



PROJECT DOCUMENT

SECTION 1: PROJECT IDENTIFICATION

1.1 Project title:	Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand
1.2 Project number:	GFL/ PMS:
1.3 Project type:	FSP
1.4 Trust Fund:	GEF
1.5 Strategic objectives:	
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 to rebuild marine fisheries
1.6 UNEP priority:	SP3 – EA321
1.7 Geographical scope:	Regional: South East Asia – Cambodia, Indonesia, Malaysia, Philippines, Thailand and Vietnam
1.8 Mode of execution:	External
1.9 Project executing organization:	SEAFDEC
1.10 Duration of project:	48 months Commencing: May 2015 Completion: April 2019

1.11 Cost of project	US\$	%
Cost to the GEF Trust Fund	3,000,000	20
Co-financing		
Cash		
National Governments	1,148,644	7
Southeast Asian Fisheries Development Centre	3,876,400	25
Sub-total	5,025,044	32
In-kind		
National Governments	5,036,806	32
SEAFDEC	2,456,000	16
UNEP	200,000	
Sub-total	7,692,806	48
Total	15,717,850	100

1.12 Project summary

The South China Sea is a global centre of shallow water marine biological diversity that supports significant fisheries that are important to the food security and export income of Southeast Asian countries. These fisheries are characterised by high levels of fishing effort from the small-scale sector. Accordingly, all inshore waters of the South China Sea basin are subject to intense fishing pressure. This situation of high small-scale fishing pressure and declining fisheries resources has contributed to the adoption of unsustainable fishing methods to maintain catch and increase incomes in the short-term. These include the use of destructive fishing gear and practices, such as the operation of demersal trawls and push nets in seagrass areas, and the detonation of explosives and release of fish poisons in coral reef areas. Small-scale inshore fishing pressure has therefore been identified as a significant cause of the degradation and loss of coastal habitats in 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 continued decline in the total area of habitats critical to the life cycles of most aquatic species, combined with the high levels of coastal community dependence on fish, has raised serious concerns for the long-term sustainability of small-scale fisheries in the region. With fish production being intrinsically linked to the quality and area of habitats and the heightened dependence of coastal communities on fish, a need exists to improve the integration of fish habitat considerations and fisheries management in the region. This project entitled “*Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand*” has been developed to meet this need via implementation of the fisheries component of the Strategic Action Programme for the South China Sea. Executed regionally by the Southeast Asian Fisheries Development Center in partnership with the government agencies responsible for fisheries in the 6 participating countries, the project is comprised of the following 4 project components.

Component 1 will result in the establishment of operational management at 14 priority fisheries *refugia*, with community-based *refugia* management plans being key outputs. Supporting activities include consultative processes to facilitate agreement among stakeholders on the boundaries of fisheries *refugia*, identification of key threats to *refugia* sites, recording of fishing community views regarding appropriate fisheries and habitat management measures, and eliciting stakeholder inputs to management plan review. *Refugia* management plans will provide rules *inter alia* on operating requirements for the use of particular classes of fishing vessels or fishing gear within *refugia*, procedures for adjusting management measures over time, and mechanisms for enforcement. Specific direction is given to drafting of regulations and ordinances required in support of plan implementation.

Component 2 focuses on strengthening the enabling environment for the formal designation and operational management of *refugia*. Preparatory activities include legal reviews to identify, *inter alia*: legal terminology for describing *refugia*; formal procedures for demarcating boundaries of spatial management areas such as *refugia*, including requirements for assessing the socio-economic impacts of management measures and stakeholder consultation; and provisions for decentralising *refugia* management to the community level via development of co-management and rights-based approaches. These national reviews are aimed at informing the drafting of required policy and legislative amendments for adoption by competent authorities. This component will also build the national and site-level science and information base required to inform the monitoring and evaluation of the effectiveness of individual *refugia* and the regional network of sites.

Component 3 focuses on strengthening information management and dissemination aimed at enhancing the national uptake of best practices in integrating fisheries management and biodiversity conservation, and in improving community acceptance of area based approaches to fisheries and coastal environmental management. Supporting activities involve the development of national knowledge management systems on the use of fisheries *refugia* in capture fisheries management, and the establishment of a Regional Education and Awareness Centre that will operate as a facility for the production and sharing of information and education materials on fisheries and critical habitat linkages in the South China Sea. Importantly, Component 3 will support the development of indicators to monitor the effectiveness of coastal fisheries management systems established for

priority fisheries *refugia*. A regional programme for the compilation of standardised fisheries statistics for use in identifying and managing fisheries *refugia* will also be developed to support longer-term management.

At the national-level, Component 4 will strengthen cross-sectorial coordination for integrated fisheries and environmental management and will harness the national scientific and technical expertise and knowledge required to inform the policy, legal and institutional reforms for fisheries *refugia* management in the participating countries. Local community action and strengthened ‘community to cabinet’ linkages will be facilitated via establishment and operation of site-based management boards for fisheries *refugia* at the 14 priority locations in the South China Sea. Regionally, Component 4 will foster regional cooperation in: the establishment and operation of a regional system of fisheries *refugia*; and in the integration of scientific knowledge and research outputs with management and policy making. This component also includes project coordination and management activities aimed at: ensuring the timely and cost effective implementation of regional and national-level activities; and satisfying the reporting requirements of UNEP and the GEF.

The longer-term goals of this project are to contribute to: improved integration of habitat and biodiversity conservation considerations in the management of fisheries in the South China Sea and Gulf of Thailand; improved national management of the threats to fish stock and critical habitat linkages within fisheries *refugia*; and enhanced uptake of good practice in integrating fisheries management and biodiversity conservation in the design and implementation of regional and national fisheries management systems. The medium-term objectives align with those of the fisheries component of the Strategic Action Programme for the South China Sea which are to: build the resilience of Southeast Asian fisheries to the effects of high and increasing levels of fishing effort; improve the understanding among stakeholders, including fisherfolk, scientists, policy-makers, and fisheries managers, of ecosystem and fishery linkages as a basis for integrated fisheries and ecosystem/habitat management; and build the capacity of fisheries departments/ministries to engage in meaningful dialogue with the environment sector regarding the improvement of fisheries and management of interactions between fisheries and critical marine habitats. Related end of project targets are:

- by 2018, to have established a regional system of a minimum of fourteen *refugia* for the management of priority transboundary, fish stocks and endangered species; and
- by 2018, to have prepared and implemented fisheries management systems in the identified priority *refugia* based on and consistent with, the ASEAN SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia.

Given the limited integration of the work of fisheries and environment ministries observed in Southeast Asia and many other parts of the world, the establishment and operation of the regional system of fisheries *refugia* provides an opportunity to learn from a regional fishery sector led initiative to collaborate with the environment sector on integrating fisheries and coastal habitat management. It is anticipated that the experience gained in the South China Sea region through this project will be suitable for application in other marine areas such as the Yellow Sea where over-fishing and the use of inappropriate fishing gear are significant impediments to more sustainable exploitation of fisheries resources and the use of coastal habitats.

TABLE OF CONTENTS

SECTION 1: PROJECT IDENTIFICATION	1
ACRONYMS AND ABBREVIATIONS	6
SECTION 2: BACKGROUND AND SITUATION ANALYSIS (BASELINE COURSE OF ACTION)	7
2.1. Background and context	7
2.1.1 Introduction	7
2.1.2 The fisheries <i>refugia</i> concept	8
2.2 Global significance	16
2.2.1 Biodiversity and dominant coastal habitats	16
2.2.2 Fish stocks and fisheries of the South China Sea	20
2.2.3 Significance of the fisheries <i>refugia</i> approach	21
2.3 Threats, root causes and barrier analysis	21
2.3.1 Threats to dominant coastal habitats	21
2.3.2 Threats from fisheries	24
2.3.3 Root causes	27
2.3.4 Barriers	28
2.4 Institutional, sectorial and policy context	29
2.5 Stakeholder mapping and analysis	29
2.6 Baseline analysis and gaps	30
2.6.1 Strategic Action Programme for the South China Sea	30
2.6.2 Planned national actions for Strategic Action Programme implementation	30
2.6.3 Planned regional actions for Strategic Action Programme implementation.....	32
2.6.4 Baseline and gaps for the operation of a regional system of fisheries <i>refugia</i>	32
2.7 Linkages with other GEF and non-GEF interventions	33
SECTION 3: INTERVENTION STRATEGY (ALTERNATIVE)	36
3.1. Project rationale, policy conformity and expected global environmental benefits	36
3.2. Project goal and objective	36
3.3. Project components and expected results	37
3.4. Intervention logic and key assumptions	54
3.4.1 Focus on fish life-cycle – critical habitat linkages and sustainable use rather than prohibition of fishing	54
3.4.2 Comparing Marine Protected Areas and fisheries <i>refugia</i>	56
3.4.3 Key assumptions.....	56
3.5 Risk analysis and risk management measures	57
3.6 Consistency with national priorities or plans	59
3.7 Incremental cost reasoning	62
3.7.1 Baseline	62
3.7.2 Business-as-usual scenario	62
3.7.3 Incremental reasoning.....	62
3.8 Sustainability	63
3.9 Replication	64
3.10 Public awareness, communications and mainstreaming strategy	65
3.10.1 Public awareness.....	65
3.10.2 Communications	66
3.10.3 Mainstreaming.....	66
3.11 Environmental and social safeguards	66
SECTION 4: INSTITUTIONAL FRAMEWORK AND IMPLEMENTATION ARRANGEMENTS	67
4.1 Regional decision making and planning	67
4.2 National planning and guidance	67
4.3 Regional coordination and management	68
SECTION 5: STAKEHOLDER PARTICIPATION	70
SECTION 6: MONITORING AND EVALUATION PLAN	70
SECTION 7: PROJECT FINANCING AND BUDGET	72
7.1. Overall project budget	72
7.2 Project co-financing	72

7.3	Project cost-effectiveness	72
REFERENCES	74
APPENDICES	79
Appendix 1:	Budget by project components and UNEP budget lines [EXCEL SHEETS]	79
Appendix 2:	Co-financing by source and UNEP budget lines [EXCEL SHEETS]	79
Appendix 3:	Incremental cost analysis	80
Appendix 4:	Results Framework.....	82
Appendix 5:	Workplan and timetable	92
Appendix 6:	Key deliverables and benchmarks	99
Appendix 7:	Costed M&E plan	105
Appendix 8:	Summary of reporting requirements and responsibilities.....	119
Appendix 9:	Standard Terminal Evaluation TOR.....	122
Appendix 10:	Decision-making flowchart and organizational chart.....	146
Appendix 11:	Terms of Reference.....	147
Appendix 12:	Co-financing commitment letters from project partners	158
Appendix 13:	Endorsement letters of GEF National Focal Points	166
Appendix 14:	Draft procurement plan [EXCEL SHEET]	175
Appendix 15:	Tracking Tools [EXCEL SHEET]	175
Appendix 16:	Environmental and social screening	176
Appendix 17:	National Project Document for Cambodia [ONLINE]	179
Appendix 18:	National Project Document for Indonesia [ONLINE]	179
Appendix 19:	National Project Document for Malaysia [ONLINE]	179
Appendix 20:	National Project Document for the Philippines [ONLINE].....	179
Appendix 21:	National Project Document for Thailand [ONLINE]	179
Appendix 22:	National Project Document for Viet Nam [ONLINE].....	179
Appendix 23:	Report of the PPG Initiation Workshop [ONLINE].....	179
Appendix 24:	Report of the PPG Validation Workshop [ONLINE].....	179
Appendix 25:	Agreement between UNEP and SEAFDEC	
Appendix 26:	Draft Letter of agreement between SEAFDEC and the National Executing entities	

ACRONYMS AND ABBREVIATIONS

APFIC	Asia-Pacific Fisheries Commission of FAO
ASEAN	Association of Southeast Asian Nations
CCRF	FAO Code of Conduct for Responsible Fisheries
COBSEA	Coordinating Body on the Seas of East Asia
EA	Ecosystem approach
EAF	Ecosystem approach to fisheries
EEZ	Exclusive Economic Zone
EOU	Evaluation Office of UNEP
FAO	Food and Agriculture Organisation of the UN
GEF	Global Environment Facility
GIS	Georeferenced Information System
GoT	Gulf of Thailand
IMC	Inter-Ministry Committee
IUCN	International Union for the Conservation of Nature
IW	GEF International Waters Focal Area
IW:LEARN	International Waters Learning, Exchange and Resource Network
M&E	Monitoring and Evaluation
MPA	Marine Protected Area
NFC	National Fisheries Committee
NAP	National Action Plan
NFRC	National Fisheries <i>Refugia</i> Committee
NSTC	National Scientific and Technical Committee
PCU	Project Co-ordinating Unit
PoW	Programme of Work
PPO	Project Plan of Operation
PSC	Project Steering Committee
RWG	Regional Working Group
RWG-CR	RWG on Coral Reefs of the UNEP/GEF South China Sea Project
RWG-F	RWG on Fisheries of the UNEP/GEF South China Sea Project
RWG-M	RWG on Mangroves of the UNEP/GEF South China Sea Project
RWG-SG	RWG on Seagrass of the UNEP/GEF South China Sea Project
RSTC	Regional Scientific and Technical Committee
SAP	Strategic Action Programme
SCS	South China Sea
SCS Project	UNEP/GEF project entitled 'Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand'
SEAFDEC	Southeast Asian Fisheries Development Centre
SFP	Sustainable Fisheries Partnership
SIDA	Swedish International Development Agency
SMART	Specific, Measureable, Achievable and Attributable, Relevant and Realistic, Time-bound, Timely, Trackable and Targeted Indicators
TDA	Transboundary Diagnostic Analysis
UNEP	United Nations Environment Programme
UNEP-DEWA	UNEP Division of Early Warning and Assessment
UNON	United Nations Office at Nairobi
WSSD	World Summit on Sustainable Development

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

2.1. Background and context

2.1.1 Introduction

1. The South China Sea, including the Gulf of Thailand (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% of the world's population.
2. Additionally, the South China Sea is a global centre of shallow water marine biological diversity that supports significant fisheries that are important to the food security and export income of Southeast Asian countries. These fisheries are characterised by high levels of fishing effort from the small-scale sector. Accordingly, all inshore waters of the South China Sea basin are subject to intense fishing pressure (UNEP, 2007a).
3. An obvious impediment to the reduction of inshore fishing effort is that small-scale operators are often entirely dependent on fish for income, food and well-being (Paterson *et al.*, 2013). The most important fish species are considered fully fished or overexploited. As a result of 'fishing down marine food webs' (Christensen, 1998), small pelagic species now dominate landings as most demersal fisheries are overfished (Lundgren *et al.*, 2006). Consequently, the investment of time and household expenditure on fuel for fishing has increased in coastal communities attempting to secure adequate dietary nutrition and income from fishing (UNEP, 2007a).
4. This situation of high small-scale fishing pressure and declining fisheries resources has contributed to the adoption of unsustainable fishing methods to maintain catch and increase incomes in the short-term. These include the use of destructive fishing gear and practices, such as the operation of demersal trawls and push nets¹ in seagrass areas, and the detonation of explosives and release of fish poisons in coral reef areas. Small-scale inshore fishing pressure has therefore been identified as a significant cause of the degradation and loss of coastal habitats in the South China Sea (UNEP, 2008a).
5. 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) (UNEP, 2008a). This continued decline in the total area of habitats critical to the life cycles of most aquatic species, combined with the high levels of coastal community dependence on fish, has raised serious concerns for the long-term sustainability of small-scale fisheries in the region.
6. Fishing was identified by the Regional Working Groups for the coastal habitats and fisheries components of the UNEP/GEF project entitled "*Reversing Environmental Degradation in the South China Sea and Gulf of Thailand*"² as a factor contributing to the continued loss of marine habitats and biodiversity in the South China Sea. The small size of vessels which are largely owner operated, and the multitude of landing points and land-based distribution networks poses problems of regulation and control that differ significantly from temperate fleets. The effects of intensive inshore fishing include: declining availability and biomass of fish species of global and transboundary significance; changes in community structure due to direct reductions of populations representing specific trophic levels of the community (e.g. predator or prey); capture mortality of rare and endangered species; large catches of juvenile fish; and the degradation and loss of habitats and associated non-target biodiversity (Paterson *et al.*, 2013). The widespread use of inappropriate and destructive fishing gear and practices, such as the use of demersal trawls and push nets in seagrass areas, and the use of poisons and explosives to catch fish in coral reef areas, is of increasing concern with respect to the degradation and loss of

¹ Push netting is not practiced in Indonesia

² Hereafter referred to as the SCS Project

habitats and biodiversity. This situation has led to an urgent need for new and innovative fisheries management approaches in the region, particularly those aimed at limiting the loss of habitats and biodiversity, and ensuring the sustainable use of biodiversity by the fisheries sector.

7. With fish production being intrinsically linked to the quality and area of habitats and the heightened dependence of coastal communities on fish, a need exists to improve the integration of fish habitat considerations and fisheries management in the region. The dilemma for the fisheries and environment sectors is that conservation of habitat does not necessarily result in increased fish stocks while lowering fishing effort does not necessarily result in the improvement of habitat. Therefore, given the complexity of the key threats to fish stocks, fish habitats and associated biodiversity in Southeast Asia, it is imperative that mechanisms for effective cross-sectorial consultation and coordination be established, particularly in terms of the identification and designation of priority ‘places’ (*sensu* Pauly, 1997) for management.

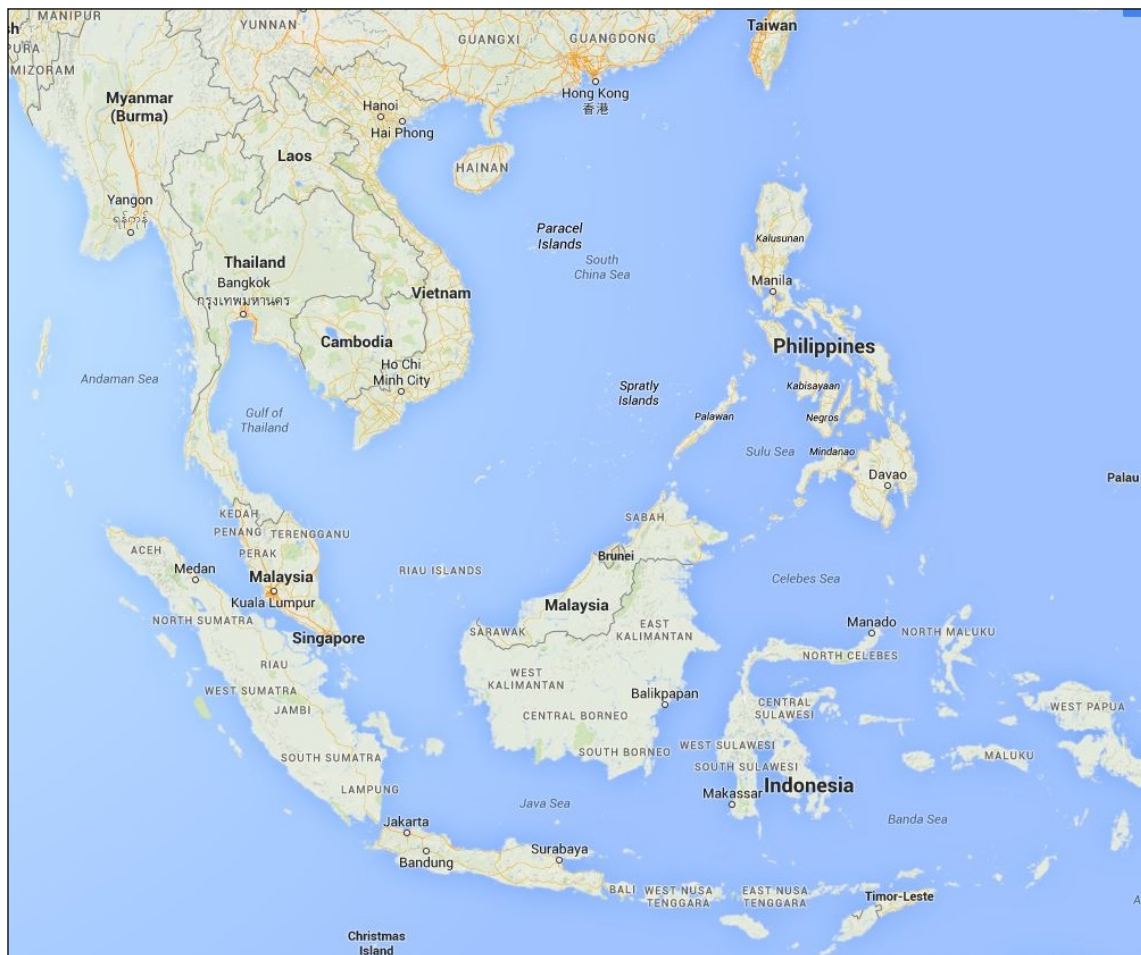


Figure 1. Map of the South China Sea and Gulf of Thailand
Source: Google Maps

2.1.2 The fisheries *refugia* concept

2.1.2.1 Fisheries component of the SCS Project

8. The SCS Project was funded by the Global Environment Facility (GEF) and implemented by the United Nations Environment Programme (UNEP) in partnership with seven riparian states bordering the South China Sea. Planning commenced in 1996; the project became fully operational in February 2002; and was formally closed at the end of January 2009. The fisheries component of the project entitled “*Over Exploitation of Fisheries in the Gulf of Thailand*” focused on the links between fish stocks and coastal habitats and was designed to secure agreement on an approach for “*Improved integration of fisheries and biodiversity management in the Gulf of Thailand*”. This component was

nested with other project components focusing on habitat degradation and loss, land-based pollution, and regional coordination within the broader management framework of the project³.

9. National activities of the fisheries component were executed by departments or research institutes of the government ministries responsible for fisheries in Cambodia, Indonesia, Malaysia, Philippines, Thailand and Viet Nam. Government nominated focal points for fisheries from these countries led the execution of regional activities through the Regional Working Group on Fisheries (RWG-F). Ten formal meetings of the RWG-F were convened between 2002 and 2008. The work of this group benefitted from the participation of 5 regional experts on fisheries, and senior advisors and technical staff of the Southeast Asian Fisheries Development Center (SEAFDEC), the Food and Agriculture Organization of the United Nations (FAO), the WorldFish Centre and the International Union for the Conservation of Nature (IUCN).

10. The direct linkages and feedback loops that were established between and among these fisheries experts and the habitat specialists, pollution scientists, lawyers, and economists involved in the broader UNEP/GEF South China Sea project was a first for a marine fisheries working group in Southeast Asia. The collaboration between the RWG-F and SEAFDEC was established to ensure that fisheries component activities complemented, rather than duplicated, work being undertaken as part of larger SEAFDEC and FAO fisheries projects and programmes.

11. During its preliminary planning stages, the RWG-F realised that initiatives to integrate fisheries and habitat management in Southeast Asia would be constrained by the following factors: (1) limited experience in national fisheries and environment departments and ministries with respect to the implementation of integrated fisheries and habitat management approaches; (2) limited information regarding fish life-cycles and critical habitat linkages and the role that coastal habitats play in sustaining fisheries; and (3) the low level of community acceptance of 'protected' area approaches to marine management in Southeast Asia.

2.1.2.2 Identified barriers to the effective integration of fisheries and habitat management

Limited practical experience in integrating fisheries and environmental considerations

12. The need to integrate fisheries and habitat management has received high-level international recognition, particularly within the framework of the approved Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem (FAO, 2002). The Reykjavik Declaration states that in an effort to reinforce responsible and sustainable fisheries in the marine ecosystems, States "*will individually and collectively work on incorporating ecosystem considerations into that management to that aim.*" The Reykjavik Conference requested the FAO to prepare "guidelines for best practices with regard to introducing ecosystem considerations into fisheries management" and the World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa, 2002, considered the Reykjavik Declaration in adopting a political declaration and plan of implementation in relation to capture fisheries. In the WSSD declaration, the Heads of State agreed to "*develop and facilitate the use of diverse approaches and tools, including the ecosystem approach, the elimination of destructive practices ... and the integration of marine and coastal areas management into key sectors*".

13. In 2003, FAO released the Technical Guidelines for Responsible Fisheries dealing specifically with the ecosystem approach to fisheries (EAF) as part of the FAO Code of Conduct for Responsible Fisheries (CCRF) (FAO, 2003). In a note regarding the preparation of the document, FAO highlights that "at the time of writing (the guidelines), there was little practical experience in implementing EAF anywhere in the world". The background to the document goes on to state that, "*these guidelines attempt to translate the requests for an ecosystem approach to fisheries into operational guidelines that can be applied to marine capture fisheries*". Similarly, the ASEAN-SEAFDEC Regional Guidelines on Responsible Fisheries in Southeast Asia provide guidance with regard to minimising the negative impacts of fishing on the environment and critical fisheries habitats (SEAFDEC, 2006). This has been further reinforced by the FAO Small-Scale Fisheries Guidelines.

14. From the perspective of improving the integration of fish stock and habitat management considerations and the adoption of the ecosystem approach promoted by the above mentioned international and regional instruments, most approaches to fisheries management in Southeast Asia do

³ Refer to Pernetta and Jiang, 2013 for further information on the management framework of the SCS project.

not effectively integrate environmental considerations. From an examination of trends in national fisheries and aquaculture policy, the Asia-Pacific Fisheries Commission (APFIC) concluded that the limited uptake of ecosystem approaches in the region “*may be because of limitations in understanding about ecosystems, and challenges in making ecosystem approaches to fisheries management operational*” (FAO, 2006). In this connection, the RWG-F identified, in the early stages of its work, that a central problem faced by fisheries ministries and departments in building environmental considerations into fisheries management is a lack of examples relevant to the region on how to implement such policies at the local level (UNEP, 2006a).

Limited knowledge of fish life-cycle and critical habitat linkages

15. Regarding the lack of knowledge concerning fish life-cycles and critical habitat linkages in the South China Sea basin, the RWG-F noted that, while the life-cycles of most fished species in the region were thought to follow the generalised three-phase ontogeny of marine fishes, very little information existed at the regional level regarding specific habitats and locations used by most fish species during critical phases of their life-cycles (UNEP, 2005a and 2006a). Spawning sites and the influence of ocean processes on the transport of fish larvae are also poorly known (UNEP, 2006b). This situation results from past fisheries research programmes having focused on determining sustainable yields of fish stocks with little emphasis being placed on fish life-cycle research.

16. Most fish life-cycle and habitat data and information in the region are qualitative in nature, providing general information regarding the presence or absence of fish and the life-cycle phase of fish species observed in a given habitat area. While this work is useful in developing an inventory of habitats and locations utilised by fished species at different phases of their life-cycle, the RWG-F identified the need for regional level research on the role of specific habitat areas in terms of fisheries production and sustaining fish stocks under scenarios of increased fishing effort (UNEP, 2006b).

17. National and regional fisheries statistics provide little insight into the role of habitat in fisheries production. Fisheries production data in all countries bordering the South China Sea is recorded by place of landing, typically with species grouped into broad generic categories. Information about the fishing gear and practices used (e.g., gear type, mesh size, time of day) is rarely recorded. The general lack of data regarding the specific locations in which fish species were harvested, coupled with poor information about the efficiency and selectivity of the fishing gear used, makes it extremely difficult to link fisheries production data to a given habitat type or fishing area. The RWG-F noted that this lack of information regarding the broad scale role of habitats in fisheries production not only hinders the identification of priority areas for management but constrains initiatives to increase the understanding of stakeholders regarding the importance of fish habitat and life-cycle linkages (UNEP, 2006a).

Low level community acceptance of ‘protected’ area-based approaches

18. During the meetings of the RWG-F it was noted that Marine Protected Areas (MPAs) were increasingly being promoted, or conceived, as essential fisheries management instruments (see Roberts and Polunin, 1993; Gell and Roberts, 2003) and that the FAO had initiated an evaluation of the effectiveness of marine protected areas as management and conservation tools for fisheries. It was agreed that, while fisheries ministries and departments in the region would need to improve their working relationships with organisations promoting MPAs, the key barrier would be in achieving acceptance among communities at the local level of the value of MPAs. The consensus view within the working group was that MPAs in Southeast Asia were widely understood by fisheries stakeholders to be areas that were closed to fishing.

19. The initial global promotion of the MPA concept clearly distinguished between the establishment of MPAs for the protection of biodiversity and fisheries respectively (Hilborn *et al.*, 2004). The distinction between these two purposes has recently been blurred by MPA advocates who have presented general MPA benefits not only in terms of biodiversity protection but also in terms of enhanced fisheries yields. The RWG-F noted with concern that most MPAs in Southeast Asia had been established under a broad banner of ‘improving the state of fisheries’, whereas the criteria for the selection of MPA sites had typically related to the achievement of objectives for biodiversity conservation or political gain rather than for fisheries management (UNEP, 2006a). This was complicated further when an objective review of the various MPA definitions suggested that the entire

Exclusive Economic Zones (EEZs) of Southeast Asian countries are, technically, MPAs because fishing in these EEZs is restricted through long-standing fisheries management measures.

2.1.2.3 Approach of the Regional Working Group on Fisheries

Addressing barriers to integration

20. A review of fisheries and habitat management initiatives in the Southeast Asian region revealed that no initiative with a direct focus on improving the integration of fisheries and habitat management in the South China Sea either existed or had previously been implemented. It was agreed that, given the important role of fisheries habitats in sustaining fish stocks and production, the trends in the degradation and loss of these habitats, and the intense small-scale fishing pressure in inshore areas, a regional system of fisheries management areas (fisheries *refugia*) would be established in the South China Sea and Gulf of Thailand. This system would focus on the improved management of the critical links between fish stocks and their habitats toward the longer-term goal of building resilience of Southeast Asian fisheries to the effects of high and increasing levels of small-scale fishing pressure (UNEP, 2006a).

21. The RWG-F agreed that the initiative would need to address the barriers to integration outlined above and specifically noted that it should:

- build the capacity of fisheries and environment departments and ministries to engage in meaningful dialogue regarding how broader multiple use planning can best contribute to improving the state of fisheries habitat management in areas of the South China Sea and the Gulf of Thailand;
- improve understanding among stakeholders, including fisherfolk, scientists, policy makers and fisheries managers, of habitat and fishery linkages as a basis for integrated fisheries and habitat management; and
- enhance and sustain the participation of local fishing communities and the private sector in management interventions for improved fisheries habitat management and biodiversity conservation through a focus on sustainable use rather than the prohibition of fishing.

22. The RWG-F further recommended that the initiative should address the barriers to integration by drawing on fisheries management concepts that are easily understood by fishing communities and emphasise sustainable use rather than simply the prohibition of fishing. The latter is considered detrimental to efforts to harness community support for area based approaches to fisheries management in Southeast Asia. The first step involved consideration of the applicability of the Marine Protected Area concept in addressing these barriers.

Consideration of the purported fisheries benefits of Marine Protected Areas:

23. In order to achieve maximum benefits, the selection of areas as MPAs must give adequate consideration to the links between specific locations and the life-cycle of important species (Russ and Alcala, 1996; Jennings, 2001; Hilborn *et al.*, 2004). The RWG-F identified that these linkages are currently not given adequate consideration in the selection of sites for MPA systems in the South China Sea despite the promotion of these systems on the basis of their purported fisheries benefits (UNEP, 2006a). It was identified that the creation of MPAs in Southeast Asia has often been ‘sold’ to fishing communities in terms of the fishery benefits. In reality, traditionally established and well managed MPAs are frequently associated with increased abundance, biomass and sizes of both focal and other species within the no take areas of an MPA (Russ and Alcala, 2004). The RWG-F considered whether MPAs, as currently designed, would actually result in any economic or food security benefits associated with increased fish availability at the fishery level in light of intense inshore small-scale fishing pressure. It was concluded that, at least in the short-term, the reverse could occur because the catch per unit effort declines as a result of increased effort in other areas of the fishery by fisherfolk displaced by the establishment of the MPA (UNEP, 2006b).

24. It has been recognised that, via the export of juveniles and adults, catch per unit effort (CPUE) in areas adjacent to MPAs can be enhanced (Russ, 2002). However, there are few examples of increased abundance and catch of fish adjacent to MPAs in the South China Sea. The Nha Trang Marine Reserve in Viet Nam, for example, has shown little evidence of benefits either in increased fish stocks or

increased income of fishing communities outside the protected area. While it is indisputable that biomass in strictly enforced no-take MPAs may increase over time, the RWG-F identified that, with the limited information available, it may be unwise to anticipate increased production across the entire geographic range of the fisheries as a result of the establishment of such areas. It is important to highlight the RWG-F view that, in effect, fisherfolk displaced from fishing areas following the establishment of an MPA will likely intensify their effort in other areas and that this may result in a decline in CPUE at the fishery level.

25. Such short term declines in CPUE would likely be expected as MPA theory dictates that spill-over benefits depend on the accumulation of at least one generation of new recruits. The period of time in which this accumulation might be expected to occur also depends on the life-history of the species concerned. For example, longer periods are required for building stocks of long-lived species (Caddy and Seijo, 1998). Russ *et al.* (2005) reported on the experience of MPA use in the Philippines, indicating that at one site it took four years of strict compliance to enable detection of small increases in biomass of high trophic level predatory species within a no-take MPA. It was further noted by Russ and Alcala (2004) that fish density and biomass were still increasing after nine years at one MPA in the Philippines and 18 years in another.

26. Hilburn *et al.* (2006) noted that three generalisations can be drawn from models of the effects of MPAs on fisheries yields: (1) MPA establishment may increase yields when fishing effort cannot be controlled and stocks would otherwise be overfished but is unlikely to improve yields of lightly fished stocks; (2) they may reduce inter-annual variability in catch in the face of stochastic events such as recruitment failure; and (3) that greatest fisheries benefits from MPAs are expected for species with intermediate rates of movement. Models suggest that MPAs are typically not effective for highly mobile species and that fishery level benefits are rarely observed for species with low rates of movement.

27. Hilburn *et al.* (*loc cit*) modelled the effects of MPA establishment within a regulated, single species fishery with a defined Total Allowable Catch based on Maximum Sustainable Yield (MSY). This demonstrated that when a stock is managed at MSY, or is overfished, the establishment of an MPA results in a decrease in abundance and catch across the fishery due to increased fishing pressure on the stock outside the MPA. Only in a heavily overexploited fishery where the stock is heading towards extinction will the establishment of an MPA not result in reduced fish availability and yield. It was concluded that, in all cases, fishing effort must be reduced outside an MPA for its establishment to result in any tangible fishery benefits.

28. Such outcomes suggest that simply establishing an MPA without consideration of the ecology and population characteristics, particularly the adult dispersal rates of the target species, is likely to be ineffective in enhancing fish catch. This is confirmed by the findings of a recent review of MPA effectiveness undertaken in connection with the proposal to establish a network of ‘fish stock recovery areas’ in Europe (Roberts and Hawkins, 2012). This review, for example, highlights the quantification of the number and biomass of the lobster *Palinurus elephas* spilling over from Columbretes Islands Marine Reserve (CIMR) in Spain and their contribution to local fishery catches reported by Goñi *et al.* (2010). In terms of the number of lobsters emigrating from the CIMR, spill-over did not account for the loss of fishing grounds associated with reserve establishment, although it did in terms of weight because the mean size of the lobsters emigrating from the reserve was larger than those outside it. These findings place further emphasis on the need to consider fish life cycle and habitat linkages in the designation of such management areas for fisheries. Particularly when they are considered in relation to the unique life history characteristics of palinurid lobsters, which incorporate aspects of both *r*- and *K*- selection (Sastry, 1983), and the role of stochastic forces and density dependent regulation in the population dynamics of palinurids (Caddy, 1986).

29. The experience of the Philippines with lack of compliance with no-take ‘fish sanctuaries’⁴ lays stress on the importance of focusing on the concepts of sustainable use and fishery-critical habitat linkages in communicating with government officials and coastal fishing communities in Southeast Asia about spatial fisheries management tools. These concepts are more easily understood and likely

⁴ The “Philippine Coral Reefs through Time” report (Philreefs, 2003) identified lack of compliance and poaching as a key threat to fish sanctuaries established along the South China Sea coast. For example, in the case of a sanctuary established at San Salvador Island in Masinloc municipality, compliance issues had resulted in growing tension between the municipal people’s organization and the “Bantay Dagat” (a civilian fisheries enforcement group made up of volunteers).

accepted at the fisheries community level than either the science of no-take areas or the concept of biodiversity and its conservation. Given the ubiquity of small-scale fishing and community dependence on fisheries in the SCS region, the RWG-F concluded that any approach developed should result in tangible benefits in terms of the maintenance of critical fisheries habitats (and hence fisheries production) while at the same time minimising the costs borne by fishing communities in terms of reductions in household income and food production (UNEP, 2006a). From the perspective of fisheries habitat management, it is also unlikely that MPAs designed without adequate consideration of fish life-cycle and critical habitat linkages will lead to effective management of habitat areas important to fisheries. Fishing communities in Southeast Asia often possess intimate knowledge of fish life-cycles and dynamics (see Ruddle, 1994). The establishment of MPAs that appear incompatible with this community-based information or cannot promise direct fishery benefits is unlikely to receive support from fishing communities.

2.1.3.4 Defining fisheries *refugia* and goals and objectives for a regional system

Defining fisheries refugia

30. Against the background of widespread over-exploitation of South China Sea fish stocks as well as the lack of sound empirical evidence for the value of MPAs in enhancing fish stocks and catch in the region, the RWG-F noted that numerous fisheries observers, including Walters (1998), Caddy (1999) and Pauly *et al.* (2005), had recently reviewed the concept of ‘natural *refugia*’ and their role in the sustainability of fisheries. During its sixth meeting the RWG-F (UNEP, 2006a) gave consideration to the role of *refugia* in fisheries in other regions, noting the example of high recruitment of hake in the Mediterranean during the 1980s despite a complete lack of input and output controls and a high percentage of juvenile fish being caught by inshore trawlers. It was noted that this is believed to have occurred due to larger spawning fish occupying deeper areas of the continental shelf in ‘natural *refugia*’ resulting from the inability of the fine inshore trawls to successfully catch fish at that depth. In that scenario, the large unfished individuals were thought to make a major spawning contribution to the adjacent fishery⁵.

31. Pauly (1997) suggested that even very low rates of fishing mortality may be unsustainable in long-lived demersal stocks unless a sizable fraction of the spawning adults are made completely inaccessible to fishing activities by occupying some natural refuge (underwater canyons, large boulders, etc.). This contention was based on the fact that many demersal species in temperate waters and large predators on coral reefs are long-lived with natural mortalities of 0.1-0.2 year⁻¹ implying that sustainable fishing could not extract more than about 10% of the stock biomass per year. Pauly (1997) also explained that such exploitation rates quickly remove the accumulations of large and old females that are the source of most eggs and subsequent recruitment to stocks of long-lived fishes. In addition, he also suggested that the relationship between fish size and fecundity is highly non-linear with large females being far more fecund than an equivalent weight of small individuals. As an example, he cited the case of the red snapper (*Lutjanus campechanus*) in which a single female (61 cm and 12.5 kg) contained the same number of eggs (9,300,000) as 212 females (42 cm and 1.1 kg each).

32. As fishing technology has developed and the size of fishing fleets has increased, the extent of natural *refugia* for fish stocks has declined, particularly in Southeast Asia where intensive and destructive fishing practices such as trawling and push netting have seriously disturbed large areas of soft bottom habitats (Pauly and Chuenpagdee, 2003). Furthermore, the degradation and loss of coastal habitats, such as mangrove forests, as a consequence of coastal infrastructure development, has dramatically reduced the expanse of habitats that have important nursery functions for commercial and subsistence species. The RWG-F identified that the maintenance of natural *refugia* critical to the life-cycle and sustainability of fished species or the establishment of *refugia* in cases where natural *refugia* no longer exist, should be an important priority in managing intense small-scale fishing

⁵ The concept of natural *refugia* is well developed in the fields of terrestrial ecology and wildlife management. For example, Novaro *et al.*, 2000 noted that wildlife hunting studies have shown that sustainability in these systems is often due the presence of inaccessible and undisturbed habitat that act as natural *refugia* for hunted species and provide a source function for rebuilding populations in areas depleted by hunting. In this connection, sustainability of resource use is evaluated on the basis of information relating to the geographical range, life-cycles, and migratory patterns of hunted species between *refugia* and hunting sites. The use of spatial controls recognising the “source-sink” nature of these systems are utilised to regulate harvests and often provide an effective platform for engagement with local communities, resource users, and policy makers.

pressure, particularly from the perspective of the food security objective for Southeast Asian fisheries management⁶. In this context, the RWG-F developed the concept of fisheries *refugia* (**Box 1**) (UNEP 2005a and 2006a).

Box 1: Definition of Fisheries <i>Refugia</i>
<p>“Spatially and geographically defined, marine or coastal areas in which specific management measures are applied to sustain important species [fisheries resources] during critical stages of their life cycle, for their sustainable use.”</p> <p>Thus, fisheries <i>refugia</i> should:</p> <ul style="list-style-type: none"> • not be simply ‘no take zones’; • have the objective of sustainable use for the benefit of present and future generations; • provide for some areas within <i>refugia</i> to be closed due to their critical importance [essential contribution] to the life cycle of a species or group of species; • focus on areas of critical importance in the life cycle of fished species, including spawning and nursery grounds, or areas of habitat required for the maintenance of brood stock; • have different characteristics according to their purposes and the species or species groups for which they are established and within which different management measures will apply; and • have management plans. <p>Management measures that may be applied within fisheries <i>refugia</i> may be drawn from the following [non-exhaustive] list of classical fisheries management actions:</p> <ul style="list-style-type: none"> • exclusion of a fishing method (e.g. light luring, purse seine fishing); • restricted gears (e.g. mesh size); • prohibited gears (e.g. push nets, demersal trawls); • vessel size/engine capacity; • seasonal closures during critical periods of fish life cycles; • seasonal restrictions (e.g. use of specific gear that may trap larvae); and • limited access and use of rights-based approaches in small-scale fisheries.

33. This definition focuses on sustainable use and clearly states that *refugia* will not simply be no-use areas. The intent of the RWG-F in defining fisheries *refugia* was that the concept should not be substituted for permanent closures or no-take MPAs and *vice versa*. Fisheries *refugia* differ from the short term area and seasonal closures commonly used in fisheries management (e.g., spot closures and closed seasons) that are often implemented in small well-defined areas of fishing grounds. The fisheries *refugia* concept, in contrast, is based on areas of critical importance to the life-cycle of the species. This means that areas located outside fishing grounds for a given species, which are critical to the life-cycle for that species, might need to be managed as fisheries *refugia*. Such management may include, for example, interventions aimed at reducing the impacts of the incidental capture of juveniles of a given species by another fishery operating in areas critical as inshore nursery *refugia* for that particular species. It may also include interventions to provide habitat protection, to ensure that areas important for egg deposition are not disturbed and/or to safeguard habitats that provide protection for juveniles from predators, such as mangroves and seagrass. Spot closures and closed seasons would form part of the suite of available management actions that could be used within a designated *refugia* management regime but the designated area or ‘place’ (Pauly, 1997) is the *refugia* itself. The distinction between *refugia* and other forms of area-based management in fisheries is the focus in the case of *refugia* on the nature of the habitat and its critical significance to fish life-cycles rather than simply the area *per se*.

Goals and Objectives

⁶ In adopting the 2001 ASEAN Resolution on Fisheries and Food Security and the Plan of Action on Sustainable Fisheries for Food Security, the Ministers of the ASEAN-SEAFDEC member countries who are responsible for fisheries resolved *inter alia* to “work towards the conservation and rehabilitation of aquatic habitats essential to enhancing fisheries resources”. Furthermore, in adopting the 2011 Resolution on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020, the Ministers responsible for fisheries resolved *inter alia* to “Implement effective management of fisheries through an ecosystem approach to fisheries that integrates habitat and fishery resource management aimed at increasing the social and economic benefits to all stakeholders”.

34. In developing the framework for a regional system of fisheries *refugia* in the South China Sea, the RWG-F recognised the need for two separate but related sets of goals and objectives as shown in Table 1. The first is related to the resource⁷ itself and the second to the institutional framework under which management is brought about. Overall, the resource related goal is to enhance the resilience of regional fish stocks to the effects of fishing. The institutional goal is to integrate fisheries and habitat management at the national level, a task which is formidable given the past history of interactions between fisheries and environmental managers in most countries in the region. Consideration of these goals and objectives enable evaluation of whether or not areas subject to seasonal closures and fisheries management zones within multiple-use MPAs can be classified as fisheries *refugia* and form part of a regional *refugia* system.

Table 1. Goals and objectives for a regional system of fisheries *refugia*

Resource-Related Goal – Increased Resilience of Regional Fish Stocks to the Effects of Fishing	Institutional-Related Goal – Fisheries and Habitat Management Conducted in an Integrated Manner
<p>Longer-Term Objectives</p> <p>Increased average size of important species Increased egg production of important species Increased recruitment of important species Increased biomass of important fish species</p>	<p>Longer-Term Objectives</p> <p>Community-based management of fisheries <i>refugia</i> for integrated fisheries and habitat management National and regional level commitments for integrated fisheries and ecosystem management Appropriately represented fisheries agenda in broader multiple use marine planning initiatives</p>
<p>Shorter-Term Objectives</p> <p>Safeguarding of natural <i>refugia</i>. Reduced capture of juveniles and pre-recruits of important species in critical fisheries habitats Reduced targeting and capture of important species when forming spawning aggregations Reduced targeting and capture of migrating fish</p>	<p>Shorter-Term Objectives</p> <p>Community-based management of fisheries <i>refugia</i> for fisheries management Understanding among fishing communities of critical habitats and fish life-cycle linkages Enhanced capacity of fisheries departments/ministries to engage in meaningful dialogue with the environment sector</p>

2.1.3.5 Selection of sites for inclusion in a regional system of fisheries *refugia*

Identification of Fisheries Refugia - Critical Spawning and Nursery Areas

35. The Sixth Meeting of the RWG-F noted that most fish populations are vulnerable to the impacts of over-fishing in areas and at times where there are high abundances of (a) stock in spawning condition, (b) juveniles and pre-recruits, or (c) pre-recruits migrating to fishing grounds. The impact of over-fishing is intensified in instances where small-scale fishers and commercial fishers share the same stock, often leading to disputes regarding the relative impact of each group (UNEP, 2006a).

36. The RWG-F agreed that this situation is characteristic of the over-fishing problem in many marine fisheries in the South China Sea. Juveniles and pre-recruits are often caught in inshore areas by small-scale fishers while fisherfolk operating large-scale vessels catch adults of the same species offshore. In circumstances such as this, high levels of fishing effort in inshore waters may drive growth over-fishing⁸, while the same circumstances in offshore areas may cause recruitment over-fishing⁹ of the same stock. FAO (2007a), for example, reports that 18-32 percent of low value ‘trash’ fish caught primarily by demersal trawling in the Gulf of Thailand are juveniles of commercially

⁷ The RWG-F developed and agreed listings of pelagic and demersal fish species, cephalopods, and crustaceans of transboundary significance during its second meeting in October 2002. In considering the species of transboundary significance for which the development of a regional system of fisheries *refugia* should focus, the RWG-F revised these lists during its ninth meeting convened on Phu Quoc Island, Viet Nam from 10th-13th July 2007. The agreed species listings, confirmed during the project preparation phase, are contained in Annex 5 of the report of that meeting (UNEP, 2007c).

⁸ Growth overfishing is caused by levels of fishing beyond that required to maximise yield per recruit, and typical involves a size at first capture in the fishery that results in an unsustainably high percentage of juveniles and pre-recruits being captured (Pauly, 1984)

⁹ Recruitment overfishing is caused by a level of fishing in which the adult stock is reduced to the extent that recruits produced are insufficient to maintain the population (Pauly, 1984)

important species often targeted by other fisheries. The RWG-F agreed that management of 'nursery *refugia*' to safeguard fish during the juvenile and pre-recruit phases of their life-cycle and the habitats utilised as nurseries can assist in the prevention of growth over-fishing. Similarly, management of 'spawning *refugia*' may assist in the prevention of recruitment over-fishing (Annex 5 of UNEP, 2006a).

37. In considering the work of the RWG-F, the Regional Scientific and Technical Committee (RSTC) of the SCS project identified that *refugia* approaches that have often been used as a fisheries management tool when more conventional techniques, such as effort or gear restrictions, have failed to achieve the desired management objectives, particularly in regions where fisheries are subject to intense and unmanageable fishing pressure, such as in the Gulf of Thailand. In other instances, fisheries *refugia* have been used to separate potentially conflicting uses of coastal waters and their limited resources. The RSTC noted that the effectiveness of fisheries *refugia* will likely depend on an appropriate consideration of known critical spawning and nursery areas in the selection of sites. In this connection, the RSTC directed the RWG-F to: review known spawning areas for fish stocks of transboundary significance with the aim of evaluating these sites as candidate spawning *refugia*; and evaluate South China Sea habitat sites as potential juvenile/pre-recruit *refugia* for significant demersal species (UNEP, 2006c).

Selection of sites for local benefit and high transboundary impact

38. The information was compiled and reviewed by the seventh meeting of the RWG-F and was subsequently considered during the eighth meeting of the RWG-F and used to list and characterise known fish spawning and nursery areas in the Gulf of Thailand and the South China Sea (UNEP, 2007b). The RWG-F reviewed the list of sites in relation to: information on the distribution and abundance of fish eggs and larvae in the South China Sea during the post northeast monsoon periods; and the outcomes of country consultations on the identification of fisheries *refugia*. In considering this information, the RWG-F gave priority to the selection of sites for inclusion in a regional system of fisheries *refugia* that would simultaneously achieve local benefits for fisheries and biodiversity as well as positive transboundary impacts at regional and global levels.

39. For example, the best information available to the group on 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. 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 importance of short mackerel to all countries of the region. The RWG-F subsequently agreed on 14 priority sites for inclusion in an initial system of fisheries *refugia* and an additional 9 sites for which additional information was required prior to their inclusion in the system. The locations of these sites are depicted in Figure 2 below.

2.2 Global significance

2.2.1 Biodiversity and dominant coastal habitats

40. The South China Sea represents an area of globally significant biological diversity. The Indo-west Pacific marine biogeographic province has long been recognized as the global centre of marine shallow-water, biodiversity. The South China Sea is located at the hub of this centre and represents an area of aggregation and overlap in distribution of Indian and Pacific Ocean derived species. Forty five species of mangrove from the global total of fifty seven; almost all coral genera; twenty of sixty species of seagrass; and, seven of nine giant clam species are found in the near-shore waters of the South China Sea. Compared to the Atlantic, the tropical Indo-west Pacific is highly diverse. Only five species of mangrove and some 35 coral species are found in the Atlantic compared with fifty one mangrove and over seven hundred coral species in the Indo-west Pacific. Over 400 species of corals are recorded from the Philippines compared with 200 species from the Red Sea, 117 from South East India and fifty-seven from the Persian Gulf.

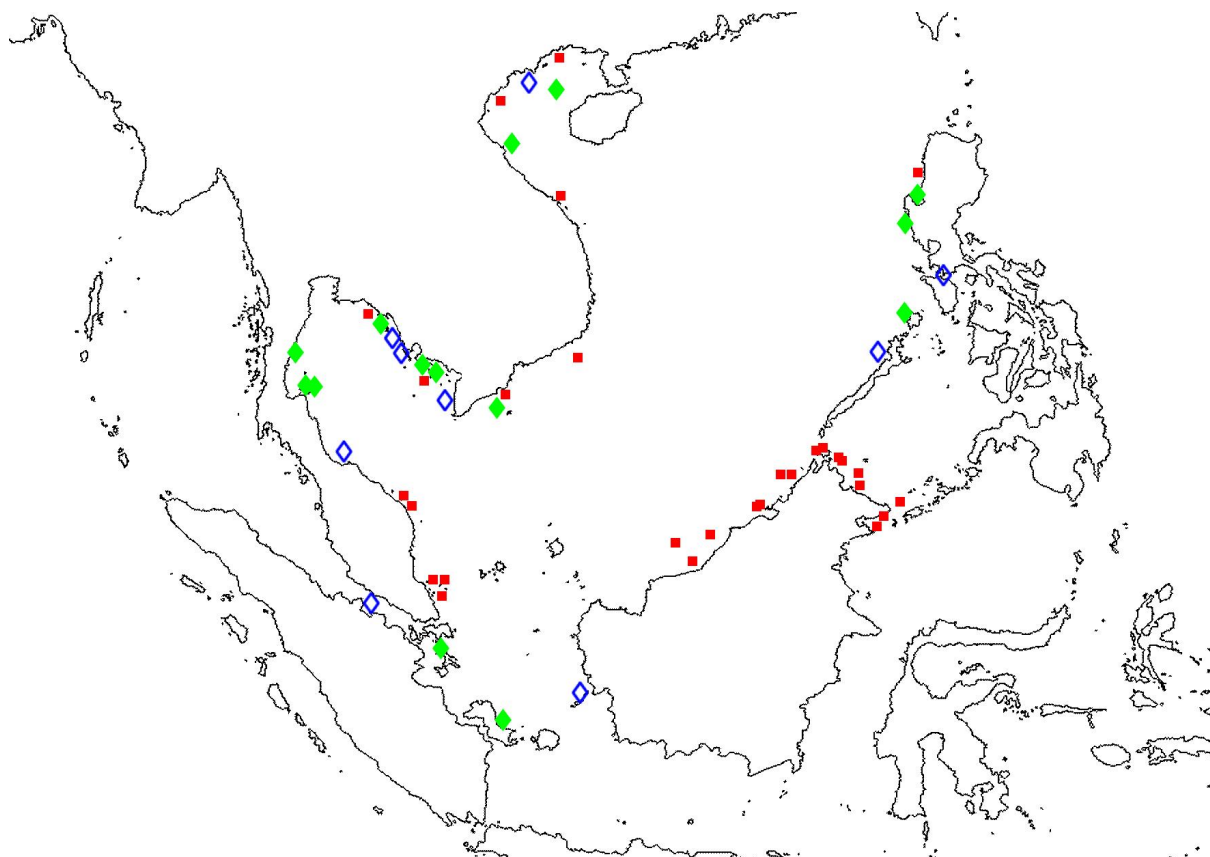


Figure 2 Location of: initial sites selected for inclusion in the regional system of *refugia* [◆]; sites of high priority for inclusion in the regional system once the initial set have been established [◇]; and other known spawning and nursery areas for fish species of transboundary significance [■]

2.2.1.1 Mangroves

41. The South China Sea is considered to be one of two global hotspots of mangrove diversity (Polidoro, *et al.*, 2010; UNEP, 2004a). 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 2). The total area of mangrove on the South China Sea coast of all countries combined is estimated to be 1,770,000 ha (UNEP, 2008a), representing 11.4% of the world's remaining 15.5 million ha (FAO, 2007b) of mangrove forest.

42. In terms of mangrove species richness, the greatest number of true mangroves are observed in Malaysia, where 41 species are recorded (FAO, 2007b), followed by Indonesia and Viet Nam with 36 and 37 species respectively (UNEP, 2008b). 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 (UNEP, 2008b). According to FAO (2007b), 16 species of true mangroves occur in Cambodia (Table 2). 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 the Gulf of Thailand waters of Viet Nam and Cambodia, respectively) compared to Thai waters in the West where 27 species are observed (UNEP, 2008b).

Table 2 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, 2008b and FAO, 2007b)

Country	Area of mangroves (ha)	Number of true mangrove species
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
Total	1,770,000	45

43. Analysis of data compiled in the National Reports on Mangroves (UNEP, 2008b) 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 (25,800ha); 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.

2.2.1.2 Coral Reefs

44. 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. Offshore, a series of large platform reefs and atolls are found; the most well-known being the Spratly Islands, the Tung-Sha Reefs and the Paracel Islands. These oceanic reefs are highly diverse and are thought to play a key role in the maintenance and replenishment of regional biodiversity and may be particularly important in the replenishment of populations of some harvested species (McManus, 1994; UNEP, 2005b).

45. Based on data compiled by members of the Regional Working Group on Coral Reefs (RWG-CR) (UNEP, 2007d), approximately 750,000 ha of coral reef has been identified in the South China Sea coastal waters of the following six countries: Cambodia (2,807 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 (5,500 ha). Accordingly, the total area of coral reefs in the coastal waters bordering the South China Sea is approximately 930,000 ha.

46. 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) (1,070 ha), Ca Na Bay (2,270 ha), and Con Dao Islands (1,000 ha) in Viet Nam; Muh Ko Chang (18,700 ha), Muh Ko Samui (39,000 ha) and Mu Koh Samei (4,200 ha) in Thailand; Palau Redang (2,550 ha), Palau Perhentian Besar (1,820 ha) and Palau Tioman (5,023 ha) in Malaysia; Anambas (6,260 ha), Bareleng dan Bintan (6,150 ha) and Natuna (15,900 ha) in Indonesia; and the Bolinao/Lingayen Gulf (9,560 ha), Calamianes Group of Islands (18,200 ha) and El Nido, Palawan (4,250 ha) in the Philippines.

47. 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. As a consequence of more recent surveys in Viet Nam (Vo and Hodgson, 1997; Vo, 1998, Vo *et al.*, 2005), 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, 2005b) (Vo *et al.*, 2013). The 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 (Spratly islands) complex suggests that careful consideration should be given to the positioning of the north-western boundary of the centre of maximum marine species richness, the Coral Triangle (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, 2007a) 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, 2004b; UNEP, 2007d), and Malaysia (Vo *et al.*, 2013).

2.2.1.3 Seagrass

48. 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 from this basin, including characterisations for seagrass sites and the first ever seagrass data sets and maps for China (UNEP, 2008c). The data, however, were based on field surveys at known seagrass locations in SCS countries and 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, 2008c).

49. 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, 2008c). *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 maritima* (UNEP, 2004c). 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*, *Halodule pinifolia*, *Syringodium isoetifolium* and *Thalassodendron ciliatum* (UNEP, 2004c).

50. The sub-tropical species *Zostera 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, *Thalassodendron 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, 2008c).

51. 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 (2,000 ha) (UNEP, 2008c, 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 may 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,

2008c and Tu Thi Lan Huong *et al.*, 2002) at this locality also indicates the importance of these transboundary waters to regional biodiversity conservation.

2.2.2 Fish stocks and fisheries of the South China Sea¹⁰

52. The South China Sea 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.

53. 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.

54. 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.

55. Viet Nam (1.2 million tonnes), Thailand (1.2 million tonnes), and Indonesia (1.0 million tonnes) are among the top five aquaculture producers by volume worldwide, and in the top ten aquaculture producing states by value. In Southeast Asia, highly priced crustaceans account for 47 percent of total aquaculture production by value. Five of the eight top shrimp producers in the world are states bordering the South China Sea (Indonesia, first; Viet Nam, second; China, third; Thailand, sixth; and, the Philippines, eighth). 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 the western Gulf of Thailand.

¹⁰ Detailed baseline assessments of fish stocks and habitats of regional, global, and transboundary significance in South China Sea of the participating countries were produced as part of fisheries component activities of the SCS project. These assessments were updated and summarised in the National Project Documents for this project which are appended to this present document. The baseline assessments present available information and data relating the status and threats of important fish stocks, habitats and areas of importance in the maintenance of exploited fish stocks, and existing management regimes. These baselines assessments will be updated with new and additional information generated during the implementation of the present project. They will also serve as important references for determining the effectiveness of management interventions supported by the project.

56. This 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.

2.2.3 Significance of the fisheries *refugia* approach

57. Given the limited integration of the work of fisheries and environment ministries observed in Southeast Asia and many other parts of the world, the establishment and operation of the regional system of fisheries *refugia* provides an opportunity to learn from a regional fishery sector led initiative to collaborate with the environment sector on integrating fisheries and coastal habitat management. As noted above, the SCS is a global hotspot of marine biodiversity subjected to high and increasing levels of small-scale fishing pressure and other threats. Various fisheries management reforms are required to fashion a sustainable future for the fisheries of this marine basin. As such, it is important that the *refugia* initiative is not viewed as a proposed ‘panacea’ to the fisheries problems of Southeast Asia, rather one of a series of complementary management strategies being promoted regionally, including efforts to curb the high and increasing levels of fishing pressure. However, given the high rates of habitat loss and the high levels of community dependence on small-scale fisheries, it is imperative that efforts to operate the regional fisheries *refugia* system be sustained.

58. Experiences in the South China Sea project suggest that the fisheries *refugia* concept has provided an adequate platform for building partnerships and enhancing communication between the environment and fisheries sectors. It also appears to be a successful approach to addressing a significant barrier to the effective integration of fisheries and habitat management, namely the adverse reaction to the MPA concept that is elicited from fishing communities and fisheries officers at the local and provincial levels. By emphasising the sustainable use aspects of *refugia* rather than the no-take approach adopted by many ministries of environment in their approach to MPAs, it has been shown that such adverse reactions can be avoided. Perhaps, more importantly, the emphasis of the concept on critical fish stock and habitat linkages provides a suitable platform for dialogue between government institutions responsible for environment and for fisheries in the identification, designation, and management of priority ‘places’ for fisheries and habitat management. It is anticipated that the experience gained in the South China Sea region will be suitable for application in other marine areas such as the Yellow Sea where over-fishing and the use of inappropriate fishing gear are significant impediments to more sustainable exploitation of fisheries resources and the use of coastal habitats.

2.3 Threats, root causes and barrier analysis

2.3.1 Threats to dominant coastal habitats

2.3.1.1 Threats to mangroves

59. 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, 2008a). 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, 2004a). The annual rates of loss in the seven countries between 1990 and 2000 were greater than the world average (Table 3). Such losses represent a loss of global biological diversity that must be a matter of global concern (UNEP, 2004a). 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, 2008a).

Table 3 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, 2004a)

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

60. 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, 2004a). Contemporary causes of loss of mangrove habitat are no longer dominated by shrimp culture although this remains one cause in China, Indonesia and Viet Nam (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, 2007b).

61. 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, 2008a). 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). Conversion to shrimp culture remains a potential long-term threat in Viet Nam. Natural threats include sea level rise and episodic threats, including tsunamis and typhoons (UNEP, 2008a).

62. 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, 2008a).

63. 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, 2008a). 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

64. 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, 2004b). 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 4) (UNEP, 2007d). Indirect causes of these threats are unsustainable practices in the fisheries sector, coastal development, deforestation and unsustainable tourism. Coral bleaching is also considered a serious threat 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% (UNEP, 2007d).

Table 4 Prioritisation of the Threats to Coral Reefs Bordering the South China Sea (excluding China) (based on UNEP, 2007d)

	Cambodia		Indonesia		Malaysia		Philippines		Thailand		Viet Nam		Region
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Weighted Score
Direct threats													
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
Indirect threats													
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 ¹¹	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		

65. Table 4 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. 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

66. 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; nutrient discharges and runoff; coastal construction; and over-fishing (UNEP, 2006d). 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, 2006d; UNEP, 2008a).

67. 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 5. The impacts of destructive fishing techniques are of particularly concern as

¹¹ Rounded to three significant figures

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, 2008a).

2.3.2 Threats from fisheries

2.3.2.1 The twin problems of over-capacity and over-exploitation

68. 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.

69. The many fish processing facilities on Phu Quoc produce a variety of marine products from locally caught fish species, notably the "nuoc mam" fish sauce that is exported to all international markets. Together with Nam Du and To Chu Islands, some large and productive fishing grounds are located in the area, the main ones being to the south of Phu Quoc, with many commercially important reef fish being caught in the area. Reef dwelling genera, such as the groupers *Epinephelus*, *Plectropomus*, *Cephalopholis*, snappers *Lutjanus*, *sweetlips Plectorhynchus*, emperors *Lethrinus*, and breams *Scolopsis*, have become the favoured targets. The fishing of seagrass beds also produces large quantities of swimming crabs and *Strombus* snails.

70. 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 fishers 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.

71. A similar situation has developed in the Masinloc area of the Philippines, where fishing is a primary source of income for more than 30 percent of households. Over-capitalisation in commercial fisheries is contributing to the illegal encroachment of larger-scale fishing operations into municipal waters, which are areas largely managed for use by small-scale fishers. This, coupled with a lack of alternative livelihoods, is thought to be the key reason why both small-scale and commercial fishers are resorting to illegal and destructive fishing practices, including blast-fishing and the use of fish poisons (cyanide) in the area.

2.3.2.2 The use of destructive and/or unsustainable fishing gear and practices

72. This issue 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. Destructive and/or unsustainable fishing gear and practices include:

- **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.

- ***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.
- ***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.

Table 5 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, 2006d; UNEP, 2008a).

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

2.3.2.3 Pollution from fish processing facilities and small fishing vessels

73. While this issue is well known at the community level, little action has been initiated to address this regionally. Seagrass and nearshore coral reef habitats are particularly threatened by pollution from small fishing vessels and fish processing facilities, particularly in the intensively used shallow embayments of the South China Sea basin. While volumes and contaminant loadings of wastewater discharges from fish processing facilities are typically unknown, it is believed to be contributing to increased biological oxygen demand and nutrient concentrations in the coastal water areas of many shallow water seagrass areas adjacent to fishing communities. This issue is compounded by the discharge of solid wastes generated by fishing communities into areas of coral reef and seagrass. The discharge of oils, both hydrocarbons and fish oils, from small fishing vessels is also common and is potentially a problem across all priority fisheries *refugia* sites in the South China Sea due to the widespread nature of the small-scale fishing sector, although it is recognized that the local significance of this problem will depend on oceanographic processes at the site-level.

2.3.2.4 Habitat destruction and pollution due to fish and shrimp farming

74. Aquaculture has been identified as a key threat to seagrass and other soft-bottom fisheries habitats in the South China Sea. Seagrass communities are used for oyster grow out in many coastal areas, resulting in habitat degradation and the accumulation of deteriorating cage materials and shells in abandoned feeding areas. As a result of the increasing demand for food in most artisanal fishing communities in the region, the total number of fish pens and cages for mariculture has increased significantly and typically exceeds maximum carrying capacity of fish farming area. In the Bolinao area of the Philippines for example, Milkfish production is intensive and the use of excessively high stocking densities by the majority of farmers has led to eutrophication of coastal water bodies. This has led to significant fish kills and the unused feed and fish wastes associated with the excessive use of artificial feeds has led to bottom water anoxia, the smothering of seagrass plants and dieback in some areas.

2.3.2.5 Illegal, unregulated and unreported fishing

75. Particularly the use of illegal and destructive fishing gear is common in many areas of the selected sites for the establishment and operation of fisheries *refugia* in 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.

2.3.3 Root causes

76. The initial Transboundary Diagnostic Analysis conducted for the South China Sea marine basin suggested that the root cause of coastal environmental degradation was the present density and growth of coastal populations. A total of 270 million people, or 5 percent of the world’s population, live in the coastal sub-regions of the five countries. The population is concentrated in 93 cities with over 100,000 inhabitants with indicative trend of doubling of populations in 32 years. Coastal tourism, increasing fisheries development, and oil exploration and exploitation, are among the major economic ‘pull factors’ causing internal migration from poorly developed inland areas to the coast in the riparian countries.

77. As a result, fisheries are critically important from the perspectives of food security and export earnings in the participating countries. These fisheries are characterised by high levels of fishing effort from the small-scale sector. Accordingly, all inshore waters of the South China Sea basin are subject to intense fishing pressure. Growing global demand for fisheries products, coupled with strong coastal community dependence on fisheries, is driving continued increases in fishing capacity and effort.

78. The situation of high small-scale fishing pressure and declining fisheries resources has contributed to the adoption of unsustainable fishing methods to maintain catch and increase incomes in the short-term. As noted in section 2.3 above, these include the use of destructive fishing gear and practices, such as the operation of demersal trawls and push nets in seagrass areas, and the detonation of explosives and release of fish poisons in coral reef areas. Small-scale inshore fishing pressure has therefore been identified as a significant cause of the degradation and loss of coastal habitats and fish stocks in waters of the South China Sea. Conversely, while action aimed at reducing the rate of loss of coastal habitats has been implemented in South China Sea waters, the decadal rate of loss of such habitats remains high (mangroves (16%), coral reefs (16%) and seagrass (30%)), raising serious concerns for the long-term sustainability of small-scale fisheries in the region.

2.3.4 Barriers

79. An obvious barrier in terms of environmental and natural resource governance and management is that environment and fisheries 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.

80. The Regional Working Group on Fisheries identified a need for national action to strengthen the integration of fisheries and habitat management along the South China Sea coast, although noted that such an initiative would be constrained by the following factors:

- limited experience in national fisheries and environment departments and ministries with respect to the implementation of integrated fisheries and habitat management approaches;
- limited information regarding fish life-cycles and critical habitat linkages and the role that coastal habitats play in sustaining fisheries; and
- the low level of community acceptance of 'protected' area approaches to marine management in East Asia.

81. To address these institutional level barriers, the fisheries *refugia* concept was developed to:

- build the capacity of fisheries and environment departments and ministries to engage in meaningful dialogue regarding how broader multiple use planning can best contribute to improving the state of fisheries habitat management;
- improve understanding among stakeholders, including fisherfolk, scientists, policy makers and fisheries managers, of habitat and fishery linkages as a basis for integrated fisheries and habitat management; and
- enhance and sustain the participation of local fishing communities and the private sector in management interventions for improved fisheries habitat management and biodiversity conservation through a focus on sustainable use rather than the prohibition of fishing.

82. At the implementation level, i.e., the actual establishment and management of fisheries *refugia* sites and a regional system of *refugia*, key barriers have been identified to include:

- Lack of procedures for the delineation of fisheries *refugia* boundaries and the setting of priorities for *refugia* site management;
- Limited experience in the development and implementation of community-based management plans for fisheries *refugia* sites;

- Underdeveloped national-level policy and planning frameworks for refugia designation and management;
- Irregular and uncoordinated update of national and regional information and databases relating to fish stocks and their habitats, including fish early life history science;
- Few regionally or locally appropriate examples of practical solutions to key threats to fish stocks and critical habitats; and
- Need for strengthened cross-sectorial coordination in the establishment and operation of fisheries *refugia* in the riparian countries of the South China Sea basin.

2.4 Institutional, sectorial and policy context

83. All participating countries have central government agencies holding a mandate to manage the fish resources of the country concerned. These agencies are in some cases part of a larger Ministry Of Agriculture or Natural Resources; in others part of a separate Marine and Fisheries Ministry e.g. Indonesia. Regardless of the higher level structure these agencies are typically divided into departments or divisions responsible for capture fisheries and aquaculture. The focal points for the present project are all located in the fisheries agencies and generally within the area of capture fisheries. All countries are members of FAO and participate in the activities of APFIC; and they are also all members of COBSEA and hence participate in UNEP's regional seas programme.

84. Each of the six National Project Documents, included as Appendices to this regional UNEP Project Document, present detailed accounts of the instruments and support mechanisms for managing marine habitats and populations in the participating countries. Specifically, the National Project Documents outline the legal instruments, i.e., national laws that also serve as the basis for local ordinances and for the country's commitment to international agreements, and institutional arrangements in support of fisheries or coastal resources management initiatives, including the roles of various government agencies, research and academic institutions, and the local government units in monitoring, control, and enforcement. The national documents also examine country-specific patterns of resource ownership, the capacity of human resources and institutions to perform research, monitoring, control, and surveillance, as well as the role of management bodies and stakeholders in managing fisheries and coastal resources.

85. In terms of cross-sectorial planning and the harnessing of scientific and technical expertise at the national level, there exists significant inter-country and inter-disciplinary diversity in the roles and responsibilities of the types of organisations involved in resource and environmental management in the participating countries (see Paterson and Pernetta, 2013). For example, as a result of recent political history in Cambodia, expertise is largely based within the government agencies responsible for agriculture/forestry/fisheries and environment, with an emerging influence of the academe. In contrast, a diverse mix of government agencies, specialised research institutes or centres and non-governmental organisations are actively engaged in planning and decision-making in Indonesia. In Thailand and the Philippines, universities play a more active role largely due to the highly regarded position of academia in the science and management of coastal and marine resources in those countries. This diversity of sectorial influence was confirmed during the preparation phase of this project and is reflected in the national level institutional frameworks and implementation arrangements for the project.

2.5 Stakeholder mapping and analysis

86. The primary stakeholders in this project are the government entities responsible for capture fisheries in each country with the agencies responsible for marine parks and protected areas also being high level stakeholders. At the regional level SEAFDEC, COBSEA and ASEAN all have interests in sustainable fisheries and biodiversity conservation and can be expected to take an active interest in project activities. Involvement of SEAFDEC as an Executing Agency aims to establish greater political support and enhanced mainstreaming of fisheries habitat and ecosystem considerations with broader fisheries management initiatives in Southeast Asia. Such broader initiatives also include SEAFDEC and APFIC programmes on the use of subsidies in fisheries, overcapacity, illegal and unregulated fishing, co-management, and rights-based approaches to fisheries management. Project activities have been developed based on extensive consultation and recommendations during the regional workshops.

87. At the site level local people's indigenous knowledge and participation will be major factors in delimiting *refugia* areas, habitat rehabilitation and the long-term management program. Scientific data and information will be supported by the views of the local people who will choose the right means or methods to strengthen their activities. It is envisaged that at each site local communities will be formally involved in the management structure and participate fully in planning activities and decision making. At the site level the fishing community involves a wide range of individuals with differing interests, involvement, and dependency upon fishing, management structures will be designed to fully engage all such individuals in project activities.

2.6 Baseline analysis and gaps

2.6.1 Strategic Action Programme for the South China Sea

88. This project was developed to implement the fisheries component of the intergovernmentally endorsed Strategic Action Programme (SAP) for the South China Sea. The revised broad objectives of the fisheries component of the SAP as developed by the RWG-F and endorsed at the intergovernmental level by the Project Steering Committee for the SCS Project, following extensive national and regional consultations, are to:

- build the resilience of Southeast Asian fisheries to the effects of high and increasing levels of fishing effort;
- improve the understanding among stakeholders, including fisherfolk, scientists, policy-makers, and fisheries managers, of ecosystem and fishery linkages as a basis for integrated fisheries and ecosystem/habitat management; and
- build the capacity of fisheries departments/ministries to engage in meaningful dialogue with the environment sector regarding the improvement of fisheries and management of interactions between fisheries and critical marine habitats.

89. The agreed targets for the fisheries component of the Strategic Action Programme are:

- to have established a regional system of a minimum of twenty *refugia* for the management of priority transboundary, fish stocks and endangered species; and
- to have prepared and implemented fisheries management systems in the identified *refugia* based on and consistent with, the ASEAN SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia.

90. More specifically the planned activities are expected to achieve the following outcomes in addition to the targets specified above:

- improved integration of habitat and biodiversity conservation considerations in the management of fisheries in the South China Sea and Gulf of Thailand;
- improved national management of the effects of fishing on critical habitats within fisheries *refugia*; and,
- enhanced uptake of good practice in integrating fisheries management and biodiversity conservation in the design and implementation of regional and national fisheries management systems and marine protected areas.

2.6.2 Planned national actions for Strategic Action Programme implementation

91. The development of the fisheries component of the South China Sea SAP recognised that the achievement of the SAP targets depend on successful national management of fisheries *refugia*. In support of this, priority national level actions for SAP implementation were identified as: (1) the designation and operational management of priority fisheries *refugia* sites; (2) development of the enabling environments for fisheries *refugia* management at national and provincial levels, including policy reforms and enhancement of the science and information base for *refugia* management; (3) capacity development through improved information management and dissemination; and (4) strengthened national coordination for fisheries *refugia* management. A summary of national level activities planned for SAP implementation is provided below:

Designation and operational management of priority fisheries refugia sites

92. This set of planned national activities relates to the establishment of operational management at priority fisheries *refugia*. Community-based *refugia* management plans are anticipated outputs. Proposed supporting activities include consultative processes to facilitate agreement among stakeholders on the boundaries of fisheries *refugia*, identification of key threats to *refugia* sites, recording of fishing community views regarding appropriate fisheries and habitat management measures, and eliciting stakeholder inputs to management plan review. *Refugia* management plans will provide rules on *inter alia*: operating requirements for the use of particular classes of fishing vessels or fishing gear within *refugia*, procedures for adjusting management measures over time, and mechanisms for enforcement. Specific direction is given to drafting of regulations and ordinances required in support of plan implementation. All countries have identified the need for management plans to contain community education and awareness programmes, mainly with a focus on participatory activities to monitor the status of fish habitats within the *refugia*, collect lost and abandoned fishing gear, and develop responsible fishing practices at the community level. Several countries, namely Viet Nam and Philippines, extended this to include the development of collaborative observer programmes among community volunteers and national and provincial fisheries enforcement agencies to detect illegal and destructive fishing activities in fisheries *refugia* and adjacent areas of sensitive habitats. Operational *refugia* management will be supported via the establishment of networks of community-based fisheries and habitat management volunteers. Plans include community capacity-building workshops on aspects of fisheries and habitat management, such as information and data collection, responsible fishing gear and practices, habitat and biodiversity conservation, and co-management.

Development of the enabling environment for fisheries refugia management

93. Activities to strengthen the legal and policy enabling environment for the formal designation and operational management of *refugia* were prioritised. Planned preparatory activities include legal reviews aimed at identifying the need for required policy and legislative amendments for drafting and adoption by competent authorities. The development of the science and information base was also prioritised, with activities planned to develop and update national fisheries databases for use in preparing annual syntheses of new and additional information and data relating to the status of stocks of priority fish, crustacean and mollusc species for dissemination at national and regional levels. It was also planned that national Geographical Information Systems (GIS) on fisheries and marine biodiversity would be developed and used in the preparation of these annual syntheses of new and additional data relating to the science and management of fish life-cycle and critical habitat linkages.

Improved information management and dissemination on fisheries refugia

94. Development of human resource capacity for the identification and management of fisheries *refugia* via improve information management and dissemination was prioritised. The development of Information and Education Campaigns (IEC) for small-scale fishing communities on the critical links between fish stocks and their habitats and the preparation of national guidelines on fisheries *refugia* management for application at the local level were priority national actions identified for SAP implementation. It was further planned that the strengthened human resource capacity, both at provincial government and fishing community levels, achieved through awareness and education programmes would be harnessed to mainstream the fisheries *refugia* concept into local/provincial policies for fisheries and environmental management.

Strengthening national coordination for fisheries refugia management

95. The key action identified for enhancing national coordination was revision of the terms of reference for the National Fisheries Committees (NFCs) established under the SCS project to accommodate overarching responsibility for the establishment of national fisheries *refugia* and the establishment of feedback mechanisms between the NFCs and Inter-Ministerial Committees of the SCS project for national level monitoring and evaluation of *refugia*. This set of planned activities also included the expansion of national coordination to include establishment of provincial or community level cross-sectorial management boards at priority *refugia* sites with responsibility for day-to-day oversight of *refugia* management and reporting to the NFCs. The latter was planned to enhance communication among stakeholders involved in fisheries management and biodiversity conservation at the sites, including provincial government officials, fisheries officers, staff of environment agencies, community representatives, NGOs and enforcement agencies.

2.6.3 Planned regional actions for Strategic Action Programme implementation

96. The South China Sea SAP presents a shared vision regarding the actions that need to be undertaken at the regional level in support of national actions. Regional level actions include, *inter alia*, networking, capacity building, public awareness and education, and applied research into management techniques and approaches that maximise the level of sustainable use without adverse environmental impact. In terms of the ongoing development of a regional network of fisheries *refugia* sites, key regional supporting actions were planned to assist countries with ongoing identification of fishery and critical habitat linkages and in improving the management of fish stocks and critical habitats for fish stocks of transboundary significance.

Regional scientific and technical support

97. Specific actions were planned to support countries through the development of protocols for delineating the boundaries of critical habitat areas that act as fisheries *refugia* and the regional compilation of information and data into a regional GIS on the distribution of coastal habitats, fisheries *refugia*, locations of marine protected areas and fisheries management zones, as well as fish egg and larvae distribution and abundance. The development of a modelling system, linking known sources and sinks of fish larvae to ocean circulation patterns and nutrient/chlorophyll concentrations in the South China Sea and Gulf of Thailand, was also given priority as a means of improving regional understanding of fish early life history and links to critical habitats. It was further agreed that the generation and uptake of good coastal fisheries management practices would be supported via the development of guidelines on managing the effects of fishing on coastal habitats and biodiversity.

Targeted demonstration activities

98. Actions to support and guide National Fisheries Departments in establishing coastal fisheries management systems in priority fisheries *refugia* were identified. Building on experiences with the habitat demonstration site approach developed by the UNEP/GEF South China Sea project, it was agreed that *refugia* sites would be selected in each country to identify and trial approaches to reducing the effects of trawl and push net fishing on seagrass habitat, as well as to test the use of fishing gear and practices that reduce the capture of juveniles, pre-recruits and fish in spawning condition.

Regional information management and dissemination

99. Development of a regional Information and Education Campaigns (IEC) for small-scale fishing communities on the critical links between fish stocks and their habitats and the preparation of guidelines on how to empower communities to enforce agreed management rules in fisheries *refugia* form priority SAP actions. It was agreed that this activity component would support the development of indicators to monitor the effectiveness of coastal fisheries management systems established in priority fisheries *refugia*. A regional programme for the compilation of standardised fisheries statistics for use in identifying and managing fisheries *refugia* would be developed to support monitoring and evaluation.

Strengthened regional coordination for a regional system of fisheries *refugia*

100. It was also agreed that actions would be implemented in support of regional coordination. Specific planned actions include, *inter alia*: promotion in regional forums and media of the role of the regional system of fisheries *refugia* in harmonizing fisheries and environmental management; establishment of a regional collaborative network of experts to guide the scientific, policy, and legal arrangements for the management of *refugia* in national waters; and the establishment of joint fisheries management frameworks between and among countries that share the use of critical habitat areas for fish stocks of transboundary importance and rare and endangered species.

2.6.4 Baseline and gaps for the operation of a regional system of fisheries *refugia*

101. The regional initiation workshop preparation phase of this project convened in Bangkok, Thailand from the 20th-22nd of January 2014 considered past and ongoing efforts to designate and manage fisheries since endorsement of the South China SAP (SEAFDEC, 2014a).

Table 6 Baseline and gaps in the establishment and operation of a regional system of fisheries *refugia*

Operational management of fisheries <i>refugia</i>

<ul style="list-style-type: none"> • <i>Refugia</i> site locations identified regionally although need to work with stakeholders locally, including academe and researchers, to delineate boundaries • Guide to planning of <i>refugia</i> management developed and published in inter-governmentally endorsed regional guidelines and a need exists to apply this at the local level • Efforts to strengthen monitoring, control, and surveillance capabilities in all countries are ongoing, although need exists to refine scope of work to support <i>refugia</i> management • Capacity building programmes at the community level focus on seafood quality and capacity issues with little emphasis on links between fisheries and environment • Low level mobilization of civil society, community organization and the private sector in site-based fisheries and habitat management
Strengthening the enabling environment and knowledge-base for fisheries <i>refugia</i> management
<ul style="list-style-type: none"> • Environmental impacts of fishing and aquaculture reflected in national and regional fisheries policies although minimal attention to effects of fishing on critical fish habitats • Absence of clear and effective policies, laws, and plans relating to the demarcation of boundaries, formal designation, and operational management of fisheries <i>refugia</i> • Review of fisheries and their habitats on the SCS coast prepared for Cambodia, Indonesia, the Philippines, Thailand and Viet Nam during 2004-2006 and need to update these • Access to data generated from fish early life history research constrained both nationally and regionally by a lack of a central repository • Information relating to fisheries and their habitats contained a number of national databases and the SCS project website although need for improved access to information regarding management areas • Information collection largely focuses on volumes with little attention to species & size selectivity of gear, size frequency and maturity, role of habitats in production • Absence of information regarding links between circulation patterns, biochemistry and fish early life history in the South China Sea and Gulf of Thailand • Few regionally or locally appropriate examples of practical solutions to key threats to fisheries <i>refugia</i>
Information management and dissemination in support of national and regional-level implementation of the fisheries <i>refugia</i> concept in the South China Sea
<ul style="list-style-type: none"> • Lessons learned in coastal habitat management from the SCS project's network of 23 demonstration sites have been documented, although there are few regionally relevant examples of best practice in integrated fisheries and biodiversity management • Awareness programmes at the community level rarely address area based management approaches • No existing mechanism for the capture, management and sharing of knowledge and experiences in the use of area based tools for fisheries management in the South China Sea region • Access to information and training materials on integrated fisheries and habitat management limited to that produced through SCS project and accessible via SCS website • Efforts to standardise reporting of regional fisheries statistics underway although little consideration given to issues relating to fish stock and habitat links
National and regional cooperation and coordination for integrated fish stock and critical habitat management in the South China Sea
<ul style="list-style-type: none"> • Limited cross-sectorial engagement in the planning of coordinated actions to manage threats to fish stocks and critical habitat linkages • Lack of a formal mechanism for the sharing of science and technical knowledge between government agencies and other stakeholders involved in fish stock and coastal environmental management in all countries • Minimal stakeholder participation in planning of local actions to manage threats to fish stocks and critical habitats linkages • Lack of a formal mechanism for the sharing of science and technical knowledge relating to fisheries <i>refugia</i> • Executing agency has managed components of larger FAO/GEF projects but is yet to act as executing agency for GEF project of this magnitude

In the case of Cambodia, it was noted that the first *refugia* was established in 2008; 4 were established in 2009 and 3 in 2010; and that a further 6 were being reviewed for possible approval. It was noted further that these sites in Cambodia are largely directed towards management of local stocks mud crabs, vinegar crabs, blood cockles, larval fish, bigeye trevally, queenfish and scad. In Indonesia, it was noted that activities had largely been confined to stakeholder consultations and incorporation of the fisheries *refugia* concept as a spatial planning tool in the national fisheries plan for the South China Sea region of Indonesian waters. In the case of the Philippines it was highlighted that *refugia* activities had largely been conducted in areas outside the South China Sea as national resources for related activities in the South China Sea waters of the Philippines had been planned for use in

association with this present project. Similarly, participants from Malaysia, Thailand and Viet Nam noted while preliminary planning and consultations had been undertaken, national plans were in place to operationalize the national sets of *refugia* sites in the context of this project. Representatives of all participating countries noted that achievement of the targets of the fisheries component of the South China Sea SAP relied significantly on an effective regional coordinated programme of actions. The validation workshop for the preparation of this project convened in Jakarta, Indonesia from 28th April - 1st May 2014 agreed on the baseline and gaps in the establishment of a regional system of fisheries *refugia* summarized in Table 6, above.

2.7 Linkages with other GEF and non-GEF interventions

102. 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 Malaysia, the project will be closely aligned with the Department of Fisheries projects entitled "National Stock Assessment Survey" and its *refugia* study on the east coast of Peninsular Malaysia. In the Philippines, the project will be closely aligned with National Stock Assessment Program (NSAP) for Region I, III, IV-B and the Ecosystems Improved for Sustainable Fisheries (ECOFISH) Project (Region IV-B) which will operate in South China Sea waters of 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.

103. Similarly in Thailand, the project will be linked to the following initiatives of the Department of Fisheries including: research project on "Short Mackerel Resources for Management in the Gulf of Thailand"; research project on "Bio-economic Model for Management of Short Mackerel Fisheries in the Western Gulf of Thailand"; monitoring of abundance and distribution of marine resources, fish egg and fish larvae; monitoring of landings to assess status of fisheries; surveillance of illegal fishing; 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". While it was recognized during project preparation that no activities of the GEF supported PEMSEA initiative are planned in areas of the priority *refugia* 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 the six-monthly meetings of the National Technical and Scientific Committees to ensure planned activities at the fisheries *refugia* 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. Additionally, the best practices and lessons learned generated from the establishment and operation of fisheries *refugia* sites will be used to guide activities of the UNEP/GEF project entitled "Implementing the Strategic Action Programme for the South China Sea" (GEF ID: 5538), specifically those relating to: the designation and management planning of sustainable use, non-conversion mangrove areas; the development and use of management tools (licensing and permit systems, seasonal closures, zoning) to address key threats at priority coral reef sites; the amendment of management plans for 7 existing MPAs with significant seagrass areas, to include specific seagrass-related management actions; and the preparation of integrated management plans for priority coastal lagoons, estuaries, tidal flats, and peat swamps. It is also anticipated that efforts to enhance the information-base for coastal habitat management and action planning to be undertaken as part of the SCS SAP implementation project will support the identification of additional fisheries *refugia* sites as part of the expansion of the

regional system to be established through this project. Importantly, the planned activity of the SCS SAP project to estimate of the value of the service provided by coastal habitats as nursery areas for offshore fish and crustaceans will be critical in strengthening the economic case for longer-term national-level investment in integrating fisheries and environmental management. It is also anticipated that there will be cross representation between the national and regional coordination bodies established under both projects to ensure that synergies are achieved in each country. As the GEF Implementing Agency for both projects UNEP will ensure that at a management level there is day-to-day contact between the SAP Implementation Unit in the COBSEA Secretariat and SEAFDEC as the regional GEF executing agency for the fisheries refugia project.

104. Regionally, the project will interact with the FAO/GEF Project on “*Strategies for Fisheries Bycatch Management*”. Similarly there is regional agreement that testing the *refugia* system in the South China Sea where significant preparatory work has been undertaken will provide a sound basis for the transfer of knowledge and experience on the use of the *refugia* approach spatial planning initiatives in the Western and Central Pacific Fisheries, the Pacific’s 14 country multi-focal area ‘Ridge to Reef’ programme, and initiatives in the Sulu-Sulawesi Marine Eco-Region in the adjacent coral triangle area. The project will also be implemented in close collaboration with the proposed coastal fisheries management project of the SEAFDEC-Sweden (SIDA) mechanism. The latter project has been designed to link closely with actions of the fisheries component of the revised Strategic Action Programme for the South China Sea and Gulf of Thailand which this project aims to implement. Linkages will also be established with the Coastal Fisheries Initiative (CFI) and Global Sustainable Supply Chains for Marine Commodities projects. While efforts of these initiatives are presently planned in areas of Indonesia and Philippines which are located outside the South China Sea, both projects represent significant opportunities for regional exchange of lessons learned that could be facilitated via the GEF IW:LEARN and LME:LEARN projects. Indeed at the national level in Indonesia and the Philippines, such coordination will be facilitated by the fact that the national lead agencies for both of abovementioned projects are the same as for this project. From the regional perspective, SEAFDEC is participating in partnership meetings of the CFI and reports on its engagement with that initiative to the Ministers responsible for fisheries in Southeast Asia through the inter-governmental SEAFDEC Council and the ASEAN-SEAFDEC Strategic Partnership on fisheries. To further strengthen this collaboration, representatives of Indonesia’s child project under the CFI aimed at promoting the Ecosystem Approach to Fisheries (EAF) in Eastern Indonesia (specifically Indonesia’s Fisheries Management Areas 715, 717 and 718) will be invited to participate in meetings of Indonesia’s National Fisheries *Refugia* Committee to facilitate exchanges and explore possibilities for scaling-up best practices in EAF in South China Sea waters of Indonesia, i.e. Fisheries Management Area 711. Additionally, representatives of the Sustainable Supply Chains for Marine Commodity Project will be invited to participate in both the national (Indonesia and the Philippines) and regional scientific bodies established under the present project to ensure complementarity of the fisheries stock status reporting and private sector engagement of both initiatives. UNEP will lead inter-regional exchange on best practices and lessons learned in fisheries *refugia* management with its initiatives in West Africa under the CFI.

105. The project will benefit significantly from linkages with programmes and projects of the regional agency, the Southeast Asian Fisheries Development Center (SEAFDEC). These programmes and projects include: the regular research cruises of SEAFDEC’s vessels as part of its offshore fisheries resource exploration initiatives in Southeast Asian waters; the human resource development programme, which links to responsible fishing gear and information and communications units; long-term efforts to enhance the compilation and utilization of fishery statistics and information for sustainable development and management of fisheries in Southeast Asia; programme initiatives to improve monitoring and control of large and small scale fisheries; assistance for capacity building in the region to address International trade-related issues; rehabilitation of fisheries resources and habitat /fishing grounds; and the promotion of sustainable fisheries, aquaculture and resource enhancement in the region.

106. 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 (Information Management and Dissemination) and Component 4 (National and Regional Cooperation and Coordination) 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.

107. 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 seascape. It 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

108. This proposal is aligned with the GEF-5 International Waters Strategic Priority 2: Catalyze multi-state cooperation to rebuild marine fisheries in the South China Sea and Gulf of Thailand Large marine ecosystems, and specifically outcome 2.1 in implementing the fisheries component of the approved South China Sea Strategic Action Programme (SCS SAP). As outlined in the SCS SAP, the fish *refugia* concept is an innovative approach to reconciling the demands of marine biodiversity with the often conflicting demands for enhanced fisheries production, and therefore the project will contribute significantly to Outcome 2.3. Since this is the first attempt to involve fisheries and environmental managers in jointly managing demersal fish stocks and the marine and coastal habitats upon which these stocks depend, the project will contribute significantly to IW Strategic Priority 3 by focusing on local pilot demonstrations and portfolio learning/shared visions of action and commitments among the SCS countries and agencies. The project will play a catalytic role in addressing transboundary water concerns by assisting countries to restore and sustain coastal and marine fish stocks and associated biodiversity and support policy, legal and institutional reforms and multiagency partnerships that contribute to WSSD targets for sustaining fish stocks.

109. The project will also indirectly contribute to two GEF-5 Biodiversity Strategic Objectives, namely: Strategic Objective 1 to improve sustainability of Protected Area Systems through improvement of fishing community's livelihoods and revenue using sustainable use approaches to managing fish stocks and critical habitats; and Strategic Objective 2 on Mainstreaming Biodiversity in Production Landscapes/Seascapes and Sectors. By using the innovative concept of fish *refugia*, the project will demonstrate the potential of biodiversity conservation and sustainably managed seascapes for marine fishery production. The project will enhance the understanding of the effectiveness of different forms of marine biodiversity protection and how to combine conservation goals with generation of local benefits in the fisheries sector at both the national and regional levels.

3.2. Project goal and objective

110. The longer-term goals of this project are to contribute to:

- improved integration of habitat and biodiversity conservation considerations in the management of fisheries in the South China Sea and Gulf of Thailand;
- improved national management of the threats to fish stock and critical habitat linkages within fisheries *refugia*; and,
- enhanced uptake of good practice in integrating fisheries management and biodiversity conservation in the design and implementation of regional and national fisheries management systems.

111. The medium-term objectives align with those of the fisheries component of the Strategic Action Programme for South China Sea which are to:

- build the resilience of Southeast Asian fisheries to the effects of high and increasing levels of fishing effort;
- improve the understanding among stakeholders, including fisherfolk, scientists, policy-makers, and fisheries managers, of ecosystem and fishery linkages as a basis for integrated fisheries and ecosystem/habitat management; and
- build the capacity of fisheries departments/ministries to engage in meaningful dialogue with the environment sector regarding the improvement of fisheries and management of interactions between fisheries and critical marine habitats.

112. This specific project objective is ‘to operate and expand the network of fisheries refugia in the South China Sea and Gulf of Thailand for the improved management of fisheries and critical marine habitats linkages in order to achieve the medium and longer-term goals of the fisheries component of the Strategic Action Programme for the South China Sea’, including:

- by 2018, to have established a regional system of a minimum of fourteen *refugia* for the management of priority transboundary, fish stocks and endangered species; and
- by 2018, to have prepared and implemented fisheries management systems in the identified priority *refugia* based on and consistent with, the ASEAN SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia.

3.3. Project components and expected results

Component 1. Identification and management of fisheries and critical habitat linkages at priority fisheries *refugia* in the South China Sea and Gulf of Thailand

This component will result in the establishment of operational management at 14 priority fisheries *refugia*, with community-based *refugia* management plans being key outputs of this component. Significantly, the implementation of these management plans will result in the amelioration of key threats at 14 fisheries *refugia* sites via the application of agreed management measures including inter alia: the exclusion of fishing methods; restricting gears; prohibiting gears; control of vessel size/engine capacity; seasonal closures and restrictions; and limiting access and the application of rights-based (and human rights-based) approaches in small-scale fisheries. Where necessary, management measures will also include the implementation of interventions to provide habitat protection, to ensure for example that areas important for egg deposition are not disturbed and/or to safeguard habitats that provide protection for juveniles from predators, such as mangroves and seagrass. Supporting activities include consultative processes to facilitate agreement among stakeholders on the boundaries of fisheries *refugia*, identification of key threats to *refugia* sites, recording of fishing community views regarding appropriate fisheries and habitat management measures, and establishment and operation of enforcement programmes at 14 priority fish *refugia* sites. Component 1 activities will also be linked to nascent processes of SEAFDEC which focus on the management of fishing capacity and energy efficiency, vessel licensing and registration, food security and alternative livelihood generation, the promotion of rights-based and human-rights based approaches to fisheries management, and sustainable supply chain issues. Such institutional-level linkages will enable the alignment of these regional initiatives at the 14 priority sites of this project where appropriate. Importantly, this component aligns with the GEF theory of change framework via **implementing strategies**, i.e., application of fisheries *refugia* to significantly reduce stress on fish stocks and coastal habitats. Specifically, component 1 will result in **269,500 ha of fish *refugia* habitat will be conserved/effectively managed** as well as a **50% reduction in fishing pressure** within sites at times critical to the life-cycles of fished species of transboundary significance.

Outcome	End of Project Target	Indicator
Outcome 1. Reduced stress on fish stocks and coastal habitats via improved national management of key anthropogenic threats to fisheries and critical habitat linkages in the South China Sea	Effective management of key threats to 14 fisheries <i>refugia</i> sites [269,500 ha], including ~50 percent reduction in fishing pressure within sites at times critical to the life-cycles of fished	Status of formal designation, management plan adoption, and community engagement in implementation of agreed management measures, including enforcement, for priority sites

and Gulf of Thailand	species of transboundary significance	
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Outcome 1.1 Fisheries and critical habitat linkages at 14 priority sites in the South China Sea and Gulf of Thailand safeguarded via the delineation of fisheries *refugia* boundaries and the setting of priorities for *refugia* management

113. Locations of priority fisheries *refugia* sites in the South China Sea have been identified through past national-level initiatives, although a need exists to work with stakeholders locally, including academe and researchers, to delineate boundaries. In support of this, fisheries and coastal habitat and data collection programmes will be developed and operated at the 14 priority sites, which will include: national reviews of existing information and data; identification of needs for management interventions; consultation workshops to secure community and fisherfolk support in information and data collection; and the design and conduct of site-based surveys to produce fisheries and habitat profile reports for fisheries *refugia* sites. The agreed process for baseline setting and the identification of priorities for intervention are outlined in **Information Box 1** below.

114. This information base to be elaborated during the first year of the project will inform consultative processes aimed at facilitating agreement among stakeholders on the boundaries of fisheries *refugia*, key threats to *refugia*, and priority management interventions for the 14 sites in the South China Sea. This will involve the conduct of consultations (including at-sea) to: draft maps of fisheries *refugia* for priority species at 14 sites; elicit fisherfolk input to boundary delineation; conduct assessment of environmental and social impacts of *refugia* designation at 14 locations; and secure formal government designation of sites as fisheries *refugia* at 14 priority locations. Importantly, this implementation of fisheries *refugia* as a marine spatial planning tool represents a globally significant initiative of the small-scale fisheries sector to guide its sustainable use of fisheries resources, fish habitats and associated biodiversity in a shared marine basin subject to high and increasing levels of fishing pressure and degradation of fisheries habitats. Related outputs will include fisheries *refugia* profile reports, including GIS maps and site characterisations, published for 14 priority sites. Related targets, activities and outputs are summarized below:

Target	Activities	Output
Agreement among stakeholders on the boundaries of fisheries <i>refugia</i> , key threats to <i>refugia</i> , and priority management interventions for 14 sites in the South China Sea and Gulf of Thailand	<ul style="list-style-type: none"> • Development of fisheries and coastal habitat information and data collection programmes for 14 priority fisheries <i>refugia</i> sites • Facilitating agreement among stakeholders on the boundaries of fisheries <i>refugia</i> at 14 priority fisheries <i>refugia</i> sites 	14 fisheries <i>refugia</i> profile reports, including GIS maps and site characterisations, published for priority sites

Information Box 1: Setting baselines and identifying priority actions at fisheries *refugia* sites

Framework process for baseline setting and identifying priorities for intervention at fishery <i>refugia</i> sites	
1. Identification of issues and problems with fish stock and coastal habitat linkages	<ul style="list-style-type: none"> • 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 • 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)
2. Quantification of the compromises to fish stock and coastal habitat linkages	<ul style="list-style-type: none"> • 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).
3. Initial prioritization of problems	<ul style="list-style-type: none"> • Based on the system description, identify and quantify compromises (steps one to three above) and threats, and produce an 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 the degradation of fish stock and critical habitat linkages (“causal chain analysis”)	<ul style="list-style-type: none"> • Determine and describe the immediate causes of identified issues • Determine and describe of the secondary causes of identified issues • Determine and describe the tertiary...to penultimate causes of identified issues
5. Identification and characterization of ultimate (root) causes of the degradation of fish stock and critical habitat linkages	<ul style="list-style-type: none"> • Determine and describe the ultimate/root causes of identified issues
6. Identification and characterization of options for intervention	<ul style="list-style-type: none"> • 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)
7. Analysis of options for intervention	<ul style="list-style-type: none"> • Examine options for intervention for commonalities and crosstalk/conflicts • Establish criteria for net benefit analyses of options
8. Determination of comparative net benefit of options for intervention	<ul style="list-style-type: none"> • 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
9. Identification of priority options for intervention	<ul style="list-style-type: none"> • 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

Outcome 1.2 Amelioration of key threats to fish stock and critical habitat linkages via the adoption and implementation of community-based *refugia* management plans at 14 sites

115. Regional guidelines on the use of fisheries *refugia* in capture fisheries management in Southeast Asia have been published as part of the inter-governmentally endorsed ASEAN-SEAFDEC Regional Guidelines for Responsible Fisheries, and a need exists to apply this at the local level. This project will support consultative processes aimed at identifying key threats to fisheries *refugia* sites and related priority management measures¹². This information will be used to develop management plans for the 14 priority sites which will outline the agreed management measures to address key threats to fish stock and critical habitat linkages. To enable the implementation of these plans following their adoption by local authorities, regulatory reforms will be enacted, and community agreements negotiated, to address threats associated with: the twin problems of over-capacity and over-exploitation; the use of destructive and/or unsustainable fishing gear and practices; pollution from fish processing facilities and small fishing vessels; habitat destruction and pollution due to fish and shrimp farming; and illegal fishing. Importantly this component will support the mainstreaming of management plan implementation into the operations of provincial agencies to provide local authority and regulatory power for the control of the number and types of fishing vessels operating within *refugia* sites, as well as the types of gears and practices employed by small-scale fisherfolk. Such powers will enable the enforcement of rules regulating, for example, the illegal encroachment of larger-scale fishing operations into provincial/municipal waters, as well as the use of explosives and poisons in the harvest of fish. The regulation of push netting, inshore trawl fishing, and the use of other unselective fishing gears and practices will also be a priority management intervention for implementation under this component, particularly where these gears and practices are used in areas of sensitive habitats such as seagrass, as well as in areas where growth and recruitment overfishing exists. Local capabilities for monitoring, control and surveillance to ensure compliance with agreed management rules will also be strengthened via complementary activities associated with the establishment of networks of management volunteers (see Outcome 1.3) and the development and

¹² The management measures to be applied within fisheries *refugia* sites are outlined above in section 2.1.3.4 and summarized further in the narrative summary of Component 1 provided in section 3.3

implementation of observer and enforcement programmes (see Outcome 1.4). Related targets, activities and outputs are summarized below:

Target	Activities	Output
Community-based <i>refugia</i> management plans developed, adopted, and under implementation at 14 fisheries <i>refugia</i> sites	<ul style="list-style-type: none"> • Consultations to identify key threats to fisheries <i>refugia</i> sites and identify management measures • Management plans for 14 sites developed through community-based consultations and adopted by local authorities • Enactment of requirement regulatory reforms, including regulations/rules, required for <i>refugia</i> management • Mainstreaming of management plan implementation into the operations of provincial/municipal authorities • Implementation of agreed priority management measures to ameliorate key threats at 14 fisheries <i>refugia</i> sites 	14 published management plans and 24 annual implementation reports

Outcome 1.3 Catalysed community action for fisheries *refugia* management at 14 sites

116. Efforts to strengthen monitoring, control, and surveillance capabilities in all countries are ongoing, although a need exists to refine scope of work to support *refugia* management. In support of this, site-level management boards will be established at each of the 14 priority *refugia* sites to enhance communication among stakeholders involved in fisheries management and biodiversity conservation, including provincial government officials, fisheries officers, staff of environment agencies, community representatives, NGOs and enforcement agencies. Fisheries *refugia* management boards will be served by management teams comprising staff of relevant provincial fisheries and environment agencies. Additionally, operational *refugia* management will be supported via the establishment of networks of community-based fisheries and habitat management volunteers. Related targets, activities and outputs are summarized below:

Target	Activities	Output
Networks of management boards and community-based fisheries and habitat management volunteers for <i>refugia</i> management established at 14 fisheries <i>refugia</i> sites	<ul style="list-style-type: none"> • Establish management teams and site-based volunteer networks at 14 sites • Conduct practical capacity building activities for mgmt volunteers at 14 sites • Coordinate monthly training and awareness activities at 14 sites 	Quarterly reports [224] of network meetings and activities [including list of participants and results of work]

Outcome 1.4 Empowered fishing communities, particularly artisanal fishermen and women involved in inshore gleaning and processing, for enforcement of agreed management rules at 14 priority *refugia* sites in the South China Sea and Gulf of Thailand

117. Capacity building programmes at the community level typically focus on seafood quality and fishing fleet capacity issues with little emphasis on links between fisheries and environment. Activities of component 1 will increase the capacity of target community members, particularly artisanal fishermen and women, to participate in *refugia* management via the development and operation of community capacity building programmes at 14 fisheries *refugia* sites. These will include participatory activities to monitor fish habitats within *refugia*, collect lost and abandoned fishing gear, and develop responsible fishing practices at the community level. Supporting activities include: the benchmarking of stakeholder capacity for participation in management; and the development of agreed objectives, syllabus, training materials and schedule for capacity building activities. Importantly, this component will strengthen the monitoring, control and surveillance capacities of the lead provincial governments that are required to successfully implement management plans at the 14 *refugia* sites. The identification and implementation of enforcement measures will be guided by the

ASEAN-SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia and the FAO Small-Scale Fisheries Guidelines, and will involve the application of emerging remote sensing technologies, including the use of aerial drones. Required reforms to the enabling environment for effective monitoring, control and surveillance will be achieved via interlinked activities of component 2 (Output 2.3) which will result in endorsed policies, executive orders, and local by-laws and ordinances for *refugia* management and related enforcement activities. Related targets, activities and outputs are summarized below:

Target	Activities	Output
Enforcement programmes at 14 fisheries <i>refugia</i> sites, including participatory activities for strengthened monitoring, control and surveillance	<ul style="list-style-type: none"> • Benchmarking of stakeholder capacity for participation in management • Development of agreed objectives, syllabus, training materials and schedule for capacity building activities • Develop and implement collaborative observer and enforcement programmes for management plan implementation at 14 sites 	14 operational enforcement programmes at priority <i>refugia</i> sites

Outcome 1.5 Strengthened civil society and community organisation participation in fisheries *refugia* management

118. Low level mobilization of civil society, community organization and the private sector in site-based fisheries and habitat management has been identified as a key barrier. This will be addressed via project activities to develop an operational partnership with the GEF Small Grants Programme to strengthen civil society and community organisation participation in the management of fisheries *refugia* at 14 sites. Supporting activities include: provision of technical assistance to local GEF Small Grant Programme proponents in design and execution of projects; and the documentation and regional and national level sharing of examples of best practice in community-based management. The related target, activities and outputs are summarized below:

Target	Activities	Output
Operational partnership with the GEF Small Grants Programme to strengthen civil society and community organisation participation in the management of fisheries <i>refugia</i> at 14 sites	<ul style="list-style-type: none"> • Support local GEF Small Grant Programme proponents in design and execution of projects • Document and share examples of best practice at regional and national levels in the 6 countries 	4 annual partnership reports

Component 2. Improving the management of critical habitats for fish stocks of transboundary significance via national and regional actions to strengthen the enabling environment and knowledge-base for fisheries *refugia* management in the South China Sea and Gulf of Thailand

119. Component 2 focuses on strengthening the enabling environment for the formal designation and operational management of *refugia*. Preparatory activities include legal reviews to identify, *inter alia*: legal terminology for describing *refugia*; formal procedures for demarcating boundaries of spatial management areas such as *refugia*, including requirements for assessing the socio-economic impacts of management measures and stakeholder consultation; and provisions for decentralising *refugia* management to the community level via development of co-management and rights-based approaches. These national reviews are intended to enable the drafting of required policy and legislative amendments for adoption by competent authorities.

This component will also build the national and site-level science and information base via activities to develop and update of national fisheries databases for use in preparing annual syntheses of new and additional information and data relating to the status of stocks of priority fish, crustacean and mollusc species for dissemination at national and regional levels. Important elements of these synthesis reports include assessments of biomass trends, recruitment and fish size derived from abundance surveys, as well as volume and value of landings by fishing area and fishing gear used. Building on foundational fish early life history science capacity, developed through the SCS project, this component will

establish and populate national databases of fish egg and larvae distribution and abundance. Additionally, component 2 will develop combined national Geographical Information Systems (GIS) on fisheries and marine biodiversity featuring information on locations and management status of coastal habitats, fisheries *refugia*, MPAs, and critical habitats for threatened and endangered species. It is envisaged that these national GIS databases will be used in the preparation of annual syntheses of new and additional data relating to the science and management of fish life-cycle and critical habitat linkages. This component aligns with the GEF theory of change framework through **strengthening institutional capacity** via reform of policy, regulatory and planning frameworks aimed at enabling improved integration of fisheries and environmental management. Additionally, the component will lead to considerable stress reduction. Specifically, the demonstrations of best practice fishing methods and practices aimed at addressing key threats to fish stock and critical habitat linkages, and the adoption of supporting laws, will result in a **20% increase in vessels applying improved gear/techniques** to safeguard fish stock and critical habitat linkages.

Outcome	End of Project Target	Indicator
Outcome 2. Increased institutional capacity in the 6 participating countries for the designation and operational management of fisheries <i>refugia</i> via the transformation of enabling environments and the generation of knowledge for planning	National and regional policy, legal and planning frameworks for demarcating boundaries and managing fisheries <i>refugia</i> , resulting in, <i>inter alia</i> , a 20 percent increase in small-scale fishing vessels using fishing gear and practices designed to safeguard fish stock and critical habitat linkages at priority sites	Status of enabling environment reform, including extent of behavioural change among small-scale fisherfolk at priority sites Extent of use of available environmental state and socio-cultural information in policy and planning frameworks

Outcome 2.1 Strengthened enabling environments for the effective management of the effects of fishing on fisheries and critical habitat linkages in the South China Sea and Gulf of Thailand

120. The environmental impacts of fishing and aquaculture are reflected in national and regional fisheries policies although minimal attention is given to effects of fishing on critical fish habitats. Component 2 will enhance policy guidance for improved management of the effects of fishing on critical habitats in the 6 participating countries. The project will: identify and document key threats from fishing and the environment to fish stock and critical habitat linkages at 14 priority sites; formulate recommendations on policy and legal reforms to support promotion of responsible fishing at 14 priority sites; facilitate consultations with fisheries industry and competent authorities on policy reforms for responsible fishing gear and practices; and guide national policy reform to promote the fisheries sector's sustainable use of fish habitats and biodiversity. Related target, activities and outputs are summarized below:

Target	Activities	Output(s)
Measures for the fisheries sector's sustainable use of fish habitats and biodiversity, and based on site-level models of ecosystem carrying capacity, incorporated in the fisheries policies of participating countries	<ul style="list-style-type: none"> Identify and document key threats from fishing and the environment to fish stock and critical habitat linkages at 14 priority sites in the 6 participating countries Formulate recommendations on policy and legal reforms to support promotion of responsible fishing at 14 priority sites in the 6 participating countries Facilitate consultations with fisheries industry and competent authorities on policy reforms for responsible fishing gear and practices in the participating countries National policy reform to promote fisheries sector's sustainable use of fish habitats and biodiversity 	<p>6 published national reviews and recommendations for reforms of national, provincial and municipal regulations/ordinances for responsible fishing practices at priority <i>refugia</i></p> <p>6 endorsed revised policies</p>

Outcome 2.2 Cross-sectorial agreement on national guidelines for the use of fisheries *refugia* for integrated fisheries and habitat management

121. As all the participating countries have endorsed the ASEAN-SEAFDEC Regional Guidelines on the Use of Fisheries *Refugia* for Sustainable Capture Fisheries Management in Southeast Asia via the inter-governmental SEAFDEC Council process, Component 2 will support that strengthening of the policy enabling environment for fisheries *refugia* establishment and management via the drafting and approval of national guidelines for local dissemination. This will involve reviews of policy and legal aspects of *refugia* in the 6 participating countries and consultative processes to elicit stakeholder input to guideline development and endorsement. This initiative will also ensure where possible that national guidelines are congruent with key recommendations of the FAO Small-Scale Fisheries Guidelines. The related target, activities and outputs are summarized below:

Target	Activities	Output
National guidelines on the use of fisheries <i>refugia</i> in integrating fisheries and habitat developed and endorsed by heads of national government departments responsible for fisheries and environment in the participating countries	<ul style="list-style-type: none"> • Reviews of policy and legal aspects of <i>refugia</i> (terminology, procedures, recommended reforms) in the 6 participating countries • National expert consultations to formulate agreed recommendations for policy and legal reforms in the 6 participating countries • Draft national guidelines on procedures for formal designation and mgmt of fisheries <i>refugia</i> in 6 participating countries • National and local consultative process to elicit stakeholder input to the draft guidelines • Amend and finalise national guidelines for approval by National Fisheries <i>Refugia</i> Committees in 6 countries 	6 published national guidelines on establishing and operating fisheries <i>refugia</i>

Outcome 2.3 Endorsed policy, legal, and planning frameworks, both at national and regional levels, for the establishment and management of fisheries *refugia*, including the reduced use of destructive fishing gear and practices in areas of critical habitats

122. There currently exists an absence of clear and effective policies, laws, and plans relating to the demarcation of boundaries, formal designation, and operational management of fisheries *refugia* in each of the participating countries. Activities of this component will support the reform of national and regional policy, legal and planning frameworks for demarcating boundaries and managing fisheries *refugia*. This will involve: the drafting and adoption of required policy and legal reforms to support *refugia* establishment and management in the 6 participating countries; development of National Action Plans for fisheries *refugia*; as well as the development of a Regional Action Plan for the management of fisheries *refugia* in the coastal areas of the South China Sea. The related target, activities and outputs are summarized below:

Target	Activities	Output(s)
National policy, legal and planning frameworks for demarcating boundaries and managing <i>refugia</i> assessed and required reforms endorsed in the participating countries and reflected in an updated regional action plan	<ul style="list-style-type: none"> • Draft required policy and legal reforms to support <i>refugia</i> establishment and management in the 6 participating countries • Convene national and local stakeholder consultations to review draft text for adoption in the 6 participating countries • Facilitate approval and formal adoption of reforms by relevant authorities at national and provincial levels for 14 priority sites in the 6 participating countries • Develop a Regional Action Plan for the management of fisheries <i>refugia</i> in coastal areas of the South China Sea marine basin 	<ul style="list-style-type: none"> • 6 national reports on policy, legal and institutional aspects of <i>refugia</i> establishment and management published • Endorsed policy and executive orders, provincial/local ordinances and by-laws • 6 endorsed National Action Plan for the management of priority fisheries <i>refugia</i> and associated biodiversity • 1 endorsed Regional Action Plan for fisheries <i>refugia</i>

Outcome 2.4 Enhanced access to information relating to status and trends in fish stocks and their habitats in waters of the SCS

123. National reviews of fish stocks and habitats of regional, global and transboundary significance in the South China Sea were prepared for Cambodia, Indonesia, the Philippines, Thailand and Viet Nam during 2004-2006 as an activity of the SCS project. Component 2 will work to enhance access to information relating to status and trends in fish stocks and their habitats in waters of the SCS marine basin via the compilation new and additional information and data relating to biomass trends, recruitment, fish size, fish habitat area and quality, and volume and value of landings by fishing area and fishing gear use. Annual synthesis reports will be prepared and the national reports on fish stocks and habitats will be updated and made available online. The related target, activities and outputs are summarized below:

Target	Activities	Output
Annual synthesis reports of new and additional information and data relating to the stocks of priority fish, crustaceans and molluscs and their habitats published in each country and disseminated at national and regional levels	<ul style="list-style-type: none"> • Compile information and data derived from abundance surveys in South China Sea waters of 6 countries for longer-term management • Compile information and data derived from surveys on size-frequency of priority species in South China Sea waters of 6 countries • Compile information and data on landings of priority species (volume/value, fishing areas and gears) in South China Sea waters of the 6 countries • Produce annual syntheses reports of new and additional information for national and regional review • Revise national reports on fish stocks and habitats in the South China Sea for each 6 participating countries 	<ul style="list-style-type: none"> • 96 quarterly and 24 annual reports on fish stocks and habitats published online

Outcome 2.5 Improved national and regional-level management and sharing of information and data on fish early life history in the waters of the South China Sea

124. A constraining factor in the identification of fish stock and critical habitat linkages is the scarcity of information relating to the early-life history of the majority of significant transboundary species in the South China Sea. A further constraint is that access to data generated from fish early life history research is constrained both nationally and regionally by lack of central repositories or databases. This project will improve national and regional-level management and sharing of information and data on fish early life history in the waters of the SCS via the development and maintenance of online national and regional fish egg and larvae databases for improved planning and management of a regional system of fisheries *refugia*. The related target, activities and outputs are summarized below:

Target	Activities	Output
Establishment and population of 6 online national databases, and 1 regional database, of fish egg and larvae distribution and abundance in national waters and the SCS basin	<ul style="list-style-type: none"> • Prepare 6 national and 1 regional inventory of fish egg and larvae samples collected from SCS waters of the 6 participating countries (both analysed and unanalysed) • Develop and maintain 6 national databases and 1 regional database of fish egg and larval fish distribution and abundance • Convene annual one-day workshops in the 6 participating countries to monitor the implementation of national programmes for the processing/analysis of fish egg and larvae samples • Prepare annual status reports on fish early life history research for each participating country for regional review 	<ul style="list-style-type: none"> • 6 databases online and populated with datasets

Outcome 2.6 Enhanced access to information relating to the locations and status of coastal habitats and management areas in the South China Sea and Gulf of Thailand

125. Information relating to fisheries and their habitats is contained a number of national databases, as well as databases on the SCS project website, although there is need for improved access to information regarding the locations and status of coastal and marine management areas, such as MPAs, coastal habitat areas, and critical habitats for threatened and endangered species. Component 2 will enhance access to this type of information via the routine compilation and update of information and data in 6 national and 1 regional Google Earth based GIS. The related target, activities and outputs are summarized below:

Target	Activities	Output
National and regional online Geographical Information Systems on fisheries and marine biodiversity featuring information on locations and management status of coastal habitats, fisheries <i>refugia</i> , MPAs, and critical habitats for threatened and endangered species	<ul style="list-style-type: none"> • Compile and update information and data in 6 * National and 1 * regional Google Earth based GIS on: distribution of habitats; known spawning areas; locations of <i>refugia</i>; MPAs; fisheries management areas; critical habitats for endangered species • Prepare annual synthesis of new and additional information included in databases 	<ul style="list-style-type: none"> • 6 national and 1 regional Geographical Information System online and populated with site-based information

Outcome 2.7 Strengthened information base for the planning, monitoring and evaluation of management at priority fisheries *refugia* sites in the South China Sea

126. Fisheries information collection in the East Asian region largely focuses on volumes of catch with little attention to species and size selectivity of gear, size frequency and maturity, and the role of habitats in production. Accordingly the ability to assess the role of critical habitats in fish life-cycles and the sustainability of fisheries is constrained. Component 2 will meet this gap via the compilation of secondary information and primary information generated through project activities into site characterisations focusing on quality and expanse of habitats, trends in annual production and value of harvests, the number and type of fishing vessels and gear used in the area and village/community level socio-economic information. This will be complemented with the site level survey programmes to be operated through component 1 which include the routine collection of information and data on: the number and types of fishing vessels operating in the *refugia* area; the species and size selectivity of the principal fishing gear used; gonadosomatic index and size frequency of priority species utilising the area; the role of fisheries *refugia* in the production (and economic value) of priority fish, crustacean, and molluscs; and usage of *refugia* by threatened and endangered marine species. The related target, activities and outputs are summarized below:

Target	Activities	Output
Fisheries and habitat data collection programmes operational to characterise 14 priority <i>refugia</i> sites in the South China Sea and Gulf of Thailand	<ul style="list-style-type: none"> • Production of detailed site characterizations for the 14 priority fisheries <i>refugia</i> sites for incorporation into national and regional datasets 	<ul style="list-style-type: none"> • Characterisations for 14 <i>refugia</i> sites accessible online

Outcome 2.8 Improved basin-wide understanding of linkages between ocean circulation patterns, nutrient/chlorophyll concentrations, and sources and sinks of fish larvae in the South China Sea

127. Collaborative research activities of the SCS Project and SEAFDEC during 2006-2008, have resulted in a preliminary information base on key spawning (sources) and nursery areas (sinks) of economically important species in the South China Sea. These research activities involved analysis of

information collected during cruises of the SEAFDEC Research Vessel M.V. SEAFDEC in the following areas: the Gulf of Thailand and the East Coast of Peninsular Malaysia; the West Coast of Sabah, Sarawak, and Brunei Darussalam; the West Coast of Luzon, Philippines; and in Vietnamese Waters. Drawing on these data, the distribution and abundance of the larvae of important demersal and pelagic fish species in the South China Sea was mapped¹³. Component 2 will build on this foundational work via the development of a modelling system, linking known sources and sinks of fish larvae to ocean circulation patterns and nutrient/chlorophyll concentrations in the South China Sea to improve regional understanding of fish early life history and links to critical habitats. The related target, activities and outputs are summarized below:

Target	Activities	Output
Strengthened information base for the planning, monitoring and evaluation of management at priority fisheries <i>refugia</i> sites in the South China Sea and Gulf of Thailand	<ul style="list-style-type: none"> • Development and application of a modelling system linking oceanographic, biochemical, and fish early life history information to improve regional understanding of fish early life history and links to critical habitats • Publication of report on application of modelling system in identifying priority locations for replication and scaling-up of fisheries <i>refugia</i> best practices 	<ul style="list-style-type: none"> • 1 modelling system online

Outcome 2.9 Regionally and locally appropriate best practices generated to address the effects of trawl and motorised push net fishing on seagrass habitat, and the capture of juveniles, pre-recruits and fish in spawning condition

128. There are few regionally or locally appropriate examples of practical solutions to key threats to fisheries *refugia* in the East Asian region. The fisheries component of the South China Sea SAP identified the need for the demonstration of targeted actions to support and guide National Fisheries Departments in the establishment of coastal fisheries management systems at priority fisheries *refugia*. Building on experiences with the habitat demonstration site approach developed by the SCS project (see Vo *et al.*, 2013), Component 2 will identify and trial approaches to reduce the effects of trawl and push net fishing on seagrass habitat, and will also test the use of fishing gear and practices that reduce the capture of juveniles, pre-recruits and fish in spawning condition. The related target, activities and outputs are summarized below:

Target	Activities	Output
Best practice fishing methods and practices to address key threats to fish stock and critical habitat linkages demonstrated at priority <i>refugia</i>	<ul style="list-style-type: none"> • Demonstrations of best practice fishing methods and practices to address key threats to fish stock and critical habitat linkages demonstrated at priority fisheries <i>refugia</i> 	<ul style="list-style-type: none"> • 4 published reports of the results of demonstrations

Component 3. Information Management and Dissemination in support of national and regional-level implementation of the fisheries *refugia* concept in the South China Sea and Gulf of Thailand

Two fundamental assumptions regarding the potential success of the fisheries *refugia* concept in improving fisheries and habitat management in Southeast Asia are that: (1) cross-sectorial co-ordination of activities between the fisheries and environment sectors in the participating countries will be successful; (2) that small-scale fishing communities will support project activities and

¹³ See Annex 5 of the Eighth RWG-F Meeting Report (UNEP, 2007b) entitled "Distribution and Abundance of Fish Larvae in the Gulf of Thailand and South China Sea"

proposed interventions. Accordingly, Component 3 focuses on strengthening information management and dissemination aimed at enhancing the national uptake of best practices in integrating fisheries management and biodiversity conservation, and in improving community acceptance of area based approaches to fisheries and coastal environmental management. Supporting activities involve the development of national knowledge management systems on the use of fisheries *refugia* in capture fisheries management, and the establishment of a Regional Education and Awareness Centre within SEAFDEC which will operate as a facility for the production and sharing of information and education materials on fisheries and critical habitat linkages. Importantly, Component 3 will support the development of indicators to monitor the effectiveness of coastal fisheries management systems established for priority fisheries *refugia*. A regional programme for the compilation of standardised fisheries statistics for use in identifying and managing fisheries *refugia* will also be developed to support monitoring and evaluation. Significantly, this component aligns with the GEF theory of change framework through **knowledge and information** activities aimed at improving information sharing and access, awareness raising, skills building, and monitoring and evaluation.

Outcome	End of Project Target	Indicator
Outcome 3. Strengthened knowledge management and information sharing and access for enhanced uptake of good practice in integrating fisheries management and biodiversity conservation in the design and implementation of fisheries and environmental management systems, including Marine Spatial Planning	National and regional systems for knowledge management and sharing, including the development of indicator sets and standardized statistics to guide the replication, scaling-up and mainstreaming of good practices in the use of fisheries <i>refugia</i> as a spatial planning tool	Extent of demonstrable use of examples of good practice in guiding the replication, scaling-up and mainstreaming of good practices

Outcome 3.1 Enhanced uptake of best practices in integrating fisheries management and biodiversity conservation, in the design and implementation of fisheries management systems

129. Lessons learned in coastal habitat management from the SCS project's network of 23 demonstration sites have been documented (see Vo *et al.*, 2013), although there are few regionally relevant examples of best practice in integrated fisheries and biodiversity management. Component 3 will fill this gap via the routine capture and codification of best practices in the establishment and operation of fisheries *refugia* sites. National and regional online catalogues will also be developed to serve as repositories of best practice examples, while communication products on best practices will be routinely prepared for dissemination and syndication, both nationally and regionally. The related target, activities and outputs are summarized below:

Target	Activities	Output(s)
Best practice approaches and measures for integrated fisheries and habitat management captured, documented and communicated nationally and regionally	<ul style="list-style-type: none"> • Quarterly capture and documentation of best practices in the establishment and operation of fisheries <i>refugia</i> in the 6 participating countries • Online catalogue of best practices approaches and measures developed and updated each 6 months • 6 monthly development of communications on best practices for dissemination and syndication, both nationally and regionally 	<ul style="list-style-type: none"> • 6 online national and 1 regional catalogue of best practice approaches and measures • 24 communications on best practices published and syndicated

Outcome 3.2 Improved community acceptance of area based approaches to fisheries and coastal environmental management

130. Many fishing families, fisheries managers, and local government officials in the region equate area-based approaches to fisheries management (zoning) as the equivalent of no-take MPAs. The latter are often viewed as unacceptable at the community level because they are rarely designated in

locations of importance to the life-cycle of fished species and neither improve fish stocks nor the community's income. The net result of such MPA establishment is largely viewed as a loss of fishing areas for small-scale fishers and non-compliance with fisheries management measures in the 'protected' areas as a result of minimal buy-in from communities (Paterson *et al.*, 2013). Additionally, community-level awareness programmes in support of fisheries and coastal management initiatives in the Southeast Asian region have rarely addressed area-based approaches to natural resource and environmental management. In this connection, activities of Component 3 are aimed at improving community acceptance of area based approaches to marine management in the 6 participating countries. This will involve the benchmarking and tracking of community acceptance of the fisheries *refugia* approach as a marine spatial planning tool, the production of locally appropriate awareness and outreach materials, and the design and implementation of targeted outreach programmes at priority communities. The related target, activities and outputs are summarized below:

Target	Activities	Output(s)
Public awareness and outreach programme to promote local social, economic and environmental benefits of fisheries <i>refugia</i> implemented at 14 priority locations in the South China Sea and Gulf of Thailand	<ul style="list-style-type: none"> Quarterly capture and documentation of best practices in the establishment and operation of fisheries <i>refugia</i> in the 6 participating countries Online catalogue of best practices approaches and measures developed and updated each 6 months 6 monthly development of communications on best practices for dissemination and syndication, both nationally and regionally 	<ul style="list-style-type: none"> 24 awareness materials published online Annual reports of outreach programmes at 14 priority locations, including tracking of extent of community acceptance [56 reports]

Outcome 3.3 Knowledge generated and experiences from establishing and operating fisheries *refugia*, captured and shared nationally, regionally, and globally

131. There currently exists no mechanism for the capture, management and sharing of knowledge and experiences in the use of area based tools for fisheries management in the South China Sea region. Project activities will capture and share (at national, regional and global levels) the knowledge generated and experience gained from the establishment and operation of a regional system of fisheries *refugia*. National and regional web portals will be established and operated for knowledge management. Additionally, the project will prepare and publish six (6) GEF International Waters Experiences Notes on the application of the *refugia* approach at the national level (one each per participating country)¹⁴. The related target, activities and outputs are summarized below:

Target	Activities	Output(s)
National knowledge management systems on the use of fisheries <i>refugia</i> in capture fisheries management established and operational	<ul style="list-style-type: none"> Establish and operate 6 national and 1 regional web portals for knowledge management on fisheries <i>refugia</i> Prepare and publish 6 GEF International Waters Experience Note on application of <i>refugia</i> approach at the national level 	<ul style="list-style-type: none"> 6 online national web portals on fisheries <i>refugia</i> 6 published GEF IW experience notes (one per country and one regional) on application of fisheries <i>refugia</i> in the South China Sea and Gulf of Thailand

Outcome 3.4 Information and Education Campaigns for small-scale fisherfolk on the links between fisheries, habitats and biodiversity coordinated regionally through a Regional Education and Awareness Centre

132. As noted above, a key constraint in the future development of the regional system of fisheries *refugia* is a shortage of information regarding fish life-cycles and critical habitat linkages in Southeast

¹⁴ Best practices and lessons learned in fisheries *refugia* management 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 the UNEP/GEF project entitled "Implementing the Strategic Action Programme for the South China Sea" (GEF ID: 5538)

Asia. SEAFDEC has been working to fill this information gap by including larval and juvenile fish surveys as part of its regular fisheries research cruises; however, the region has faced difficulties in the processing of samples due to limited expertise in national fisheries departments. Additionally, there is a need for capacity enhancement among middle to senior level fisheries and environment managers, both at the central government and provincial levels, and fisherfolk and fishing communities on fish stock and environment links. The SCS project worked to meet this need via a regional capacity building programme which addressed fish early life history science and the use of spatial tools in fisheries management. Currently however, regional and national level access to information and training materials on integrated fisheries and habitat management is limited to that produced through the SCS project and which is currently accessible via the SCS website¹⁵. Component 3 activities build on this via the establishment of a Regional Education and Awareness Centre for the production and sharing of information and education materials on fisheries and critical habitats. The related target, activities and outputs are summarized below:

Target	Activities	Output
Regional Education and Awareness Centre on fisheries and critical habitats established and operating as a facility for the production and sharing of information and education materials for <i>refugia</i> management	<ul style="list-style-type: none"> • Establish a Regional Education and Awareness Centre on fisheries and critical habitats • Production and regional-level sharing of information and education materials for <i>refugia</i> management 	<ul style="list-style-type: none"> • Information and education materials accessible at SEAFDEC and online

Outcome 3.5 Standardised methods for collection and analysis of information and data, for use in assessing the impacts of *refugia* and in the design appropriate indicators for the longer-term operation of the regional system of fisheries *refugia*

133. There has been significant work undertaken by SEAFDEC over recent decades to standardise the reporting of Southeast Asia's regional fisheries statistics. To date however, there has been little consideration given to information and data relating to fish stock and habitat links. As a result, national and regional fisheries statistics provide little insight into the role of habitats in fisheries production. Component 3 links to nascent processes of SEAFDEC to standardize methods for the collection and analysis of information and data for use in assessing impacts of *refugia* and the design of appropriate indicators for the longer-term operation of the regional system of fisheries *refugia*. This will be supported by a regional consultative process to facilitate agreement on stress reduction and environmental state targets and indicators for managed *refugia*. This Component 3 initiative will be underpinned by the Component 1 activity directed at the development and operation of fisheries and coastal habitat information and data collection programmes at the 14 priority fisheries *refugia* sites to establish the baseline of resource and socio-economic information for longer-term monitoring and evaluation. These information and data collection programmes will be initiated at project inception and include activities to *inter alia*: review existing information and data on fisheries and coastal habitats at 14 sites; national consultation workshops to secure community and fisherfolk support in information and data collection; the design and conduct of site-based surveys to produce fisheries and habitat profile reports for 14 sites; and the conduct of quarterly fisheries and habitat surveys¹⁶. Component 3 will act to refine data collection procedures and secure regional commitment to the longer-term operation of fisheries and habitat surveys conducted as part of the regular research cruises of M.V. SEAFDEC 2 and national research institutes. The related target, activities and outputs for Outcome 3.5 are summarized below:

Target	Activities	Output
Regional agreement on standardised information and data collection procedures in support of longer-term operation of a regional	<ul style="list-style-type: none"> • Develop standardised information and data collection procedures in support of longer-term operation of a regional system of fisheries <i>refugia</i> • Regional consultation to agree on stress 	<ul style="list-style-type: none"> • 1 endorsed regional report published online

¹⁵ See <http://www.unepscs.org/Training/Workshops/Materials.html> for a compilation of these resources

¹⁶ Similarly, Component 1 activities will be based on the agreed process for baseline setting and identifying priority options for intervention at fisheries *refugia* sites outlined in para. 114 of this document.

system of fisheries <i>refugia</i> , including design of stress reduction and environmental state indicators for managed <i>refugia</i>	reduction and environmental state indicators for managed <i>refugia</i>	
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Component 4 National and regional cooperation and coordination for integrated fish stock and critical habitat management in the South China Sea and Gulf of Thailand¹⁷

At the national-level, Component 4 will strengthen cross-sectorial coordination for integrated fisheries and environmental management and will harness the national scientific and technical expertise and knowledge required to inform the policy, legal and institutional reforms for fisheries *refugia* management in the participating countries. Local community action and strengthened ‘community to cabinet’ linkages will be facilitated via establishment and operation of site-based management boards for fisheries *refugia* at the 14 priority locations in the South China Sea. Regionally, Component 4 will foster regional cooperation in: the establishment and operation of a regional system of fisheries *refugia*; and in the integration of scientific knowledge and research outputs with management and policy making. This component also includes project coordination and management activities aimed at: ensuring the timely and cost effective implementation of regional and national-level activities; and satisfying the reporting requirements of UNEP and the GEF. Component 4 activities will achieve the following results:

Outcome	End of Project Target	Indicator
Outcome 4. Cost-effective and efficient coordination of national and regional level cooperation for integrated fisheries and environmental management	Effective multi-lateral and intergovernmental communication and joint decision-making, including the use of a consensual knowledge-base in planning ecologically and cost-effective management actions	Extent and continuity of stakeholder participation in meetings of project management bodies, including the scope and uptake of joint management and planning decisions

Outcome 4.1 Strengthened cross-sectorial coordination in the establishment and operation of fisheries *refugia* in the participating countries

134. Limited cross-sectorial engagement in the planning of coordinated actions to manage threats to fish stocks and critical habitat linkages has been identified as a key barrier in each of the participating countries. National activities of Component 4 will establish and operate National Fisheries *Refugia* Committees (NFRCs) to strengthen cross-sectorial coordination in the establishment and management of fisheries *refugia*. The NFRC’s will assume overarching responsibility for the execution of national level activities of the project and will, *inter alia*: receive, review, and approve reports from the management boards of *refugia* sites; consider advice from the National Scientific and Technical Committees in decision-making; meet on a quarterly basis to guide the timely execution of project activities; provide direction and strategic guidance to the National Lead Agencies and *refugia* management boards; assess and advise on stakeholder involvement in fisheries and environmental management; and approve annual progress reports for transmission to the SEAFDEC PCU and UNEP. The related target, activities and outputs are summarized below:

Target	Activities	Output
National Fisheries <i>Refugia</i> Committees established in 6	• Develop and agree ToR, membership &	• 6 NFRC Terms of

¹⁷ A key consideration in the design of project component 4 activities was the establishment of a project management structure that provides a clear separation between discussions of scientific and technical matters from discussion dealing with policy and principles at both the national and regional levels. This separation is aimed at facilitating clarity in discussions and decision-making at both scientific/technical and decision-making levels, specifically to ensure that scientific and technical considerations do not become obfuscated by political discussions. This key design principle aims to enable scientific and technical issues to be discussed and analyzed in a strictly operational context by scientists and managers from the participating countries, leading to recommendations being made to the policy level decision-making bodies (both nationally and regionally) that are solely based on the best available, scientific and technical, data and information.

countries, functional and advising national decision-makers and regional <i>fora</i>	<p>operational rules for National Fisheries <i>Refugia</i> Committee's (or equivalent) for 6 participating countries</p> <ul style="list-style-type: none"> • Establish and convene quarterly meetings of the National Fisheries <i>Refugia</i> Committee (NFRC) (or equivalent) for 6 participating countries • NFRC review and endorsement of quarterly work plans and progress and financial reports, including tracking of continuity of participation of stakeholders, in each of the 6 participating countries • National NFRC inputs to mid-term review and terminal evaluation of national and regional aspects of project in each 6 participating countries 	Reference and 48 biannual meeting reports (joint management decisions and participant lists)
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Outcome 4.2 National scientific and technical expertise and knowledge harnessed to inform policy, legal and institutional reforms for fisheries *refugia* management in the participating countries

135. The participating countries lack formal mechanisms for the sharing of scientific and technical knowledge between government agencies and other stakeholders involved in fish stock and coastal environmental management. Component 4 will establish and operate National Scientific and Technical Committees (NSTCs) in the participating countries to harness national scientific and technical expertise and knowledge to inform reforms for fisheries *refugia* management. The NSTCs will assume overarching responsibility for the review and co-ordination of national scientific and technical activities of the project and will, *inter alia*: provide the NFRC with recommendations on proposed national and site-based activities, work plans, and budgets; provide the NFRC with 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 *refugia* management; compile and evaluate national level sources of information and data for sharing at the regional level through the Regional Scientific and Technical Committee; and ensure that planned national level 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. The related target, activities and outputs are summarized below:

Target	Activities	Output
National Scientific and Technical Committees (NSTC) established in 6 countries, functional and advising site-level management boards, the NFRC and the Regional Scientific and Technical Committee	<ul style="list-style-type: none"> • Develop and agree Terms of Reference, membership & operational rules for National Scientific and Technical Committees for 6 participating countries • Establish and convene 6 monthly meetings of the National Scientific and Technical Committee (or equivalent) in each of the six participating countries • Provision of technical and scientific inputs to planning of activities in components 1, 2 and 3 led by National Lead Agencies in each of 6 participating countries 	<ul style="list-style-type: none"> • 6 NSTC Terms of Reference and 96 quarterly meeting reports (scientific and technical advice and participants lists)

Outcome 4.3 Community-led planning of fisheries *refugia* management at priority locations in the South China Sea and Gulf of Thailand

136. Stakeholder participation in the planning of local actions to manage threats to fish stocks and critical habitats is limited in riparian communities of the South China Sea basin. Component 4 will

catalyze local community action via the establishment and operation of site-based management boards for the 14 priority fisheries *refugia* sites. Initial activities will involve the review of governance arrangements at each site to identify required Terms of Reference and membership of site-based management boards, including the creation of linkages with other local planning bodies. The development of these institutional arrangements will be guided by ASEAN-SEAFDEC Guidelines for Responsible Fisheries in Southeast Asia and the recently adopted FAO Small-Scale Fisheries Guidelines. The site-based management boards will *inter alia*: plan and guide the timely execution of site-based activities; review and take action where necessary to ensure appropriate levels of government, NGO, community, and private sector engagement in site-level activities; ensure compatibility between the recommendations for action at the fisheries *refugia* site with other local level activities for fisheries and coastal habitat management; prepare and endorse quarterly progress reports for transmission to the meetings of the NFRC; facilitate the approval and implementation, by the competent local authority, of management plans and courses of action developed during project execution; and identify best practices for replication and scaling-up as well as the mainstreaming of the fisheries *refugia* approaches at the local level. The related target, activities and outputs are summarized below:

Target	Activities	Output
Local community action catalysed via establishment and operation of site-based management boards for fisheries <i>refugia</i> at 14 locations in the South China Sea and Gulf of Thailand	<ul style="list-style-type: none"> • Review governance arrangements at each site to identify required Terms of Reference and membership of site-based management boards, including links to other local planning bodies • Establish and convene quarterly meetings of site-based management boards at the 14 sites • Preparation of quarterly work plans and progress and financial reports on activities at each of the 14 sites 	<ul style="list-style-type: none"> • 14 Management Board Terms of Reference and 224 quarterly meeting reports (joint management decisions and participant lists)

Outcome 4.4 Regional cooperation in the integration of scientific knowledge and research outputs with management and policy making

137. The regional level sharing of science and technical knowledge relating to fisheries *refugia* is constrained by the lack of an appropriate regional forum. Component 4 will establish and operate a Regional Scientific and Technical Committee (RSTC) which will function as a bridge between the scientific community and decision-makers involved in the establishment and operation of a regional system of fisheries *refugia*. In addition to providing a forum for scientific and technical issues to be discussed and analyzed without being obfuscated by political influences, the operation of the RSTC will also enable the harnessing of expertise from the variety of disciplines required for the identification, delineation and management of *refugia*, which include, *inter alia*, fisheries science, oceanography, and coastal and marine ecology. Specifically, the RSTC will be responsible 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 Project Steering Committee.

138. The RSTC will also be responsible for ensuring that scientific and technical aspects of the fisheries *refugia* project meet International standards. Specifically, it will review the substantive activities of the project to: (a) identify and manage fisheries and critical habitat linkages at priority fisheries *refugia* in the South China Sea and Gulf of Thailand; (b) improve the management of critical habitats for fish stocks of transboundary significance via national and regional actions to strengthen the enabling environment and knowledge-base for fisheries *refugia* management; (d) enhance information management and dissemination in support of national and regional-level implementation of the fisheries *refugia* concept; and (e) strengthen national and regional cooperation and coordination in the operation of a regional system of fisheries *refugia*. Furthermore, as the over-riding scientific and technical body for the project, the RSTC shall provide sound scientific and technical advice to the Project Steering Committee regarding matters requiring decision and shall provide direction and strategic guidance to the national level activities of the fisheries *refugia* initiative as required.

Target	Activities	Output
Regional Scientific and Technical Committee (RSTC) established and functioning as a bridge between the scientific community and decision-makers for operation of a regional system of fisheries <i>refugia</i>	<ul style="list-style-type: none"> • Develop and agree Terms of Reference, membership & operational rules for the RSTC • Convene meetings of the RSTC 	<ul style="list-style-type: none"> • RSTC Terms of Reference and 4 annual meeting reports (documenting scientific and technical advice and participant lists)

Outcome 4.5 Regional cooperation in the establishment and operation of a regional system of fisheries *refugia*

139. A Project Steering Committee will be established and operated through Component 4 to oversee and act as a principal decision making body for the project. The PSC's role will be to provide managerial and governance advice to the project, and to guide the Project Coordination Unit (PCU) of the Southeast Asian Fisheries Development Centre (SEAFDEC) in the implementation and monitoring of the overall regional project. The PSC 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 PSC, agree on meeting procedures, and finalise Terms of Reference for the PSC. The related target, activities and outputs are summarized below:

Target	Activities	Output
Project Steering Committee established and functioning to oversee and act as a principal decision making body for the project	<ul style="list-style-type: none"> • Develop and agree Terms of Reference, membership & operational rules for the PSC • Convene meetings of the PSC 	<ul style="list-style-type: none"> • PSC Terms of Reference and 4 annual meeting reports (documenting joint decisions and participant lists)

Outcome 4.6 Effective coordination of regional and national-level activities and reporting requirements of UNEP and GEF satisfied

140. A regional Project Co-ordination Unit (PCU) will be established through Component 4. The PCU will be housed within SEAFDEC and will be led by a Project Director with support from SEAFDEC'S policy, technical and financial units. The PCU will be responsible for: overall leadership, management and technical oversight of the fisheries *refugia* project; regional project governance, monitoring and reporting; policy/technical advice and advocacy; regional and national coordination, including the establishment of partnerships and networking; and external communications. The PCU will also: promote the role of the regional system of fisheries *refugia* in harmonizing fisheries and environmental management in regional forums and media; establish and maintain a regional collaborative network of experts to guide the scientific, policy, and legal arrangements for the management of *refugia* in national waters; and provide Secretariat support to the RSTC and PSC. The related target, activities and outputs are summarized below:

Target	Activities	Output
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Functioning regional Project Coordinating Unit (PCU) supporting the coordination of regional and national level activities associated with the establishment and operation of regional system of fisheries <i>refugia</i> and meeting reporting requirements of UNEP and the GEF	<ul style="list-style-type: none"> • Establishment and operation of the regional Project Coordinating Unit • Appointment and retention of the Project Director 	<ul style="list-style-type: none"> • Terms of Reference and contracts for project coordination unit staff
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3.4. Intervention logic and key assumptions

141. A key perspective in the Southeast Asian region is that over-exploitation in fisheries may be a sign of community failure. Community values, norms and knowledge are critically important in guiding sustainable fisheries practices and the erosion of past community arrangements for the management of fisheries, including traditional rules covering the times and locations for fishing, may have opened the door to the adoption of unsustainable practices. In light of the competing demands on fish to drive export earnings and to secure a sustainable supply of protein and income for coastal communities, significant effort has been made in recent years to decentralise the responsibility of fisheries management with the aim of establishing co-management approaches.

142. Accordingly, the ASEAN/SEAFDEC regional guidelines for responsible fisheries call for fisheries *refugia* to be used as a complementary tool to broader regional initiatives focusing on: co-management; illegal, unreported and unregulated fishing; alternative and supplementary livelihood creation in support of broader capacity reduction needs; data collection and statistics; and the promotion of responsible fishing gear and practices. With the designation and management of *refugia* being the responsibility of fisheries ministries and given the evident stakeholder support for the *refugia* approach, the conditions for effective coordination of these complementary initiatives are enhanced. This provides for *refugia* management to be equitable and to best respond to broader drivers in regional fisheries management, including capacity reduction needs.

3.4.1 Focus on fish life-cycle – critical habitat linkages and sustainable use rather than prohibition of fishing

143. Similarly, while many Southeast Asian communities have traditions of local fisheries management the rapid development of fisheries over the past 50 years has contributed to the erosion of these structures. Prior to the rapid uptake of demersal trawl fishing in the 1960s, fisheries were characterised by the use of mainly passive fishing gear to target small pelagic species supplying local markets (Pauly and Chuenpagdee, 2003). Community level management at that time included rules controlling the times and locations of fishing based on community knowledge of fish movements and reproduction (Ruddle, 1994). In contrast, the imposition of closed areas and seasons by central governments over past decades has largely focused on restricting the levels of overall trawl fishing effort. While this has recently been refined to restrict the use inshore of destructive push nets and trawl fishing in some areas, existing closed areas have rarely been designated from the perspective of the nature of the habitats contained in such areas and the essential contribution of those habitats to fisheries (UNEP, 2007a). This emphasis of the fisheries *refugia* approach on fish life-cycle and critical habitat linkages will likely assist with regional efforts to develop co-management in small-scale fisheries as it will allow for the design of community level rules that align more narrowly and explicitly to the needs of communities.

144. Experience of pilot activities of the SCS project indicate that the fisheries *refugia* approach has been well received at all levels and has been utilised within the participating countries to build partnerships and to enhance communication between the fisheries and environment sectors. A relevant example is the experience of Viet Nam in the use of fisheries *refugia* as a tool for integrated fisheries and habitat management at Ham Ninh in the Phu Quoc Archipelago. The intensity of fishing operations in the nearshore waters of that site are such that serious community concern was expressed regarding the degradation and loss of seagrass habitat as a result of fishing and consequent effects on the longer-term availability of local fish resources critical for local income and food. As a strategy to improve communication between fisheries and environment managers in addressing this issue, the

fisheries *refugia* concept was successfully introduced to the Phu Quoc Management Board responsible for coral reef and seagrass management as a means of improving the management of fish stocks and habitat links at Ham Ninh (Paterson *et al.*, 2013). It was noted in several commune consultations at that site that the *refugia* concept and its focus on life cycle and habitat linkages was more relevant to local stakeholders than scientific concepts such as representativeness, comprehensiveness, and uniqueness that community members had previously been introduced to in discussions on MPA planning.

145. Similarly, the subsequent consultations undertaken with commune fisherfolk, fish traders, and women involved in inshore gleaning and processing at Ham Ninh revealed that, by emphasising the sustainable use aspects of *refugia* rather than the no-take approach adopted as part of conventional MPA systems, adverse reactions at the community level were avoided. This was viewed as being a necessary prerequisite to any dialogue regarding improved fishing practices within the site. A similar experience has been documented from pilot activities in the Philippines where the fisheries *refugia* concept was used successfully by the National Fisheries Research and Development Institute of the Philippines' Bureau of Fisheries and Aquatic Resources to facilitate the resolution a long-running conflict between the fisheries and environment sectors in the Visayan Sea. As a result of intensive inshore fishing pressure, environmental NGOs had lobbied for the prohibition of fishing; that was not considered feasible, at least, in the short term, due to high levels of local community dependence on fishing. Parties to the dispute subsequently reached agreement on the use of the fisheries *refugia* approach to identify critical areas of habitat to be regulated and managed rather than adopting total closure (Paterson *et al.*, 2013).

3.4.2 Comparing Marine Protected Areas and fisheries *refugia*

146. Empirical evidence of an overall increase in fishery benefits following the establishment of an MPA is still controversial as increased catches frequently do not compensate for the decreased area of fishing grounds. In addition, MPA models have shown that, the effects on fisheries yield are highly dependent on a number of factors, including amongst others: dispersal in the larval, juvenile and adult stages, configuration of the reserve, and the status of the fishery. It is becoming increasingly acknowledged that traditional MPAs are unlikely to enhance fish stocks and catch in intensely used areas of the South China Sea and Gulf of Thailand as they are directed towards achieving the wider objectives of biodiversity conservation that often precludes adequate consideration of the life history and population dynamics of fishery species. The fisheries *refugia* concept has been developed to redress this imbalance. Experience in its application suggests that the *refugia* approach may potentially bring greater long-run benefits to the fisheries and environmental sectors in achieving mutually acceptable outcomes.

147. In the case of MPAs, the objectives are often broadly focussed at the ecosystem level rather than on fisheries, while the sites are selected on the basis of biodiversity criteria rather than on their significance to the life cycle of the species concerned. Similarly, the focus on protection rather than sustainable use has made MPAs generally less acceptable than *refugia* at the level of the primary stakeholders (fisherfolk and local government officers). Where the focus of fisheries *refugia* is on the benefits to fishing communities in terms of food security objectives rather than a primary focus on biological diversity, there exists great potential for the wider uptake and scaling-up of the fisheries *refugia* approach. Similarly, the initial piloting of the fisheries *refugia* approach in the region highlights its effectiveness in improving cooperation among fisheries and environment stakeholders.

148. Similarly, while it is currently not possible to compare the direct resource-related benefits of no-take MPAs and *refugia*, an additional institutional-related benefit of the *refugia* approach could potentially be the longer-term broadening of management objectives at individual *refugia* sites to accommodate non-fishery related conservation goals. The *refugia* approach provides a suitable platform for improved dialogue and the development of practical experience in the use of area-based management tools in integrating fisheries and habitat management that has not been previously achieved due to the emphasis on no-take MPAs by environment agencies in Southeast Asia.

3.4.3 Key assumptions

149. While experience indicates that the *refugia* concept has significant potential for overcoming barriers to integrated fisheries and habitat management, the concept has not been tested from the perspectives of the identified resource-related goals and objectives defined for the regional system of *refugia*. This project aims to establish and monitor the effectiveness of fisheries *refugia* sites in each of the six participating countries. Planned national actions for the *refugia* will also build on preliminary initiatives to establish baselines and to undertake both formal scientific and community-level monitoring of *refugia* sites.

150. From the perspective of the management of fisheries and critical habitat linkages at the priority *refugia* sites, a key assumption is that there will be adequate local cooperation to agree boundaries and compile and analysis information to identify threats and agree management actions for those sites. Regarding the development and implementation of management plans for individual sites, it is assumed that sufficient buy-in from local officials will be generated to ensure management plan implementation, and training materials will be sufficiently well designed to result in the tangible empowerment of community members, particularly artisanal fishermen and women involved in inshore gleaning and processing, to enforce agreed management rules at the sites.

151. Regarding the improvement of management of critical habitats for fish stocks of transboundary significance, it is assumed that the fisheries sector will be willing to engage on issues relating to environmental performance. It is also assumed that the fisheries and environment sectors will be willing to agree on guidelines promoting cross-sectorial cooperation and make joint commitments to the reform of national policy, legal and regulatory frameworks governing the management of fisheries *refugia*. Similarly, a key assumption of efforts to enhance access to information relating to status and trends in fish stocks and their habitats in waters of the SCS, is that a

high level of coordination can be generated between and among provincial and municipal fisheries officers to access the required information.

152. Regarding the establishment and population of national level databases on fish early life history and marine spatial planning, it is assumed that individual scientists and data holders will be willing to share information for inclusion in a national repository, and that Internet connectivity in the provincial and local offices of departments of fisheries and environment is adequate to support the online updating of databases. Planned effort to strengthen monitoring and evaluation of *refugia* effectiveness will also require the use of standardised data collection methods and procedures. Given the diversity of fishing vessels and gears used within the *refugia* sites, and the often adverse weather conditions associated with monsoon seasons, it is assumed that locally appropriate information and data collections methods and procedures can be designed and agreed upon, without loss of regional comparability.

153. Enhanced national uptake of best practices in the integration of fisheries management and biodiversity conservation in the design and implementation of fisheries management systems in the participating countries, assumes that a sufficient number of best practices will be generated from the early *refugia* sites. If insufficient best practices are documented and shared regionally, awareness building initiatives will be based on a limited number of local examples and may not be effective in engaging community members and resource users in the wider region.

3.5 Risk analysis and risk management measures

154. At project concept development stage, two key risks regarding the potential success of the fisheries *refugia* concept in improving fisheries and habitat management in Southeast Asia were identified. The first was that cross-sectorial co-ordination of activities between the fisheries and environment sectors in the participating countries would be successful. The second identified risk was that small-scale fishing communities would support the initiative and interventions proposed as many fishing families, fisheries managers, and local government officials in the region equate area-based approaches to fisheries management (zoning) as the equivalent of no-take MPAs. As noted above, the latter are often viewed as unacceptable at the community level because they are rarely designated in locations of importance to the life-cycle of fished species and neither improve fish stocks nor the community's income. The net result of such MPA established is largely viewed as a loss of fishing areas for small-scale fishers and non-compliance with fisheries management measures in the 'protected' areas as a result of minimal buy-in from communities.

155. The outcomes of extensive community and stakeholder consultations in the participating countries during the SCS project suggest that the *refugia* concept is well accepted by small-scale fishing communities and local officials. To date fishing communities in Cambodia, Indonesia, Philippines, Thailand, and Viet Nam have expressed their strong support for the establishment and management of fisheries *refugia* in areas of critical fisheries habitats. Achievements at pilot fisheries *refugia* sites in the Philippines, Thailand, and Viet Nam to date indicate that this assumption will be met. A further identified risk was that the national governments will take action to implement management plans for critical habitat areas of specific fisheries *refugia*, taking into consideration the vulnerability to potential climate change impacts and the need for adaptation response options. It was identified that the project would effectively manage this risk as all governments have adopted habitat specific National Action Plans in support of the regional Strategic Action Programme and that the further development of the system of fisheries *refugia* is part of the agreed SAP.

156. The risks and assumptions identified during the consultative project preparation phase for this project are summarized in Table 7. A risk log identifying risk management measures for identified risks of medium-high likelihood or impact severity is provided in Table 8.

Table 7 Risks and assumptions identified during the preparation phase of the fisheries *refugia* project

Operational management of fisheries <i>refugia</i>
<ul style="list-style-type: none"> • Adequate local cooperation to agree boundaries and compile and analyse information to identify threats and agree management actions • Sufficient local buy-in from local officials to ensure management plan implementation • Fisherfolk and resource users willing to participate in management on a voluntary basis • Training materials are sufficiently well designed to engage target audiences • There will be a sufficient number of civil society and community based organizations in priority sites to act as GEF SGP project proponents
Strengthening the enabling environment and knowledge-base for fisheries <i>refugia</i> management
<ul style="list-style-type: none"> • Willingness of the fisheries sector to engage on issues relating to environmental performance • Willingness of the fisheries and environment sectors to agree on guidelines promoting cross-sectorial cooperation • National and provincial government commitment to reform • Commitments of national governments to cooperate and jointly plan actions relating to management of fish stock and critical habitat linkages for fish stocks of transboundary significance • Adequate coordination with provincial and municipal fisheries officers to access required information • Willingness of individual scientists and data holders to share information for inclusion in a national repository • Internet connectivity in provincial and local offices of departments of fisheries and environment adequate to support online updating of database • Consistent use of standardised data collection methods and procedures • Available information is sufficient to model linkages • Willingness of fisherfolk to engage in activities focused on development of more responsible fishing gear and methods
Information Management and Dissemination in support of national and regional-level implementation of the fisheries <i>refugia</i> concept in the South China Sea
<ul style="list-style-type: none"> • Sufficient number of best practices will be generated at priority <i>refugia</i> sites • Awareness and outreach materials are sufficiently well designed to engage community members and resource users • Internet connectivity at provincial and community-level offices of government agencies and other stakeholders adequate to support web-based information sharing • Adequate commitment of regional executing agency to sustain longer-term operation of the facility as core function of its Training Department • Harnessing sufficient scientific and technical expertise to guide development of regionally and locally appropriate procedures
National and regional cooperation and coordination for integrated fish stock and critical habitat management in the South China Sea
<ul style="list-style-type: none"> • Willingness of fisheries and environment sectors to engage in joint planning and decision-making via National Fisheries <i>Refugia</i> Committees • Securing adequate and consistent inputs of expertise to work of National Scientific and Technical Committee (NSTCs) may be compromised if incentives for national specialists to participate in work of the NSTCs are inadequate • Existing tensions between local fisherfolk and government agencies may limit community leader participation in management planning • Harnessing sufficient scientific and technical expertise across disciplines including, <i>inter alia</i>, fisheries science, oceanography, coastal and marine ecology • Regional executing agency ability to recruit and retain appropriately qualified staff for project coordination unit

157. As outlined in Table 8 it is anticipated that all risks will be effectively managed by the project. The outcomes of extensive community and stakeholder consultations and pilot initiatives of the SCS project and during the preparation phase of this project suggest that the *refugia* concept is well accepted by small-scale fishing communities and local officials. The political acceptance of the *refugia* approach is evidenced by the inter-governmentally approved guidelines for the establishment of fisheries *refugia* that constitute part of the ASEAN SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia. In this connection, the 2008 intergovernmental meeting of

the SEAFDEC Council urged SEAFDEC member country governments to develop projects and initiatives aimed at ensuring more ecosystem based approaches to fisheries management in the region.

3.6 Consistency with national priorities or plans

162. The FAO CCRF recognizes that fisheries have the potential to alter the structure, biodiversity, and productivity of marine ecosystems, and recommends that innovative ecosystem-based approaches to fisheries management should be incorporated into existing regional and national fisheries management frameworks where possible. The Ministers responsible for fisheries in the participating countries have endorsed, through the Intergovernmental SEAFDEC Council, the ASEAN-SEAFDEC Regional Guidelines on the Use of Fisheries *Refugia* for Sustainable Capture Fisheries Management in Southeast Asia as part of the ASEAN-SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia for the implementation of the FAO CCRF. In this connection, during the 2008 Intergovernmental meeting of the SEAFDEC Council, the Ministers responsible for fisheries resolved to develop projects and initiatives aimed at ensuring more ecosystem-based approaches to fisheries management in the region. This political resolve was strengthened in 2011 through the ASEAN-SEAFDEC “*Resolution on Sustainable Fisheries for Food Security for the ASEAN Region Toward 2020*” adopted by fisheries Ministers on 7 June 2011.

163. This latter resolution was aligned with principles of the ASEAN Vision 2020 and relevant ASEAN declarations/initiatives which included: the Roadmap for an ASEAN Community; the ASEAN Economic Community Blueprint; the ASEAN Socio-Cultural Community Blueprint; the ASEAN Integrated Food Security Framework and Strategic Plan of Action on Food Security in the ASEAN Region; and the ASEAN Multi-sectorial Framework on Climate Change - Agriculture and Forestry Towards Food Security. Importantly, this resolution highlighted national priority for regional and national efforts to integrate fisheries production, habitat conservation and food security considerations which this project addresses. In this connection, the *refugia* approach has been promoted in the following fisheries policies and plans of partner member countries as a priority tool for improved fisheries habitat management: Fisheries Law of Cambodia; South China Sea Fisheries Management Zone Plan in Indonesia; the Comprehensive National Fisheries Industry Development Plan in the Philippines; Thailand’s Marine Fisheries Policy; and the National Plan for the Management of Aquatic Species and Habitats in Viet Nam. This represents the first time regional consensus has been reached on how to build the resilience of Southeast Asian fisheries to the effects of high and increasing levels of small-scale inshore fishing effort.

Table 8 Risks and proposed management strategies and safeguards for the SEAFDEC/UNEP/GEF fisheries *refugia* project

Risk Description	Category	Impact Severity	Likelihood	Risk Management Strategy and Safeguards	By When/Whom?
Existing tensions among fisherfolk, resource users, and environmental NGOs may limit local cooperation in designation and management of <i>refugia</i>	Social	High	Low-Medium	Extensive consultations through SCS project identified <i>refugia</i> as appropriate tool for alleviating conflicts and enhancing cooperation. Operation of multi-stakeholder local management boards and awareness activities will foster and build capacity for local stakeholder engagement in the participatory planning, monitoring and evaluation of <i>refugia</i> management.	<ul style="list-style-type: none"> Initiated during project inception period National Lead Agencies and site-based management boards
<i>Refugia</i> management plans will not be endorsed and afforded adequate levels of local political support for implementation	Political	High	Low-medium	Local officials equate area-based approaches to management as equivalent of no-take MPAs which have low levels of community support. <i>Refugia</i> approach provides local administrations with an opportunity to demonstrate an innovative approach to sustainable use and biodiversity conservation. Further support and buy-in from officials will be generated via national level networking of local officials with scientific and technical initiatives and site-based management boards, as well as effective communication at the level of local leaders of the benefits and costs, including social aspects, of <i>refugia</i> operation.	<ul style="list-style-type: none"> Initiated following inception period and sustained for project duration National Lead Agencies and National Science and Technical Committees
Resources users will not be effectively engaged in efforts to build capacity for local enforcement of agreed rules for <i>refugia</i> management	Capacity	Medium	High	While fishing communities have expressed their strong support for the establishment and management of fisheries <i>refugia</i> at the 3 priority sites, past awareness and capacity building efforts have largely focused on seafood quality and fishing capacity issues with little emphasis on links between fisheries and environment. Similarly there are few national examples of best practice in integrating fish stock and habitat management. Project efforts will focus on capturing local examples of best practice for sharing via stakeholder-driven consultative processes and innovative adult learning approaches. Backstopping will be provided via the SCS-SGP partnership by catalyzing local action to build enforcement capacity among fisherfolk.	<ul style="list-style-type: none"> Initiated as activity of management plan development in Yr 2 National Fisheries <i>Refugia</i> Committees, National Science and Technical Committees, and site-based management boards Supporting guidance from regional Project Coordinating Unit
Fisheries sector will not be willing to engage on issues relating to environmental performance	Political	High	Low-Medium	Traditional fisheries management approaches at the local level were based on intimate knowledge of links between fish stocks and environment. While these arrangement have in large been eroded by contemporary management approaches, local small-scale fisherfolk are a rich source of knowledge on fish movements, reproduction and use of habitats. Additionally it is fisherfolk whom absorb impacts of environmental compromises. This risk is in part moderated as the <i>refugia</i> concept was designed to align with fisherfolk knowledge of fish life-	<ul style="list-style-type: none"> Engagement with fisherfolk initiated during inception period Yr 2-3 for involvement in management planning and targeted demonstration activities

				cycle and usage of habitats. Support will also be provided to fisherfolk during management planning at priority for the planning and demonstration of responsible fishing gear and practices. Fisherfolk will also be engaged in targeted pilot activities to reduce the effects of trawl and push net fishing on seagrass habitat, as well as to test the use of fishing gear and practices that reduce the capture of juveniles, pre-recruits and fish in spawning condition.	<ul style="list-style-type: none"> • National Fisheries <i>Refugia</i> Committees, National Science and Technical Committees, and site-based management boards • Supporting guidance from regional Project Coordinating Unit
Inadequate cross-sectorial cooperation between fisheries and environment departments	Political	High	Low - medium	There currently exists limited cross-sectorial engagement in the planning of coordinated actions to manage threats to fish stocks and critical habitat linkages presenting a high risk to effective management of <i>refugia</i> sites. To address this risk a cross-sectorial National Fisheries <i>Refugia</i> Committee (NFRC) will be established and operated to guide national activities. At the <i>refugia</i> site level representatives of environment and fisheries sectors will be included in site-based management boards to facilitate joint planning of integrated and coordinated action for fisheries and habitat management. This risk is also offset by the fact that participating countries have adopted National Action Plans that emphasize multidisciplinary, ecosystem-based, and integrated approaches to coastal habitat management.	<ul style="list-style-type: none"> • Initiated during project inception period and sustained for project duration • National Lead Agencies and local lead agencies
Inadequate national commitment for the policy, legal and institutional reforms required for effective <i>refugia</i> management	Political	Medium	Medium	Political acceptance of <i>refugia</i> is in part evidenced by the intergovernmentally approved guidelines for the establishment of fisheries <i>refugia</i> that constitute part of the ASEAN SEAFDEC regional guidelines for responsible fisheries. It is additionally evidenced by incorporation of <i>refugia</i> approaches in fisheries development plans of the participating countries. Despite this, reform of policy legal frameworks requires high level commitment. This will be addressed via regional communications strategy and at high level political <i>fora</i> , including meetings of the SEAFDEC Council.	<ul style="list-style-type: none"> • Initiated during project inception period and sustained for project duration • National Lead Agencies • SEAFDEC and regional Project Coordinating Unit
Limited access to local sources of information and data to effectively characterize <i>refugia</i> sites for management planning	Organisational	High	Medium	Coordination with provincial and municipal officers responsible for fisheries, environment and coasts in information collection is often constrained by inadequate resourcing for networking and communications. The project will address this via establishment of mechanisms to link local and national agency staff through site-based management boards. Additionally, mechanisms will be established to support national-level sub-contracting of provincial and local agencies in the compilation of required information and data to inform planning.	<ul style="list-style-type: none"> • Initiated during project inception period and sustained for project duration • National Lead Agencies • Local Agencies

3.7 Incremental cost reasoning

3.7.1 Baseline

164. There is considerable global concern for the ecosystem effects of fishing, particularly the loss of habitats and coastal and marine biodiversity as a result of fishing. In the South China Sea this concern is intensified by the facts that the marine basin is a global centre of shallow water marine biodiversity and that most stocks of economically important fish species are considered to be fully fished or over exploited. Increasing global demands for fisheries products and the dependence of coastal communities on fish for food and income is resulting in continued increases in fishing effort. This has caused fishing down the marine food chain in the region, coupled with an increasing dependence of the artisanal sector on small pelagic species due to declining availability of demersal species. 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 use of destructive fishing practices by some fishermen in order to maintain incomes and food production in the short-term.

165. 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) (UNEP, 2008a). This continued decline in the total area of habitats critical to the life cycles of most aquatic species, combined with the high levels of coastal community dependence on fish, has raised serious concerns for the long-term sustainability of small-scale fisheries in the region. With fish production being intrinsically linked to the quality and area of habitats and the heightened dependence of coastal communities on fish, a need exists to improve the integration of fish habitat considerations and fisheries management in the region.

3.7.2 Business-as-usual scenario

166. An emerging theme from the SCS project is the need for improved management of the key threats to fish stocks and habitats. The main barriers to reducing the levels of the threats include:

- low level understanding amongst stakeholders, including fisherfolk, scientists, policy makers, and fisheries and habitat managers of ecosystem and fishery linkages,
- existing low level community acceptance of “protected” area-based approaches to marine management – several past conservation initiatives in the region, particularly those associated with Marine Protected Areas, have promoted the complete closure of areas to fishing which is a futile if not impossible task in Southeast Asia. Such closures have been promoted in terms of potential fisheries benefits, resulting from recruitment to the fish catch outside the protected area. Fishing communities and managers have rarely been involved in the selection and management of protected areas,
- limited information regarding fish life-cycle and critical habitat linkages, and the role marine habitats play in sustaining fisheries, and
- low level experience in national fisheries/environment departments and ministries in development of integrated approaches to fisheries and habitat management.

3.7.3 Incremental reasoning

167. Recent experience indicates that barriers to integration will not be addressed in the absence of a regionally coordinated programme of linked national and regional actions. By addressing barriers to integration and expanding the use of the fisheries *refugia* approach through the establishment and operational management of a network of fisheries *refugia* sites, the project will result in significant incremental benefit compared to the ‘no action’ option. Anticipated incremental benefits include: demonstration of sustainable use of fish stocks and habitats at fisheries *refugia* sites; improved community acceptance and cost-effectiveness of area based approaches to marine management; establishment of policy and regulatory frameworks governing the fisheries sector that incorporate measures for the sustainable use of fish habitats and biodiversity; and multi-lateral political

commitments to enhance co-operation on fish stock and habitat management. It is anticipated that the experiences gained in this region will be suitable for application in other large marine ecosystems such as the Yellow Sea where over-fishing and the use of inappropriate fishing gear are significant impediments to more sustainable exploitation of fish stocks, their habitats, and associated biodiversity.

168. The project intends to build on existing investments and the policy and scientific basis for the regional system of fisheries *refugia* established through the SCS project. The development of the fisheries *refugia* concept as a tool for integrating fish stock and habitat management was undertaken by the RWG-F in close collaboration with SEAFDEC, FAO, IUCN, and World Fish Center. The concept was elaborated and refined, and priority *refugia* sites identified, based on: the outcomes of regional and national level expert and fishing community consultations; national reports on fisheries, mangroves, coral reefs, seagrass, and wetlands from the seven participating countries of the South China Sea project; 135 habitat site characterisations prepared during the SCS Project; the SCS meta-database and GIS; and information contributed directly by fisheries and habitat focal points. This has been supported by three regional training courses and 12 national training seminars on the scientific and management aspects of operating the regional *refugia* system.

169. Cost effectiveness was a key criterion for development of the *refugia* initiative. The concept aims to improve the use of area-based approaches to fish stock and habitat management, whilst overcoming the problems associated with the emphasis on no-take Marine Protected Areas in the region. The latter include low fishing community acceptance, and high costs in terms of displacement of fishermen and enforcement. The fisheries *refugia* initiative addresses the present problems by drawing on fisheries management concepts that are easily understood at the fishing community level and emphasise the sustainable use of fisheries resources and their habitats rather than the prohibition of fishing.

170. There is regional consensus amongst the fisheries and habitat specialists of the SCS Project that the *refugia* concept represents an innovative approach for building fishing community support for area-based approaches to fisheries and habitat management, through which fish stock and habitat conservation objectives can be achieved simultaneously. The focus of the project on establishing operational management at 14 priority fisheries *refugia* sites will enable the efficient timing of site level activities required to ensure the transfer of lessons-learned between and amongst sites, and evaluation of the effectiveness of project interventions in achieving the medium and longer term resource and institutional objectives of the *refugia* system.

3.8 Sustainability

171. At the local fishery level, national project activities will contribute to ecological sustainability via incorporation of rules and activities in the proposed fisheries *refugia* management plans designed to ensure that: harvests are sustainable in the sense of avoiding the depletion of fish stocks; 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 the ecosystem. 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 fisherfolk. 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.

172. Sustainability of project activities will also be fostered via the development of municipal and provincial level capacity for cross-sectorial planning and management of fisheries and environment. Reform of local policies and laws, including the development and enactment of municipal by-laws and ordinances for *refugia* management will result in the regulatory framework required to guide the longer-term sustainable use of fisheries and coastal habitats and their resources. The focus on sustainable use inherent in the *refugia* concept also aims to build the resilience of coastal fishing communities from the perspective of nutritional security. Corresponding national-level activities to reform policy, legal and institutional frameworks to support the longer-term uptake of the *refugia*

approach, specifically via the establishment of national planning and scientific and technical bodies for *refugia* and the adoption of national plans of action, will result in national level replication at additional sites on the South China Sea Coast of participating countries.

3.9 Replication

173. The concepts of “*replication*” and “*scaling-up*” 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, adequate consideration of what the terms mean with respect to initiatives aimed at fostering integrated approaches to fisheries and environmental management, have the potential to lead to confusion amongst national and local beneficiaries about expectations.

174. 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 fisheries management model, approach, strategy, technology, or communications tool within a particular *refugia* site or at another location. Accordingly, replication is defined in the context of national activities of the fisheries *refugia* project as “*The activity of copying the specific features of a fisheries and/or habitat management approach that made it successful in one setting and re-applying these as part of the process of establishing and operating fisheries refugia in the same or another setting*”. Examples may include, *inter alia*, using the structure and Terms of Reference for a local *refugia* management board at one site and applying it to another, or using a fishing practice or gear type that was successful in reducing the capture of juvenile fish at one *refugia* site and applying at another site.

175. 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 these definitions in the context of this project, may include for example increasing the institutional scale of fisheries *refugia* 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 in integrated fish stock and habitat management generated at one *refugia* site to all known *refugia* 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 integrated fisheries and habitat management via their application at broader geographic and institutional scales as part of the process of establishing and operating a network of fisheries refugia in the South China Sea*”.

176. The above definitions of replication and scaling-up lend themselves to ease of application in the establishment and operation of a network of fisheries *refugia* in the participating countries. The high levels of dependence on fish for food and income, coupled with the threats to fish stocks and their habitats, 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 fisheries overexploitation and nutritional security issues in many coastal communities, coupled with the limited policy and legal frameworks for the integration of fisheries and coastal habitat management, creates significant opportunities for the successful uptake of best practices and lessons learned.

177. Specific areas of learning and best practices identified for replication and scaling-up as part of fisheries *refugia* activities in participating countries include: stakeholder engagement; cross-sectorial coordination; evidence-based planning; application of management models and strategies; use of responsible fishing gears and practices; communications and awareness; and political commitment. Lessons learned and best practices in these areas will be tracked on an annual basis and used to prepare a replication and scaling-up plan. Matrices for the planning of replication and scaling-up

strategies were prepared as part of project preparation and are included in the National Project Documents included as appendices to this document.

3.10 Public awareness, communications and mainstreaming strategy

178. Experience from efforts in integrated natural resource management in the South China Sea indicates that efforts in integration are initially vulnerable fledglings when introduced at national and provincial units of government, and as such, at the mercy of the bureaucratic pecking order. In order for efforts to survive and grow, national and local level leaders of such processes need to be able effectively communicate the benefits of such integrated approaches across a broad range of government agencies, local institutions, and resource users in order to convince stakeholders that it is in their best interest to voluntarily coordinate across areas such as: (1) policy development and planning; (2) investment in efforts to reduce stress on fisheries resources and habitats; and (3) strengthening community engagement in management.

3.10.1 Public awareness

179. Public awareness and the effective use of the media are critical elements of efforts to raise awareness, to stimulate support for necessary policy and legal reforms, and for outreach with development partners and donors. It has also been identified as being essential in ensuring that best practices generated through projects and national policy development processes are captured, shared and effectively communicated to guide the longer-term sustainability of investments. The latter is particularly relevant to national level activities of the fisheries *refugia* project in the South China SEA which aims to bridge the divide between fisheries and environment sectors. Given the global and regional experience of limited cross-sectorial coordination and collaboration between these sectors, the fisheries *refugia* project will rely significantly on targeted messaging and coordination with national and municipal media outlets to raise awareness about project activities aimed at: establishing and managing fisheries *refugia* sites for improved management of fish stock and critical habitat linkages; strengthening enabling environments via necessary policy, legal and institutional reforms; and improving the environmental performance of the fisheries sector.

180. Activities of Component 1 will address this need via the production of awareness and training materials in support of project efforts to increase the capacity of target community members, particularly artisanal fishermen and women, to participate in *refugia* management. Activities of component 2 include the publication and dissemination of national guidelines on the establishment and management of fisheries *refugia* in support of efforts to strengthen the policy enabling environment for the designation and management of *refugia* sites in national waters. Component 2 will also develop national and regional online Geographical Information Systems on fisheries and marine biodiversity to assist with raising stakeholder awareness of the locations and management status of coastal habitats, fisheries *refugia*, MPAs, and critical habitats for threatened and endangered species. Additionally, public awareness and outreach programme to promote local social, economic and environmental benefits of fisheries *refugia* will be implemented at the 14 priority *refugia*. To add value to these awareness activities, a Regional Education and Awareness Centre on fisheries and critical habitats will be established and operating through Component 3 as a facility for the production and sharing of information and education materials for *refugia* management

3.10.2 Communications

181. Specific communications activities will include the national level communication of best practice approaches and measures aimed at enhancing national uptake of best practices in integrating fisheries management and biodiversity conservation in the design and implementation of fisheries management systems. Component 1 will produce fisheries *refugia* profile reports, including GIS maps and detailed site characterisations, for the 14 priority sites which will be used to inform consultative processes to delineate *refugia* boundaries and to secure their formal designation for management. Activities of component 2 involve the publication of national reviews and recommendations for reforms of national, provincial and municipal regulations/ordinances for responsible fishing practices at priority *refugia* for use in facilitating consultations with fisheries industry and competent authorities on policy reforms for responsible fishing gear and practices in the participating countries. Similarly, Component 2 will prepare national reports on policy, legal and institutional aspects of *refugia* establishment and management for use as a communication tool in consultations with relevant national authorities on required legal, policy and planning reforms. Component 2 will also produce communication products relating to the status of fish stocks and habitats in the South China Sea to inform monitoring and evaluation of the effectiveness of individual *refugia* and the regional system of sites. To assist with ensuring ease of access and syndication of communication products, Component 3 will facilitate the establishment and update of six national and one regional interlinked web portals on fisheries *refugia*. Opportunities for public-private partnerships with national media providers and outlets will be explored to support targeted television and radio broadcasting of nationally and regionally generated media products. Liaison with national and provincial media outlets will also be undertaken to ensure broad syndication of media products to increase the scope and reach of communications.

3.10.3 Mainstreaming

182. The definitions of “mainstream” contained in the Cambridge and Oxford dictionaries are “*considered normal, and having or using ideas, beliefs, etc which are accepted by most people*” and “*the ideas and opinions that are thought to be normal because they are shared by most people; the people whose ideas and opinions are most accepted*”, respectively. Interpretation of these definitions in the context of this project, may include for example the fisheries *refugia* concept being considered “normal” or “mainstream” by individuals, agencies, and organisations responsible for the planning and financing fisheries and coastal habitat management. Accordingly, mainstreaming is defined in the context of the fisheries *refugia* project as “*A service function of the process of establishing and operating fisheries refugia which involves making the refugia concept central to the work of fisheries and environment agencies and fishing communities in efforts to integrate fish stock and habitat management*”. National level mainstreaming efforts will be supported through targeted communications, awareness raising, and networking via the operation of national and local level coordinating bodies for fisheries *refugia*. The extent of national level mainstreaming generated will be benchmarked and tracked according to: (1) the extent of harmonisation of sectorial policies and legislation relating to fisheries habitat management; and (2) the streamlining of government agency expenditure on fisheries and habitat management at priority sites. This information will be used to guide the longer-term replication and scaling-up of fisheries *refugia* initiatives at the national level.

3.11 Environmental and social safeguards

183. The priority fisheries *refugia* sites are becoming increasingly densely populated coastal areas wherein natural and social systems are characterized by multiple compromises as a result of the threats reviewed in Section 2 of this document. A screening of potential environmental and social impacts of national level activities of the SEAFDEC/UNEP/GEF Fisheries *Refugia* 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 proposed national level activities were identified. The screening report is appended to this document as Appendix.16.

184. 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 biodiversity due to fishing. This is considered important because of the potential fisheries benefits associated with effective fisheries and habitat management at the local level, which is particularly important in the case of Southeast Asia due to the continuing importance of fisheries to food security and the maintenance of livelihoods.

SECTION 4: INSTITUTIONAL FRAMEWORK AND IMPLEMENTATION ARRANGEMENTS

4.1 Regional decision making and planning

Project Steering Committee

185. A Project Steering Committee will be established and operated to oversee and act as a principal decision making body for the project. The PSC's role will be to provide managerial and governance advice to the project, and to guide the Project Coordination Unit (PCU) of the Southeast Asian Fisheries Development Centre (SEAFDEC) in the implementation and monitoring of the overall regional project. The PSC will also provide a regional forum for reviewing and resolving national concerns, reviewing and approving annual work plans and budgets, and providing a regional forum for stakeholder participation. The PSC will meet annually and its membership 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, National Fisheries *Refugia* Committee; the other shall be the Chairperson of the National Scientific and Technical Committee. The UNEP Task Manager will participate in PSC meetings and the Project Director shall serve as Secretary of the committee.

Regional Scientific and Technical Committee

186. A Regional Scientific and Technical Committee will be established and operated as a bridge between the scientific community and decision-makers involved in the establishment and operation of a regional system of fisheries *refugia*. The RSTC is responsible for ensuring that scientific and technical aspects of the fisheries *refugia* project meet International standards. Specifically, it will review the substantive activities of the project and provide sound scientific and technical advice to the Project Steering Committee regarding matters requiring decision. The RSTC shall also provide direction and strategic guidance to the National Fisheries Refugia Committees and Site-based Management Boards as required. The RSTC will meet biannually and its membership shall consist of the Chairpersons of the National Scientific and Technical Committees (NSTC); a representative of SEAFDEC; and selected regional experts. The Project Director shall serve as Secretary of the committee.

4.2 National planning and guidance

National Fisheries Refugia Committees

187. National Fisheries *Refugia* Committees (NFRCs) will be established and operated to strengthen cross-sectorial coordination in the establishment and management of fisheries *refugia*. The NFRC's will assume overarching responsibility for the execution of national level activities of the project and will, *inter alia*: receive, review, and approve reports from the management boards of *refugia* sites; consider advice from the National Scientific and Technical Committees in decision-making; meet on a quarterly basis to guide the timely execution of project activities; provide direction and strategic guidance to the National Lead Agencies and *refugia* management boards; assess and advise on stakeholder involvement in fisheries and environmental management; and approve annual progress reports for transmission to the SEAFDEC PCU and UNEP. The NFRCs shall meet on a quarterly basis. Provisional memberships of the NFRCs were determined for each participating country during project preparation and these membership lists are included in the National Project Documents appended to this document.

Harnessing scientific and technical expertise at the national level

188. National Scientific and Technical Committees (NSTCs) will be established and operated in the participating countries to harness national scientific and technical expertise and knowledge to inform reforms for fisheries *refugia* management. The NSTCs will assume overarching responsibility for the review and co-ordination of national scientific and technical activities of the project and will, *inter alia*: provide the NFRC with recommendations on proposed national and site-based activities, work plans, and budgets; provide the NFRC with 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 *refugia* management; compile and evaluate national level sources of information and data for sharing at the regional level through the Regional Scientific and Technical Committee; and ensure that planned national level 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. The NSTCs will meet biannually. Provisional memberships of the NSTCs were determined for each participating country during project preparation and these membership lists are included in the National Project Documents appended to this document.

Catalyzing community-led action at priority fisheries refugia sites

189. Site-based management boards will be established at each of the 14 priority fisheries *refugia* sites. These management boards will *inter alia*: plan and guide the timely execution of site-based activities; review and take action where necessary to ensure appropriate levels of government, NGO, community, and private sector engagement in site-level activities; ensure compatibility between the recommendations for action at the fisheries *refugia* site with other local level activities for fisheries and coastal habitat management; prepare and endorse quarterly progress reports for transmission to the meetings of the NFRC; facilitate the approval and implementation, by the competent local authority, of management plans and courses of action developed during the course of project execution; and identify best practices for replication and scaling-up as well as the mainstreaming of the fisheries *refugia* approaches at the local level. The site-based management boards will meet quarterly. Provisional memberships of each of the 14 management boards were determined during project preparation and these membership lists are included in the respective National Project Documents appended to this document.

Supporting national coordination

190. The National Lead Agencies for this project, namely the Fisheries Administration of Cambodia, the Directorate General of Capture Fisheries (Indonesia), the Department of Fisheries (Malaysia), the National Fisheries Research and Development Institute (Philippines), the Department of Fisheries (Thailand), and the Fisheries Administration of Viet Nam, shall: assume overall responsibility for the execution of the national-level activities in their respective countries; nominate a National (political) Focal Point who shall act as the Chairperson of the NFRC; nominate a national Technical Focal Point who shall act as the Chairperson of the NSTC, and Secretary of the NFRC. The National Focal Point shall act as the main point of contact with SEAFDEC and UNEP, and shall participate in annual regional Project Steering Committee meetings; plan and direct the implementation of activities based on the results framework, work plan and timetable contained in the respective National Project Documents; and submit all planning, progress and financial reports to the regional Project Co-ordinating Unit in a timely manner.

4.3 Regional coordination and management

191. A regional Project Co-ordinating Unit (PCU) will be established within SEAFDEC and will be led by a Project Director with support from SEAFDEC'S policy, technical and financial units. The PCU will be responsible for: overall leadership, management and technical oversight of the fisheries *refugia* project; regional project governance, monitoring and reporting; policy/technical advice and

advocacy; regional and national coordination, including the establishment of partnerships and networking; and external communications. The PCU will also: promote the role of the regional system of fisheries *refugia* in harmonizing fisheries and environmental management in regional forums and the media; establish and maintain a regional collaborative network of experts to guide the scientific, policy, and legal arrangements for the management of *refugia* in national waters; and provide Secretariat support to the RSTC and PSC. The management framework for this project is depicted in Figure 3. SEAFDEC’s linkages with ASEAN through the ASEAN-SEAFDEC Strategic Partnership is depicted in Figure 4.

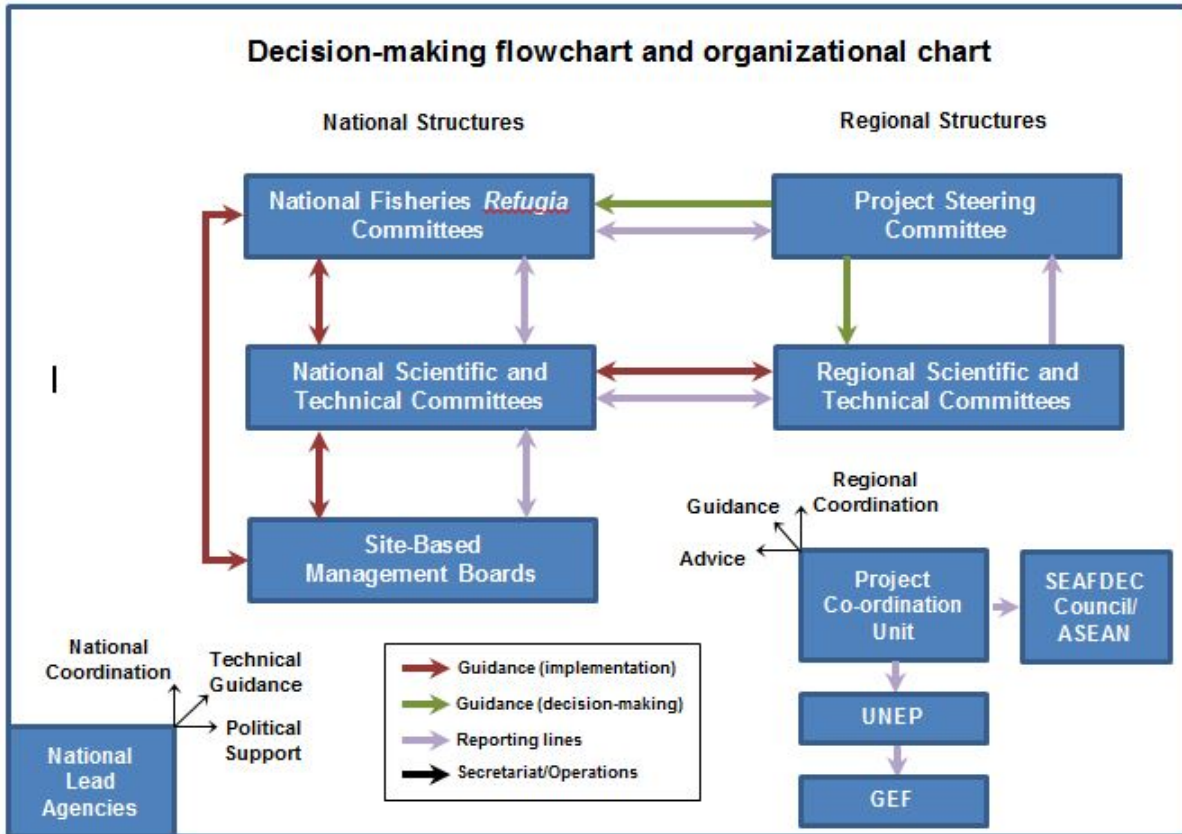


Figure 3 Project management framework for the SEAFDEC/UNEP/GEF fisheries *refugia* project

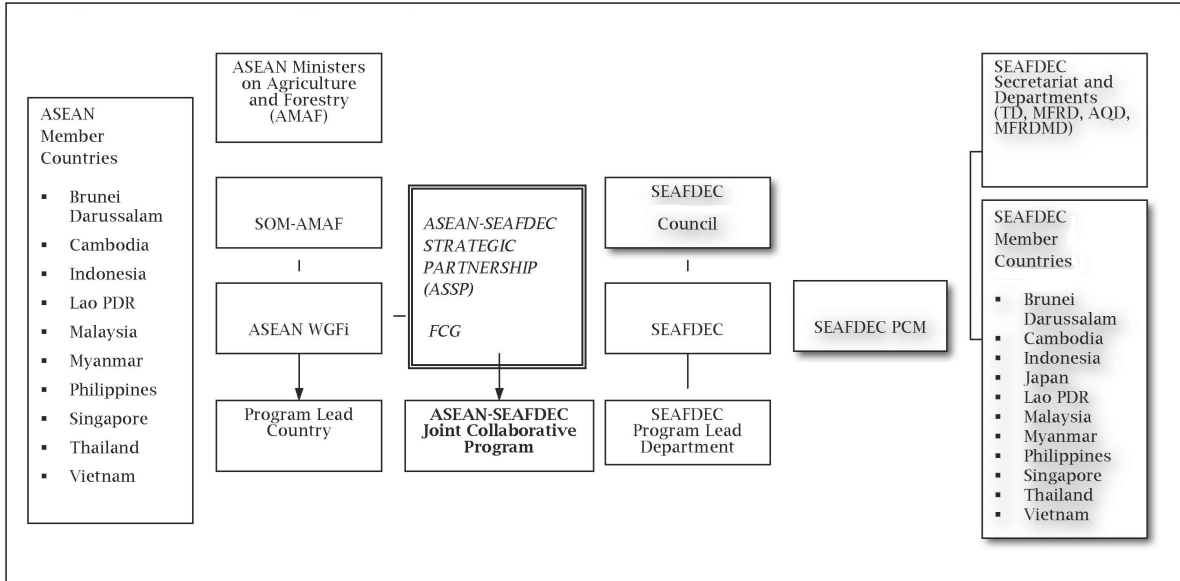


Figure 4 Linkage between ASEAN and SEAFDEC

SECTION 5: STAKEHOLDER PARTICIPATION

192. At the regional level the major stakeholders are the executing agency, SEAFDEC and the fisheries agencies of the six participating countries. At the national level key stakeholders include the agencies responsible for both fisheries and the Environment and those agencies having interests in coastal development and use. Participation of these stakeholders in project activities will be facilitated through their involvement where appropriate in *refugia* management boards. These stakeholders will assist with the identification of proposed measures for the fisheries sector’s sustainable use of fish habitats and biodiversity for incorporation into national fisheries policy and plans. Substantive input and support will also be sought from these stakeholders regarding the national endorsement of guidelines for the establishment and management of fisheries *refugia* and the associated policy, legal and institutional reforms.

193. Regarding the scientific and technical aspects of the project, key stakeholders include scientific and technical staff of: the Fisheries agencies; and Provincial Administration; and representatives of small and middle-scale fishing sectors, related projects, NGOs and the private sector. Participation of these stakeholders in scientific and technical activities of the project will be planned and managed through the Scientific and Technical Working Group. Specific scientific and technical activities these stakeholders will be engaged on include: enhancing access to information relating to status and trends in fish stocks and their habitats in waters of the SCS; improving national-level management and sharing of information and data on fish early life history in waters of the SCS; enhancing access to information relating to the locations and status of coastal habitats and management areas; and building the site-level information base for *refugia* planning and management.

194. At the operational, management level, key stakeholders have been identified to include the: coastal fisheries offices; Commune/village Councils; Village Chiefs; and representatives of fishing communities. Participation of these stakeholders will be facilitated via quarterly meetings of the site-based management boards of priority sites. Specific activities these stakeholders will be engaged in relate to: delineating boundaries and planning the formal designation of fisheries *refugia* sites; developing Community-based Management Plans; and the day-to-day planning and management of *refugia* sites.

SECTION 6: MONITORING AND EVALUATION PLAN

195. The project will follow UNEP standard monitoring, reporting and evaluation processes and procedures. Substantive and financial project reporting requirements are summarized in Appendix 8. Reporting requirements and templates are an integral part of the UNEP legal instrument to be signed by the executing agency and UNEP.

196. 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.

197. 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 Director 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.

198. 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 of the Task Manager in UNEP-DEPI GEF IW Unit who will also review the quality of draft project outputs, and provide feedback to the project partners.

199. At the time of project approval 80 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 fisheries profile reports for the 14 priority *refugia* sites.

200. Project supervision will take an adaptive management approach. The Project Director 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.

201. A Mid-term Review (MTR) or Mid-term Evaluation (MTE) will be organized by the UNEP Evaluation Office or the Task Manager in consultation with the Project Director and the outcomes reported to the Project Steering Committee. It will take place during the first quarter of 2017 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 purpose of the Mid-Term Review (MTR) or Mid-Term Evaluation (MTE) is to provide an independent assessment of project performance at mid-term, to analyze whether the project is on track, what problems and challenges the project is encountering, and which corrective actions are required so that the project can achieve its intended outcomes by project completion in the most efficient and sustainable way. In addition, it will verify information gathered through the GEF tracking tools. 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/evaluation 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.

202. 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 EO and submitted along with the report to the GEF Evaluation Office not later than 6 months after the completion of the evaluation. The TE will provide an independent assessment of project performance (in terms of relevance, effectiveness and efficiency), and determine the likelihood of impact and sustainability. It will have two primary purposes:

- (i) to provide evidence of results to meet accountability requirements, and
- (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP and executing partners.

While a TE should review use of project funds against budget, it would be the role of a financial audit to assess probity (i.e. correctness, integrity etc.) of expenditure and transactions.

203. The standard terms of reference for the terminal evaluation are included in Appendix 11. These will be adjusted to the special needs of the project.

204. The TE report will be sent to project stakeholders for comments. Formal comments on the report will be shared by the EO in an open and transparent manner. The project performance will be assessed against standard evaluation criteria using a six point rating scheme. The final determination of project ratings will be made by the EO when the report is finalised. The evaluation report will be publically disclosed and will be followed by a recommendation compliance process.

205. 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

204. The overall budget for the project is **US\$15,729,612** of which **US\$3,000,000** will be financed by the GEF Trust Fund through the GEF's International Waters focal area.

7.2 Project co-financing

205. The agency direct in-kind co-financing value for this specific project is estimated at approximately 200,000USD over the project period and will be provided through various UNEP divisions (DEPI, DEWA, and ROAP). The total value of this additional contribution is estimated at approximately 265,000USD over the project period.

206. The majority of the co-financing for the project comes from the fisheries agencies of the participating governments (US\$1,148,644 cash; and US\$5,036,806 in-kind) and from the Southeast Asian Fisheries Development Center (SEAFDEC), an intergovernmental organisation and the regional executing entity for the project (US\$3,876,400 cash; and US\$2,456,000 in-kind).

7.3 Project cost-effectiveness

207. The fisheries *refugia* project 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.

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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

There is considerable global concern regarding the ecosystem effects of fishing, particularly the loss of habitats and coastal and marine biodiversity as a result of fishing. In the South China Sea this concern is intensified by the facts that the marine basin is a global centre of shallow water marine biodiversity and that most stocks of economically important fish species are considered to be fully fished or over exploited. Increasing global demands for fisheries products and the dependence of coastal communities on fish for food and income is resulting in continued increases in fishing effort. This has caused fishing down the marine food chain in the region, coupled with an increasing dependence of the artisanal sector on small pelagic species due to declining availability of demersal species. 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 use of destructive fishing practices by some fishermen in order to maintain incomes and food production in the short-term.

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) (UNEP, 2008a). This continued decline in the total area of habitats critical to the life cycles of most aquatic species, combined with the high levels of coastal community dependence on fish, has raised serious concerns for the long-term sustainability of small-scale fisheries in the region. With fish production being intrinsically linked to the quality and area of habitats and the heightened dependence of coastal communities on fish, a need exists to improve the integration of fish habitat considerations and fisheries management in the region.

Business-as-usual scenario

An emerging theme from the SCS project is the need for improved management of the key threats to fish stocks and habitats. The main barriers to reducing the levels of these threats include:

- low level understanding amongst stakeholders, including fisherfolk, scientists, policy makers, and fisheries and habitat managers of ecosystem and fishery linkages,
- existing low level community acceptance of “protected” area-based approaches to marine management – several past conservation initiatives in the region, particularly those associated with Marine Protected Areas, have promoted the complete closure of areas to fishing which is a futile if not impossible task in Southeast Asia. Such closures have been promoted in terms of potential fisheries benefits, resulting from recruitment to the fish catch outside the protected area. Fishing communities and managers have rarely been involved in the selection and management of protected areas,
- limited information regarding fish life-cycle and critical habitat linkages, and the role marine habitats play in sustaining fisheries, and
- low level experience in national fisheries/environment departments and ministries in development of integrated approaches to fisheries and habitat management.

Incremental reasoning

Recent experience indicates that barriers to integration will not be addressed in the absence of a regionally coordinated programme of linked national and regional actions. By addressing barriers to integration and expanding the use of the fisheries *refugia* approach through the establishment and operational management of a network of fisheries *refugia* sites, the project will result in significant incremental benefit compared to the ‘no action’ option. Anticipated incremental benefits include: demonstration of sustainable use of fish stocks and habitats at fisheries *refugia* sites; improved community acceptance and cost-effectiveness of area based approaches to marine management; establishment of policy and regulatory frameworks governing the fisheries sector that incorporate measures for the sustainable use of fish habitats and biodiversity; and multi-lateral political

commitments to enhance co-operation on fish stock and habitat management. It is anticipated that the experiences gained in this region will be suitable for application in other large marine ecosystems such as the Yellow Sea where over-fishing and the use of inappropriate fishing gear are significant impediments to more sustainable exploitation of fish stocks, their habitats, and associated biodiversity.

The project intends to build on existing investments and the policy and scientific basis for the regional system of fisheries *refugia* established through the SCS project. The development of the fisheries *refugia* concept as a tool for integrating fish stock and habitat management was undertaken by the RWG-F in close collaboration with SEAFDEC, FAO, IUCN, and World Fish Center. The concept was elaborated and refined, and priority *refugia* sites identified, based on: the outcomes of regional and national level expert and fishing community consultations; national reports on fisheries, mangroves, coral reefs, seagrass, and wetlands from the seven participating countries of the South China Sea project; 135 habitat site characterisations prepared during the SCS Project; the SCS meta-database and GIS; and information contributed directly by fisheries and habitat focal points. This has been supported by three regional training courses and 12 national training seminars on the scientific and management aspects of operating the regional *refugia* system.

Cost effectiveness was a key criterion for development of the *refugia* initiative. The concept aims to improve the use of area-based approaches to fish stock and habitat management, whilst overcoming the problems associated with the emphasis on no-take Marine Protected Areas in the region. The latter include low fishing community acceptance, and high costs in terms of displacement of fishermen and enforcement. The fisheries *refugia* initiative addresses the present problems by drawing on fisheries management concepts that are easily understood at the fishing community level and emphasise the sustainable use of fisheries resources and their habitats rather than the prohibition of fishing.

There is regional consensus amongst the fisheries and habitat specialists of the SCS Project that the *refugia* concept represents an innovative approach for building fishing community support for area-based approaches to fisheries and habitat management, through which fish stock and habitat conservation objectives can be achieved simultaneously. The focus of the project on establishing operational management at 14 priority fisheries *refugia* sites will enable the efficient timing of site level activities required to ensure the transfer of lessons-learned between and amongst sites, and evaluation of the effectiveness of project interventions in achieving the medium and longer term resource and institutional objectives of the *refugia* system.

Appendix 4: Results Framework

Table 1 Results framework for project component 1

Component	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
1. Identification and management of fisheries and critical habitat linkages at priority fisheries <i>refugia</i> in the South China Sea and Gulf of Thailand	1. Reduced stress on fish stocks and coastal habitats via improved national management of key anthropogenic threats to fisheries and critical habitat linkages in the South China Sea and Gulf of Thailand	<i>Status of formal designation, management plan adoption, and community engagement in implementation of agreed management measures, including enforcement, for priority sites</i>	<i>Rate of coastal habitat loss from SCS basin is high (e.g., 30% per decade for seagrass) Fishing identified as a key threat to coastal habitats</i>	<i>Effective management of key threats to 14 fisheries <i>refugia</i> sites [269,500 ha], including ~50 percent reduction in fishing pressure within sites at times critical to the life-cycles of fished species of transboundary significance</i>	<i>Adopted management plans Regular reports of meetings of national and regional project management bodies Reports of independent mid-term and terminal project evaluations</i>	<i>Adequate local cooperation to compile and analyze information to establish baselines and standardized procedures to measure and monitor the effectiveness of agreed stress reduction measures</i>
	1.1 Fisheries and critical habitat linkages at 14 priority sites in the South China Sea and Gulf of Thailand safeguarded via the delineation of fisheries <i>refugia</i> boundaries and the setting of priorities for <i>refugia</i> management	Status of boundary delineation and agreement on proposed management interventions	<i>Refugia</i> site locations identified regionally although need to work with stakeholders, locally including academe and researchers, to delineate boundaries	Agreement among stakeholders on the boundaries of fisheries <i>refugia</i> , key threats to <i>refugia</i> , and priority management interventions for 14 sites in the South China Sea and Gulf of Thailand	14 fisheries <i>refugia</i> profile reports, including maps and site characterisations, published for 14 priority sites	Adequate local cooperation to agree boundaries and compile and analyse information to identify threats and agree management actions
	1.2 Amelioration of key threats to fish stock and critical habitat linkages via the adoption and implementation of community-based <i>refugia</i> management plans at 14 sites	Status of adoption and implementation of the management plans Total area of fisheries <i>refugia</i> (ha) under management	Guide to planning of <i>refugia</i> management developed and published in inter-governmentally endorsed regional guidelines and a need exists to apply this at the local level	Community-based <i>refugia</i> management plans that are consistent with the FAO and ASEAN-SEAFDEC Guidelines for Responsible Fisheries developed, adopted, and under implementation at 14 fisheries <i>refugia</i> sites	14 published management plans and annual implementation reports	Sufficient local buy-in from local officials to ensure management plan implementation
	1.3 Catalysed community action for fisheries <i>refugia</i> management at 14 sites	Status and effectiveness of the management board and volunteer networks	Efforts to strengthen monitoring, control, and surveillance capabilities in all countries are ongoing,	Networks of management boards and community-based fisheries and habitat management	224 quarterly reports of network meetings and activities [including list of participants and results	Fisherfolk and resource users willing to participate in management on a voluntary basis

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			although need exists to refine scope of work to support <i>refugia</i> management	volunteers for <i>refugia</i> management established at 14 fisheries <i>refugia</i> sites	of work]	
	1.4 Empowered fishing communities, particularly artisanal fishermen and women involved in inshore gleaning and processing, for enforcement of agreed management rules at 14 priority <i>refugia</i> sites in the South China Sea and Gulf of Thailand	Increase in the proportion of target community members [minimum of 30 percent women] participating in <i>refugia</i> management, including enforcement, at the site level	Capacity building programmes at the community level focus on seafood quality and capacity issues with little emphasis on links between fisheries and environment	Enforcement programmes at 14 fisheries <i>refugia</i> sites, including participatory activities for monitoring, control and surveillance	14 operational enforcement programmes at priority sites	Training materials are sufficiently well designed to engage target audience
	1.5 Strengthened civil society and community organisation participation in fisheries <i>refugia</i> management	Number of GEF Small Grants Programme projects commissioned and implemented in support of <i>refugia</i> management objectives	Low level mobilization of civil society, community organization and the private sector in site-based fisheries and habitat management	Operational partnership with the GEF Small Grants Programme to strengthen civil society and community organisation participation in the management of fisheries <i>refugia</i> at 14 sites	4 annual reports of <i>Refugia</i> -SGP partnership	There will be sufficient number of civil society and community based organizations in priority sites to act as GEF SGP project proponents

Table 2 Results framework for project component 2

Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
2. Improving the management of critical habitats for fish stocks of transboundary significance via national and regional actions to strengthen the enabling environment and knowledge-base for fisheries <i>refugia</i> management in the South China Sea and Gulf of Thailand	2. Increased institutional capacity in the 6 participating countries for the designation and operational management of fisheries refugia via the transformation of enabling environments and the generation of knowledge for planning	<i>Status of enabling environment reform, including extent of behavioural change among small-scale fisherfolk at priority sites Extent of use of available environmental state and socio-cultural information in policy and planning frameworks</i>	<i>Weak enabling environments and limited knowledge within national fisheries and environment departments and ministries with respect to the implementation of measures aimed at managing threats to fish stock and critical habitat linkages</i>	<i>National and regional policy, legal and planning frameworks for demarcating boundaries and managing fisheries refugia, resulting in, inter alia, a 20 percent increase in small-scale fishing vessels using measures aimed at safeguard fish stock and critical habitat linkages at priority sites</i>	<i>Endorsed policies and plans Regular reports of meetings of national and regional project management bodies Reports of independent mid-term and terminal project evaluations</i>	<i>Willingness of fisheries and environment sectors to agree on guidelines promoting cross-sectorial cooperation and make joint commitments to the reform of national policy, legal and regulatory frameworks governing the management of fisheries refugia</i>
	2.1 Strengthened enabling environments for the effective management of the effects of fishing on fisheries and critical habitat linkages in the South China Sea and Gulf of Thailand	Status of policy revision and endorsement	Environmental impacts of fishing and aquaculture reflected in national and regional fisheries policies although minimal attention to effects of fishing on critical fish habitats	Measures for the fisheries sector's sustainable use of fish habitats and biodiversity, and based on site-level models of ecosystem carrying capacity, incorporated in the fisheries policies of participating countries	6 endorsed revised policies	Willingness of the fisheries sector to engage on issues relating to environmental performance
	2.2 Cross-sectorial agreement on national guidelines for the use of fisheries <i>refugia</i> for integrated fisheries and habitat management	Status of endorsement of national guidelines	ASEAN-SEAFDEC regional guidelines endorsed	National guidelines on the use of fisheries <i>refugia</i> in integrating fisheries and habitat management developed and endorsed by heads of national government departments responsible for fisheries and environment in the	6 published national guidelines on establishing and operating fisheries <i>refugia</i>	Willingness of the fisheries and environment sectors to agree on guidelines promoting cross-sectorial cooperation

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				participating countries		
	2.3 Endorsed policy, legal, and planning frameworks, both at national and regional levels, for the establishment and management of fisheries <i>refugia</i> , including the reduced use of destructive fishing gear and practices in areas of critical habitats	Status of endorsement of national fisheries <i>refugia</i> policies, enactment of supporting laws, and plan implementation	Absence of clear and effective policies, laws, and plans relating to the demarcation of boundaries, formal designation, and operational management of fisheries <i>refugia</i>	National policy, legal and planning frameworks for demarcating boundaries and managing <i>refugia</i> assessed and required reforms endorsed in the participating countries and reflected in an updated regional action plan	6 national reports on policy, legal and institutional aspects of <i>refugia</i> establishment and management published Endorsed policy and executive orders, provincial/local ordinances and by-laws 6 endorsed National Action Plans for the management of priority fisheries <i>refugia</i> and associated biodiversity 1 endorsed Regional Action Plan for fisheries <i>refugia</i>	National and provincial government commitment to reform Commitments of national governments to cooperate and jointly plan actions relating to management of fish stock and critical habitat linkages for fish stocks of transboundary significance
	2.4 Enhanced access to information relating to status and trends in fish stocks and their habitats in waters of the SCS	Volume of new and additional information compiled on: biomass trends; recruitment; fish size; fish habitat area and quality; and volume and value of landings by fishing area and fishing gear use	Review of fisheries and their habitats on the SCS coast prepared for Cambodia, Indonesia, the Philippines, Thailand and Viet Nam during 2004-2006	Annual synthesis reports of new and additional information and data relating to the stocks of priority fish, crustaceans and molluscs and their habitats published in each country and disseminated at national and regional levels	96 quarterly and 6 annual reports on fish stocks and habitats published online	Adequate coordination with provincial and municipal fisheries officers to access required information
	2.5 Improved national and regional-level management and sharing of information and data on fish early life history in the waters of the SCS	Status of national and regional databases and the number of datasets contained therein	Access to data generated from fish early life history research constrained both nationally and regionally by a lack of central repository	Establishment and population of 6 online national databases, and 1 regional database, of fish egg and larvae distribution and abundance in national waters and the SCS basin	6 databases online and populated with datasets	Willingness of individual scientists and data holders to share information for inclusion in a national repository
	2.6 Enhanced access to information relating to	Status of the national and regional GIS and	Information relating to fisheries and their	National and regional online Geographical	6 national and 1 regional Geographical	Internet connectivity in provincial and local

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	the locations and status of coastal habitats and management areas in the SCS and GoT	the number of sites presented and characterised	habitats contained a number of national databases and the SCS project website although need for improved access to information regarding management areas	Information Systems on fisheries and marine biodiversity featuring information on locations and management status of coastal habitats, fisheries <i>refugia</i> , MPAs, and critical habitats for threatened and endangered species	Information System online and populated with site-based information	offices of departments of fisheries and environment adequate to support online updating of database
	2.7 Strengthened information base for the planning, monitoring and evaluation of management at priority fisheries <i>refugia</i> sites in the South China Sea and GoT.	Completeness of site characterisations for 14 priority <i>refugia</i>	Information collection largely focuses on volumes with little attention to species & size selectivity of gear, size frequency and maturity, role of habitats in production	Fisheries and habitat data collection programmes operational to characterise 14 priority <i>refugia</i> sites in the South China Sea and Gulf of Thailand	Characterisations for 14 <i>refugia</i> sites accessible online	Consistent use of standardised data collection methods and procedures
	2.8 Improved basin-wide understanding of linkages between ocean circulation patterns, nutrient/chlorophyll concentrations, and sources and sinks of fish larvae in the South China Sea	Status of modelling system and extent of its use in decision-making and planning	Absence of information regarding links between circulation patterns, biochemistry and fish early life history in the South China Sea and Gulf of Thailand	Modelling system linking oceanographic, biochemical, and fish early life history information developed applied to improve regional understanding of fish early life history and links to critical habitats	1 regional modelling system online	Available information is sufficient to model linkages
	2.9 Regionally and locally appropriate best practices generated to address the effects of trawl and motorised push net ¹⁸ fishing on seagrass habitat, and the capture of juveniles, pre-recruits and fish in spawning condition	Status of demonstration activities Number of best practice fishing methods and practices demonstrated	Few regionally or locally appropriate examples of practical solutions to key threats to fisheries <i>refugia</i>	Best practice fishing methods and practices to address key threats to fish stock and critical habitat linkages demonstrated at priority <i>refugia</i>	4 published reports of the results of demonstrations	Willingness of fisherfolk to engage in activities focused on development of more responsible fishing gear and methods

¹⁸ Push netting is not found in Indonesia

Table 3 Results framework for project component 3

Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
3. Information Management and Dissemination in support of national and regional-level implementation of the fisheries <i>refugia</i> concept in the South China Sea and Gulf of Thailand	3. Strengthened knowledge management and information sharing and access for enhanced uptake of good practice in integrating fisheries management and biodiversity conservation in the design and implementation of fisheries and environmental management systems, including Marine Spatial Planning	<i>Extent of demonstrable use of examples of good practice in guiding the replication, scaling-up and mainstreaming of good practices</i>	<i>Low-level ability of stakeholders to engage in meaningful dialogue regarding how broader multiple use planning can best contribute to improving the state of fisheries and biodiversity conservation</i>	<i>National and regional systems for knowledge management and sharing, including the development of indicator sets and standardized statistics to guide the replication, scaling-up and mainstreaming of good practices in the use of fisheries refugia as a spatial planning tool</i>	<i>Routine communications on progress and lessons learned prepared and shared Annual results reports published and disseminated National and regional web portals for knowledge management and information exchange accessible online</i>	<i>If insufficient good practices are documented and shared regionally, awareness building initiatives will be based on a limited number of local examples and may not be effective in engaging community members and resource users in the wider region</i>
	3.1 Enhanced uptake of best practices in integrating fisheries management and biodiversity conservation, in the design and implementation of fisheries management systems	Number of best practice approaches and measures tested and codified Number, scope and reach of communications to share best practices Demonstrable use of best practices in policy and planning	Lessons learned in coastal habitat management from the SCS project's network of 23 demonstration sites have been documented, although there are few regionally relevant examples of best practice in integrated fisheries and biodiversity management	Best practice approaches and measures for integrated fisheries and habitat management captured, documented and communicated nationally and regionally	6 online national and 1 regional catalogue of best practice approaches and measures 24 communications on best practices published and syndicated	Sufficient number of best practices will be generated at priority <i>refugia</i> sites
	3.2 Improved community acceptance of area based approaches to fisheries and coastal environmental management	Extent of community acceptance of the use of fisheries <i>refugia</i> in coastal fisheries management	Awareness programmes at the community level rarely address area based management approaches	Public awareness and outreach programme to promote local social, economic and environmental benefits of fisheries <i>refugia</i> implemented at 14 priority locations in	24 awareness materials published online 56 annual reports of outreach programmes at 14 priority locations, including tracking of extent of community	Awareness and outreach materials are sufficiently well designed to engage community members and resource users

Draft #14 UNEP Project Document

				the South China Sea and Gulf of Thailand	acceptance	
	3.3 Knowledge generated and experiences from establishing and operating fisheries <i>refugia</i> , captured and shared nationally, regionally, and globally	Status of national web portals Status of publication of GEF IW experience notes	No existing mechanism for the capture, management and sharing of knowledge and experiences in the use of area based tools for fisheries management in the South China Sea region	National knowledge management systems on the use of fisheries <i>refugia</i> in capture fisheries management established and operational	6 online national web portals on fisheries <i>refugia</i> 7 published GEF IW experience notes (one per country and one regional) on application of fisheries <i>refugia</i> in the South China Sea and Gulf of Thailand	Internet connectivity at provincial and community-level offices of government agencies and other stakeholders adequate to support web-based information sharing
	3.4 Information and Education Campaigns for small-scale fisherfolk on the links between fisheries, habitats and biodiversity coordinated regionally through a Regional Education and Awareness Centre	Status of the Regional Education and Awareness Centre at SEAFDEC Volume of information and education material compiled, produced and made accessible	Access to information and training materials on integrated fisheries and habitat management limited to that produced through SCS project and accessible via SCS website	Regional Education and Awareness Centre on fisheries and critical habitats established and operating as a facility for the production and sharing of information and education materials for <i>refugia</i> management	Information and education materials accessible at SEAFDEC and online	Adequate commitment of regional executing agency to sustain longer-term operation of the facility as core function of its Training Department
	3.5 Standardised methods for collection and analysis of information and data, for use in assessing the impacts of <i>refugia</i> and in the design appropriate indicators for the longer-term operation of the regional system of fisheries <i>refugia</i>	Status of regional agreements Extent of demonstrated use of the agreed procedures in operation of site-level information and data collection programmes	Efforts to standardise reporting of regional fisheries statistics underway although little consideration given to issues relating to fish stock and habitat links	Regional agreement on standardised information and data collection procedures in support of longer-term operation of a regional system of fisheries <i>refugia</i> , including design of stress reduction and environmental state indicators for managed <i>refugia</i>	1 regionally endorsed report published online	Harnessing sufficient scientific and technical expertise to guide development of regionally and locally appropriate procedures

Table 4 Results framework for project component 4

Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
4. National and regional cooperation and coordination for integrated fish stock and critical habitat management in the South China Sea and Gulf of Thailand	<i>Cost-effective and efficient coordination of national and regional level cooperation for integrated fisheries and environmental management</i>	<i>Extent and continuity of stakeholder participation in meetings of project management bodies, including the scope and uptake of joint management and planning decisions</i>	<i>Lack of national and regional-level mechanisms to facilitate integration of fisheries management and biodiversity conservation</i>	<i>Effective multi-lateral and intergovernmental communication and joint decision-making, including the use of a consensual knowledge-base in planning ecologically and cost-effective management actions</i>	<i>Regular reports of meetings of national and regional project management bodies Reports of independent mid-term and terminal project evaluations</i>	<i>Consultative processes will elicit adequate stakeholder input and commitment of support from national networks to enable integrated management</i>
	4.1 Strengthened cross-sectorial coordination in the establishment and operation of fisheries <i>refugia</i> in the participating countries	Extent and continuity of national government agency participation in National Fisheries <i>Refugia</i> Committee meetings	Limited cross-sectorial engagement in the planning of coordinated actions to manage threats to fish stocks and critical habitat linkages	National Fisheries <i>Refugia</i> Committees (NFRC) established in 6 countries, functional and advising national decision-makers and regional <i>fora</i>	6 NFRC Terms of Reference and 48 biannual meeting reports (joint management decisions and participant lists)	Willingness of fisheries and environment sectors to engage in joint planning and decision-making via NFRC
	4.2 National scientific and technical expertise and knowledge harnessed to inform policy, legal and institutional reforms for fisheries <i>refugia</i> management in the participating countries	Status of the NTSC's and the uptake of the scientific and technical advice they provide	Lack of a formal mechanism for the sharing of science and technical knowledge between government agencies and other stakeholders involved in fish stock and coastal environmental management in all countries	National Technical and Scientific Committees (NTSC) established in 6 countries, functional and advising site-level management boards, the NFRC and the Regional Scientific and Technical Committee	6 NTSC Terms of Reference and 96 quarterly meeting reports (scientific and technical advice and participants lists)	Securing adequate and consistent inputs of expertise to work of NTSC may be compromised if incentives for national specialists to participate in work of the NTSC are inadequate
	4.3 Community-led planning of fisheries <i>refugia</i> management at priority locations in the South China Sea and Gulf of Thailand	Continuity of participation of community stakeholders in the planning, monitoring and evaluation of fisheries <i>refugia</i> management	Minimal stakeholder participation in planning of local actions to manage threats to fish stocks and critical habitats linkages	Local community action catalysed via establishment and operation of site-based management boards for fisheries <i>refugia</i> at 14 locations in the South China Sea and Gulf of Thailand	14 Management Board Terms of Reference and 224 quarterly meeting reports (joint management decisions and participant lists)	Existing tensions between local fisherfolk and government agencies may limit community leader participation in management planning
	4.4 Regional cooperation in the	Status of the RSTC and the uptake of the	Lack of a formal mechanism for the	Regional Scientific and Technical	1 RSTC Terms of Reference and 4	Harnessing sufficient scientific and technical

Draft #14 UNEP Project Document

	integration of scientific knowledge and research outputs with management and policy making	scientific and technical advice it provides Continuity of participation of members in annual meetings	sharing of science and technical knowledge relating to fisheries <i>refugia</i>	Committee (RSTC) established and functioning as a bridge between the scientific community and decision-makers for operation of a regional system of fisheries <i>refugia</i> [biannual meetings]	annual meeting reports (documenting scientific and technical advice and participant lists)	expertise across disciplines including, <i>inter alia</i> , fisheries science, oceanography, coastal and marine ecology
	4.5 Regional cooperation in the establishment and operation of a regional system of fisheries <i>refugia</i>	Status of the PSC Continuity of participation of members in annual meetings	UNEP and GEF requirement for establishment of regional decision making and planning body for the project	Project Steering Committee established and functioning to oversee and act as a principal decision making body for the project	1 PSC Terms of Reference and 8 annual meeting reports (documenting joint decisions and participant lists)	Senior officials of national fisheries administrations acknowledge importance assigned to operation of such a body by UNEP & GEF
	4.6 Effective coordination of regional and national-level activities and reporting requirements of UNEP and GEF satisfied	Program coordination unit recruited and staff retained	Executing agency has managed components of larger FAO/GEF projects but is yet to act as executing agency for GEF project of this magnitude	Functioning regional Project Coordinating Unit (PCU) supporting the coordination of regional and national level activities associated with the establishment and operation of regional system of fisheries <i>refugia</i> and meeting reporting requirements of UNEP and the GEF	Terms of Reference and contracts for project coordination unit staff	Regional executing agency ability to recruit and retain appropriately qualified staff for project coordination unit

Appendix 5: Work plan and timetable

Table 1 Work plan and timetable for project component 1

Activity Description	Year 1				Year 2				Year 3				Year 4			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
COMPONENT 1: Identification and management of fisheries and critical habitat linkages at priority fisheries refugia in the South China Sea																
1.1	Developing fisheries and coastal habitat information and data collection programmes for 14 priority fisheries refugia sites (underpins Outcome 3.5)															
1.1.1.	Review existing information and data on fisheries and coastal habitats at 14 sites, including needs for management interventions identified															
1.1.2	National consultation workshops to secure community and fisherfolk support in information & data collection															
1.1.3	Design and conduct site-based surveys to produce fisheries and habitat profile report for 14 sites															
1.1.4	Design and conduct fisheries surveys at 14 sites and submit data to a national & regional online database															
1.2	Facilitating agreement among stakeholders on the boundaries of fisheries refugia at 14 priority fisheries refugia sites															
1.2.1	Conduct consultations (including at-sea) to draft maps of fisheries refugia for priority species at 14 sites															
1.2.2	Prepare maps for 14 refugia and elicit fisherfolk input to boundary delineation through consultation															
1.2.3	Conduct assessment of environmental and social impacts of refugia designation at 14 locations															
1.2.4	Secure formal government designation of sites as fisheries refugia at 14 priority locations															
1.3	Developing Community-Based Management Plans for 14 priority fisheries refugia sites															
1.3.1	Consultations to identify key threats to fisheries refugia sites and identify management measures															
1.3.2	Management plans for 14 sites developed through community-based consultations															
1.3.3	Regulations/rules required for refugia management drafted with fisherfolk and local authorities															
1.3.4	Management plans adopted by local authorities and regulatory reforms enacted															
1.4	Establishing operational management for 14 priority fisheries refugia sites															
1.4.1	Establish management teams and site-based volunteer networks at 14 sites															
1.4.2	Conduct practical capacity building programme for management volunteers at 14 sites															
1.4.3	Coordinate monthly training and awareness															

1.4.4	activities at 14 sites, including pilot mgmt activities Develop and implement collaborative observer and enforcement programmes for management plan implementation at 14 sites																	
1.5	Strengthening civil society and community organization participation in the management of 14 fisheries <i>refugia</i> sites																	
1.5.1	Support local GEF Small Grant Programme proponents in design and execution of projects																	
1.5.2	Document and share examples of best practice at regional and national levels in the 6 countries																	

Table 2 Work plan and timetable for project component 2

Activity Description	Year 1				Year 2				Year 3				Year 4				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
COMPONENT 2: Improving the management of critical habitats for fish stocks of transboundary significance via national and regional actions to strengthen the enabling environment and knowledge-base for fisheries <i>refugia</i> management in the South China Sea																	
2.1	Enhancing policy guidance for improved management of the effects of fishing on critical habitats in the 6 participating countries																
2.1.1	Identify and document key threats from fishing and the environment to fish stock and critical habitat linkages at 14 priority sites in the 6 participating countries																
2.1.2	Formulate recommendations on policy and legal reforms to support promotion of responsible fishing at 14 priority sites in the 6 participating countries																
2.1.3	Facilitate consultations with fisheries industry and competent authorities on policy reforms for responsible fishing gear and practices in the participating countries																
2.1.4	National policy reform to promote fisheries sector's sustainable use of fish habitats and biodiversity																
2.2	Defining the policy and legal basis for formal designation and establishment of fisheries <i>refugia</i> in the 6 participating countries																
2.2.1	Reviews of policy and legal aspects on <i>refugia</i> (terminology, procedures, recommended reforms) in the 6 participating countries																
2.2.2	National expert consultations to formulate agreed recommendations for policy and legal reforms in the 6 participating countries																
2.3	Development of national guidelines on the establishment and operation of fisheries <i>refugia</i> and reflected in an updated regional <i>refugia</i> action plan																
2.3.1	Draft national guidelines (based on 2.1.2) on procedures for formal designation and mgmt of fisheries <i>refugia</i> in 6 participating countries																
2.3.2	National and local consultative process to elicit stakeholder input to the draft guidelines																
2.3.3	Amend and finalise national guidelines for approval																

	by National Fisheries <i>Refugia</i> Committees in 6 countries																		
2.3.4	Draft regional <i>refugia</i> action plan																		
2.4	Reforming national and regional policy, legal and planning frameworks for demarcating boundaries and managing <i>refugia</i>																		
2.4.1	Based on 2.1.2 & 2.1.3, draft required policy and legal reforms to support <i>refugia</i> establishment and mgmt in 6 participating countries																		
2.4.2	Convene national and local stakeholder consultations to review draft text for adoption in 6 countries																		
2.4.3	Facilitate approval and formal adoption of reforms by the authorities at national and provincial levels for 14 priority sites in 6 countries																		
2.4.4	Develop Regional Action Plan for the management of <i>refugia</i> in coastal areas of the South China Sea																		
2.5	Enhancing access to information relating to status and trends in fish stocks and their habitats in waters of the SCS marine basin																		
2.5.1	Compile information and data derived from abundance surveys in 6 countries for longer-term management																		
2.5.2	Compile information and data derived from surveys on size-frequency of priority species in 6 countries																		
2.5.3	Compile information and data on landings of priority species (volume/value, fishing areas and gears) in South China Sea waters of the 6 countries																		
2.5.4	Produce annual syntheses reports of new and additional information for national and regional review																		
2.5.5	Revise national reports on fish stocks and habitats in the South China Sea for each 6 participating countries																		
2.6	Improved national and regional-level management and sharing of information and data on fish early life history in the waters of the SCS																		
2.6.1	Prepare 6 national and 1 regional inventory of fish egg and larvae samples collected from SCS waters of the 6 participating countries (both analysed and unanalysed)																		
2.6.2	Develop and maintain 6 national databases and 1 regional database of fish egg and larval fish distribution and abundance																		

2.6.3	Convene annual one-day workshops in the 6 participating countries to monitor the implementation of national programmes for the processing/analysis of fish egg and larvae samples																	
2.6.4	Prepare annual status reports on fish early life history research for each participating country for regional review																	
2.7	Enhancing access to information relating to the locations and status of coastal habitats and management areas in the SCS																	
2.7.1	Compile and update information and data in 6 * National and 1 * regional Google Earth based GIS on: distribution of habitats; known spawning areas; locations of <i>refugia</i> ; MPAs; fisheries management areas; critical habitats for endangered species																	
2.7.2	Prepare annual synthesis of new and additional information included in databases (2.7.1)																	
2.8	Strengthening the information base for the planning, monitoring and evaluation of management at 14 priority fisheries <i>refugia</i> sites																	
2.8.1	Based on 1.1.4, produce detailed site characterizations for the 14 priority fisheries <i>refugia</i> sites for incorporation into national and regional datasets																	
2.9	Improved basin-wide understanding of linkages between ocean circulation patterns, nutrient/chlorophyll concentrations, and sources and sinks of fish larvae in the South China Sea																	
2.9.1	Development of modelling system linking oceanographic, biochemical, and fish early life history information developed applied to improve regional understanding of fish early life history and links to critical habitats																	
2.9.2	Publication of report on application of modelling system in identifying priority locations for replication and scaling-up of fisheries <i>refugia</i> best practices																	
2.10	Regionally and locally appropriate best practices generated to address the effects of trawl and push net fishing on seagrass habitat, and the capture of juveniles, pre-recruits and fish in spawning condition																	
2.10.1	Best practice fishing methods and practices to address key threats to fish stock and critical habitat linkages demonstrated at priority <i>refugia</i>																	

Table 3 Work plan and timetable for project component 3

Activity Description	Year 1				Year 2				Year 3				Year 4			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
COMPONENT 3: Information Management and Dissemination in support of national and regional-level implementation of the fisheries <i>refugia</i> concept in the South China Sea																
3.1	Enhancing uptake of best practices in integrating fisheries management and biodiversity conservation in the 6 participating countries															
3.1.1	Quarterly capture and documentation of best practices in the establishment and operation of fisheries <i>refugia</i> in the 6 participating countries															
3.1.2	Online catalogue of best practices approaches and measures developed and updated each 6 months															
3.1.3	6 monthly development of communications on best practices for dissemination and syndication, both nationally and regionally															
3.2	Improving community acceptance of area based approaches to marine management in the 6 participating countries															
3.2.1	Produce locally appropriate public awareness and outreach materials to promote local social, economic and environmental benefits of fisheries <i>refugia</i>															
3.2.2	In connection with activity 1.4.3, implement targeted annual outreach programmes at priority communities at the 14 sites in the SCS															
3.2.3	Benchmark and annually track community acceptance of <i>refugia</i> approach as a marine spatial planning tool															
3.3	Knowledge generated and experiences from establishing and operating fisheries <i>refugia</i> captured and shared nationally, regionally, and globally															
3.3.1	Establish and operate 6 national and 1 regional web portals for knowledge management on fisheries <i>refugia</i>															
3.3.2	Prepare and publish 6 GEF International Waters Experience Note on application of <i>refugia</i> approach at the national level															
3.4	Information and Education Campaigns for small-scale fisherfolk on the links between fisheries, habitats and biodiversity coordinated regionally through a Regional Education and Awareness Centre															
3.4.1	Establishment of Regional Education and Awareness Centre on fisheries and critical habitats															
3.4.2	Production and regional-level sharing of information and education materials for <i>refugia</i> management															
3.5	Standardised methods for collection and analysis of information and data for use in assessing impacts of <i>refugia</i> and design appropriate indicators for the longer-term operation of the regional system of fisheries <i>refugia</i> (underpinned by information and data collection programmes of Component 1)															
3.5.1	Develop standardised information and data collection procedures in support of longer-term operation of a regional system of fisheries <i>refugia</i> ,															
3.5.2	Regional consultation to agree on stress reduction															

and environmental state indicators for managed <i>refugia</i>																		
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Table 4 Work plan and timetable for project component 4

Activity Description	Year 1				Year 2				Year 3				Year 4				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
COMPONENT 4: National cooperation and coordination for integrated fish stock and critical habitat management in the South China Sea																	
4.1	Strengthened cross-sectorial coordination in the establishment and operation of fisheries <i>refugia</i> in the participating countries																
4.1.1	Develop and agree ToR, membership & operational rules for National Fisheries <i>Refugia</i> Committee's (or equivalent) for 6 participating countries																
4.1.2	Establish and convene quarterly meetings of the National Fisheries <i>Refugia</i> Committee (NFRFC) (or equivalent) for 6 participating countries																
4.1.3	NFRFC review and endorsement of quarterly work plans and progress and financial reports, including tracking of continuity of participation of stakeholders, in each of the 6 participating countries																
4.1.4	National NFRFC inputs to mid-term review and terminal evaluation of national and regional aspects of project in each 6 participating countries																
4.2	Harnessing national scientific and technical expertise and knowledge to inform policy, legal and institutional reforms for fisheries <i>refugia</i>																
4.2.1	Establish and convene 6 monthly meetings of the National Scientific and Technical Committee (or equivalent) in each of the six participating countries																
4.2.2	Provision of technical and scientific inputs to planning of activities in components 1, 2 and 3 led by National Lead Agencies in each of 6 participating countries																
4.3	Catalyzing local community action via establishment and operation of site-based management boards at 14 priority <i>refugia</i> sites																
4.3.1	Review governance arrangements at each site to identify required ToR and membership of site-based management boards, including links to other local planning bodies																
4.3.2	Establish and convene quarterly meetings of site-based management boards at the 14 sites																
4.3.3	Preparation of quarterly work plans and progress and financial reports on activities at each of the 14 sites																

4.4	Regional cooperation in the integration of scientific knowledge and research outputs with management and policy making																		
4.4.1	Establishment and operation of the Regional Scientific and Technical Committee (biannual meetings)																		
4.5	Regional cooperation in the establishment and operation of a regional system of fisheries <i>refugia</i>																		
4.5.1	Establishment and operation of a regional Project Steering Committee (PSC) (annual meetings)																		
4.6	Effective coordination of regional and national-level activities and reporting requirements of UNEP and GEF satisfied																		
4.6.1	Establishment and operation of the regional Project Coordinating Unit, including appointment and retention of a Project Director																		

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
Component I: – Identification and management of fisheries and critical habitat linkages at priority fisheries <i>refugia</i> in the South China Sea and Gulf of Thailand				
1.1: Fisheries <i>refugia</i> profile reports, including GIS maps and site characterisations, published for 14 priority sites	Status of boundary delineation and agreement on proposed management interventions	<i>Refugia</i> site locations identified regionally although need to work with stakeholder locally, including academe and researchers, to delineate boundaries	Equivalent to end-of-project target	Agreement among stakeholders on the boundaries of fisheries <i>refugia</i> , key threats to <i>refugia</i> , and priority management interventions for 14 sites
1.2: Published management plans and annual implementation reports for 14 sites	Status of adoption and implementation of the management plans	Guide to planning of <i>refugia</i> mgmt. developed and published in inter-governmentally endorsed regional guidelines and a need exists to apply this at the local level	Key threats to fisheries <i>refugia</i> sites identified Draft management plans	Community-based <i>refugia</i> management plans developed, adopted, and under implementation at 14 fisheries <i>refugia</i> sites
1.3: Quarterly reports of network meetings and activities [including list of participants and results of work] for 14 sites	Status and effectiveness of the management board and volunteer networks	Efforts to strengthen monitoring, control, and surveillance capabilities in all countries are ongoing, although need exists to refine scope of work to support <i>refugia</i> management	None	Networks of management boards and community-based fisheries and habitat management volunteers for <i>refugia</i> management established at 14 fisheries <i>refugia</i> sites.
1.4: Training materials published online and reports of training and awareness activities	Increase in capacity to participate in <i>refugia</i> management among target community members	Capacity building programmes at the community level focus on seafood quality and capacity issues with little emphasis on links between fisheries and environment	Stakeholder capacity for participation in mgmt. benchmarked Agreed objectives, syllabus and schedule for capacity building activities	Community capacity programmes at 14 fisheries <i>refugia</i> sites, including participatory activities to monitor fish habitats within <i>refugia</i> , collect lost and abandoned fishing gear, and develop responsible fishing practices at the community level
1.5: Annual report of <i>Refugia</i> -SGP partnership	Number of GEF Small Grants Programme projects commissioned and implemented in support of <i>refugia</i> management objectives	Low level mobilization of civil society, community organization and the private sector in site-based fisheries and habitat management	Suitable GEF SGP proponent identified at 14 sites	Operational partnership with the GEF Small Grants Programme to strengthen civil society and community organisation participation

Table 2 Key deliverables and benchmarks for project component 2

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
Component II – Improving the management of critical habitats for fish stocks of transboundary significance via national and regional actions to strengthen the enabling environment and knowledge-base for fisheries <i>refugia</i> management in the South China Sea and Gulf of Thailand				
2.1: (a) Published national reviews & recommendations for reforms of national, provincial and municipal regulations/ordinances for responsible fishing practices at priority <i>refugia</i> (b) Endorsed revised policies	Status of policy revision and endorsement	Environmental impacts of fishing and aquaculture reflected in national and regional fisheries policies although minimal attention to effects of fishing on critical fish habitats	Proposed policy and legal reforms for promotion of responsible fishing at priority sites formulated Consultations with fishing industry initiated	Measures for the fisheries sector's sustainable use of fish habitats and biodiversity, and based on site-level models of ecosystem carrying capacity, incorporated in the fisheries policies of participating countries
2.2: Published national guidelines on establishing and operating fisheries <i>refugia</i>	Status of endorsement of national guidelines	ASEAN-SEAFDEC regional guidelines endorsed	Guidelines drafted National and local consultative process initiated	National guidelines on the use of fisheries <i>refugia</i> in integrating fisheries and habitat developed and endorsed by heads of national government departments responsible for fisheries and) environment in the participating countries
2.3: (a) 6 national reports on policy, legal and institutional aspects of <i>refugia</i> establishment and management published (b) Endorsed policy and executive orders, provincial/local ordinances and by-laws (c) Endorsed National Action Plans for the management of priority fisheries <i>refugia</i> and associated biodiversity (d) Endorsed Regional Action Plan for fisheries <i>refugia</i>	Status of endorsement of national fisheries <i>refugia</i> policies, enactment of supporting laws, and plan implementation	Absence of clear and effective policies, laws, and plans relating to the demarcation of boundaries, formal designation, and operational management of fisheries <i>refugia</i>	Consultations on required policy & legal reforms for <i>refugia</i> demarcation and management initiated	National policy, legal and planning frameworks for demarcating boundaries and managing <i>refugia</i> assessed and required reforms endorsed in the participating countries and reflected in an updated regional action plan
2.4: Quarterly and annual reports on fish stocks and habitats published online	Volume of new and additional information compiled on: biomass trends; recruitment; fish size;	Review of fisheries and their habitats on the SCS coast prepared for Cambodia, Indonesia,	First annual synthesis reports published	Annual synthesis reports of new and additional information and data relating to the stocks

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
	fish habitat area and quality; and volume and value of landings by fishing area and fishing gear use	the Philippines, Thailand and Viet Nam during 2004-2006		of priority fish, crustaceans and molluscs and their habitats published in each country and disseminated at national and regional levels
2.5: Databases online and populated with datasets	Status of national and regional databases and the number of datasets contained therein	Access to data generated from fish early life history research constrained both nationally and regionally by a lack of central repository	National and regional inventories of fish egg and samples prepared First annual status report on fish early life history research prepared	Establishment and population of 6 online national databases, and 1 regional database, of fish egg and larvae distribution and abundance in national waters and the SCS basin
2.6: National and regional Geographical Information System online & populated with site-based information	Status of the national and regional GIS and the number of sites presented and characterised	Information relating to fisheries and their habitats contained a number of national databases and the SCS project website although need for improved access to information regarding management areas	Site characterisation templates prepared and agreed by NSTC and RSTC	National and regional online Geographical Information Systems on fisheries and marine biodiversity featuring information on locations and management status of coastal habitats, fisheries <i>refugia</i> , MPAs, and critical habitats for threatened and endangered species
2.7: Characterisations for 14 <i>refugia</i> sites accessible online	Completeness of site characterisations for 14 priority <i>refugia</i>	Information collection largely focuses on volumes with little attention to species & size selectivity of gear, size frequency and maturity, role of habitats in production	Site characterisation templates prepared and agreed by NSTC and RSTC	Fisheries and habitat data collection programmes operational to characterise 14 priority <i>refugia</i> sites in the South China Sea and Gulf of Thailand
2.8: Modelling system online	Status of modelling system and extent of its use in decision-making and planning	Absence of information regarding links between circulation patterns, biochemistry and fish early life history in the South China Sea and Gulf of Thailand	Scope of work for model development prepared and agreed by NSTC and RSTC	Modelling system linking oceanographic, biochemical, and fish early life history information developed & applied to improve regional understanding of fish early life history and links to critical habitats
2.9: Published reports of the results of demonstrations	Status of demonstration activities Number of best practice fishing	Few regionally or locally appropriate examples of practical solutions to key threats to fisheries <i>refugia</i>	Threats from fishing to fish stock and critical habitat links identified at 14 priority sites	Best practice fishing methods and practices to address key threats to fish stock and critical habitat linkages

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
	methods and practices demonstrated			demonstrated at priority <i>refugia</i>

Table 3 Key deliverables and benchmarks for project component 3

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
Component III – Information Management and Dissemination in support of national and regional-level implementation of the fisheries <i>refugia</i> concept in the South China Sea and Gulf of Thailand				
3.2 (a) 6 online national and 1 regional catalogue of best practice approaches and measures (b) Communications on best practices published and syndicated	(a) Number of best practice approaches and measures tested and codified (b) Number, scope and reach of communications to share best practices (c) Demonstrable use of best practices in policy and planning	Lessons learned in coastal habitat management from the SCS project's network of 23 demonstration sites have been documented, although there are few regionally relevant examples of best practice in integrated fisheries and biodiversity management	Online database for cataloguing best practice examples accessible via project website	Best practice approaches and measures for integrated fisheries and habitat management captured, documented and communicated nationally and regionally
3.2 (a) Awareness materials published online (b) Annual reports of outreach programmes at 14 priority locations, including tracking of extent of community acceptance	Extent of community acceptance of the use of fisheries <i>refugia</i> in coastal fisheries management	Awareness programmes at the community level rarely address area based management approaches	Community acceptance of <i>refugia</i> approach in project Yr 1 benchmarked	Public awareness and outreach programme to promote local social, economic and environmental benefits of fisheries <i>refugia</i> implemented at 14 priority locations in the South China Sea and Gulf of Thailand
3.3 (a) Online national web portals on fisheries <i>refugia</i> (b) Published GEF IW experience notes (one per country and one regional) on application of fisheries <i>refugia</i> in the South China Sea and Gulf of Thailand	(a) Status of national web portals (b) Status of publication of GEF IW experience notes	No existing mechanism for the capture, management and sharing of knowledge and experiences in the use of area based tools for fisheries management in the South China Sea region	Web portal for the exchange of knowledge on <i>refugia</i> approach accessible online	National knowledge management systems on the use of fisheries <i>refugia</i> in capture fisheries management established and operational
3.4 Information and education materials accessible at SEAFDEC and online	(a) Status of the Regional Education and Awareness Centre at SEAFDEC (b) Volume of information and	Access to information and training materials on integrated fisheries and habitat management limited to that produced	None	Regional Education and Awareness Centre on fisheries and critical habitats established and operating as a facility for the production

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
	education material compiled, produced and made accessible	through SCS project and accessible via SCS website		and sharing of information and education materials for <i>refugia</i> management
3.5: Endorsed report published online	(a) Status of regional agreements (b) Extent of demonstrated use of the agreed procedures in operation of site-level information and data collection programmes	Efforts to standardise reporting of regional fisheries statistics underway although little consideration given to issues relating to fish stock and habitat links	None	Regional agreement on standardised information and data collection procedures in support of longer-term operation of a regional system of fisheries <i>refugia</i> , including design of stress reduction and environmental state indicators for managed <i>refugia</i>

Table 4 Key deliverables and benchmarks for project component 4

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
Component IV – National and regional cooperation and coordination for integrated fish stock and critical habitat management in the South China Sea and Gulf of Thailand				
4.1: NFRC Terms of Reference and biannual meeting reports (joint management decisions and participant lists)	Extent and continuity of national government agency participation in National Fisheries <i>Refugia</i> Committee meetings	Limited cross-sectorial engagement in the planning of coordinated actions to manage threats to fish stocks and critical habitat linkages	Quarterly meetings of NFRCs	National Fisheries <i>Refugia</i> Committees (NFRC) established in 6 countries, functional and advising national decision-makers and regional <i>fora</i>
4.2: NTSC Terms of Reference and quarterly meeting reports (scientific and technical advice and participants lists)	Status of the NTSC's and the uptake of the scientific and technical advice they provide	Lack of a formal mechanism for the sharing of science and technical knowledge between government agencies and other stakeholders involved in fish stock and coastal environmental management in all countries	Biannual meetings of NTSCs	National Technical and Scientific Committees (NTSC) established in 6 countries, functional and advising site-level management boards, the NFRC and the Regional Scientific and Technical Committee
4.3: Management Board Terms of Reference and quarterly meeting reports (joint management decisions and participant lists)	Continuity of participation of community stakeholders in the planning, monitoring and evaluation of fisheries <i>refugia</i> management	Minimal stakeholder participation in planning of local actions to manage threats to fish stocks and critical habitats linkages	Quarterly meetings of Site-Based Management Boards	Local community action catalysed via establishment and operation of site-based management boards for fisheries <i>refugia</i> at 14 locations in the South China Sea and Gulf of Thailand

Project Outputs	Description of indicator	Baseline level	Mid-term target	End-of-project target
4.4 RSTC Terms of Reference and annual meeting reports (documenting scientific and technical advice and participant lists)	Status of the RSTC and the uptake of the scientific and technical advice it provides Continuity of participation of members in annual meetings	Lack of a formal mechanism for the sharing of science and technical knowledge relating to fisheries <i>refugia</i>	Biannual meetings of the RSTC	Regional Scientific and Technical Committee (RSTC) established and functioning as a bridge between the scientific community and decision-makers for operation of a regional system of fisheries <i>refugia</i> [annual meetings]
4.5 PSC Terms of Reference and annual meeting reports (documenting joint decisions and participant lists)	Status of the PSC Continuity of participation of members in annual meetings	UNEP and GEF requirement for establishment of regional decision making and planning body for the project	Annual meetings of the PSC Completion of Annual Project Implementation Reviews	Project Steering Committee established and functioning to oversee and act as a principal decision making body for the project
4.6: Terms of Reference and contracts for program coordination unit staff	Program coordination unit recruited and staff retained	Executing agency has managed components of larger FAO/GEF projects but is yet to act as executing agency for GEF project of this magnitude	Timely and cost effective delivery of project outputs	Functioning regional Project Coordinating Unit (PCU) supporting the coordination of regional and national level activities associated with the establishment and operation of regional system of fisheries <i>refugia</i> and meeting reporting requirements of UNEP and the GEF

Appendix 7: Costed M&E plan

Results-Based Monitoring and Evaluation Framework

1. Monitoring Framework and Budget

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 ¹⁹ (Object of expenditure & cost)
1.1 Procedures for the delineation of fisheries <i>refugia</i> boundaries and the setting of priorities for <i>refugia</i> management developed, documented and shared regionally	Status of boundary delineation and agreement on proposed management interventions	<i>Refugia</i> site locations identified regionally although need to work with stakeholder locally, including academe and researchers, to delineate boundaries	NA (to be completed by end Yr 2)	Agreement among stakeholders on the boundaries of fisheries <i>refugia</i> , key threats to <i>refugia</i> , and priority management interventions for 14 sites in the South China Sea and Gulf of Thailand	Fisheries <i>refugia</i> profile reports, including maps and site characterisations, published for 14 priority sites	Quarterly Quarterly Biannually Biannually	Site-level National-level National-level Regional-level	<ul style="list-style-type: none"> • Site-Based Management boards • National Fisheries <i>Refugia</i> Committee • National Scientific & Technical Committees • Regional Scientific & Technical Committee 	Yr 1-2	National and Regional Coordination Meetings (budget line 3300)
1.2 Community-based <i>refugia</i> management plans that are consistent with the FAO and ASEAN-SEAFDEC Guidelines for Responsible	Status of adoption and implementation of the management plans Total area of fisheries <i>refugia</i> (ha) under	Guide to planning of <i>refugia</i> management developed and published in inter-governmentally endorsed regional guidelines and	Key threats to fisheries <i>refugia</i> sites identified Draft management plans	Community-based <i>refugia</i> management plans developed, adopted, and under implementation at 14 fisheries <i>refugia</i> sites	Published management plans and annual implementation reports	Quarterly Quarterly Biannually	Site-level National-level National-level	<ul style="list-style-type: none"> • Site-Based Management boards • National Fisheries <i>Refugia</i> Committee • National Scientific & 	Yr 2-3.5	National and Regional Coordination Meetings (budget line 3300)

¹⁹ 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 4 relating to national and regional cooperation coordination (UNEP budget line series 3300).

Draft #14 UNEP Project Document

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 ¹⁹ (Object of expenditure & cost)
Fisheries, developed and implemented as a demonstration of integrated fisheries and habitat management in the South China Sea and GoT	management	a need exists to apply this at the local level				Biannually Biannually	Regional-level Regional-level	Technical Committees • Regional Scientific & Technical Committee • Project Steering Committee		
1.3 Community action for fisheries <i>refugia</i> management catalysed at 14 sites	Status and effectiveness of the management board and volunteer networks	Efforts to strengthen monitoring, control, and surveillance capabilities in all countries are ongoing, although need exists to refine scope of work to support <i>refugia</i> management	NA	Networks of management boards and community-based fisheries and habitat management volunteers for <i>refugia</i> management established at 14 fisheries <i>refugia</i> sites	Quarterly reports of network meetings and activities [including list of participants and results of work]	Quarterly Biannually Biannually	National-level National-level Regional-level	• National Fisheries <i>Refugia</i> Committee • National Scientific & Technical Committees • Regional Scientific & Technical Committee	Yr 2-4	National and Regional Coordination Meetings (budget line 3300)
1.4 Fishing communities, particularly artisanal fishermen and women involved in inshore gleaning and processing, empowered to enforce agreed	Increase in capacity to participate in <i>refugia</i> management among target community members	Capacity building programmes at the community level focus on seafood quality and capacity issues with little emphasis on links	Stakeholder capacity for participation in mgmt. benchmarked Agreed objectives, syllabus and schedule for	Community capacity programmes at 14 fisheries <i>refugia</i> sites, including participatory activities to monitor fish habitats within <i>refugia</i> , collect lost	Training materials published online and reports of training and awareness activities	Biannually Biannually	National-level Regional-level	• National Scientific & Technical Committees • Regional Scientific & Technical Committee	Yr 2-4	National and Regional Coordination Meetings (budget line 3300)

Draft #14 UNEP Project Document

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 ¹⁹ (Object of expenditure & cost)
management rules at 14 priority <i>refugia</i> sites in the South China Sea and Gulf of Thailand		between fisheries and environment	capacity building activities	and abandoned fishing gear, and develop responsible fishing practices at the community level						
1.5 Strengthened community participation in fisheries <i>refugia</i> management	Number of GEF Small Grants Programme projects commissioned and implemented in support of <i>refugia</i> management objectives	Low level mobilization of civil society, community organization and the private sector in site-based fisheries and habitat management	Suitable GEF SGP proponent identified at 14 sites	Operational partnership with the GEF Small Grants Programme to strengthen civil society and community organisation participation in the management of fisheries <i>refugia</i> at 14 sites	Annual report of <i>Refugia</i> -SGP partnership	Biannually Biannually	National-level Regional-level	<ul style="list-style-type: none"> • National Scientific & Technical Committees • Regional Scientific & Technical Committee 	Yr 3-4	National and Regional Coordination Meetings (budget line 3300)
2.1 Enhanced policy guidance for improved management of the effects of fishing on critical habitats	Status of policy revision and endorsement	Environmental impacts of fishing and aquaculture reflected in national and regional fisheries policies although minimal attention to effects of fishing on critical fish	Proposed policy and legal reforms for promotion of responsible fishing at priority sites formulated Consultations with fishing	Measures for the fisheries sector's sustainable use of fish habitats and biodiversity, and based on site-level models of ecosystem carrying capacity, incorporated in the fisheries	Published national reviews and recommendations for reforms of national, provincial and municipal regulations/ordinances for responsible fishing practices at priority	Quarterly Biannually Biannually	National-level National-level Regional-level	<ul style="list-style-type: none"> • National Fisheries <i>Refugia</i> Committee • National Scientific & Technical Committees • Regional Scientific & Technical 	Yr 1-3	National and Regional Coordination Meetings (budget line 3300)

Draft #14 UNEP Project Document

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 ¹⁹ (Object of expenditure & cost)
		habitats	industry initiated	policies of participating countries	<i>refugia</i> Endorsed revised policies			Committee		
2.2 Nationally endorsed guidelines on the establishment and management of fisheries <i>refugia</i>	Status of endorsement of national guidelines	ASEAN-SEAFDEC regional guidelines endorse	Guidelines drafted National and local consultative process initiated	National guidelines on the use of fisheries <i>refugia</i> in integrating fisheries and habitat developed and endorsed by heads of national government departments responsible for fisheries and) environment in the participating countries	Published national guidelines on establishing and operating fisheries <i>refugia</i>	Quarterly Biannually Biannually	National-level National-level Regional-level	<ul style="list-style-type: none"> • National Fisheries <i>Refugia</i> Committee • National Scientific & Technical Committees • Regional Scientific & Technical Committee 	Yr 2-3	National and Regional Coordination Meetings (budget line 3300)
2.3 Nationally (including subnationally) and regionally endorsed policy, legal, and planning frameworks for the establishment and management of fisheries <i>refugia</i> , including the	Status of endorsement of national fisheries <i>refugia</i> policies, enactment of supporting laws, and plan implementation	Absence of clear and effective policies, laws, and plans relating to the demarcation of boundaries, formal designation, and operational management of fisheries <i>refugia</i>	Consultations on required policy & legal reforms for <i>refugia</i> demarcation and management initiated	National policy, legal and planning frameworks for demarcating boundaries and managing <i>refugia</i> assessed and required reforms endorsed in the participating	6 national reports on policy, legal and institutional aspects of <i>refugia</i> establishment and management published Endorsed policy and executive	Quarterly Biannually Biannually	National-level National-level Regional-level	<ul style="list-style-type: none"> • National Fisheries <i>Refugia</i> Committee • National Scientific & Technical Committees • Regional Scientific & Technical 	Yr 2-3	National and Regional Coordination Meetings (budget line 3300)

Draft #14 UNEP Project Document

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 ¹⁹ (Object of expenditure & cost)
reduced use of destructive fishing gear and practices in areas of critical habitats				countries and reflected in an updated regional action plan	orders, provincial/local ordinances and by-laws Endorsed National Action Plan for the management of priority fisheries <i>refugia</i> and associated biodiversity Endorsed Regional Action Plan for fisheries <i>refugia</i>			Committee		
2.4 Enhanced access to information relating to status and trends in fish stocks and their habitats in waters of the SCS and GoT	Volume of new and additional information compiled on: biomass trends; recruitment; fish size; fish habitat area and quality; and volume and value of landings by fishing area and fishing gear use	Review of fisheries and their habitats on the SCS coast prepared for Cambodia, Indonesia, the Philippines, Thailand and Viet Nam during 2004-2006	First annual synthesis reports published	Annual synthesis reports of new and additional information and data relating to the stocks of priority fish, crustaceans and molluscs and their habitats published in each country and disseminated at national and regional levels	Quarterly and annual reports on fish stocks and habitats published online	Biannually Biannually	National-level Regional-level	<ul style="list-style-type: none"> National Scientific & Technical Committees Regional Scientific & Technical Committees 	Yr 1-4	National and Regional Coordination Meetings (budget line 3300)
2.5 Improved	Status of	Access to data	National	Establishment	Databases	Biannually	National-	<ul style="list-style-type: none"> National 	Yr 1-4	National and

Draft #14 UNEP Project Document

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 ¹⁹ (Object of expenditure & cost)
national and regional-level management and sharing of information and data on fish early life history in the waters of the SCS AND GOT	national and regional databases and the number of datasets contained therein	generated from fish early life history research constrained both nationally and regionally by a lack of central repository	and regional inventories of fish egg and samples prepared First annual status report on fish early life history research prepared	and population of 6 online national databases, and 1 regional database, of fish egg and larvae distribution and abundance in national waters and the SCS basin	online and populated with datasets	Biannually	level Regional-level	Scientific & Technical Committees • Regional Scientific & Technical Committee		Regional Coordination Meetings (budget line 3300)
2.6 Enhanced access to information relating to the locations and status of coastal habitats and management areas in the SCS and GoT	Status of the national and regional GIS and the number of sites presented and characterised	Information relating to fisheries and their habitats contained a number of national databases and the SCS project website although need for improved access to information regarding management areas	Site characterisation templates prepared and agreed by NSTC and RSTC	National and regional online Geographical Information Systems on fisheries and marine biodiversity featuring information on locations and management status of coastal habitats, fisheries <i>refugia</i> , MPAs, and critical habitats for threatened and endangered species	National and regional Geographical Information System online and populated with site-based information	Biannually Biannually	National-level Regional-level	• National Scientific & Technical Committees • Regional Scientific & Technical Committee	Yr 2-3	National and Regional Coordination Meetings (budget line 3300)
2.7 Strengthened information	Completeness of site characterisation	Information collection largely	Site characterisation	Fisheries and habitat data collection	Characterisations for 14 <i>refugia</i> sites	Biannually	National-level	• National Scientific &	Yr 1-4	National and Regional Coordination

Draft #14 UNEP Project Document

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 ¹⁹ (Object of expenditure & cost)
base for the planning, monitoring and evaluation of management at priority fisheries <i>refugia</i> sites in the South China Sea and GoT.	ns for 14 priority <i>refugia</i>	focuses on volumes with little attention to species & size selectivity of gear, size frequency and maturity, role of habitats in production	templates prepared and agreed by NSTC and RSTC	programmes operational to characterise 14 priority <i>refugia</i> sites in the South China Sea and Gulf of Thailand	accessible online	Biannually	Regional-level	Technical Committees • Regional Scientific & Technical Committee		Meetings (budget line 3300)
2.8 Improved basin-wide understanding of linkages between ocean circulation patterns, nutrient/chlorophyll concentrations, and sources and sinks of fish larvae in the South China Sea and Gulf of Thailand	Status of modelling system and extent of its use in decision-making and planning	Absence of information regarding links between circulation patterns, biochemistry and fish early life history in the South China Sea and Gulf of Thailand	Scope of work for model development prepared and agreed by NSTC and RSTC	Modelling system linking oceanographic, biochemical, and fish early life history information developed applied to improve regional understanding of fish early life history and links to critical habitats	Modelling system online	Biannually Biannually	National-level Regional-level	• National Scientific & Technical Committees • Regional Scientific & Technical Committee	Yr 2-3	National and Regional Coordination Meetings (budget line 3300)
2.9 Regionally and locally appropriate best practices generated to address the effects of trawl and motorised push net ²⁰	Status of demonstration activities Number of best practice fishing methods and practices	Few regionally or locally appropriate examples of practical solutions to key threats to fisheries	Threats from fishing to fish stock and critical habitat links identified at 14 priority sites	Best practice fishing methods and practices to address key threats to fish stock and critical habitat linkages	Published reports of the results of demonstrations	Biannually Biannually	National-level Regional-level	• National Scientific & Technical Committees • Regional Scientific	Yr 3-4	National and Regional Coordination Meetings (budget line 3300)

Draft #14 UNEP Project Document

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 ¹⁹ (Object of expenditure & cost)
fishing on seagrass habitat, and the capture of juveniles, pre-recruits and fish in spawning condition	demonstrated	<i>refugia</i>		demonstrated at priority <i>refugia</i>				& Technical Committee		
3.1 Enhanced national uptake of best practices in integrating fisheries management and biodiversity conservation, in the design and implementation of fisheries management systems	Number of best practice approaches and measures tested and codified Number, scope and reach of communications to share best practices Demonstrable use of best practices in policy and planning	Lessons learned in coastal habitat management from the SCS project's network of 23 demonstration sites have been documented, although there are few regionally relevant examples of best practice in integrated fisheries and biodiversity management	Online database for cataloguing best practice examples accessible via project website	Best practice approaches and measures for integrated fisheries and habitat management captured, documented and communicated nationally and regionally	6 online national and 1 regional catalogue of best practice approaches and measures Communications on best practices published and syndicated	Biannually Biannually	National-level Regional-level	<ul style="list-style-type: none"> National Scientific & Technical Committees Regional Scientific & Technical Committee 	Yr 1-4	National and Regional Coordination Meetings (budget line 3300)
3.2 Improved community acceptance of area based approaches to fisheries and coastal environmental management	Extent of community acceptance of the use of fisheries <i>refugia</i> in coastal fisheries management	Awareness programmes at the community level rarely address area based management approaches	Community acceptance of <i>refugia</i> approach in project Yr 1 benchmarked	Public awareness and outreach programme to promote local social, economic and environmental benefits of	Awareness materials published online Annual reports of outreach programmes	Biannually Biannually	National-level Regional-level	<ul style="list-style-type: none"> National Scientific & Technical Committees Regional Scientific 	Yr 1-4	National and Regional Coordination Meetings (budget line 3300)

Draft #14 UNEP Project Document

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 ¹⁹ (Object of expenditure & cost)
				fisheries <i>refugia</i> implemented at 14 priority locations in the South China Sea and Gulf of Thailand	at 14 priority locations, including tracking of extent of community acceptance			& Technical Committee		
3.3 Knowledge generated and experiences from establishing and operating fisheries <i>refugia</i> , captured and shared nationally, regionally, and globally	Status of national web portals Status of publication of GEF IW experience notes	No existing mechanism for the capture, management and sharing of knowledge and experiences in the use of area based tools for fisheries management in the South China Sea region	Web portal for the exchange of knowledge on <i>refugia</i> approach accessible online	National knowledge management systems on the use of fisheries <i>refugia</i> in capture fisheries management established and operational	Online national web portals on fisheries <i>refugia</i> Published GEF IW experience notes (one per country and one regional) on application of fisheries <i>refugia</i> in the South China Sea and Gulf of Thailand	Biannually Biannually	National-level Regional-level	<ul style="list-style-type: none"> • National Scientific & Technical Committees • Regional Scientific & Technical Committee 	Yr 2-4	National and Regional Coordination Meetings (budget line 3300)
3.4 Information and Education Campaigns for small-scale fisherfolk on the links between fisheries, habitats and biodiversity coordinated	Status of the Regional Education and Awareness Centre at SEAFDEC Volume of information and education material compiled,	Access to information and training materials on integrated fisheries and habitat management limited to that produced through SCS project and	NA	Regional Education and Awareness Centre on fisheries and critical habitats established and operating as a facility for the production	Information and education materials accessible at SEAFDEC and online	Biannually Biannually	National-level Regional-level	<ul style="list-style-type: none"> • National Scientific & Technical Committees • Regional Scientific & Technical Committee 	Yr 3-4	National and Regional Coordination Meetings (budget line 3300)

Draft #14 UNEP Project Document

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 ¹⁹ (Object of expenditure & cost)
regionally through a Regional Education and Awareness Centre	produced and made accessible	accessible via SCS website		and sharing of information and education materials for <i>refugia</i> management						
3.5 Standardised methods for collection and analysis of information and data, for use in assessing the impacts of <i>refugia</i> and in the design appropriate indicators for the longer-term operation of the regional system of fisheries <i>refugia</i>	Status of regional agreements Extent of demonstrated use of the agreed procedures in operation of site-level information and data collection programmes	Efforts to standardise reporting of regional fisheries statistics underway although little consideration given to issues relating to fish stock and habitat links	NA	Regional agreement on standardised information and data collection procedures in support of longer-term operation of a regional system of fisheries <i>refugia</i> , including design of stress reduction and environmental state indicators for managed <i>refugia</i>	Endorsed report published online	Biannually Biannually	National-level Regional-level	<ul style="list-style-type: none"> • National Scientific & Technical Committees • Regional Scientific & Technical Committee 	Yr 3-4	National and Regional Coordination Meetings (budget line 3300)
4.1 Strengthened cross-sectorial coordination in the establishment and operation of fisheries <i>refugia</i> in the participating countries	Extent and continuity of national government agency participation in National Fisheries <i>Refugia</i> Committee meetings	Limited cross-sectorial engagement in the planning of coordinated actions to manage threats to fish stocks and critical habitat linkages	Quarterly meetings of NFRCs	National Fisheries <i>Refugia</i> Committees (NFRC) established in 6 countries, functional and advising national decision-makers and	NFRC Terms of Reference and biannual meeting reports (joint management decisions and participant lists)	Biannually	Regional-level	<ul style="list-style-type: none"> • Regional Scientific & Technical Committee 	Yr 1-4	National and Regional Coordination Meetings (budget line 3300)

Draft #14 UNEP Project Document

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 ¹⁹ (Object of expenditure & cost)
				regional <i>fora</i>						
4.2 National scientific and technical expertise and knowledge harnessed to inform policy, legal and institutional reforms for fisheries <i>refugia</i> management in the participating countries	Status of the NTSC's and the uptake of the scientific and technical advice they provide	Lack of a formal mechanism for the sharing of science and technical knowledge between government agencies and other stakeholders involved in fish stock and coastal environmental management in all countries	Biannual meetings of NTSCs	National Technical and Scientific Committees (NTSC) established in 6 countries, functional and advising site-level management boards, the NFRC and the Regional Scientific and Technical Committee	NTSC Terms of Reference and quarterly meeting reports (scientific and technical advice and participants lists)	Biannually	Regional-level	<ul style="list-style-type: none"> Regional Scientific & Technical Committee 	Yr 1-4	National and Regional Coordination Meetings (budget line 3300)
4.3 Community-led planning of fisheries <i>refugia</i> management at priority locations in the South China Sea and Gulf of Thailand	Continuity of participation of community stakeholders in the planning, monitoring and evaluation of fisheries <i>refugia</i> management	Minimal stakeholder participation in planning of local actions to manage threats to fish stocks and critical habitats linkages	Quarterly meetings of Site-Based Management Boards	Local community action catalysed via establishment and operation of site-based management boards for fisheries <i>refugia</i> at 14 locations in the South China Sea and Gulf of Thailand	Management Board Terms of Reference and quarterly meeting reports (joint management decisions and participant lists)	<p>Biannually</p> <p>Biannually</p>	<p>National-level</p> <p>Regional-level</p>	<ul style="list-style-type: none"> National Scientific & Technical Committees Regional Scientific & Technical Committee 	Yr 1-4	National and Regional Coordination Meetings (budget line 3300)
4.4 Regional cooperation in the integration of scientific	Status of the RSTC and the uptake of the scientific and	Lack of a formal mechanism for the sharing	Biannual meetings of the RSTC	Regional Scientific and Technical Committee	RSTC Terms of Reference and annual meeting	Annually	Regional-level	<ul style="list-style-type: none"> Project Steering Committee 		National and Regional Coordination Meetings

Draft #14 UNEP Project Document

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 ¹⁹ (Object of expenditure & cost)
knowledge and research outputs with management and policy making	technical advice it provides Continuity of participation of members in annual meetings	of science and technical knowledge relating to fisheries <i>refugia</i>		(RSTC) established and functioning as a bridge between the scientific community and decision-makers for operation of a regional system of fisheries <i>refugia</i> [annual meetings	reports (documenting scientific and technical advice and participant lists)					(budget line 3300)
4.5 Regional cooperation in the establishment and operation of a regional system of fisheries <i>refugia</i>	Status of the PSC Continuity of participation of members in annual meetings	UNEP and GEF requirement for establishment of regional decision making and planning body for the project	Annual meetings of the PSC Completion of Annual Project Implementation Reviews	Project Steering Committee established and functioning to oversee and act as a principal decision making body for the project	PSC Terms of Reference and annual meeting reports (documenting joint decisions and participant lists)	Annually	Regionally	UNEP Task Manager	Yr 1-4	National and Regional Coordination Meetings (budget line 3300)
4.6 Effective coordination of regional and national-level activities and reporting requirements of UNEP and GEF satisfied	Program coordination unit recruited and staff retained	Executing agency has managed components of larger FAO/GEF projects but is yet to act as executing agency for GEF project of this	Timely and cost effective delivery of project outputs	Functioning regional Project Coordinating Unit (PCU) supporting the coordination of regional and national level activities associated with the	Terms of Reference and contracts for program coordination unit staff	Annually	Regionally	UNEP Task Manager		National and Regional Coordination Meetings (budget line 3300)

Draft #14 UNEP Project Document

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 ¹⁹ (Object of expenditure & cost)
		magnitude		establishment and operation of regional system of fisheries <i>refugia</i> and meeting reporting requirements of UNEP and the GEF						

2. Cost of acquisition of essential baseline data during first year of project: In support of the project activity to facilitate agreement among stakeholders on the boundaries of fisheries *refugia*, key threats to *refugia*, and priority management interventions for 14 sites in the South China Sea basin, national level activities are planned for Year 1 to develop fisheries and coastal habitat information and data collection programmes. These activities include: the review of existing information and data on fisheries and coastal habitats at the priority sites, including identification of the needs for management; consultation workshops to secure community and fisherfolk support in information and data collection; and the design and conduct of site-based survey to produce fisheries and habitat profile reports for the 14 priority sites. The outcomes of this work will be used to establish baseline conditions at each site, including information on institutional settings and barriers, and act as the basis for the harmonized national and regional results tracking and reporting system to be established by the project. A total of US\$110,600 of GEF grant funds (equivalent to US\$7,900 per site) has been allocated to this set of activities, whereas the equivalent combined commitment of national government co-financing for this acquisition of essential baseline data amounts to US\$704,167. The specific output of this set of activities will be the publication of fisheries *refugia* profile reports, including GIS maps and site characterisations, for each the 14 priority sites.

3. Cost of project inception workshop (please include proposed location, number of participants): Nil. The project preparation phase of this project involved six national and two regional consultation workshops. It was agreed during the regional validation workshop that, as the majority of inception tasks had been completed via this consultative process, any outstanding project inception issues would be considered as part of the 1st Project Steering Committee meeting. In addition to improving the cost-effectiveness of the project, it was further agreed during project preparation that omitting the need for separate inception workshop, would assist with the timely achievement of project results within the 4-year timeframe.

4. Cost of Mid-Term Review/Evaluation: US\$40,000

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	
Monitoring			
Preparation of the Overall Project Plan of Operations (PPO), Work-plans and Time-tables, budgets, Risk and IW indicator tables	SEAFDEC/PCU	Project Director	Project Document Resolutions of the Project Steering Committee Meetings
Preparation of individual country/regional work plans: Cambodia (C) Indonesia (I) Malaysia (M) Philippines (P) Thailand (T) Vietnam (V) Regional (R)	National Agency/Regional Project Coordination Unit: C: Department of Fisheries Conservation, Fisheries Administration I: Directorate General of Capture Fisheries, MMFA M: Department of Fisheries, Malaysia P: National Fisheries Research and Development Institute T: Department of Fisheries, Thailand V: Fisheries Administration, Vietnam R: PCU/SEAFDEC	National Focal Points & Project Director: C: Mr. Ouk Vibol I: Mr. Trian Yunanda M: Mr. Zulkifli Bin Talib P: Mr. Noel Barut T: Ms. Rattana Munprasit V: Mrs. Nguyen Thi Trang Nhung R: Project Director	Project Document Resolutions of the National Fisheries <i>Refugia</i> Committee Meetings Resolutions of the Project Steering Committee Meetings
Preparation of Overall Project Progress Reports	SEAFDEC/PCU UNEP-DEWA	Project Director UNEP Task Manager	Project Coordination Unit's reports to PSC & UNON
Preparation of country and regional component quarterly progress reports: Cambodia (C) Indonesia (I) Malaysia (M) Philippines (P) Thailand (T) Vietnam (V) Regional (R)	National Agency/Regional Project Coordination Unit: C: Department of Fisheries Conservation, Fisheries Administration I: Directorate General of Capture Fisheries, MMFA M: Department of Fisheries, Malaysia P: National Fisheries Research and Development Institute T: Department of Fisheries, Thailand V: Fisheries Administration, Vietnam R: PCU/SEAFDEC	National Focal Points & Project Director: C: Mr. Ouk Vibol I: Mr. Trian Yunanda M: Mr. Zulkifli Bin Talib P: Mr. Noel Barut T: Ms. Rattana Munprasit V: Mrs. Nguyen Thi Trang Nhung R: Project Director	Component Coordination Units reports to PSC and PCU

Draft #14 UNEP Project Document

M&E COMPONENT/ ACTIVITY	RESPONSIBILITY ASSIGNMENT		MEANS OF ASSESSMENT/ MONITORING/DATA SOURCE
	INSTITUTION/ AGENCY	PROJECT/ AGENCY OFFICER	
Preparation of Expenditure Statements (including co-financing): Cambodia (C) Indonesia (I) Malaysia (M) Philippines (P) Thailand (T) Vietnam (V) Regional (R)	National Agency/Regional Project Coordination Unit: C: Department of Fisheries Conservation, Fisheries Administration I: Directorate General of Capture Fisheries, MMFA M: Department of Fisheries, Malaysia P: National Fisheries Research and Development Institute T: Department of Fisheries, Thailand V: Fisheries Administration, Vietnam R: PCU/SEAFDEC	National Focal Points & Project Director: C: Mr. Ouk Vibol I: Mr. Trian Yunanda M: Mr. Zulkifli Bin Talib P: Mr. Noel Barut T: Ms. Rattana Munprasit V: Mrs. Nguyen Thi Trang Nhung R: Project Director	UNON-IMIS
Preparation of counterpart contribution reports: Cambodia (C) Indonesia (I) Malaysia (M) Philippines (P) Thailand (T) Vietnam (V) Regional (R)	National Agency/Regional Project Coordination Unit: C: Department of Fisheries Conservation, Fisheries Administration I: Directorate General of Capture Fisheries, MMFA M: Department of Fisheries, Malaysia P: National Fisheries Research and Development Institute T: Department of Fisheries, Thailand V: Fisheries Administration, Vietnam R: PCU/SEAFDEC	National Focal Points & Project Director: C: Mr. Ouk Vibol I: Mr. Trian Yunanda M: Mr. Zulkifli Bin Talib P: Mr. Noel Barut T: Ms. Rattana Munprasit V: Mrs. Nguyen Thi Trang Nhung R: Project Director	Reports on co-financing to the PSC

Draft #14 UNEP Project Document

M&E COMPONENT/ ACTIVITY	RESPONSIBILITY ASSIGNMENT		MEANS OF ASSESSMENT/ MONITORING/DATA SOURCE
	INSTITUTION/ AGENCY	PROJECT/ AGENCY OFFICER	
On-site supervision of Component Activities: Cambodia (C) Indonesia (I) Malaysia (M) Philippines (P) Thailand (T) Vietnam (V) Regional (R)	National Agency/Regional Project Coordination Unit: C: Department of Fisheries Conservation, Fisheries Administration I: Directorate General of Capture Fisheries, MMFA M: Department of Fisheries, Malaysia P: National Fisheries Research and Development Institute T: Department of Fisheries, Thailand V: Fisheries Administration, Vietnam R: PCU/SEAFDEC	National Focal Points & Project Director: C: Mr. Ouk Vibol I: Mr. Trian Yunanda M: Mr. Zulkifli Bin Talib P: Mr. Noel Barut T: Ms. Rattana Munprasit V: Mrs. Nguyen Thi Trang Nhung R: Project Director	On-site data collection
UNEP-DEWA Supervision Missions	PCU UNEP-DEWA	UNEP Task Manager	On-site data collection Mission reports
Evaluation			
Meetings of the PSC	SEAFDEC/PCU (acting as Secretariat of the Committee)	Project Director UNEP Task Manager	Minutes of the meetings of the PSC
Meetings of the RSTC	SEAFDEC/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 SEAFDEC/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

Establishment and Operation of a Regional System of Fisheries *Refugia* in 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:

- improved integration of habitat and biodiversity conservation considerations in the management of fisheries in the South China Sea and Gulf of Thailand;
- improved national management of the threats to fish stock and critical habitat linkages within fisheries *refugia*; and,
- enhanced uptake of good practice in integrating fisheries management and biodiversity conservation in the design and implementation of regional and national fisheries management systems.

The medium-term objectives align with those of the fisheries component of the Strategic Action Programme for South China Sea which are to:

- build the resilience of Southeast Asian fisheries to the effects of high and increasing levels of fishing effort;
- improve the understanding among stakeholders, including fisherfolk, scientists, policy-makers, and fisheries managers, of ecosystem and fishery linkages as a basis for integrated fisheries and ecosystem/habitat management; and
- build the capacity of fisheries departments/ministries to engage in meaningful dialogue with the environment sector regarding the improvement of fisheries and management of interactions between fisheries and critical marine habitats.

The indicators given in the project document for these stated objectives were:

- by 2018, to have established a regional system of a minimum of fourteen *refugia* for the management of priority transboundary, fish stocks and endangered species; and
- by 2018, to have prepared and implemented fisheries management systems in the identified priority *refugia* based on and consistent with, the ASEAN SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia.

Demonstration of the establishment and operational management of priority fisheries *refugia*

- Agreement among stakeholders on the boundaries of fisheries *refugia*, key threats to *refugia*, and priority management interventions for 14 sites in the South China Sea and Gulf of Thailand
- Community-based *refugia* management plans developed, adopted, and under implementation at 14 fisheries *refugia* sites
- Networks of management boards and community-based fisheries and habitat management volunteers for *refugia* management established at 14 fisheries *refugia* sites
- Community capacity programmes at 14 fisheries *refugia* sites, including participatory activities to monitor fish habitats within *refugia*, collect lost and abandoned fishing gear, and develop responsible fishing practices at the community level
- Operational partnership with the GEF Small Grants Programme to strengthen civil society and community organisation participation in the management of fisheries *refugia* at 14 sites

Strengthening the enabling environments for the management of a regional system of fisheries refugia

- Measures for the fisheries sector's sustainable use of fish habitats and biodiversity, and based on site-level models of ecosystem carrying capacity, incorporated in the fisheries policies of participating countries
- National guidelines on the use of fisheries *refugia* in integrating fisheries and habitat developed and endorsed by heads of national government departments responsible for fisheries and environment in the participating countries
- National policy, legal and planning frameworks for demarcating boundaries and managing refugia assessed and required reforms endorsed in the participating countries and reflected in an updated regional action plan
- Annual synthesis reports of new and additional information and data relating to the stocks of priority fish, crustaceans and molluscs and their habitats published in each country and disseminated at national and regional levels
- Establishment and population of 6 online national databases, and 1 regional database, of fish egg and larvae distribution and abundance in national waters and the SCS basin
- National and regional online Geographical Information Systems on fisheries and marine biodiversity featuring information on locations and management status of coastal habitats, fisheries *refugia*, MPAs, and critical habitats for threatened and endangered species
- Fisheries and habitat data collection programmes operational to characterise 14 priority *refugia* sites in the South China Sea and Gulf of Thailand
- Modelling system linking oceanographic, biochemical, and fish early life history information developed applied to improve regional understanding of fish early life history and links to critical habitats
- Best practice fishing methods and practices to address key threats to fish stock and critical habitat linkages demonstrated at priority *refugia*

Information and knowledge management

- Best practice approaches and measures for integrated fisheries and habitat management captured, documented and communicated nationally and regionally
- Public awareness and outreach programme to promote local social, economic and environmental benefits of fisheries *refugia* implemented at 14 priority locations in the South China Sea and Gulf of Thailand
- National knowledge management systems on the use of fisheries *refugia* in capture fisheries management established and operational
- Regional Education and Awareness Centre on fisheries and critical habitats established and operating as a facility for the production and sharing of information and education materials for *refugia* management
- Regional agreement on standardised information and data collection procedures in support of longer-term operation of a regional system of fisheries *refugia*, including design of stress reduction and environmental state indicators for managed *refugia*

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 to rebuild marine fisheries

Executing Arrangements

The implementing agency for this project was UNEP and the executing agency was: Southeast Asian Fisheries Development Centre (SEAFDEC)

The lead national agencies in the focal countries were:

The Fisheries Administration of Cambodia,

The Directorate General of Capture Fisheries (Indonesia),

The Department of Fisheries (Malaysia),

The National Fisheries Research and Development Institute (Philippines),

The Department of Fisheries (Thailand), and

The Fisheries Administration of Viet Nam,

Project Activities

The project comprised activities grouped in four components.

Component 1 will result in the establishment of operational management at 14 priority fisheries *refugia*, with community-based *refugia* management plans being key outputs. Supporting activities include consultative processes to facilitate agreement among stakeholders on the boundaries of fisheries *refugia*, identification of key threats to *refugia* sites, recording of fishing community views regarding appropriate fisheries and habitat management measures, and eliciting stakeholder inputs to management plan review. *Refugia* management plans will provide rules *inter alia* on operating requirements for the use of particular classes of fishing vessels or fishing gear within *refugia*, procedures for adjusting management measures over time, and mechanisms for enforcement. Specific direction is given to drafting of regulations and ordinances required in support of plan implementation.

Component 2 focuses on strengthening the enabling environment for the formal designation and operational management of *refugia*. Preparatory activities include legal reviews to identify, *inter alia*: legal terminology for describing *refugia*; formal procedures for demarcating boundaries of spatial management areas such as *refugia*, including requirements for assessing the socio-economic impacts of management measures and stakeholder consultation; and provisions for decentralising *refugia* management to the community level via development of co-management and rights-based approaches. These national reviews are aimed at informing the drafting of required policy and legislative amendments for adoption by competent authorities. This component will also build the national and site-level science and information base required to inform the monitoring and evaluation of the effectiveness of individual *refugia* and the regional network of sites.

Component 3 focuses on strengthening information management and dissemination aimed at enhancing the national uptake of best practices in integrating fisheries management and biodiversity conservation, and in improving community acceptance of area based approaches to fisheries and coastal environmental management. Supporting activities involve the development of national knowledge management systems on the use of fisheries *refugia* in capture fisheries management, and the establishment of a Regional Education and Awareness Centre that will operate as a facility for the production and sharing of information and education materials on fisheries and critical habitat linkages in the South China Sea. Importantly, Component 3 will support the development of indicators to monitor the effectiveness of coastal fisheries management systems established for priority fisheries *refugia*. A regional programme for the compilation of standardised fisheries statistics for use in identifying and managing fisheries *refugia* will also be developed to support longer-term management.

At the national-level, Component 4 will strengthen cross-sectorial coordination for integrated fisheries and environmental management and will harness the national scientific and technical expertise and knowledge required to inform the policy, legal and institutional reforms for fisheries *refugia* management in the participating countries. Local community action and strengthened 'community to cabinet' linkages will be facilitated via establishment and operation of site-based management boards for fisheries *refugia* at the 14 priority locations in the South China Sea. Regionally, Component 4 will foster regional cooperation in: the establishment and operation of a regional system of fisheries *refugia*; and in the integration of scientific knowledge and research outputs with management and policy making. This component also includes project coordination and management activities aimed

at: ensuring the timely and cost effective implementation of regional and national-level activities; and satisfying the reporting requirements of UNEP and the GEF.

Budget

At project inception the following budget prepared:

	<u>GEF</u>	<u>Co-funding</u>
Project preparation funds:	100,000	100,000
GEF full Size Grant	3,000,000	12,717,850
TOTAL (including project preparation funds)	3,100,000	12,817,850

Co-funding sources: National governments of the six participating countries and the Southeast Asian Fisheries Development Centre

Anticipated: US\$12,817,850

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 SEAFDEC Project Director and Secretary General 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 visits²¹ 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 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.²²

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

²¹ Evaluators should make a brief courtesy call to GEF Country Focal points during field visits if at all possible.

²² However, the views and comments expressed by the evaluator need not be restricted to these items.

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:

- *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 fisheries *refugia* 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 / drivenness:

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 1* 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 and SEAFDEC

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

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

With a copy to:

Brennan Van Dyke
Deputy Director, Office for Operations
Director, Donor Partnerships, GEF Coordination and Contributions
Email: 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

The Final evaluation will also be copied to the following GEF National Focal Points.

Cambodia
Mr. Lonh HEAL
Operational Focal Point since 2005-01-14
Technical Director General
Ministry of Environment
48 Samdech Preah Sihanouk Tonle Bassac Chamkarmon
Phnom Penh,
Cambodia
Tel:+ 855 12 923 526/ 011 855 129 27001
Fax:011 855 23 987 880
Email:heal_lonhmoe@yahoo.com

Indonesia
Ms. Tuti Hendrawati MINTARSIH
Operational Focal Point since 2014-07-25
Senior Advisor to the Minister on Law and Institutional Relations
Ministry of Environment
Jalan D.I. Panjaitan, Kav. 24
Jakarta, DKI Jakarta 13410
Indonesia
Tel:+ 62 21 858 0109/ 858 0066
Fax:+ 62 21 858 0109/ 858 0066
Email:THM126@yahoo.com, gefsecindonesia@gmail.com

Malaysia
Dr. Gary William THESEIRA
Operational Focal Point since 2014-09-25
Deputy Undersecretary

Ministry of Natural Resources and Environment
Environmental Management and Climate Change Division, No. 25, Jalan Persiaran Perdana,
Presint 4
Putrajaya, Putrajaya 62574
Malaysia
Tel:+ 603 8886 1131, + 603 8886 132
Fax:011 603 8888 4473
Email:gtheseira@nre.gov.my, gtheseira.nre@l.govuc.gov.my

Philippines

Ms. Analiza REBUELTA - TEH

Operational Focal Point since 2009-05-04
Undersecretary
Department of Environment and Natural Resources
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Fax:011 632 926 8074, + 632 926 8065
Email:analiza@denr.gov.ph, tehanna08@gmail.com, tehanna17@yahoo.com

Thailand

Mrs. Mingquan WICHAYARANGSARIDH

Operational Focal Point since 2014-07-16
Permanent Secretary
Ministry of Natural Resources and Environment
92 Soi Phahon Yothin 7 Phahon Yothin Road
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Tel:+ 662 278 8542-4
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bee.wacharee@gmail.com

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
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Tel:+ 84 4 3795 6868 ext. 1189
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The final evaluation report will be published on the Evaluation and Oversight Unit's web-site 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 **ddmmyyy** and end on **ddmmyyyy** (# days) spread over # weeks (# days of travel, to {country(ies)}, and # days desk study). The evaluator will submit a draft report on **ddmmyyyy** 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 **ddmmyyyy** after which, the consultant will submit the final report no later than **ddmmyyyy**.

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
A. Attainment of project objectives and results (overall rating) Sub criteria (below)		
A. 1. Effectiveness		
A. 2. Relevance		
A. 3. Efficiency		
B. Sustainability of Project outcomes (overall rating) Sub criteria (below)		
B. 1. Financial		
B. 2. Socio Political		
B. 3. Institutional framework and governance		
B. 4. Ecological		
C. Achievement of outputs and activities		
D. Monitoring and Evaluation (overall rating) Sub criteria (below)		
D. 1. M&E Design		
D. 2. M&E Plan Implementation (use for adaptive management)		
D. 3. Budgeting and Funding for M&E activities		
E. Catalytic Role		
F. Preparation and readiness		
G. Country ownership / drivenness		
H. Stakeholders involvement		
I. Financial planning		
J. Implementation approach		
K. UNEP Supervision and backstopping		

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* (mill US\$)		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 (*)										
-										
-										
-										
-										
Totals										

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:

GEF Report Quality Criteria	UNEP EOU Assessment	Rating
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?		
UNEP EOU additional Report Quality Criteria	UNEP EOU Assessment	Rating
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.

Annex 4 to Appendix 9

GEF Minimum requirements for M&E

Minimum Requirement 1: Project Design of M&E²³

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.

²³ <http://gefweb.org/MonitoringandEvaluation/MEPoliciesProcedures/MEPTools/meptstandards.html>

SMART INDICATORS GEF projects and programs should monitor using relevant performance indicators. The monitoring system should be “SMART”:

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

The management framework for this project, depicting the inter-linkages of national and regional structures and decision making processes, is provided below in Figure 1. A key feature of this framework is the establishment of a project management structure that provide a clear separation between discussions of scientific and technical matters from discussion dealing with policy and principles at both the national and regional levels. This separation is aimed at facilitating clarity in discussions and decision-making at both scientific/technical and decision-making levels, specifically to ensure that scientific and technical considerations do not become obfuscated by political discussions. This key design principle aims to enable scientific and technical issues to be discussed and analyzed in a strictly operational context by scientists and managers from the participating countries, leading to recommendations being made to the policy level decision-making bodies (both nationally and regionally) that are solely based on the best available, scientific and technical, data and information. Additionally, the national coordination mechanisms are designed to facilitate cross-sectorial coordination and to catalyze community –led planning of actions for integrated fisheries and habitat management at the local level.

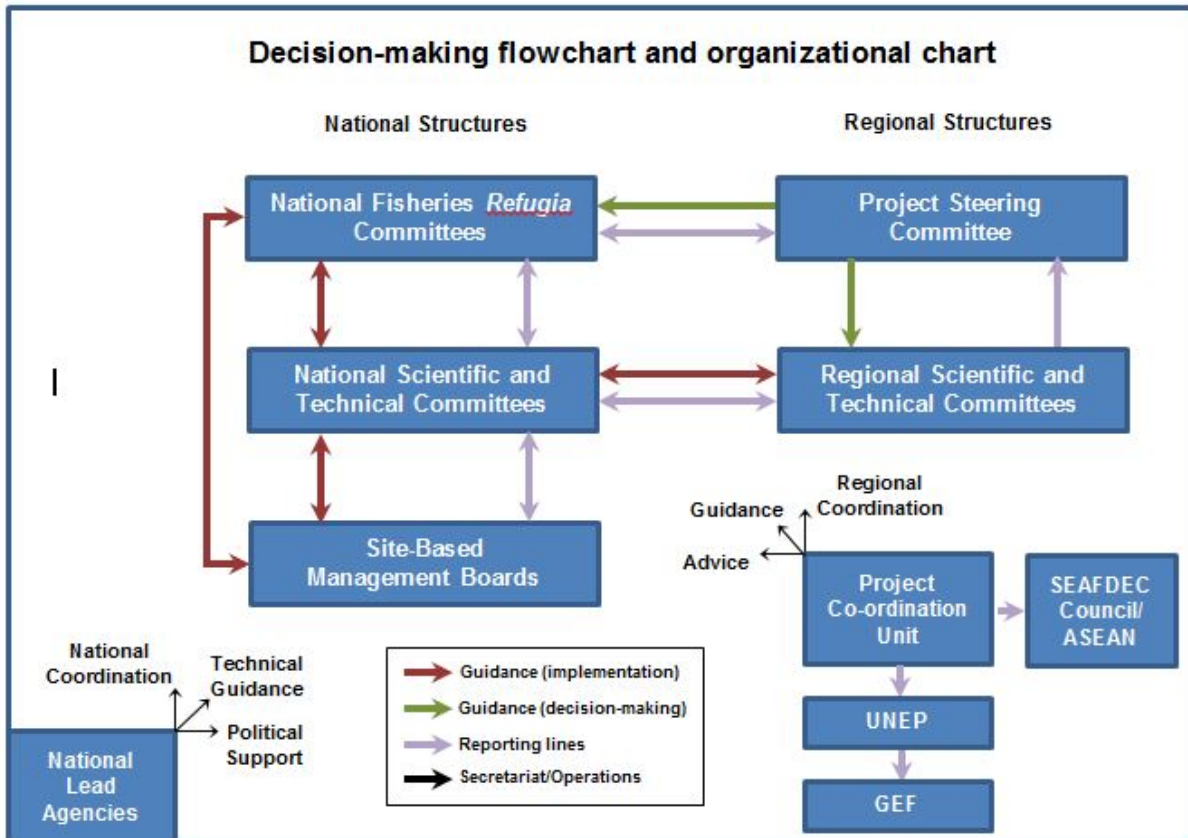


Figure 1 Project management framework for the fisheries *refugia* project

Key organs of this framework include: the Project Steering Committee; Regional Scientific and Technical Committee; the National Fisheries *Refugia* Committees; National Scientific and Technical Committees; and the Site-Based Management Boards. The National Lead Agencies and Project Co-ordinating Unit serve national and regional level coordination functions, respectively. Provisional Terms of Reference for each of these bodies were developed during project preparation and are included Appendix 11 of the regional UNEP project document.

Appendix 11: Terms of Reference

PROVISIONAL TERMS OF REFERENCE FOR THE PROJECT STEERING COMMITTEE

1. RATIONALE AND PURPOSE OF THE PROJECT STEERING COMMITTEE

1.1 To facilitate the achievement of the goals and objectives of the SEAFDEC/UNEP/GEF project entitled “*Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand*”, a Project Steering Committee (PSC) will be established as the primary policy-making body for the project.

1.2 The PSC’s role will be to provide managerial and governance advice to the project, and to guide the Project Coordination Unit (PCU) of the Southeast Asian Fisheries Development Center (SEAFDEC) in the implementation and monitoring of the overall regional project. The PSC 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 PSC, agree on meeting procedures, and finalise Terms of Reference for the PSC.

2. THE PROJECT STEERING COMMITTEE SHALL:

2.1 Provide direction and strategic guidance to the Project Co-ordinating Unit (PCU) 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 Project Co-ordinating Unit (PCU) regarding the outputs and outcomes of project activities;

2.4 Assist the Project Co-ordinating Unit in ensuring co-ordination among national site-based activities and other national level activities to further enhance national capacity to develop integrated approaches fisheries and environmental management;

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 SEAFDEC Council, the Implementing Agency UNEP and the GEF Secretariat;

2.8 Assist the PCU in leveraging required project co-financing and additional funds that may be required from time to time;

2.9 Work with the PCU and National Lead Agencies in mainstreaming integrated fisheries and environmental management 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 PROJECT STEERING COMMITTEE

3.1 Full members of the Project Steering Committee (PSC) 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, National Fisheries *Refugia* Committee; the other shall be the Chairperson of the National Scientific and Technical Committee;

3.2 The UNEP Task Manager will participate as an observer in PSC meetings;

3.3 The PSC 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 PSC 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 COMMITTEE

4.1 The Project Director of SEAFDEC's PCU shall act as Secretary to the meetings of the Committee.

4.2 Other staff of SEAFDEC's PCU may provide Secretariat and technical support to the meetings of the PSC as required.

5. MEETINGS OF THE COMMITTEE

5.1 The PCU shall convene regular annual meetings of the RSC 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 Project Co-ordinating Unit; and at the request of the Project Co-ordinating Unit when circumstances demand.

6. CONDUCT OF 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 SEAFDEC/UNEP/GEF project entitled “*Establishment and Operation of a Regional System of Fisheries Refugia in 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 Project Steering Committee.

1.2 The RSTC will also be responsible for ensuring that scientific and technical aspects of the fisheries *refugia* project meet International standards. Specifically, it will review the substantive activities of the project to: (1) identify and manage fisheries and critical habitat linkages at priority fisheries *refugia* in the South China Sea and Gulf of Thailand; (2) improve the management of critical habitats for fish stocks of transboundary significance via national and regional actions to strengthen the enabling environment and knowledge-base for fisheries *refugia* management; (3) enhance information management and dissemination in support of national and regional-level implementation of the fisheries *refugia* concept; and (4) strengthen national and regional cooperation and coordination in the operation of a regional system of fisheries *refugia*.

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 Project Steering Committee regarding matters requiring decision and shall provide direction and strategic guidance to the national level activities of the fisheries *refugia* initiative 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 fisheries *refugia* project;

3.1.2 Review and evaluate, from a scientific and technical perspective, progress in implementation of the fisheries *refugia* project, and provide guidance for improvement when necessary;

3.1.3 Provide the Project Steering Committee with recommendations on proposed regional activities, work plans, and budgets;

3.1.4 Provide the Project Steering Committee with technical guidance and suggestions to improve project activities where necessary, including reforms of national and regional policy and planning frameworks for integrated approaches to fisheries and environmental management;

3.1.5 Facilitate co-operation with relevant international, regional, and national organisations and projects to enhance the effectiveness and efficiency of the fisheries *refugia* initiative;

3.1.6 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 fisheries *refugia* 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 the operation of a regional system of *refugia*;

3.2.3 Receive, review, and comment on drafts of national policies and/or action frameworks; and

3.2.3 Advise the regional Project Coordinating Unit and National Focal Points of the need for public awareness and information materials concerning integrated approaches to fisheries resource and environmental management in the South China Sea and Gulf of Thailand.

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 and Scientific Committees (NTSC); a representative of SEAFDEC; up to 5 selected regional experts; and the Project Director of SEAFDEC's PCU.

4.2 SEAFDEC's PCU, in consultation with National 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 Regional Project Steering Committee at which they shall present the reports and recommendations of the RSTC.

5. SECRETARIAT

5.1 The regional Project Co-ordinating Unit shall act as Secretariat to the RSTC and shall ensure that reports of the meetings are circulated to all members of the regional Project Steering Committee.

6. MEETINGS OF THE REGIONAL SCIENTIFIC AND TECHNICAL COMMITTEE

6.1 The regional Project Coordinating 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.

TERMS OF REFERENCE FOR THE PROJECT CO-ORDINATING UNIT

1. RATIONALE AND PURPOSE OF A PROJECT CO-ORDINATING UNIT

The Project Co-ordinating Unit (PCU) for the UNEP/GEF Project entitled: “*Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand*” is established under the Project Document paragraph 124 as approved by the collaborating institutions and organisations during the project preparation phase as follows:

A regional Project Co-ordinating Unit (PCU) will be established within the Southeast Asian Fisheries Development Center for: overall coordination and supervision of the execution of the SEAFDEC/UNEP/GEF project entitled “*Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand*” in line with the policy and administrative guidelines provided by the GEF, UNEP and SEAFDEC. The PCU will be led by a Project Director and shall provide quality technical support, guidance and advice on the fisheries *refugia* initiative in the South China Sea.

2. ROLE AND FUNCTION

The PCU will be responsible for: overall leadership, management and technical oversight of the fisheries *refugia* 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 SEAFDEC’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 Project Steering Committee, National Fisheries *Refugia* Committees, National Focal Points, the UNEP Task Manager and relevant donors;
- 3.3 Provide Secretariat support to both the Project Steering Committee and Regional Scientific and Technical Committee;
- 3.4 Coordinate and monitor the activities described in the work plan, and report to UNEP and the regional Project Steering 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 *refugia* 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;
- 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 fisheries *refugia* project;
- 3.8 Coordinate and oversee the preparation of the substantive and operational reports for the fisheries *refugia* project;
- 3.9 Collect and disseminate information on policy, economic, social, scientific, and technical issues related to operation of a regional system of fisheries *refugia*;
- 3.10 Promote public awareness and stakeholder engagement activities necessary for successful fisheries *refugia* 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 fisheries *refugia* project to ensure effective communication with national governments, SEAFDEC Council, UNEP and the GEF.

4. MANAGEMENT OF THE PROJECT CO-ORDINATING UNIT

4.1 The Project Co-ordinating Unit will be led by a Project Director. He/she shall liaise directly with the National Focal Points and other relevant bodies and stakeholders where 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 the Secretary General and other representatives of SEAFDEC and report directly to the Secretary General of SEAFDEC and to the UNEP Task Manager. The position of Project Director encompasses the following major functions:

- Leadership, management and technical oversight of the fisheries *refugia* project;
- Regional project governance and monitoring;
- Policy/technical advice and advocacy;
- Regional and national coordination, partnership and networking; and
- External communication

4.3 A Project Accountant of SEAFDEC will be assigned to work under the direct supervision of the Project Director. The Project Accountant will: assist in the collation of project financial information and financial reporting to UNEP and the GEF; prepare draft budget revisions and working budgets in consultation with the Project Director; assist the Project Director to prepare budget and financial statements for Project Steering Committee meetings and regularly brief the PCU on the financial status of the project; serve as an expert resource for the various committees and working groups of the project on financial reporting requirements; and provide will provide support to the PCU and the national teams on efficient and effective financial management, including training support.

4.4 Additionally, a Project Administrator of SEAFDEC will be assigned to work under the direct supervision of the Project Director. He/She will be responsible for the overall provision of administrative assistance and support across all aspects of the project. This will include: provision of administrative and technical support for the organisation of meetings/conferences; developing and maintaining the project's filing system (electronic and hardcopies of all inward and outward communications); liaison with the National Lead Agencies on asset procurement and maintenance to ensure transparent and efficient procurement and operations of project assets; providing logistical support to the conduct of project activities (workshops, stakeholder consultations, arrangements of study tours, etc.); and arrange and organise travel for project staff.

5. APPOINTMENT OF THE REGIONAL PROJECT DIRECTOR

Decision-making regarding the selection and recruitment of this post will be made jointly by the UNEP Task Manager and SEAFDEC. Selection criteria identified during project preparation are outlined below.

The selected candidate will have:

5.1 At least ten 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: fisheries science and management, coastal policy and planning, and/or ecology;
- 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.

**PROVISIONAL TERMS OF REFERENCE FOR THE
NATIONAL FISHERIES *REFUGIA* COMMITTEES**

1. RATIONALE AND PURPOSE OF THE NATIONAL FISHERIES *REFUGIA* COMMITTEES

The National Fisheries *Refugia* Committees shall operate on the basis of consensus to:

1. Assume overarching responsibility for the execution of national level activities of the SEAFDEC/UNEP/GEF Fisheries *Refugia* Project [Insert Country Name];
2. Receive, review, and approve reports from the Fisheries *Refugia* Management Boards regarding the outputs and outcomes of efforts to establish and manage fisheries *refugia* sites;
3. Meet on a quarterly basis during the operational phase of the project to guide the timely execution of project activities, particularly activities at the individual *refugia* sites, and to consider, amend and endorse quarterly work-plans, narrative progress and financial reports for submission to the regional Project Coordinating Unit;
4. Provide direction and strategic guidance to the National Lead Agency and site-based management boards for individual *refugia* sites on the national and local reforms to enhance the uptake of the fisheries *refugia* approach and strengthen the integration of fisheries and environmental management;
5. Review planned and ongoing fisheries and environment projects being operated along the South China Sea coast of the Philippines with the aim of minimising duplication of efforts, and to identify opportunities for cooperation and the sharing of examples of best practices in integrated fisheries and environmental management;
6. Assess stakeholder involvement in fisheries and environmental management and to 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 fisheries *refugia* project and other National, provincial and municipal activities in fisheries and environmental management;
8. Approve annual progress reports for transmission to the SEAFDEC Council, UNEP and the GEF Secretariat;
9. Assist the national lead agency and focal point 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 SCIENTIFIC AND TECHNICAL COMMITTEES**

1. RATIONALE AND PURPOSE OF THE NATIONAL SCIENTIFIC AND TECHNICAL COMMITTEES

The National Scientific and Technical Committee shall operate on the basis of consensus to:

1. Review and co-ordinate national scientific and technical activities of the SEAFDEC/UNEP/GEF Fisheries *Refugia* Project in [country name];
2. Review and evaluate, from a scientific and technical perspective, progress in the establishment of fisheries *refugia* sites, and provide guidance for improvement when necessary;
3. Provide the National Fisheries *Refugia* Committee with recommendations on proposed national and site-based activities, work plans, and budgets;
4. Provide the National Fisheries *Refugia* Committee 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 identifying and managing fisheries *refugia* 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 the fisheries *refugia* sites and oversee the national synthesis of this information to identify overall needs and priorities for individual sites and networks of *refugia* sites 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
SITE-BASED MANAGEMENT BOARDS**

The Site-Based Fisheries *Refugia* Management Boards shall operate on the basis of consensus to:

1. Meet on a monthly basis during the project inception period and a quarterly basis thereafter to guide the timely execution of activities to establish and operate fisheries *refugia*;
2. Receive, review and approve reports from the Fisheries *Refugia* Management Team regarding the outputs and outcomes of project activities;
3. Assist the Fisheries *Refugia* Management Team in ensuring co-ordination among the fisheries *refugia* project and other local activities undertaken during the course of the project to further enhance local capacity to strengthen the integration of fisheries and habitat management;
4. Review stakeholder involvement in project activities and take action where necessary to ensure appropriate levels of government, NGO, community, and private sector engagement;
4. Ensure compatibility between the recommendations for action at the fisheries *refugia* site with other local level activities for fisheries and coastal habitat management;
5. Review and evaluate, at the site level, progress in implementation of the project, and provide guidance for improvement to the Fisheries *Refugia* Management Team and National Fisheries *Refugia* Committee;
6. Approve quarterly progress reports for transmission to the meetings of the National Fisheries *Refugia* Committee;
7. Facilitate the approval and implementation by the competent municipal authority, management plans and courses of action developed during the course of project execution;
8. Assist the Fisheries *Refugia* Management Team in leveraging required project co-financing and additional funds that may be required from time to time;
9. Work with the Fisheries *Refugia* Management Team in identifying best practices for replication and scaling-up as well as the mainstreaming of the fisheries *refugia* approaches at the local level; and
10. Agree at their first meeting:
 - a) the membership, meeting arrangements, and terms of reference of the committee
 - b) such standing orders and manner of conducting business as may be considered necessary by the committee.

TERMS OF REFERENCE FOR THE NATIONAL LEAD AGENCIES

The National Lead Agencies shall:

1. Assume overall responsibility for the execution of the national-level activities of the SEAFDEC/UNEP/GEF Fisheries *Refugia* Project in accordance with the National Project Document and regional UNEP Project Document;
2. Provide Secretariat support to the operation of the National Fisheries *Refugia* Committee (NFRC) and the National Scientific and Technical Committee (NSTC) and convene quarterly and biannual meetings of these bodies, respectively;
3. Nominate a National Focal Point to (a) act as the main point of contact with SEAFDEC, UNEP, Chairs of the NFRC, NSTC and site based management boards, and (b) participate in annual regional Project Steering Committee meetings;
4. Plan and implement activities based on the results framework, work plan and timetable contained in the National Project Documents aimed at achieving the national-level goals and objectives for the SEAFDEC/UNEP/GEF Fisheries *Refugia* Project;
5. Prepare and facilitate endorsement, by the National Fisheries *Refugia* Committee (NFRC), of 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 at SEAFDEC 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 NFRC and subsequent submission to the Project Director at SEAFDEC 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 establish operational management of priority fisheries *refugia* sites;
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 National Project Document and costed work plans endorsed by the National Fisheries *Refugia* Committee. For each disbursement, proper supporting documentation shall be maintained, including original invoices, bills, and receipts pertinent to the transaction.
10. Provide SEAFDEC with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of SEAFDEC.UNEP/GEF project funds;
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 integrated fisheries and habitat management generated through this project; and
13. Ensure that the work of the parties under this agreement is suitably promoted as part of the SEAFDEC/UNEP/GEF Fisheries *Refugia* Project, including labelling of outputs with agreed logos.

Appendix 12: Co-financing commitment letters from project partners



KINGDOM OF CAMBODIA
Nation Religion King

Ministry of Agriculture,
Forestry and Fisheries
Fisheries Administration
N°.....1229..... FiA

Phnom Penh 09 June, 2014

To: **Ms. Isabelle Van der Beck**
Portfolio Manager, GEF International Waters
900, 17th Street NW, Washington, D.C. - 20006
Tel: +1-202-974-1314
E-mail: isabelle.vanderbeck@unep.org

Subject: Letter of Commitment for Co-financing to the SEAFDEC/UNEP/GEF Project entitled "Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and the Gulf of Thailand"

Dear Ms. Isabelle Van der Beck,

As the National Agency for the above mentioned project in Cambodia, the Fisheries Administration is pleased to inform you that co-financing for the project has been secured as follows:

1. Co-financing in kind:	US\$ 1,473,235
2. Co-financing in cash:	US\$ 65,488

Total: US\$ 1,538,723

We look forward to ongoing collaboration with UNEP to ensure the successful implementation of this important project.

Mine sincerely,




Prof. Nao Thuok, Ph. D.
Director-General of Fisheries Administration
SEAFDEC Council Director for Cambodia

Copy to: Dr. Chumnarn Pongsri
Secretary General, SEAFDEC
P.O. Box 1046 Kasetsart Post Office
Bangkok, 10903, Thailand
Phone: +66 2940 6326
Fax: +66 2940 6336
E-mail: sg@seafdec.org

Fisheries Administration, # 186, Preah Norodom Blvd., P.O. Box 582, Phnom Penh, Cambodia
Tel: (855-23) 215 796, Fax: (855-23) 215 470, E-mail: nuov@mobilnet.com.kh, www.fia.gov.kh



**MINISTRY OF MARINE AFFAIRS AND FISHERIES
REPUBLIC OF INDONESIA**

DIRECTORATE GENERAL OF CAPTURE FISHERIES
Mina Bahari 2 Building 12th floor, Jl. Medan Merdeka Timur no.16 - JAKARTA
Phone: +62-21-3519070/Fax: +62-21-3521781 www.kkp.go.id

Jakarta, 28 May 2014

To: Ms. Isabelle Van der Beck
Portfolio Manager, GEF International Waters
900, 17th Street NW, Washington, D.C. – 20006
Tel: +1-202-974-1314
E-mail: isabelle.vanderbeck@unep.org

**Subject: Letter of Commitment for Co-financing to the SEAFDEC/UNEP/GEF Project entitled
"Establishment and Operation of a Regional System of Fisheries Refugia in the South China
Sea and the Gulf of Thailand"**

Dear Ms. Isabelle Van der Beck,

As the National Agency for the abovementioned project in Indonesia, Directorate General of Capture Fisheries, Ministry of Marine Affairs and Fisheries, is pleased to inform you that co-financing for the project has been secured as follows:

1. Co-financing in kind	:	US\$ 609.107
2. Co-financing in cash	:	US\$ 581.776
Total	:	US\$ 1.190.883

We look forward to ongoing collaboration with UNEP to ensure the successful implementation of this important project.

Yours sincerely,

Dr. Abdur Rauf Sam.
Secretary of Directorate General of Capture Fisheries
Ministry of Marine Affairs and Fisheries

Copy to: Dr. Chumnarn Pongsri
Secretary General, SEAFDEC
P.O. Box 1046 Kasetsart Post Office
Bangkok, 10903, Thailand
Phone: +66 2940 6326
Fax: +66 2940 6336
E-mail: sg@seafdec.org



DIRECTOR GENERAL
Department of Fisheries Malaysia
Ministry of Agriculture and Agro-Based Industry Malaysia
Level 1-6, Wisma Tani, 4G2,
No. 30, Persiaran Perdana, Presint 4,
Federal Government Administrative Center,
62628 PUTRAJAYA,
MALAYSIA.



Tel: 603-8870 4212
Fax: 603-8889 1195
Official Portal: www.dof.gov.my

Our Ref. : Prk.ML(S)-10/02/58 (1)
Date : 15 October 2014

Ms. Isabelle Van der Beck
Portfolio Manager, GEF International Waters
900, 17th Street NW, Washington, D.C. – 20006
Tel: +1-202-974-1314
E-mail: isabelle.vanderbeck@unep.org

Dear Sir/Mdm,

LETTER OF COMMITMENT FOR CO-FINANCING TO THE SEAFDEC/UNEP/GEF PROJECT ENTITLED "ESTABLISHMENT AND OPERATION OF A REGIONAL SYSTEM OF FISHERIES REFUGIA IN THE SOUTH CHINA SEA AND THE GULF OF THAILAND"

The matter mentioned above refers.

2. The Department of Fisheries Malaysia being the responsible agency for the execution of the abovementioned project in Malaysia is pleased to inform you that we are committed to co-finance the project as follows:

1. Co-financing in kind	:	US\$ 443,424
2. Co-financing in cash	:	US\$ 92,500
Total	:	US\$ 535,924

We look forward to ongoing collaboration with UNEP to ensure the successful implementation of this important project.

Yours sincerely,

(DATO' HJ. ISMAIL BIN ABU HASSAN)
Deputy Director General
Department of Fisheries Malaysia and
SEAFDEC Alternate Council Director for Malaysia

c.c SEAFDEC National Coordinator for Malaysia
Director, FRI, Pulau Pinang
Director of Capture Fisheries Research Division, FRI Kampung Acheh,
Secretary General, SEAFDEC

PERIKINAN PRODUKTIF MENJANA TRANSFORMASI



Republic of the Philippines
Department of Agriculture
NATIONAL FISHERIES RESEARCH AND DEVELOPMENT INSTITUTE
Corporate 101 Bldg. Mother Ignacia Street, South Triangle, Quezon City
Tel. 352 3596 –Website:www.nfrdi.da.gov.ph



June 16, 2014

TO: MS. ISABELLE VAN DER BECK
Portfolio Manager, GEF International Waters
900, 17th Street NW, Washington, D.C. – 20006
Tel: +1-202-974-1314
E-mail: isabelle.vanderbeck@unep.org

Subject: Letter of Commitment for Co-financing to the SEAFDEC/UNEP/GEF Project entitled "Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and the Gulf of Thailand"

Dear Ms. Isabelle Van der Beck,

As the National Agency for the above-mentioned project in the Philippines, the Bureau of Fisheries and Aquatic Resources-National Fisheries Research and Development Institute (BFAR-NFRDI) is pleased to inform you that co-financing for the project has been secured over the 4-year implementation of the project in the Philippines as follows:

1. Co-financing in kind:	USD 647,300.00
2. Co-financing in cash:	USD 203,880.00
Total:	USD 851,180.00

We look forward to ongoing collaboration with UNEP to ensure the successful implementation of this important project.

Yours sincerely,


MELCHOR M. PAYAMEN
Officer-in-Charge

"Ensuring Sustainable Fisheries Through Research and Development"





No. 0500.1/ 7502

Department of Fisheries
Kasetsart University Campus
Bangkok 10900, Thailand
Tel: 662-5620540
Fax: 662-5620571

11 November, 2014

Dear Ms. Isabelle Van der Bec,
Subject : Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand”

As the National Agency of Thailand for the “Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand Project”, the Department of Fisheries is pleased to inform you that co-financing for the project has been secured as follows:

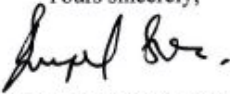
1. Co-financing in kind : US\$783,888
2. Co-financing in cash : US\$129,800

Total : US\$913,688

(Nine hundred thousand six hundred and eighty eight dollars only)

We look forward to ongoing collaboration with UNEP to ensure the successful implementation of this important project.

Yours sincerely,


(Dr. Joopool Sanguansin)
Director General
Department of Fisheries

To: Ms. Isabelle Van der Beck
Portfolio Manager, GEF International Waters
900, 17th Street NW, Washington, D.C. – 20006
Tel: +1-202-974-1314 E-mail: isabelle.vanderbeck@unep.org

Copy to: Dr. Chumnam Pongsri
Secretary General, SEAFDEC
P.O. Box 1046 Kasetsart Post Office Bangkok, 10903, Thailand
Phone: +66 2940 6326 Fax: +66 2940 6336 E-mail: sg@seafdec.org



THE MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT OF S.R.VIETNAM
DIRECTORATE OF FISHERIES (D-DISH)

Address: 10 Nguyen Cong Hoan, Ba Dinh, Hanoi, Vietnam
Tel: (84-4) 37716299 Fax: (84-4) 37345120/37245374



Hanoi, 26 May 2014

To: Ms. Isabelle Van der Beck
Portfolio Manager, GEF International Waters
900, 17th Street NW, Washington, D.C. – 20006
Tel: +1-202-974-1314
E-mail: isabelle.vanderbeck@unep.org

**Subject: Letter of commitment for Co-financing to the SEAFDEC/UNEP/GEF Project entitled
“Establishment and Operation of a Regional System of Fisheries Refugia in the South
China Sea and the Gulf of Thailand”**

Dear Ms. Isabelle Van der Beck,

As the National Agency for the above mentioned Project in Vietnam, the Directorate of Fisheries (D-FISH) is pleased to inform you that co-financing for the project has been secured as follows:

- | | |
|--------------------------|----------------|
| 1. Co-financing in-kind: | US\$ 1,079,852 |
| 2. Co-financing in cash: | US\$ 75,200 |
| Total: | US\$ 1,155,052 |

Amount in words: One million one hundred and fifty five thousand fifty two dollars only.

We look forward to ongoing collaboration with UNEP to ensure the successful implementation of this important project.

Sincerely yours,

Dr. Pham Anh Tuan
Deputy Director, Directorate of Fisheries (D-FISH)

Copy to: Dr. Chumnarn Pongsri
Secretary General, SEAFDEC
P.O. Box 1046 Kasetsart Post Office
Bangkok, 10903, Thailand
Phone: +66 2940 6326
Fax: +66 2940 6336
E-mail: sg@seafdec.org



SOUTHEAST ASIAN FISHERIES DEVELOPMENT

TRAINING DEPARTMENT

Secretariat
P.O. Box 1046
Kasemart Post Office
Bangkok 10003,
Thailand
Tel: +66 (0) 2940 6336
Fax: +66 (0) 2940 6336
<http://www.seafdec.org>

Training Department (TD)
P.O. Box 97, Phrasornthadi,
Samut Prakan 10290
Thailand
Tel: +66 (0) 2425 6100
Fax: +66 (0) 2425 6110
+66 (0) 2425 6111
<http://td.seafdec.org>

**Marine Fisheries Research
Department (MFRD)**
2 Parala Road
Off Lim Chu Kang Road,
Singapore 718915
Tel: +65 6790 7973
Fax: +65 6861 3196
<http://www.fishandfryinfo.com>

**Aquaculture Department
(AQD)**
Tighenan, 5021 Bolo,
Philippines
Tel: +633 3335-1009,
+633 336 2963
Fax: +633 3335-1008
<http://www.seafdec.org.ph>

**Marine Fishery Resources
Development and Management
Department (MFRD/MD)**
Fisheries Garden, Chandering
21080 Kuala Terengganu, Malaysia
Tel: +6 (09) 616 3130
Fax: +6 (09) 617 5136, 617 4042
<http://www.mfrdmd.org.my>

TD 14/1137

Ms. Isabelle Van der Beck
Portfolio Manager, GEF International Waters
900, 17th Street NW, Washington, D.C. – 20006
Tel: +1-202-974-1314
E-mail: isabelle.vanderbeck@unep.org

28 November 2014

Madam,

Letter of commitment for Co-financing to the SEAFDEC/UNEP/GEF Project "Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and the Gulf of Thailand"

As the regional agency for the above project, the Southeast Asian Fisheries Development Center (SEAFDEC) is pleased to inform you that we will ensure to support the Project as shown below:

1. Co-financing for In-kind:	US\$ 2,456,000
2. Co-financing in cash:	US\$ 3,876,400
Total:	US\$ 6,332,400

Amount in words: Six million three hundred thirty two thousand and four hundred dollars only.

We look forward to the successful collaboration and implementation of this project.

Sincerely yours,

Dr. Chumnarn Pongsri
Secretary- General and
Chief of the Training Department



UNITED NATIONS ENVIRONMENT PROGRAMME
 Programme des Nations Unies pour l'environnement Programa de las Naciones Unidas para el Medio Ambiente
 برنامج الأمم المتحدة للبيئة
 联合国环境规划署



MEMORANDUM

To:	Brennan Van Dyke GEF Executive Coordinator UNEP	Date:	11 August 2015
From:	Mette L. Wilkie <i>Mette Wilkie</i> Director, DEPI	Reference:	TN/co
Subject:	Letter of Co-financing for the GEF Full Size Project: Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand		

This memo confirms the commitment of the Marine Ecosystems Unit (MEU) providing co-financing support to the GEF Full Size Project: Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand.

The co-financing of USD 200,000 will be spread over the project period at USD 50,000 per year towards support with staff and activities related to MEU.

2015	2016	2017	2018
US \$ 50,000	US \$ 50,000	US \$ 50,000	US \$ 50,000

Best Regards


cc. Takehiro Nakamura UNEP/DEPI
 Isabella Vanderbeck UNEP/DEPI

2524

Letter 8

Co-financing commitment letter for UNEP

Appendix 13: Endorsement letters of GEF National Focal Points



KINGDOM OF CAMBODIA
NATION-RELIGION-KING

Ministry of Environment

Phnom Penh... 21 November 2012

No:..... 182 DG..... MoE

To: Mayam Niamir-Fuller
Director, GEF Coordination Officer UNEP
PO Box 30552 Nairobi, Kenya
Email: maryam.niamir-fuller@unep.org
Tel:(254 20 762-4166)

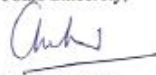
Subject: Endorsement for the project entitled: "Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand".

In my capacity as GEF Operational Focal Point for Cambodia, I confirm that the above project proposal (a) is in accordance with my government's national priorities and our commitment to the relevant global environmental conventions; and (b) was discussed with relevant stakeholders.

I am pleased to endorse the preparation of the above project proposal with the support of UNEP as the GEF Agency and SEAFDEC as the Executing Agency. If approved, the proposal will be prepared and implemented by the Fisheries Administration, Cambodia. I request UNEP to provide a copy of the project document before it is submitted to the GEF Secretariat for CEO endorsement.

The total financing from GEFTF being requested for this project is US\$3,000,000 from International Waters, exclusive of project preparation grant (PPG), and agency fee (9.5%) services associated with the total GEF grant. The financing requested for the project is detailed in the table below.

Source of Funds	GEF Agency	Focal Area	Amount (in US\$)			
			Project Preparation	Project	Fee	Total
GEFTF	UNEP	IW	150,000	3,000,000	299,250	3,449,250
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
Total GEF Resources			150,000	3,000,000	299,250	3,449,250

Yours Sincerely,

Dr. Lonh Heal
Operational Focal Point
Technical Director general
Ministry of Environment
The Kingdom of Cambodia

JK

Co. 48, Samdech Preah Shanouk, Tonle Bassac, Chamkarmon, Phnom Penh, CAMBODIA, Fax : 855 23 21 25 40 Phone : Standard 023 21 34 62
023 21 29 64



**KEMENTERIAN LINGKUNGAN HIDUP
REPUBLIK INDONESIA**

JALAN D.I. PANJAITAN, KEBON NANAS, JAKARTA 13410, INDONESIA • KOTAK POS 7777 JAT 13000
TELEPON : 021-8517148, 8580067-69 (OPERATOR) • FAKSIMILIE 021-8517147 • SITUS : www.menlh.go.id

March 28, 2013

Our Ref. : B-10 E/GEF-OFP/LH/KJS/03/2013
Encl. : -
Subject : **Endorsement for the project entitled: "Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand"**

Ms. Maryam Niamir-Fuller
Director, GEF Coordination Office
United Nation Environment Program (UNEP)
PO BOX 30552, Nairobi, Kenya
Email: maryam.niamir-fuller@unep.org

Dear Ms. Niamir-Fuller,

In my capacity as GEF Operational Focal Point for Indonesia I confirm that the above project proposal (a) is in accordance with my government's national priorities and our commitment to the relevant global environmental conventions; and (b) was discussed with relevant stakeholders.

I am pleased to endorse the preparation of the above project proposal with the support of UNEP as the GEF Agency and Southeast Asian Fisheries Development Center (SEAFDEC) as the Executing Agency. If approved, the proposal will be prepared and implemented by the Ministry of Marine Affairs and Fisheries, Indonesia. I request UNEP to provide a copy of the project document before it is submitted to the GEF Secretariat for CEO endorsement.

The total financing from GEFTF being requested for this project is US\$ 3,499,250 from International Waters, exclusive of project preparation grant (PPG), and agency fee (9.5%) services associated with the total GEF grant.

2./ the financing.....

- 2 -

The financing requested for the project is detailed in the table below.

Source of Funds	GEF Agency	Focal Area	Country	Allocation Amount in (US\$)			
				PPG	GEF Grant	Fee	Total
GEFTF	UNEP	International Waters	Global	150,000	3,000,000	299,000	3,499,250
TOTAL GEF Resources				150,000	3,000,000	299,000	3,499,250

I thank you for your kind cooperation and I look forward to hearing the positive response from the GEF.

Sincerely,



Dana A. Kartakusuma
 GEF Operational Focal Point /
 Assistant Minister,
 Global Environment Affairs

Cc:

1. Mrs. Hermien Roosita, Secretary of the Ministry of Environment, Indonesia
2. Mr. Arief Yuwono, Deputy Director, Environmental Degradation and Climate Change Control, Ministry of Environment, Indonesia
3. Mr. Syarief Widjaja, Secretary General Ministry of Marine Affairs and Fisheries, Indonesia
4. Mr. Wiwit Wirsatyo, GEF Political Focal Point for Indonesia
5. Mr. Rasio Ridho Sani, Director, Bureau for Planning and International Cooperation, Ministry of Environment, Indonesia
6. Ms. Isabelle Van der Beck, Portfolio Manager, GEF International Waters

Letter 2

GEF Operational Focal Point endorsement letter for Indonesia

6-MAR-2013 12:17 FROM: RA-PEJ, PERIKAMAN 098891195

TO: 095629485336

P:3



MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT, MALAYSIA,
ENVIRONMENTAL MANAGEMENT AND CLIMATE CHANGE DIVISION
LEVEL 6, WISMA SUMBER ASLI
NO. 25, PERSIARAN PERDANA, PRECINT 4
FEDERAL GOVERNMENT ADMINISTRATIVE CENTRE
62574 PUTRAJAYA



Telephone : 603-8866 1111
Telefax : 603-8866 4473

Our Ref : NRE(S) 002-S/1 Jld. 20
Date : 5 Mar 2013

MARYAM NIAMIR-FULLER
Director, GEF Coordination Office
United Nations Environment Programme
UNEP, P.O.Box 30552-00100
NAIROBI, KENYA
(e-mail: maryam.niamir-fuller@unep.org)

Dear Madam,

**ENDORSEMENT FOR THE ESTABLISHMENT AND OPERATION OF A
REGIONAL SYSTEM OF FISHERIES REFUGIA IN THE SOUTH CHINA SEA AND
GULF OF THAILAND**

In my capacity as GEF Operational Focal Point for Malaysia, I confirm that the above project proposal (a) is in accordance with my government's national priorities, and our commitment to the relevant global environmental conventions; and (b) was discussed with relevant stakeholders, including the global environmental convention focal points.

I am pleased to endorse the preparation of the above project proposal with the support of the GEF Agency(ies) listed below. If approved, the proposal will be prepared and implemented by the Department of Fisheries Malaysia under the Ministry of Agriculture and Agro-based Industry Malaysia. I request the GEF Agency(ies) to provide a copy of the project document before submitted to the GEF Secretariat for CEO endorsement.

The total financing (from GEFTF, LDCF, SCCF and/or NPIF) being requested for this project is USD 3,449,250.00 inclusive of the project preparation grant (PPG), if any; and Agency fees for project cycle management services associated with the total GEF grant. The financing requested for Malaysia is detailed in the table below:

"Minsiter Sumber Asli dan Alam Sekitar untuk Kerajaan Malaysia"



MINISTERI Sumber Asli dan Alam Sekitar
KEMENTERIAN Pertanian dan Industri Agro
KEMENTERIAN Alam Sekitar dan Kualiti Alam
UNITED NATIONS Environment Programme
GEF SECRETARIAT

Source of Funds	GEF Agency	Focal Area	Amount (In USD)			
			Project Preparation	Project	Fee	Total
GEFTF	UNEP	IW	150,000.00	3,000,000.00	299,250.00	3,449,250.00
Total GEF Resources			150,000.00	3,000,000.00	299,250.00	3,449,250.00

Thank you.

Sincerely,



DR. LIAN KOK FEI

Under Secretary of Environmental Management & Climate Change Division
 On behalf of the Secretary General
 Ministry of Natural Resources and Environment
 Cum GEF Operational Focal Point, Malaysia

Cc:

Deputy Secretary General (Environment)
 Ministry of Natural Resources & Environment Malaysia

Under Secretary
 Biodiversity and Forestry Management Division
 Ministry of Natural Resources and Environment Malaysia
 (Convention Focal Point for UNCBD)
 (attn: Mr. K. Nagulendran)

Letter 3

GEF Operational Focal Point endorsement letter for Malaysia



Republic of the Philippines
Department of Environment and Natural Resources
 Visayas Avenue, Diliman, Quezon City, 1100
 Tel. Nos. (632) 929-66-26 to 29 • (632) 929-62-52
 929-66-20 • 929-66-33 to 35 • 929-70-41 to 43

24 October 2012

DR. MARYAM NIAMIR-FULLER
 Director
 Division of Global Environment Facility
United Nations Environment Programme (UNEP)
 P.O. Box 30652
 Nairobi, Kenya

Subject: Endorsement of Project Identification Form (PIF) for Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and the Gulf of Thailand

Dear **Dr. Fuller**:

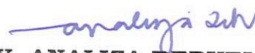
In my capacity as GEF Operational Focal Point for the Philippines, I confirm that the above regional project proposal is (a) in accordance with the government's national priorities and our commitments to the relevant global environmental conventions; and (b) was discussed with relevant stakeholders, including the convention focal point.

I am pleased to endorse the preparation of the above project proposal with the support of the UNEP. If approved, the proposal will be prepared and implemented by the National Fisheries Research and Development Institute-Bureau of Fisheries and Aquatic Resources, Department of Agriculture (NFRDI-BFAR-DA) and Southeast Asian Fisheries Development Center (SEAFDEC). Further, I request the UNEP to provide a copy of the project document for work program inclusion before it is submitted to the GEF Secretariat for CEO endorsement.

The total GEF Financing being requested for this project is USD 3,449,250.00 from International Waters inclusive of project preparation grant (PPG) and Agency Fee (9.5%) for project cycle management services associated with the total GEF Grant. The financing requested for the project is detailed in the table below:

Source of Funds	GEF Agency	Focal Area	Amount (in US\$)			
			PPG	Project	Fee	Total
GEFTF (select)	UNEP (select)	IW (select)	150,000	3,000,000	299,250	3,449,250
Total GEF Resources			150,000	3,000,000	299,250	3,449,250

Very truly yours,


ATTY. ANALIZA REBUelta-TEH
 // Undersecretary
 Chief of Staff
 GEF Operational Focal Point



No. 0204.4/ ๔๔๐

Ministry of Natural Resources
and Environment
92 Soi Phahon Yothin 7
Phahon Yothin Road
Bangkok 10400 Thailand
Tel/Fax: +66 2 278 8621

๑ April B.E. 2556 (2013)

Dear Ms. Niamir-Fuller,

Subject: Endorsement for the project entitled: "Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand".

In my capacity as GEF Operational Focal Point for Thailand, I confirm that the above project proposal (a) is in accordance with my government's national priorities and our commitment to the relevant global environmental conventions; and (b) was discussed with relevant stakeholders, including the global environmental convention focal points.

I am pleased to endorse the preparation of the above project proposal with the support of UNEP as the GEF Agency and SEAFDEC as the Executing Agency. If approved, the proposal will be prepared and implemented by the Department of Fisheries, Ministry of Agriculture and Cooperatives. I request the GEF Agency to provide a copy of the project document before it is submitted to the GEF Secretariat for CEO endorsement.

/The total...

Ms. Maryam Niamir-Fuller
Director, GEF Coordination Office UNEP
PO Box 30552 Nairobi, Kenya
Tel: (254 20 762-4166)

-2-

The total financing (from GEFTF) being requested for this project is US\$ 3,394,500 inclusive of project preparation grant (PPG), if any, and Agency fees for project cycle management services associated with the total GEF grant. The financing requested for Thailand is detailed in the table below.

Source of Funds	GEF Agency	Focal Area	Amount (in US\$)			
			Project Preparation	Project	Fee	Total
GEFTF	UNEP	International Waters	100,000	3,000,000	294,500	3,394,500
Total GEF Resources			100,000	3,000,000	294,500	3,394,500

I consent to the utilization of Thailand's allocations in GEF-5 as defined in the System for Transparent Allocation of Resources (STAR).

Yours sincerely,



Mr. Chote Trachu
 Permanent Secretary
 Ministry of Natural Resources and Environment
 Thailand GEF Operational Focal Point

GEF VIETNAM OPERATIONAL FOCAL POINT
 479 Hoang Quoc Viet Road., Cau Giay dist., Hanoi, SR. Vietnam
 Tel: (844) 37931627; Fax: (844) 37931730; E-mail: nvtai@isponre.gov.vn

8th April, 2013

To : **Ms. Maryam Niamir-Fuller**
 Director
 UNEP Division of GEF Coordination
 GEF Agency Coordination
 Email: unepgef@unep.orgiam

Subject: Endorsement for *"Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand"*

Dear Ms. Maryam Niamir-Fuller,

In my capacity as GEF Operational Focal Point for the Socialist Republic of Viet Nam, I would like to inform you that Viet Nam GEF Steering Committee has reviewed the above project proposal. I confirm that the above project proposal (a) is in accordance with my government's national priorities and our commitments to the relevant global environmental conventions; and (b) was discussed with the relevant stakeholders, including the global environmental convention focal points.

I am pleased to endorse the above-mentioned project proposal with the support of the GEF Agency(ies) listed below. If approved, the project will be implemented by Ministry of Agriculture and Rural Development (MARD). I request the GEF Agency(ies) to provide a copy of the project document before it is submitted to the GEF Secretariat for CEO endorsement.

The total financing from GEFTF being requested for this regional project is US\$ 3,285,000, inclusive of project preparation grant (PPG), if any, and agency fee for project cycle management services associated with the total GEF grant. The financing requested for the regional project is detailed in the table below.

Source of Funds	GEF Agency	Focal Area	Amount (in US\$)			
			Project Preparation	Project	Fee	Total
GEFTF	UNEP	International Waters		3,000,000	285,000	3,285,000
Total GEF resources				3,000,000	285,000	3,285,000

Sincerely,



Dr. Nguyen Van Tai
 GEF Operational Focal Point
 Director General, ISPONRE/MONRE

Copy to: **Ms. Naoko Ishii**,
 Chief Executive Officer and Chairperson, GEF
Mr. Tran Hong Ha
 Deputy Minister of Natural Resources and Environment,
 GEF Political Focal Point

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 SEAFDEC/UNEP/GEF Fisheries *Refugia* 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 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 14 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 of <i>refugia</i> are designed to ensure that establishment of management area do not create any external impacts on nearby MPAs
- wetland	Yes	Fisheries dependent information and data collection will be undertaken in wetland areas of sites and will result in no additional impact from project activities.
- mangrove	Yes	Fisheries dependent information and data collection will be undertaken in wetland areas of sites and will result in no additional impact from project activities.
- estuarine	No	All project sites are marine.
- 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 target fisheries <i>refugia</i> sites.
- 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	The 14 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, fishing vessels operating in the area will be employed in the conduct of fishery dependent surveys and testing of responsible fishing gear and practices. 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 fisheries systems and secure longer-term options for the sustainable use of biodiversity at 14 priority locations.
- Will project cause increase in peak and flood flows? (including from temporary	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

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or permanent waste waters)		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	The 14 sites are characterised by social tensions and conflicts associated with illegal fishing and between fisherfolk and environmental NGOs. The fisheries <i>refugia</i> concept to be tested through the project has been demonstrated to provide common ground between stakeholders. This issue was explored for each of the 14 sites during the PPG phase and no negative impacts are anticipated as a result of testing the <i>refugia</i> approach at the sites.
- 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 responsible for fisheries and environment.
- 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 fisheries and coastal habitat 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 resources? (incl. loss of downstream beneficial uses (water supply or fisheries)?	No	This issue was considered during the PPG and no negative impact is anticipated. The fisheries <i>refugia</i> concept to be tested through the establishment and operational management of 14 sites focuses on sustainable use as opposed to the prohibition of fishing associated with MPAs. Accordingly it is anticipated that the project will result in enhancement of

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		livelihood and food security benefits associated with small-scale fisheries.
- 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. Key project activities are aimed at the strengthened consideration of environment and biodiversity conservation in food production systems associated with marine capture fishing. Modifications to fishing gear and practices are anticipated although the social and financial costs and benefits of these will be assessed prior to their adoption. The latter will be facilitated through consultative processes to develop management plans for individual fisheries <i>refugia</i> sites.
- 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 small-scale fisheries.
- 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. Indeed the project activities will be aligned with regional initiatives addressing forced labour in the fishing sector.
- 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 Fisheries <i>Refugia</i> Committee on a quarterly basis to ensure transparency.

- Appendix 17: National Project Document for Cambodia [ONLINE]**
- Appendix 18: National Project Document for Indonesia [ONLINE]**
- Appendix 19: National Project Document for Malaysia [ONLINE]**
- Appendix 20: National Project Document for the Philippines [ONLINE]**
- Appendix 21: National Project Document for Thailand [ONLINE]**
- Appendix 22: National Project Document for Viet Nam [ONLINE]**
- Appendix 23: Report of the PPG Initiation Workshop [ONLINE]**
- Appendix 24: Report of the PPG Validation Workshop [ONLINE]**

Appendix 25: Project Cooperation Agreement between UNEP and SEAFDEC

Appendix 26: Draft Letter of Agreement between SEAFDEC and the National Executing Entities

MEMORANDUM OF UNDERSTANDING

between the

SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER

and

[INSERT NAME OF NATIONAL LEAD AGENCY]

1. PARTIES

1.1 This Memorandum of Understanding is entered into between, the Southeast Asian Fisheries Development Center, and **[INSERT NAME OF NATIONAL LEAD AGENCY]** in its capacity as the National Lead Agency in **[INSERT COUNTRY NAME]** for the SEAFDEC/UNEP/GEF Project entitled “*Establishing and Operating a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand*”.

2. BACKGROUND

2.1 The Southeast Asian Fisheries Development Center (SEAFDEC) has been designated as the Executing Agency of the United Nations Environment Programme (UNEP) implemented, and Global Environment Facility (GEF) financed project entitled, “*Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and the Gulf of Thailand*” (referred to hereafter as the SEAFDEC/UNEP/GEF Fisheries Refugia Project). This project has the following objective:

“To operate and expand the network of fisheries refugia in the South China Sea and Gulf of Thailand for the improved management of fisheries and critical marine habitats linkages in order to achieve the medium and longer-term goals of the fisheries component of the Strategic Action Programme for the South China Sea.”

2.2 SEAFDEC and the National Lead Agency, **[INSERT NAME OF NATIONAL LEAD AGENCY]**, for the execution of the SEAFDEC/UNEP/GEF Fisheries Refugia Project project in **[INSERT COUNTRY NAME]** have, on the basis of their respective mandates, a common aim in the furtherance of integrated fisheries and habitat management to achieve the targets of the fisheries component of the Strategic Action Programme for the South China Sea. Additionally, the parties to this instrument are committed to the implementation of the ASEAN-SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia and the 2011 Resolution on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020, in which the Ministers responsible for fisheries resolved *inter alia* to “*Implement effective management of fisheries through an ecosystem approach to fisheries that integrates habitat and fishery resource management aimed at increasing the social and economic benefits to all stakeholders*”.

3. PURPOSE

3.1 This Memorandum sets forth the tasks of **[INSERT NAME OF NATIONAL LEAD AGENCY]** and SEAFDEC, and related financial mechanisms, for the execution of national-level activities of the SEAFDEC/UNEP/GEF Fisheries Refugia Project in **[INSERT COUNTRY NAME]**. This instrument also acts as the agreement of the Parties to join efforts and to maintain close working

relationships, in order to achieve the targets and outcomes of the project according to the agreed results framework, work plan and timetable, activities, and budget set out in the National Project Document for [INSERT COUNTRY NAME] which is included as an integral part of this Memorandum in Annex 1.

4. TASKS BY THE NATIONAL LEAD AGENCY

4.1 The [INSERT NATIONAL LEAD AGENCY NAME] shall:

- a. Assume overall responsibility for the execution of the national-level activities of the SEAFDEC/UNEP/GEF Fisheries *Refugia* Project in accordance with the results framework, work plan and timetable of activities, and budget set out in the National Project Document for [INSERT COUNTRY NAME] (see Annex 1);
- b. Provide Secretariat support to the operation of the National Fisheries *Refugia* Committee (NFRC) and the National Scientific and Technical Committee (NSTC) and convene quarterly meetings of these bodies;
- c. Nominate a National Focal Point to act as the main point of contact with SEAFDEC, and Chair of the NFRC, and participate in annual regional Project Steering Committee meetings;
- d. Nominate a National Technical Focal Point to act as the main point of contact with Project PCU, Chair NSTC and participate in the biannual regional meetings of the Regional Scientific and Technical Meeting;
- e. Plan and implement activities based on the results framework, work plan and timetable contained in the National Project Document aimed at achieving the national-level goals and objectives for the SEAFDEC/UNEP/GEF Fisheries *Refugia* Project in [INSERT COUNTRY NAME];
- f. Prepare and facilitate endorsement, by the National Fisheries *Refugia* Committee (NFRC), of quarterly costed work plans to guide the execution of national and site-based activities of the project;
- g. Submit endorsed quarterly national costed work plans together with a cash advance request in the format attached as Annex 2 to this document to the Project Coordinating Unit at SEAFDEC at least five (5) working days before the commencement 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).
- h. Prepare and submit quarterly progress reports (Annex 3), expenditure reports (Annex 4), and cash advance requests (Annex 2) for endorsement by the NFRC and subsequent submission to the Project Coordinating Unit at SEAFDEC at least five (5) working days before the end of each quarter;
- i. Prepare annual progress reports on national-level activities (Annex 5) and results of efforts to establish operational management of priority fisheries *refugia* sites in [INSERT COUNTRY NAME];
- j. 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 National Project Document and costed work plans endorsed by the National Fisheries *Refugia* Committee. For each disbursement, proper supporting documentation shall be maintained, including original invoices, bills, and receipts pertinent to the transaction.

- k. Provide SEAFDEC with certified periodic financial statements, reports on cofinancing received (Annex 6) and with an annual audit of the financial statements relating to the status of SEAFDEC/UNEP/GEF project funds as at 31 December each year. This should be reported in an opinion by a recognised firm of public accountants (for a government, by Government auditors), which shall be dispatched to SEAFDEC by 31 March. In particular, the auditors should be asked to report whether, in their opinion: proper books of account and records have been maintained; all project expenditures are supported by vouchers and adequate documentation; and, expenditures have been incurred in accordance with the objectives outlined in the National Project Document for [INSERT COUNTRY NAME] (Annex 1).
- l. Be responsible for the proper custody, maintenance and care of all equipment purchased for use at the national level;
- m. Upon completion of the project, [INSERT ACRONYM FOR NATIONAL LEAD AGENCY] shall maintain the records for a period of at least four years unless otherwise agreed upon between the Parties.
- n. 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 integrated fisheries and habitat management generated through this project; and
- o. Ensure that the work of the parties under this agreement is suitably promoted as part of the SEAFDEC/UNEP/GEF Fisheries *Refugia* Project, including labeling of outputs with agreed logos.

4. TASKS BY SEAFDEC

4.1 SEAFDEC agrees to perform the following tasks:

- a. Organise and convene annual meetings of the regional Project Steering Committee and biannual meetings of the Regional Scientific and Technical Committee;
- b. Coordinate the delivery of technical and administrative support for the timely and efficient delivery of national activities of the project as required;
- c. Liaise with National Government agencies and development partners to secure required levels of political support and co-financing for the project;
- d. Disburse GEF grant funds to the [INSERT NATIONAL LEAD AGENCY NAME] according to the agreed work plan and budget schedule contained in Annex 1; and
- e. Provide financial support to enable the National Fisheries Focal Point and National Technical Focal Point to travel to meetings of regional committees of the project management framework.

5. TRANSFER OF PAYMENTS AND RELEASE OF FUNDS

5.1 In accordance with the national budget for [INSERT COUNTRY NAME], SEAFDEC has allocated and will make available to [INSERT ACRONYM THE FOR LEAD AGENCY], GEF grant funds up to the maximum amount of [INSERT AMOUNT]. The first tranche of funds will be advanced to [INSERT ACRONYM THE FOR LEAD AGENCY] upon signature of this agreement. The second and subsequent tranches will be advanced to [INSERT ACRONYM THE FOR LEAD AGENCY] on a quarterly basis, only when a financial and progress report for the completed quarter have been submitted to, and accepted by, SEAFDEC.

5.2 Monetary contributions by SEAFDEC will be made in United States dollars by wire transfer to a separate bank account established by the lead agency for management of project funds. Details for that account are as follows:

Name of account:
Account number:
Name of bank:
Address of bank:
SWIFT code:

5.3 SEAFDEC will advise the National Focal Point of the transfer of payments within 5 working days by email and fax. Where possible, an electronic copy of telegraphic transfer advice from SEAFDEC's bank will be forwarded to the [INSERT ACRONYM FOR NATIONAL LEAD AGENCY] at that time.

6. REFUND OF UNSPENT BALANCE

6.1 The National Lead Agency will refund to SEAFDEC in US dollars any unspent balance of the funds provided by SEAFDEC within 30 days after completion of the final task. Such refund should be wired to:

Name of account:
Account number:
Name of bank:
Address of bank:
Swift code:

7. CORRESPONDENCE

All correspondence regarding this agreement should be addressed to:

In [INSERT COUNTRY NAME]:

To: [INSERT NATIONAL FOCAL POINT NAME AND FULL CONTACT DETAILS]

Copy to: [INSERT NATIONAL FOCAL POINT NAME AND FULL CONTACT DETAILS]

In SEAFDEC:

To: [INSERT NAME AND CONTACT DETAILS FOR SEAFDEC'S MANAGER]

Copy to: [INSERT NAME AND CONTACT DETAILS FOR SEAFDEC SG]

8. EFFECTIVE DATE

8.1 The term of the present Memorandum of Understanding (MoU) shall commence on the date of the signature of the present instrument and terminate by [INSERT PROJECTED COMPLETION DATE]. National activities shall commence and be completed in accordance with the work plan and time-table of activities set out in Annex 1.

9. SIGNATURES

FOR NATIONAL LEAD AGENCY

By: _____

Name:

Title:

Date:

FOR SEAFDEC

By: _____

Name: Dr. Chumnarn Pongsri

Title: Secretary-General

Date: