERENCE**

#### **The RWG-CR shall:**

5.1 Provide direction, and strategic guidance to the National Coral Reef Committees regarding the sustainable management of 153,000 ha of coral reef at 82 priority sites by Yr 5, including a reduction in the decadal rate of degradation in live coral cover from 16 to 5%, including the achievement of the following targets:

- Management capacity built for 82 coral reef sites
- Management approaches (integrated, community-based, multiple use) improved at 82 coral reef sites
- Management tools (licensing and permit systems, seasonal closures, zoning) developed and utilized to address key threats at priority sites
- Established mechanism for the monitoring of management, ecological and socio-economic indicators at 82 sites

5.2 Assume overall responsibility for the timely execution of project activities in support of the achievement of the abovementioned targets;

5.3 Update, in close collaboration with the National Coral Reef Committees, the regional coral reef meta-database and GIS, including meta-data on biodiversity and the results of coral reef research pertaining to this project.

5.4 Develop, in close collaboration with the National Coral Reef Committees, public awareness and information materials concerning the national and regional importance of such ecosystems;

5.5 Update in close collaboration with the National Coral Reef Committees, regional data sets relating to the economic valuation of coral reef ecosystems with a view to incorporation of such valuations in national economic and development planning;

5.6 Receive, and review reports, data and information from the National Coral Reef Committees and compile the regional syntheses regarding coral reef management needs and priorities;

5.7 Develop guidelines regarding best practices for sustainable coral reef management for adoption and application at national level in participating countries;

5.8 Develop, review and recommend for adoption by the Regional Scientific and Technical Committee the proposed targets and timelines that may be included in a revised Strategic Action programme in order to achieve, sustainable management of coral reefs bordering the South China Sea in the longer-term;

5.9 Prepare a regional review of national experiences in coral reef restoration with a view to developing widely applicable guidelines concerning best practices in coral reef restoration and rehabilitation;

5.10 Review and evaluate, at the regional level, progress in implementation of the coral reef activities of the project, and provide guidance for improvement when necessary; and

5.11 Develop annual workplans and provide periodic progress reports to the Regional Scientific and Technical Committee.

## **PROVISIONAL TERMS OF REFERENCE FOR THE REGIONAL WORKING GROUP ON SEAGRASS**

### **1. RATIONALE AND PURPOSE OF A REGIONAL WORKING GROUP ON SEAGRASS**

1.1 To facilitate the achievement of the Strategic Action Programme targets for seagrass, a Regional Working Group on seagrass (RWG-SG) shall be established with overall responsibility for: co-ordinating the work of the National Seagrass Committees established in each of the participating countries; for ensuring effective implementation of project activities undertaken in the context of the achievement of the seagrass management targets of the project; and to provide a mechanism for exchange of information and experience of seagrass management activities in each country.

### **2. MEMBERSHIP**

2.1 The RWG-SG of the SCS-SAP Implementation Project shall consist of the Chairpersons of the National Seagrass Committees together with one member of the SCS-SAP Implementation Unit and selected regional experts. The SCS-SAP Implementation Unit in consultation with the National Technical Focal Points for the project shall nominate no more than four such experts to ensure a balance of expertise and specialisation consistent with the mandate of the working group.

2.2 The membership of the RWG-SG shall be formally established at the first meeting of the Working Group, which shall elect a Chairperson and a Vice-Chair from amongst its members. The Vice-Chair shall act as Chairperson of meetings in the absence of the Chairperson. The Chairperson of the RWG-SG will represent the RWG-SG on the Regional Scientific and Technical Committee (RSTC) and will attend the meetings of that Committee.

### **3. SECRETARIAT**

3.1 The SCS-SAP Implementation Unit (SCS-SAP IU) shall act as Secretariat to the RWG-SG, and shall ensure that reports of the meetings are circulated to all members of the working group, and are copied to the members of the Regional Scientific and Technical Committee. The National Seagrass Committees shall serve as the principal source of national scientific and technical data and information to the RWG-SG.

### **4. MEETINGS OF THE COMMITTEE**

4.1 The SCS-SAP Implementation Unit in consultation with the Chairperson shall convene meetings of the RWG-SG according to an agreed schedule, which will form part of the agreed work plan and timetable for the work of the Committee. The first meeting of the RWG-SG will be convened within three months of signature of the operational project document to agree on the detailed activities, workplan and timetable for the first twenty-four months of project execution leading to the project's mid-term review.

### **5. TERMS OF REFERENCE**

#### **The RWG-SG shall:**

5.1 Provide direction, and strategic guidance to the National Seagrass Committees regarding the conservation, management and sustainable use of 25,900 ha of known seagrass area in the South China Sea by Year 5 of the project, including the achievement of the following targets:

- Twenty-one seagrass areas totalling 25,900 ha under sustainable management with supporting laws and regulations

- Amended management plans for 7 existing MPAs with significant seagrass areas, to include specific seagrass-related management actions
- Designation of 7 new Marine Protected Areas focusing on seagrass areas
- Established mechanism for monitoring management, ecological and socio-economic indicators at 21 sites

5.2 Assume overall responsibility for the timely execution of project activities in support of the achievement of the abovementioned targets;

5.3 Update, in close collaboration with the National Seagrass Committees, the regional seagrass meta-database and GIS, including meta-data on biodiversity and the results of seagrass research pertaining to this project.

5.4 Develop, in close collaboration with the National Seagrass Committees, public awareness and information materials concerning the national and regional importance of such ecosystems;

5.5 Update in close collaboration with the National Seagrass Committees, regional data sets relating to the economic valuation of seagrass ecosystems with a view to incorporation of such valuations in national economic and development planning;

5.6 Receive, and review reports, data and information from the National Seagrass Committees and compile the regional syntheses regarding seagrass management needs and priorities;

5.7 Develop guidelines regarding best practices for sustainable seagrass management for adoption and application at national level in participating countries;

5.8 Develop, review and recommend for adoption by the Regional Scientific and Technical Committee the proposed targets and timelines that may be included in a revised Strategic Action programme in order to achieve, sustainable management of seagrass of the South China Sea in the longer-term;

5.9 Prepare a regional review of national experiences in seagrass restoration with a view to developing widely applicable guidelines concerning best practices in seagrass restoration and rehabilitation;

5.10 Review and evaluate, at the regional level, progress in implementation of the seagrass activities of the project, and provide guidance for improvement when necessary; and

5.11 Develop annual workplans and provide periodic progress reports to the Regional Scientific and Technical Committee.

## **PROVISIONAL TERMS OF REFERENCE FOR THE REGIONAL WORKING GROUP ON WETLANDS**

### **1. RATIONALE AND PURPOSE OF A REGIONAL WORKING GROUP ON WETLANDS**

1.1 To facilitate the achievement of the Strategic Action Programme targets for wetlands, a Regional Working Group on wetlands (RWG-W) shall be established with overall responsibility for: co-ordinating the work of the National Wetland Committees established in each of the participating countries; for ensuring effective implementation of project activities undertaken in the context of the achievement of the wetland management targets of the project; and to provide a mechanism for exchange of information and experience of wetland management activities in each country.

### **2. MEMBERSHIP**

2.1 The RWG-W of the SCS-SAP Implementation Project shall consist of the Chairpersons of the National Wetland Committees together with one member of the SCS-SAP Implementation Unit and selected regional experts. The SCS-SAP Implementation Unit in consultation with the National Technical Focal Points for the project shall nominate no more than four such experts to ensure a balance of expertise and specialisation consistent with the mandate of the working group.

2.2 The membership of the RWG-W shall be formally established at the first meeting of the Working Group, which shall elect a Chairperson and a Vice-Chair from amongst its members. The Vice-Chair shall act as Chairperson of meetings in the absence of the Chairperson. The Chairperson of the RWG-W will represent the RWG-W on the Regional Scientific and Technical Committee (RSTC) and will attend the meetings of that Committee.

### **3. SECRETARIAT**

3.1 The SCS-SAP Implementation Unit (SCS-SAP IU) shall act as Secretariat to the RWG-W, and shall ensure that reports of the meetings are circulated to all members of the working group, and are copied to the members of the Regional Scientific and Technical Committee. The National Wetland Committees shall serve as the principal source of national scientific and technical data and information to the RWG-W.

### **4. MEETINGS OF THE COMMITTEE**

4.1 The SCS-SAP Implementation Unit in consultation with the Chairperson shall convene meetings of the RWG-W according to an agreed schedule, which will form part of the agreed work plan and timetable for the work of the Committee. The first meeting of the RWG-W will be convened within three months of signature of the operational project document to agree on the detailed activities, workplan and timetable for the first twenty-four months of project execution leading to the project's mid-term review.

### **5. TERMS OF REFERENCE**

#### **The RWG-W shall:**

5.1 Provide direction, and strategic guidance to the National Wetland Committees regarding the integrated management of 783,900 ha of coastal wetland at 19 sites, including habitat restoration and protection strengthened at priority locations, including the achievement of the following targets:

- Development and implementation of integrated management plans for 3 lagoons (26,818 ha), 9 estuaries (614,680 ha), 5 tidal flats (96,903 ha), 1 peat swamp (45,700 ha) and 1 non-peat swamp (9,808 ha)
- Declaration of at least 7 wetland areas with protection status (i.e. non-hunting area, nature reserves, protected areas, Ramsar Sites).
- Development, adoption and implementation of a regional estuary monitoring scheme at the national level

5.2 Assume overall responsibility for the timely execution of project activities in support of the achievement of the abovementioned targets;

5.3 Update, in close collaboration with the National Wetland Committees, the regional wetland meta-database and GIS, including meta-data on biodiversity and the results of wetland research pertaining to this project.

5.4 Develop, in close collaboration with the National Wetland Committees, public awareness and information materials concerning the national and regional importance of such ecosystems;

5.5 Update in close collaboration with the National Wetland Committees, regional data sets relating to the economic valuation of wetland ecosystems with a view to incorporation of such valuations in national economic and development planning;

5.6 Receive, and review reports, data and information from the National Wetland Committees and compile the regional syntheses regarding wetland management needs and priorities;

5.7 Develop guidelines regarding best practices for sustainable wetland management for adoption and application at national level in participating countries;

5.8 Develop, review and recommend for adoption by the Regional Scientific and Technical Committee the proposed targets and timelines that may be included in a revised Strategic Action programme in order to achieve, sustainable management of wetlands bordering the South China Sea in the longer-term;

5.9 Prepare a regional review of national experiences in wetland restoration with a view to developing widely applicable guidelines concerning best practices in wetland restoration and rehabilitation;

5.10 Review and evaluate, at the regional level, progress in implementation of the wetland activities of the project, and provide guidance for improvement when necessary; and

5.11 Develop annual workplans and provide periodic progress reports to the Regional Scientific and Technical Committee.

## **PROVISIONAL TERMS OF REFERENCE FOR THE REGIONAL WORKING GROUP ON LAND-BASED POLLUTION**

### **1. RATIONALE AND PURPOSE OF A REGIONAL WORKING GROUP ON LAND-BASED POLLUTION**

1.1 To facilitate the achievement of the Strategic Action Programme targets for land-based pollution management, a Regional Working Group on Land-based Pollution (RWG-LbP) shall be established with overall responsibility for: co-ordinating the work of the National Land-Based Pollution Committees established in each of the participating countries; for ensuring effective implementation of project activities undertaken in the context of the achievement of the land-based pollution management targets of the project; and to provide a mechanism for exchange of information and experience of land-based pollution management activities in each country.

### **2. MEMBERSHIP**

2.1 The RWG-LbP of the SCS-SAP Implementation Project shall consist of the Chairpersons of the National Land-based Pollution Committees together with one member of the SCS-SAP Implementation Unit and selected regional experts. The SCS-SAP Implementation Unit in consultation with the National Technical Focal Points for the project shall nominate no more than four such experts to ensure a balance of expertise and specialisation consistent with the mandate of the working group.

2.2 The membership of the RWG-LbP shall be formally established at the first meeting of the Working Group, which shall elect a Chairperson and a Vice-Chair from amongst its members. The Vice-Chair shall act as Chairperson of meetings in the absence of the Chairperson. The Chairperson of the RWG-LbP will represent the RWG-LbP on the Regional Scientific and Technical Committee (RSTC) and will attend the meetings of that Committee.

### **3. SECRETARIAT**

3.1 The SCS-SAP Implementation Unit (SCS-SAP IU) shall act as Secretariat to the RWG-LbP, and shall ensure that reports of the meetings are circulated to all members of the working group, and are copied to the members of the Regional Scientific and Technical Committee. The National Land-based Pollution Committees shall serve as the principal source of national scientific and technical data and information to the RWG-LbP.

### **4. MEETINGS OF THE COMMITTEE**

4.1 The SCS-SAP Implementation Unit in consultation with the Chairperson shall convene meetings of the RWG-LbP according to an agreed schedule, which will form part of the agreed work plan and timetable for the work of the Committee. The first meeting of the RWG-LbP will be convened within three months of signature of the operational project document to agree on the detailed activities, workplan and timetable for the first twenty-four months of project execution leading to the project's mid-term review.

### **5. TERMS OF REFERENCE**

#### **The RWG-LbP shall:**

5.1 Provide direction, and strategic guidance to the National Land-based Pollution Committees regarding the achievement of the land-based pollution targets of the Strategic Action Programme for the South China Sea;

- 5.2 Assume overall responsibility for the timely execution of project activities in support of the achievement of the abovementioned targets;
- 5.3 Update, in close collaboration with the National Land-based Pollution Committees, the regional land-based pollution meta-database and GIS, including meta-data on pollution hotspots and the results of pollution hotspot research pertaining to this project;
- 5.4 Develop, in close collaboration with the National Land-Based Pollution Committees, public awareness and information materials concerning the national and regional importance of effective pollution control;
- 5.5 Update in close collaboration with the National Land-based Pollution Committees, regional data sets relating to the economic impacts of land-based pollution with a view to incorporation of such valuations in national economic and development planning;
- 5.6 Receive, and review reports, data and information from the National Land-based Pollution Committees and compile the regional syntheses regarding wetland management needs and priorities;
- 5.7 Develop guidelines regarding best in land-based pollution management for adoption and application at national level in participating countries;
- 5.8 Develop, review and recommend for adoption by the Regional Scientific and Technical Committee the proposed targets and timelines that may be included in a revised Strategic Action programme in order to achieve, sustainable management of land-based pollution in the longer-term;
- 5.9 Work to ensure that the nutrient carrying capacity model developed for the South China Sea marine basin is used to communicate with decision-makers about the localized versus transboundary impacts of land-based pollution in the SCS;
- 5.10 Work at the regional level to estimate total contaminant loading and carrying capacity of the SCS via the application of quantitative modeling and GIS-based techniques for seven heavy metals (Hg, Cd, Pb, Cu, Cr, As, Zn);
- 5.11 Guide research efforts of the project to quantify the impacts of estimated heavy metal contaminant loadings to the South China Sea and ensure that this information is communicated to decision-makers in a timely and engaging manner;
- 5.12 Collaborate with the National Land-based Pollution Committees to quantify effluent volumes and contaminant loadings from coastal aquaculture to the SCS marine basin and communicate this information to decision-makers;
- 5.13 Provide regional guidance on options for strengthening and harmonizing national policies and laws, and supporting financial mechanism, for the management of land-based sources of pollution;
- 5.14 Review and evaluate, at the regional level, progress in implementation of the land-based pollution activities of the project, and provide guidance for improvement when necessary; and
- 5.15 Develop annual workplans and provide periodic progress reports to the Regional Scientific and Technical Committee.

## **PROVISIONAL TERMS OF REFERENCE FOR THE REGIONAL TASK FORCE ON ECONOMIC VALUATION**

### **1. BACKGROUND**

1.1 The work of the SCS project on economic valuation resulted in a standardised method for computing national and regional weighted mean values of resources and services that can be applied more widely in handling and manipulating economic valuation data from multiple locations across any time span. The technique can be applied in any setting where multiple currencies, varying exchange rates and widespread inter-locational variation in farm gate prices are found. This is a critically important tool for SAP implementation as the specific targets of the revised SAP have been valued or, more specifically, the incremental benefit derived from achieving the target has been valued. Additionally, the values saved by achieving the targets have been compared with the costs of implementing the actions defined in the regional SAP through a cost benefit analysis.

1.2 Despite these advancements, several challenges exist in the application of economic valuation in decision-making for transboundary water resource management in the South China Sea; indeed the issues of economic valuation of ecosystem goods and services in development planning remains a challenge facing the entire portfolio of GEF investments in procuring the goods and services of the global environment, particularly in its International Waters focal area. Better economic valuation of the South China Sea's resources is critical for decision making that will lead to sustainable use. The values determined through the previous SCS project are incomplete since not all known goods or services from individual coastal ecosystems have been valued. One area of current weakness is that comparatively few existing values for the service provided by habitats as nursery areas for off-shore fish and crustaceans are included. This is known to be a significant and major service provided by mangrove and seagrass habitats and work will be undertaken to establish the economic values of these services.

1.3 It is anticipated that actions at the national and regional level to implement the SAP will generate more extensive datasets at the national level, which if included in the regional dataset will greatly enhance the utility of the regional dataset in determining regional priorities for action and intervention. One additional area of identified need that the project will address is in the determination of economic losses of coastal ecosystem goods and services consequent upon coastal shipping accidents and land-based pollution damage.

1.4 The SCS-SAP Implementation Project aims to improve the national and regional values for the Total Economic Values of coastal habitats for use in development planning and decision-making, and will make substantive contributions to the conduct of cost-benefit analyses of management options undertaken as part of national action planning for coastal habitats and land-based pollution, as well as in updating the SCS TDA and SAP. It will also build on preliminary work of the SCS project to value the economic impacts of land-based pollution from local, national and transboundary perspectives and will contribute to the planning of a mechanism for the sustainable financing of land-based pollution activities of a revised SAP.

### **2. OBJECTIVE OF THE REGIONAL TASK FORCE ON ECONOMIC VALUATION**

2.1 The Regional Task Force on Economic Valuation (RTF-E) is re-established with the primary objective of advising and supporting the national committees and regional working groups by providing the appropriate expertise and assistance in completing the envisaged economic valuations and cost-benefit analyses. It is anticipated that the operation of the RTF-E will contribute significantly to the achievement of the following targets:

- Expanded datasets of economic valuation information on the goods and services of SCS coastal habitats;
- Estimates of the value for the service provided by coastal habitats as nursery areas for coastal fish and crustaceans;
- Estimates of economic losses of coastal ecosystem goods and services consequent upon coastal shipping accidents and pollution damage; and
- Updated estimates of Total Economic Values for coastal habitats of the SCS and converted to 2017 value by means of the consumer price index

### **3. TASK FORCE MEMBERS**

3.1 The Task Force will be comprised of: one environmental or resource economist, nominated by each of the participating countries; and two regional, environmental economic experts; all of whom will serve as members in their personal capacity. Each participating country will nominate these members, in accordance with procedures agreed by the SCS-SAP Implementation Committee. The membership of the committee will be established at its first meeting, at which a Chairperson, a Vice-Chairperson and Rapporteur will be elected from the members. The Vice-Chairperson will act as Chairperson of meetings in the absence of the Chairperson.

### **4. SECRETARIAT**

4.1 The SCS-SAP Implementation Unit will serve as Secretariat to the RTF-E and will ensure that the reports of the meetings are circulated to all members of the committee, the National Focal Points, Regional Working Group Members, and National Committees as promptly as possible following the closure of the meetings.

### **5. TERMS OF REFERENCE**

5.1 In principle, the RTF-E shall serve as the principal source of economic advice and information to the project. In doing so, the terms of reference for the Task Force may be expected to include, among other things:

- identifying available reference materials and information regarding various established economic valuation techniques that have been applied or can be applied to, the coastal resources and environments within the South China region;
- compiling a comprehensive, annotated bibliography of existing empirical studies, research and data regarding environmental, economic and resource valuations conducted in the countries of the South China Sea Region;
- providing advice and guidance regarding the methodologies and values that can be used in the framework of economic and cost-benefit analyses required to achieve SAP targets, and prepare updated National Action Plans and a revised Strategic Action Programme for the South China Sea

### **6. MEETINGS OF THE TASK FORCE**

6.1 The SCS-SAP Implementation Unit shall convene meetings of the RTF-E to advise the SCS-SAP Implementation Committee or, as required in order to complete the tasks assigned to the Task Force. The SCS-SAP Implementation Unit shall convene one meeting of the RTF-E prior to the annual meeting of the SCS-SAP Implementation Committee in order to ensure economic advice being provided to the project is as up-to-date as possible. Additional *ad hoc* meetings may be convened as required.



## **PROVISIONAL TERMS OF REFERENCE FOR THE NATIONAL INTER-MINISTRY COMMITTEES**

### **1. RATIONALE AND PURPOSE OF THE NATIONAL INTER-MINISTRY COMMITTEES**

The National Inter-Ministry Committees shall operate on the basis of consensus to:

1. Assume overarching responsibility for the execution of national level activities of the UNEP/GEF project entitled '*Implementing the Strategic Action Programme for the South China Sea and Gulf of Thailand*' in [Insert Country Name];
2. Receive, review, and approve reports from the National Technical Working Groups and National Committees for mangroves, coral reefs, seagrass, wetlands, land-based pollution, and economic valuation regarding the outputs and outcomes of efforts to achieve Strategic Action Programme targets;
3. Meet on a biannual basis during the operational phase of the project to guide the timely execution of project activities, particularly activities at the site level, and to consider, amend and endorse quarterly work-plans, narrative progress and financial reports for submission to the regional SCS-SAP Implementation Unit;
4. Provide direction and strategic guidance to the National Technical Working Group and National Committees for mangroves, coral reefs, seagrass, wetlands, land-based pollution, and economic on the national and local reforms to achieve SAP targets and mainstream best practices in to natural resource and environmental management of the South China Sea marine basin;
5. Review planned and ongoing coastal and marine environment projects being operated along the South China Sea coast with the aim of minimising duplication of efforts, and to identify opportunities for cooperation and the sharing of examples of best practices in reversing environmental degradation trends;
6. Assess stakeholder involvement in national level execution of the SCS SAP Implementation project and take action where necessary to ensure appropriate levels of government, civil society and community organisation, environmental NGOs, Women's groups, and private sector engagement in project activities.
7. Ensure compatibility between site-based activities of the SCS SAP Implementation project and other National, provincial and municipal activities in coastal and marine environmental management;
8. Approve annual progress reports for transmission to the COBSEA Intergovernmental Meetings, UNEP and the GEF Secretariat;
9. Assist the National Committees for mangroves, coral reefs, seagrass, wetlands, land-based pollution, and economic valuation in securing co-financing committed to the project and in leveraging additional funding that may be required from time to time.
10. Agree at their first meeting:
  - a) the membership, meeting arrangements, and terms of reference of the committee; and
  - b) such standing orders and manner of conducting business as may be considered necessary by the committee.

## **PROVISIONAL TERMS OF REFERENCE FOR THE NATIONAL TECHNICAL WORKING GROUPS**

### **1. RATIONALE AND PURPOSE OF THE NATIONAL TECHNICAL WORKING GROUPS**

The National Technical Working Groups shall operate on the basis of consensus to:

1. Review and co-ordinate national scientific and technical activities of the UNEP/GEF project entitled "*Implementing the Strategic Action Programme for the South China Sea and Gulf of Thailand*" in [country name];
2. Review and evaluate, from a scientific and technical perspective, progress in the achievement of Strategic Action Programme targets, and provide guidance for improvement when necessary;
3. Provide the National Inter-Ministry Committees with recommendations on proposed national and site-based activities, work plans, and budgets;
4. Provide the National Inter-Ministry Committees with technical guidance and suggestions to improve project activities where necessary, including the reform of policy, legislation and institutional arrangements;
5. Facilitate co-operation with relevant national and provincial organisations and projects to enhance the information and science base for use in achieving Strategic Action Programme targets and in preparing updated National Action Plans and a revised Strategic Action Programme in [country name];
6. Compile and evaluate national level sources of information and data for sharing at the regional level;
7. Receive, and review reports, data and information from site-based activities of the project and oversee the national synthesis of this information to identify overall needs and priorities for individual sites and future targets for mangroves, coral reefs, seagrass, wetlands, and land-based pollution management in [country name];
8. Ensure that planned national level project activities are consistent with the national results framework for the project, and that the subsequent monitoring and reporting of project results is undertaken in a standardized and consistent manner;
9. Agree at their first meeting:
  - a) the membership, meeting arrangements, and terms of reference of the committee; and
  - b) such standing orders and manner of conducting business as may be considered necessary by the committee.

**PROVISIONAL TERMS OF REFERENCE FOR THE  
SPECIALIZED EXECUTING AGENCIES FOR  
MANGROVES, CORAL REEFS, SEAGRASS, WETLANDS, LAND-BASED POLLUTION  
AND ECONOMIC VALUATION**

The National Specialized Executing Agencies shall:

1. Assume overall responsibility for the execution of the national-level activities in their respective areas of expertise for the UNEP/GEF project entitled '*Implementing the Strategic Action Programme for the South China Sea and Gulf of Thailand*' in accordance with the results framework contained in the regional UNEP Project Document;
2. Provide Secretariat support to the operation of the National Committees for mangroves, coral reefs, seagrass, wetlands, land-based pollution, and economic valuation and convene quarterly meetings of these bodies, respectively;
3. Nominate a National Focal Point to (a) act as the main point of contact with the SCS SAP Implementation Unit and UNEP; (b) act as Chair of his/her respective National Committee; (c) act as a member of NTWG; and (d) act as a member of the respective Regional Working Group or Task Force;
4. Plan and implement activities based on the results framework, work plan and timetable contained in the UNEP Project Document aimed at achieving the national-level goals and targets of the project and the Strategic Action Programme for the South China Sea;
5. Prepare and facilitate endorsement, by the National Inter-Ministry Committee (IMC), quarterly costed work plans to guide the execution of national and site-based activities of the project;
6. Submit endorsed quarterly national costed work plans to the Project Director of the SCS-SAP Implementation Unit within five (5) working days before the end of each quarter (i.e. Quarter 1 is January-March, Quarter 2 is April-June, Quarter 3 is July-September, Quarter 4 is October-December).
7. Prepare and submit quarterly progress reports, expenditure reports, and cash advance requests for endorsement by the National Inter-Ministry Committee and subsequent submission to the Project Director of the SCS-SAP Implementation Unit within five (5) working days before the end of each quarter;
8. Prepare annual progress reports on national-level activities and results of efforts to meet SAP targets;
9. Maintain accurate and up-to-date records and documents in respect of all expenditures incurred with the funds made available to ensure that all expenditures are in conformity with the provisions of the endorsed costed work plans. For each disbursement, proper supporting documentation shall be maintained, including original invoices, bills, and receipts pertinent to the transaction.
10. Provide the SCS-SAP Implementation Unit with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of project funds advanced to the Specialized Executing Agency;
11. Be responsible for the proper custody, maintenance and care of all equipment purchased for use at the national level;
12. Lead national-level efforts to secure co-financing committed to this project and to leverage additional funding required to replicate and scale-up best practices in coastal and marine environmental management generated through this project; and

13. Ensure that the work of the parties under this agreement is suitably promoted as part of the UNEP/GEF project entitled '*Implementing the Strategic Action Programme for the South China Sea and Gulf of Thailand*', including labelling of outputs with agreed logos.

## **TERMS OF REFERENCE FOR THE SCS-SAP IMPLEMENTATION UNIT**

### **1. RATIONALE AND PURPOSE OF A SCS-SAP IMPLEMENTATION UNIT**

1.1 The SCS-SAP Implementation Unit for the UNEP/GEF Project entitled: “*Implementing the Strategic Action Programme for the South China Sea and Gulf of Thailand*” is established under the Project Document paragraph 432 as approved by the collaborating institutions and organisations during the project preparation phase as follows:

1.2 A South China Sea Strategic Action Programme Implementation Unit (SCS-SAP IU) shall be established at SEAFDEC, which serves as one of the GEF Regional Executing Agencies. The SCS-SAP IU shall have responsibility for the day-to-day management of project activities, and oversight of SAP implementation, including liaison with the National Focal Ministries (ministries responsible for environmental matters), the Specialised Executing Agencies at national level and other partners involved in SAP implementation.

1.3 The SCS-SAP IU will be led by a Project Director and shall provide quality technical support, guidance and advice on the implementation of project activities and the achievement of SAP targets.

### **2. ROLE AND FUNCTION**

2.1 The SCS-SAP IU will be responsible for: overall leadership, management and technical oversight of the SCS SAP implementation project; regional project governance, monitoring and reporting; policy/technical advice and advocacy; regional coordination, including the establishment of partnerships and networking; and external communications.

### **3. THE PROJECT CO-ORDINATING UNIT SHALL:**

3.1 Assume general responsibility for the day-to-day management and implementation of all project objectives and activities;

3.2 Prepare the annual work plan of the project, in a format consistent with UNEP’s budget, work programme and monitoring and evaluation procedures and financial regulations on the basis of the regional UNEP Project Document, and in close consultation and coordination with the SCS SAP Implementation Committee, National Inter-Ministry Committees, National Focal Points, the UNEP Task Manager and relevant donors;

3.3 Provide Secretariat support to the SCS SAP Implementation Committee, Regional Scientific and Technical Committee, Regional Working Groups and Regional Task Forces;

3.4 Coordinate and monitor the activities described in the work plan, and report to UNEP and the regional SCS-SAP Implementation Committee;

3.5 Facilitate liaison and networking between and among the 6 country participants, relevant regional organisations, other relevant organisations, non-governmental organisations, key stakeholders and other individuals involved in SAP project implementation;

3.6 Foster and establish links with other related programmes and projects and, where appropriate, with other regional GEF International Waters projects, e.g. IW:LEARN, the SEAFDEC/UNEP/GEF Fisheries Refugia Project and PEMSEA,

3.7 Oversee the development of Terms of Reference for consultants and contractors, and be ultimately responsible for the delivery of work produced by consultants under the project;

3.8 Coordinate and oversee the preparation of the substantive and operational reports for the project;

3.9 Guide other SCS-SAP Implementation Unit staff in the collection and dissemination of information on policy, economic, social, scientific, and technical issues related to achievement of SAP targets;

3.10 Promote public awareness and stakeholder engagement activities necessary for successful project implementation;

3.11 Assist in the delivery of training courses on technical matters, project management, and monitoring and evaluation to strengthen regional capacity in GEF project execution; and

3.12 Lead in the development of integrated and simplified results tracking and reporting tools for the project to ensure effective communication with national governments, UNEP and the GEF.

#### **4. MANAGEMENT OF THE SCS-SAP Implementation Unit**

4.1 The SCS-SAP Implementation Unit will be led by a Project Director. He/she shall liaise directly with the National Focal Points and other relevant bodies and stakeholders were relevant. He/she will also liaise with representatives of UNEP and GEF, as well as other regional donors, in order to coordinate the annual work plan for the project. He/she shall be responsible for all technical, planning, managerial, monitoring, progress and financial reporting for the project.

4.2 The Project Director will consult and coordinate closely with other representatives of UNEP and report directly to the UNEP Task Manager. The position of Project Director encompasses the following major functions:

- Leadership, management and technical oversight of the SCS SAP Implementation project;
- Regional project governance and monitoring;
- Policy/technical advice and advocacy;
- Regional and national coordination, partnership and networking; and
- External communication

4.3 The Project Director will be supported by the following SCS-SAP Implementation Unit staff: Regional Team and Science Leader; Tropical Coastal Habitat Expert; Marine Pollution Expert; GIS and Data Management Expert; Communications and Knowledge Management Adviser; Monitoring and Evaluation Adviser; Project Administrator; and a Project Accountant. Terms of Reference for these positions will be developed during project inception as a primary task of the Project Director.

#### **5. APPOINTMENT OF THE PROJECT DIRECTOR**

Decision-making regarding the selection and recruitment of this post will be made by the UNEP Task Manager. Selection criteria identified during project preparation are outlined below.

The selected candidate will have:

5.1 At least fifteen years of relevant experience in international development in cross-sectorial natural resource management with a minimum of ten years operating in developing country contexts at both strategic regional and technical national levels;

5.2 Proven skills in project team leadership, coordinating multi-disciplinary team inputs, and managing programmes and resources in developing countries;

5.3 Proven ability to work with partners and the ability to plan, coordinate and manage complex programmes and projects in developing countries;

- 5.4 Demonstrable excellent verbal and written communications skills, both at a technical level and in the preparation of information for policy makers and wider civil society;
- 5.5 Previous experience in the operational aspects of large UN-implemented projects or similar regional/multi-country projects in developing countries, as well as experience with funding organizations such as the GEF will be an advantage;
- 5.6 Post-graduate qualifications in one or more of the following disciplines: ecology, natural sciences, coastal management, coastal policy and planning, and/or International development;
- 5.7 Excellent working knowledge of English;
- 5.8 Familiarity with the goals and procedures of international organizations, in particular those of the GEF and UNEP; and
- 5.9 Knowledge of GEF co-financing approaches will be a distinct advantage.

**Appendix 12:** Co-financing commitment letters from project partners [[ONLINE](#)]

**Appendix 13:** Endorsement letters of GEF National Focal Points [[ONLINE](#)]

**Appendix 14:** Draft procurement plan [[EXCEL SPREADSHEET](#)]

**Appendix 15:** Tracking Tools [[EXCEL SPREADSHEET](#)]

## **Appendix 16: Environmental and Social Screening**

The following screening of potential environmental and social impacts of national level activities of the UNEP/GEF project entitled “Implementing the Strategic Action Programme for the South China Sea and Gulf of Thailand” was undertaken during the Project Preparation Phase. Specific elements of the project design assessed included the proposed locations of activities, possible environmental impacts, and social considerations. No adverse impacts as a result of the execution of proposed national level activities were identified.

### **(a) Locations**

	<i>Yes/No/N.A.</i>	<i>Comment/explanation</i>
- Is the project area in or close to -		
- densely populated area	Yes	All sites are densely populated and characterised by multiple environmental and social compromises, including conflicts over near shore use. Specific project activities focus on development of locally appropriate spatial planning solutions to minimise conflict and improved security.
- cultural heritage site	No	No project activities are planned in or adjacent to cultural heritage sites.
- protected area	Yes	Consultative processes in the delineating boundaries and establishing management protected areas etc are designed to ensure that establishment of management area do not create any external impacts on nearby protected areas.
- wetland	Yes	Information and data collection will be undertaken in wetland areas and will result in no additional impact from project activities.
- mangrove	Yes	Information and data collection will be undertaken in mangrove areas and will result in no additional impact from project activities.
- estuarine	No	Information and data collection will be undertaken in estuarine areas and will result in no additional impact from project activities.
- buffer zone of protected area	No	No project activities are planned in or close to any buffer zone of protected areas in the vicinity of the priority sites of this project.
- special area for protection of biodiversity	No	No project activities are planned in or close to any special area for protection of biodiversity.
- Will project require temporary or permanent support facilities?	No	No temporary or permanent support facilities are required.

### **(b) Environmental Impacts**

	<i>Yes/No/N.A.</i>	<i>Comment/explanation</i>
- Are ecosystems related to project fragile or degraded?	Yes	All project sites contain fragile and degraded coastal habitats. Project activities aim to reverse degradation of these habitats and contribute to their longer-term sustainable use.
- Will project cause any loss of precious ecology, ecological, and economic functions due to construction of infrastructure?	No	This aspect was considered during the PPG phase and no negative impact is anticipated. While no construction of infrastructure is planned at any sites, some in situ sampling equipment will be deployed at a number of sites. Accordingly, no adverse environmental impacts are anticipated.
- Will project cause impairment of ecological opportunities?	No	This aspect was considered during the PPG phase and no impairment of ecological opportunities are anticipated. Conversely, project activities aim to build resilience of coastal and marine ecosystems and secure longer-term options for the sustainable use of biodiversity with the SCS marine basin.

- Will project cause increase in peak and flood flows? (including from temporary or permanent waste waters)	N.A.	While not applicable to this project, localised land and sea based pollution represent threats to the priority locations. Where such threats are prioritised for action, efforts to address the management of contaminant sources will be planned through cross-sectorial coordination mechanisms established through the project.
- Will project cause air, soil or water pollution?	N.A.	This aspect was considered during the PPG phase and was deemed not applicable to this project.
- Will project cause soil erosion and siltation?	N.A.	This aspect was considered during the PPG phase and was deemed not applicable to this project.
- Will project cause increased waste production?	N.A.	This aspect was considered during the PPG phase and was deemed not applicable to this project.
- Will project cause Hazardous Waste production?	N.A.	This aspect was considered during the PPG phase and was deemed not applicable to this project.
- Will project cause threat to local ecosystems due to invasive species?	N.A.	This aspect was considered during the PPG phase and was deemed not applicable to this project.
- Will project cause Greenhouse Gas Emissions?	N.A.	This aspect was considered during the PPG phase and was deemed not applicable to this project.
- Other environmental issues, e.g. noise and traffic	N.A.	This aspect was considered during the PPG phase and was deemed not applicable to this project.

**(c) Social Impacts**

	Yes/No/N.A.	Comment/explanation
- Does the project respect internationally proclaimed human rights including dignity, cultural property and uniqueness and rights of indigenous people?	Yes	These issues were considered during the PPG and are reflected in the proposed terms of reference and operating procedures for national and local level coordinating and consultative bodies to ensure regular project decision-making reflects the internationally proclaimed human rights including dignity, cultural property and uniqueness and rights of indigenous people?
- Are property rights on resources such as land tenure recognized by the existing laws in affected countries?	Yes	This issue was considered during the PPG and is reflected in the proposed terms of reference and operating procedures for national and local level coordinating and consultative bodies to ensure property rights and land and sea use tenure are appropriately reflected in project planning decisions.
- Will the project cause social problems and conflicts related to land tenure and access to resources?	No	This aspect was considered during the PPG phase and will be addressed via efforts to mainstream land and marine tenure issues into project activities at all levels.
- Does the project incorporate measures to allow affected stakeholders' information and consultation?	Yes	This issue was considered during the PPG and a full component was included in the project design aimed at catalysing stakeholder engagement and participation in project planning, reporting, and monitoring and evaluation. Additionally, the project will stimulate vertical networking and communication between national and municipal agencies involved in environment and natural resource management.
- Will the project affect the state of the targeted country's (-ies') institutional context?	No	This issue was considered during the PPG and no negative impact is anticipated. Rather the project aims to result in strengthened institutional linkages between agencies involved in natural resource management with the view for streamlining of investment in integrated natural resource and environmental mgmt.
- Will the project cause change to beneficial uses of land or	No	This issue was considered during the PPG and no negative impact is anticipated. Rather it is anticipated that the project will result in enhancement

resources? (incl. loss of downstream beneficial uses (water supply or fisheries)?		of livelihood and food security benefits associated with coastal communities use of goods and services associated with coastal habitats.
- Will the project cause technology or land use modification that may change present social and economic activities?	Yes	This issue was considered during the PPG and no negative impact is anticipated.
- Will the project cause dislocation or involuntary resettlement of people?	No	This issue was considered during the PPG and no negative impact is anticipated.
- Will the project cause uncontrolled in-migration (short- and long-term) with opening of roads to areas and possible overloading of social infrastructure?	N.A.	This aspect was considered during the PPG phase and was deemed not applicable to this project.
- Will the project cause increased local or regional unemployment?	No	This issue was considered during the PPG and no negative impact is anticipated, rather improved livelihoods are anticipated via the establishment of more resilient coastal communities.
- Does the project include measures to avoid forced or child labour?	Yes	This issue was considered during the PPG and no negative impact is anticipated.
- Does the project include measures to ensure a safe and healthy working environment for workers employed as part of the project?	Yes	This issue was considered during the PPG and no negative impact is anticipated.
- Will the project cause impairment of recreational opportunities?	No	This issue was considered during the PPG and no negative impact is anticipated.
- Will the project cause impairment of indigenous people's livelihoods or belief systems?	No	This issue was considered during the PPG and no negative impact is anticipated.
- Will the project cause disproportionate impact to women or other disadvantaged or vulnerable groups?	No	This issue was considered during the PPG and no negative impact is anticipated.
- Will the project involve and/or be complicit in the alteration, damage or removal of any critical cultural heritage?	No	This issue was considered during the PPG and no negative impact is anticipated.
- Does the project include measures to avoid corruption?	Yes	This issue was considered during the PPG and no negative impact is anticipated. Additionally, the project budget will be presented to and fully reviewed by all members of the national and regional committees on a routine basis to ensure transparency.