Background Paper for the
East Asian Seas Stocktaking Meeting

Preparation of a Programmatic Approach for the Coordinated Sound Management and Development of the East Asia Seas Region

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1. EXECUTIVE SUMMARY

The Seas of East Asia (EAS) are bordered by China, Japan and the Korean Peninsula in the north and the Southeast Asian nations in the south. The region harbours a significant part of the world's coral reefs and mangroves and also produces about 40 percent of the world's fish catch and more than 80 percent of aquaculture. The human pressure on marine and coastal resources is very high with approximately 2 billion people living in the region. The EAS region encompasses a series of large marine ecosystems (LMEs), subregional seas and their coastal areas. This includes the Yellow Sea, the East China Sea, the South China Sea, Gulf of Thailand, the Sulu-Celebes Sea and the Indonesian Seas — six LMEs of great ecological and economic importance.

The objective of the stocktaking is to provide a background document of past and current GEF operations and other investments in the EAS region in support of a consultative review meeting of GEF and partners in the region. The stocktaking review intends to: (1) identify geographical and thematic gaps and future investment needs in the East Asian Seas region; (2) identify governance mechanisms and their mandates; and (3) identify emerging issues in the EAS region and recommendations for future actions. The background paper will support the formulation of an agreed common vision as the basis for the development of a common agenda or programming framework to be financed by the International Waters (IW) Focal Area with possible linkages to other GEF Focal Areas. The study is carried out as a desk study using all relevant documentation from the Global Environment Facility website, as well as project publications and evaluations and interviews with relevant partners.

The stocktaking found that the region is comprehensively covered by assessments, including Transboundary Diagnostic Analysis (TDAs) and Strategic Action Program (SAP) processes, with the exception of the East China Sea, which could benefit from such a process to better identify the key transboundary issues related to rapid coastal development. However, the main focus for the future should be to implement the existing SAPs for the South China Sea and the Yellow Sea, as well as other existing planning frameworks, such as the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA), in order to move from planning to implementation and scaling up of investments.

Fisheries stands out as the issue not given adequate attention by GEF, in relation to its importance and in comparison to other transboundary concerns, such as pollution and habitat destruction and community modification. This issue is crucial in view of growing populations, and the need to secure food supply from the sea and to alleviate poverty. The Ecosystem Approach to Fisheries (EAF) management, incorporating the Integrated Coastal Management (ICM) management concept, could provide the necessary framework and process for addressing multisectoral conflicts in the coastal zone that contribute to the decline of fishery resources. Long-term investments for EAF are needed.

In order to scale up investments and to leverage larger amounts of co-financing to future GEF projects, there should be an increased emphasis on funding to single country projects, as they are, on average, mobilizing almost ten times as much co-financing as regional and global projects. This approach may also speed up policy reform at the

national level in support of ICM and other integrated approaches, as closer attention can be paid to national coordination issues in projects only dealing with one country.

GEF and partners have made substantial investments in the EAS Region and yet there is no regional agency that collates information and conducts harmonized monitoring of results gathered by the riparian countries, which impedes the sharing of information and lessons from past experiences among LMEs and adaptive management within an LME . A coordinating mechanism and agreed procedures and methodologies are necessary to monitor improvement of the status of the LMEs in the EAS as a result of interventions. In this regard, the institutionalization of PEMSEA provides an opportunity to bring different initiatives together under one single umbrella. Better coordination of GEF support to the EAS region would also strengthen the extent to which ecosystem-based management could be applied in the EAS and interventions harmonized from local to national to regional levels. Different planning frameworks, such as the SDS-SEA and the South China Sea SAPs, should be linked spatially and operationally to ensure that different Ecosystem-based Management (EBM) tools are applied in an integrated and coordinated manner.

Strengthened regional coordination of interventions in the EAS also need to be reflected in enhanced inter-sectoral coordination in coastal and marine management at the national level to enable countries to better respond to transboundary management challenges, such as monitoring management interventions on marine pollution, fisheries recovery, or habitat improvement. The lack of resources and the difficulty in changing governmental structures are some reasons why establishing coordinating mechanisms have not progressed significantly. New policies that meet present issues, such as transboundary pollution, poaching, etc., require fiscal allocations; otherwise the policy remains an academic document.

A wide range of emerging issues that are affecting the EAS have been identified by different agencies, forums and by the countries themselves. The countries are concerned with land-based sources of pollution, habitat destruction and community modification, fisheries issues, and climate change, while invasive marine species is generally not so high on the agenda. Climate change and population growth are the main drivers of many of the emerging problems or worsening trends in the EAS environmental status. There is hence a need to address climate change impacts both in terms of adaptation needs and possible mitigation actions. The costs of climate change to countries in the region could be equivalent to a loss of 6.7 percent of GDP by 2100, which is more than twice the world average.

Sustainable use of resources in LMEs should be addressed at both the supply side of and the demand side for natural resources. On average, the per capita consumption of fish in the region is about 30 kg per year and this could increase to 50 kg per year. With increasing demand and population growth, there will be greater pressure to expand exploitation of natural fish stocks or increase aquaculture production. Growth of human population should thus be managed in parallel with efforts on environmental and resources management.

2. BACKGROUND/INTRODUCTION

The Seas of East Asia (EAS) are bordered by China, Japan and the Korean Peninsula in the north and the Southeast Asian nations in the south (Figure 1). The region harbours a significant part of the world's coral reefs and mangroves and also produces about 40 percent of the world's fish catch and more than 80 percent of aquaculture. The human pressure on marine and coastal resources is very high with approximately 2 billion people living in the region.[1]

The EAS region encompasses a series of large marine ecosystems (LME), subregional seas and their coastal areas. This includes the Yellow Sea, the East China Sea, the South China Sea, Gulf of Thailand, the Sulu-Celebes Sea and the Indonesian Seas — six LMEs of great ecological and economic importance. The physical extent of each LME and its boundaries are based on four linked ecological, rather than political or economic, criteria: (1) bathymetry; (2) hydrography; (3) productivity; and (4) trophic relationships. Globally, the LMEs are centers of coastal ocean pollution and nutrient over-enrichment, habitat degradation (e.g., seagrasses, corals, and mangroves), overfishing, biodiversity loss, and climate change effects.[2]

This report is taking stock of results of GEF projects in these LMEs, including overlaps with two LMEs bordering Australia:

1. Yellow Sea (LME #48)
2. East China Sea (LME #47)
3. South China Sea (LME #36)
4. Gulf of Thailand (LME #35)
5. Sulu-Celebes (Sulawesi) Sea (LME #37)
6. Indonesian Sea (LME #38)
7. North Australian Shelf (Arafura Sea, Gulf of Carpentaria) (LME #39)
8. Northwest Australian Shelf (Timor Sea) (LME #45)

The countries that border these LMEs are: Australia; Brunei; Cambodia; China; DPR Korea; Indonesia; Japan; Malaysia; Philippines; RO Korea; Singapore; Thailand; Timor-Leste; and Viet Nam.

Figure 1. Overview Map of EAS region (adapted from PEMSEA).

Since its establishment, in the early 1990, the GEF has allocated US$1.1 billion in grants with over US$4 billion in co-financing for 183 projects in the International Waters (IW) focal area. The GEF is the largest financial institution with the mandate, ability and experience to address current and future challenges to shared freshwater and marine systems. The GEF has supported regional collaborative efforts for 22 transboundary surface water basins, 16 large marine ecosystems, and 5 cross-border groundwater systems globally.[3] This report (Chapter 4) analyzes the share of total GEF IW funding that has been allocated to the EAS region.

3. OBJECTIVES AND METHODS FOR THE STOCKTAKING

3.1. Objectives

The objective of the stocktaking is to provide a background document of past and current GEF operations and other investments in the EAS region in support of a consultative review meeting of GEF and regional partners. The stocktaking review intends to: (1) assess the accomplishments (Outcomes and Outputs) of projects undertaken under GEF 1-4 in addressing transboundary issues, that were identified in the TDAs of the LMEs in the East Asian Seas; (2) identify geographical and thematic gaps and future investment needs in the EAS region; (3) identify governance mechanisms and their mandates; and (4) identify emerging issues in the EAS region and make recommendations for future actions. The background paper will support the formulation of an agreed common vision as the basis for the development of a common agenda or programming framework to be financed by the IW focal area with possible linkages to other GEF focal areas.

3.2 Methods

The study is carried out as a desk study using all relevant documentation from the GEF website as well as project publications and evaluations and also includes interviews with relevant partners. All projects have been reviewed and scored using the following criteria:

1. Progress achieved in past GEF Projects in the LMEs in the EAS and other investments that contribute to impacts in the EAS and the extent to which the following priority transboundary issues have been addressed:

    i. Water pollution from land-based sources;
    ii. Water resources uses and management in coastal zones and small islands, including groundwater;
    iii. Unsustainable exploitation of fisheries — coastal and oceanic;
    iv. Protection of riverine, coastal and other marine habitats;
    v. Invasive species; and
    vi. Climate change impacts.

2. Common approaches taken by the GEF Projects in the LMEs, to address these concerns including the use of:

    i. Transboundary Diagnostic Analysis (TDA) and development of Strategic Action Programs (SAPs);
    ii. Integrated Coastal Management (ICM);
    iii. Ecosystem-based Management (EBM);
    iv. Integrated Water Resources Management (IWRM);
    v. Rights-based approaches to habitat and fisheries management (e.g., establishment of community-based fisheries refugia and limited entry fisheries); and
    vi. Conservation-based approaches to habitat and fisheries management (e.g., establishment of marine protected areas).

3. Impact of the projects in influencing regional and national policies to address these concerns.

The results of this analysis are complemented by the evaluation reports of projects and other relevant project publications.

In addition, an analysis is conducted of the existing regional coordination and/or governance mechanisms in the EAS region for management of international waters. Criteria for evaluating the regional mechanisms loosely follow the approach presented by Haas (2008)[4], but adapted to the needs of this study. The criteria for evaluating the effectiveness of governance in the EAS region are thus:

i. Level of collaboration
   - Monitoring Program and Information Sharing;
   - Action Plan – Legally Binding Agreement;
   - Legal Personality of Institution

ii. Sustainable financing
   - Sustainable financing plan;
   - Sustainable financing of Secretariat in the short to medium term or in the medium to long term;
   - Medium to long term financing for programs and activities secured

iii. Involvement of riparian countries
   - Single country;
   - 2 or more countries;
   - All countries bordering the LME

iv. Involvement of national stakeholders
   - 1 National Institution per country
   - Multisectoral;
   - Participation of Local Government/civil society.

To determine the commitment of the countries in addressing the transboundary issues in the LMEs and to identify the transboundary issues that are highest in the priorities of the countries, a survey of the national policies with regards to the transboundary issues was conducted from websites of relevant governmental agencies coupled with a survey of key agencies using a questionnaire (Annex 3). The questionnaire was distributed to heads of agencies in the countries that are responsible for addressing the thematic issues of interest to GEF International Waters. Telephone interviews were conducted two weeks after the distribution of the questionnaires.

To determine which transboundary issue/s remain/s to further address, the following criteria are used:

- Urgency (based on scientific reports in the last 5 years) – 25 %
- Identified priorities by governments – 25 %
- Level of investment is low over the last 15 years – 25 %
- “Tipping point” aspect (a small additional investment is needed to make it achieve its outcome) – 25 %

4. OVERVIEW OF PAST AND CURRENT ACTIVITIES IN THE EAS REGION

4.1 Assessments of Transboundary Concerns in EAS LMEs

GEF has supported many investments in the last 15 years to assess and improve the status of the Large Marine Ecosystems in the EAS region (Annex 1). The GEF Projects were implemented at global, regional, or national levels. The global projects were implemented across all LMEs and were intended to contribute to improving the LMEs in the EAS region. The regional projects are implemented at the LME level by several countries surrounding the LME. There are also projects that are implemented in one country that address one transboundary issue. The LMEs in the EAS region that were assessed are:

i. Yellow Sea – using the Transboundary Diagnostic Analysis (TDA) and Global International Waters Assessment (GIWA) methodologies[5]
ii. East China Sea – using the GIWA methodology[6]
iii. South China Sea – using the TDA and GIWA methodologies[7]
iv. Sulu-Celebes Sea – using the GIWA methodology[8]
v. Indonesian Seas – using the GIWA methodology[9]
vi. Mekong River Basin – using the GIWA methodology[10]

Strategic Action Programs (SAPs) are approved for the Yellow Sea and South China Sea. The TDA/SAP development is underway in the Sulu-Celebes (Sulawesi) Sea and Arafura-Timor Seas Projects. Table 1 below summarizes the priority transboundary concerns in the different EAS LMEs, as assessed through TDAs or GIWA:

Table 1: Priority Transboundary Concerns and SAP Targets in EAS LMEs.

LME	Priority Transboundary Issues	Status of SAP and Agreed Targets
Yellow Sea	**1.** Pollution (eutrophication and harmful and toxic algal blooms, contaminants and their effects, etc.) **2.** Ecosystem degradation (changes in biomass abundance, species composition) **3.** Loss of fisheries production (loss of commercially important species, unsustainable mariculture) **4.** Loss of biodiversity	SAP endorsed waiting for funding for full-scale implementation[11]. **Targets:** 1. 25-30% reduction in fishing effort 2. Rebuilding of overexploited marine living resources 3. Improvement of mariculture techniques to reduce environmental stress 4. Meeting international requirements on contaminants 5. Reduction of total loading of nutrients from 2006 levels 6. Reduce standing stock of marine litter from current level 7. Reduce contaminants,…, to nationally acceptable levels 8. Better understanding and prediction of ecosystem changes for adaptive management 9. Maintenance and improvement of current populations/distributions of living organisms… 10. Maintenance of habitats according to standards and regulations of 2007 11. Reduction of the risk of introduced species

LME	Priority Transboundary Issues	Status of SAP and Agreed Targets
East China Sea	1. Unsustainable exploitation of fish and other living resources 2. Pollution 3. Habitat and community modification 4. Freshwater shortage 5. Global change	No SAP developed.
South China Sea	1. The loss and degradation of coastal habitats (coral reefs, seagrass, mangroves, and wetlands); 2. Overexploitation of living aquatic resources; 3. Land-based marine pollution 4. Critical absence of regional agreements	SAP endorsed waiting for funding for full-scale implementation.[12] Targets: 1. **Mangroves:** increase in areas to be transferred to Protected Area Status; non-conversion of mangroves; improved management relating to sustainable use; replanting deforested mangrove land; and enrichment planting to increase mangrove biodiversity. 2. **Coral reefs:** at least 70% of the existing area of coral reefs in the 82 target coral reef sites (153,000 ha) put under an appropriate form of sustainable management and; reduce the regional decadal rate of degradation in live coral cover from the present rate of 16% to 5%. 3. **Seagrass:** twenty-one managed areas totalling 26,576 ha (approximately 33% of seagrass sites) in the SCS, under sustainable management; amendment of the management plans for seven existing Marine Protected Areas (MPAs) to include specific seagrass-related management actions; and adoption of seven new MPAs specifically focusing on seagrass habitats. 4. **Coastal Wetlands:** management plans for at least three lagoons, nine estuaries, five tidal flats, one peat swamp; to increase by at least seven wetland areas, the number of sites with protection; and regional estuary monitoring scheme implemented. 5. **Fisheries:** regional system of a minimum of 20 refugia for the management of priority, transboundary, fish stocks and endangered species; and prepared and implemented fisheries management systems in the identified refugia. **6. Land-based Pollution:** estimate total contaminant loading to the SCS; regional criteria for contaminants in sediment and biota; characterize and prioritize all hotspots surrounding the SCS; amending national/provincial, legislation/regulations in support of all Land-based Pollution targets of the SAP; meet ASEAN seawater quality criteria for 90% of monitoring stations in the 17 hotspots characterized by the RWG-LbP between 2002 – 2004 and 80% of other monitoring in coastal waters.
Sulu-Celebes (Sulawesi) Seas	1. Unsustainable exploitation of fish and other living resources	Regional assessments: • Biodiversity visioning for SSME conducted 1999 to 2001

LME	Priority Transboundary Issues	Status of SAP and Agreed Targets
	2. Habitat and community modification 3. Pollution 4. Freshwater shortage 5. Global change	• GIWA conducted in 2002 • SSME Conservation Plan, with 10 Objectives, including 3 Programs of Work • TDA and SAP under development with GEF funding
Indonesia Seas	In the **Sunda sub-system** (Java Sea): 1. Pollution 2. Freshwater shortage 3. Habitat and community modification 4. Unsustainable exploitation of fish and other living resources 5. Global change In the **Wallacea sub-system** (partly overlaps with the Timor Sea – see ATSEA): 1. Habitat and community modification 2. Unsustainable exploitation of fish and other living resources 3. Freshwater shortage 4. Pollution 5. Global change In the **Sahul sub-system** (covers most of the Arafura Sea – *see ATSEA*): 1. Unsustainable exploitation of fish and other living resources 2. Habitat and community modification 3. Pollution 4. Freshwater shortage 5. Global change	Regional assessments: • Regional assessment – GIWA • Linkages to ATSEA TDA/SAP under development with GEF funding
Arafura-Timor Seas	See Wallacea and Sahul sub-systems above	• TDA and SAP under development with GEF funding
Mekong River Basin	1. Habitat and community modification 2. Unsustainable exploitation of fish and other living resources 3. Freshwater shortage 4. Pollution 5. Global change	

In addition, the **Sustainable Development Strategy for the Seas of East Asia (SDS-SEA)**[13] that provides an overarching framework for all the LMEs in the EAS has the following foci:

- Ensure sustainable use of coastal and marine resources;
- Preserve species and areas of the coastal and marine environment that are pristine or are of ecological, social or cultural significance;
- Protect ecosystems, human health and society from risks occurring as a consequence of human activities;
- Develop economic activities in the coastal and marine environment that contribute to economic prosperity and social well-being while safeguarding ecological values;
- Implement international instruments relevant to the management of the coastal and marine environment; and
- Communicate with stakeholders to raise public awareness, strengthen multisectoral participation and obtain scientific support for the sustainable development of the coastal and marine environment.

The SDS-SEA identifies ICM as an effective management framework to achieve the sustainable development of coastal and marine areas. Subsequently, the Haikou Partnership Agreement (2006) set a target of 20 percent of the region's coastline to be covered by ICM programs by 2015. In 2010, it is estimated that countries have scaled up ICM programs to cover between 9 to 10 percent of the coastline of the region.[14]

In November 2009, PEMSEA organized the East Asian Seas Congress[15] that brought together more than 1,400 participants with participation from 14 countries in the EAS region. The Congress took stock of progress in addressing six thematic areas in the EAS region and remaining challenges that are summarized in Table 2 below.

Table 2: Thematic issues in the EAS region and remaining challenges.

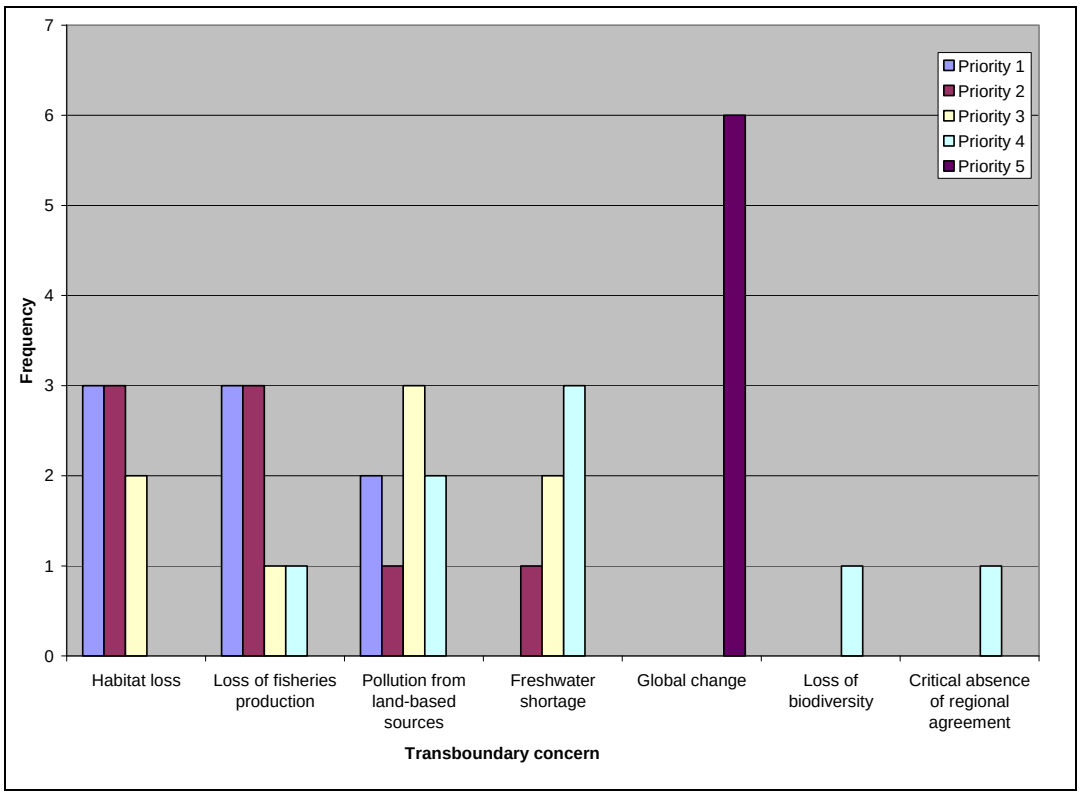
Thematic area	Remaining challenges
Coastal and ocean governance	• Climate change cannot be decoupled from development • ICM must be integrated into national ocean and coastal policy
Natural and man-made hazard prevention and management	• Local capacity development required in order to assess risks, develop and implement effective responses, and strengthen resiliency through education, alternative livelihoods
Habitat protection, restoration and management	• Further efforts are required to enhance the capability of local communities to manage and maintain habitats
Water use and supply management	• Water is a serious emerging challenge to the region and climate change is adding to the problem
Food security and livelihood management	• Better aquaculture practices are required • Highly sectoral approaches to fisheries cannot effectively solve the complex problems
Pollution reduction and waste management	• Still huge demand for environmental facilities and services in the region

Climate change emerges as a cross-cutting issue, which will affect governance, the frequency of natural hazards, such as storms and floods, water use and supply.

The frequency by which the transboundary issues are ranked as priority one to five in Table 1 is summarized in Figure 2 below. It could be argued that priorities identified through a rigorous TDA process in the YSLME and SCS should not be compared with GIWA assessments that are older and based on more generic criteria. However, the GIWA results are used to give the big picture of the major threats to the EAS region, and the analysis can be updated once the Sulu-Celebes and ATSEA TDAs have been finalized.

It can be seen that the two most important threats to the environment and sustainable development of the EAS region is habitat loss/ecosystem degradation and loss of fisheries production, followed by pollution from land-based sources. Freshwater shortage is also a significant threat, while global change was ranked as number five by all the GIWA assessments. Climate change as a driver of global change was not analyzed separately at the time, but is included in new TDAs under development, such as the one for ATSEA. Loss of biodiversity was included as a separate issue only in the YSLME TDA, and critical absence of regional agreement in the SCS TDA.

Figure 2. Summary of priority transboundary concerns across LMEs in the EAS region (including the three sub-systems of the Indonesian Seas).

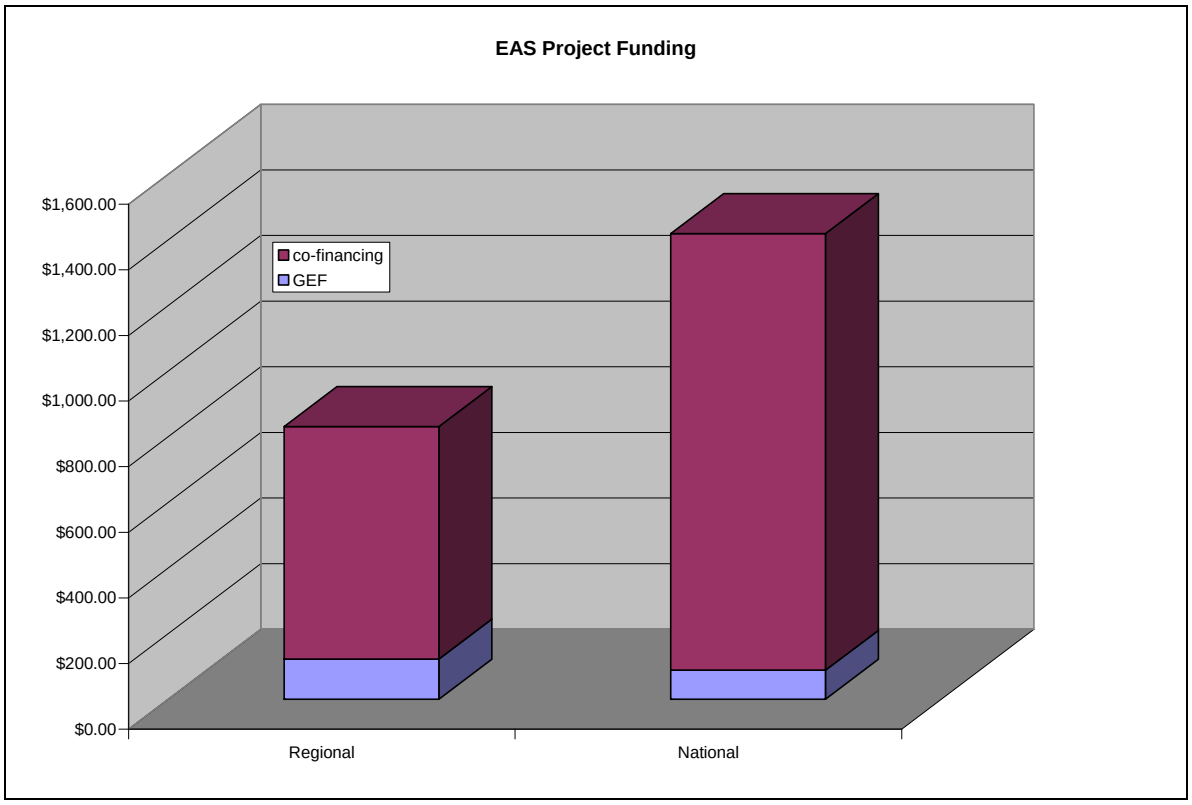


4.2 GEF Investments in the EAS region

GEF funding to International Waters projects in the EAS region is summarized in Table 3 below using UNEP's Regional Seas Programme guidelines for financing of the implementation of regional seas conventions and action plans[16] to categorize the different types of environmental financing. Total GEF funding committed to the EAS region since its inception amounts to US$ 210.69 million, spread over almost 30 projects, which is equivalent to almost 20 percent of total GEF IW funding.[a] This has in turn leveraged around US$ 2 billion in co-financing.

Most of the GEF funding has been invested in regional initiatives followed by national initiatives. National projects have been most successful in leveraging co-financing (Figure 3) and the overall GEF to co-financing ratio is 1:15. Most of this co-financing comes from international financial institutions and national governments. Regional projects, on the other hand, have co-financing ratios of around 1:6 with NGOs and Research Institutions playing an important role in complementing government, multilateral and bilateral funding. The overall co-financing to the International Waters portfolio in the EAS region is approximately 1:10.

Figure 3: Funding to different types of projects in the EAS region.



[a] Note that some projects also received funding from other focal areas and the total IW funding therefore probably comes to around 18% of GEF total to the focal area.

Table 3: Funding to International Waters Projects and Programmes in the EAS region.

Transboundary Initiatives	National Govern-ment	Local Govern-ment	GEF	IFIs	Multi-lateral Agency	Bilat-erals	NGOs/ Research Inst.	Economic instru-ments	Private sector, PPPs	Total funding (US$ Million)
1. Regional Projects										
1a. Regional Initiatives										
PEMSEA Phase 1-3, including PPP (1993-2011)	x	x	36.1		x	x	x	x	x	462.1
Partnership Investment Fund for Pollution Reduction, Tranche 1 (2006-2010)	x		35.0*	x						910.3*
CTI/IWLearn	x	x	2.7	x	x	x			x	5.97
1b. LME/Sub-regional Seas projects										
South China Sea and Gulf of Thailand (2002-2008)	x	x	16.41		x		x			32
Yellow Sea LME (2004-2010)	x	x	14.7		x		x			30
Sulu-Celebes LME (2009-2013)	x		3.0		x		x			6.8
Arafura-Timor Seas (2009-2013)	x		2.7		x		x			8.4
1c. Regional Fisheries Projects										
Southeast Asia CTI (2009-2013) (MFA)	x		10.3	x		x	x		x	76.5
Western Pacific East Asia Oceanic Fisheries Management Project (WPEA) (2009-2011)	x		1.0		x	x	x			4.6
Bycatch Management (2009-2014)	x		3.0		x				x	6.7
1d. Regional River Basin Projects										
Mekong River Basin Water Utilization Project (2000-2008)	x		11.1	x						17.95
Mekong River Basin Wetland Biodiversity Conservation and Sustainable Use Program (2004-2009) (BD)	x		4.53		x		x			13.9
National Performance Assessment and Sub-Regional Strategic Environment Framework in the Greater Mekong Subregion (2002-2007) (MFA)	x		0.8	x						2.4
1e. Other relevant regional projects										
Livestock-Waste Management in East Asia (2006-)	x		7.7		x					24.71
Marine Electronic Highway Demonstration (2006-)	x		8.3		x					16.27

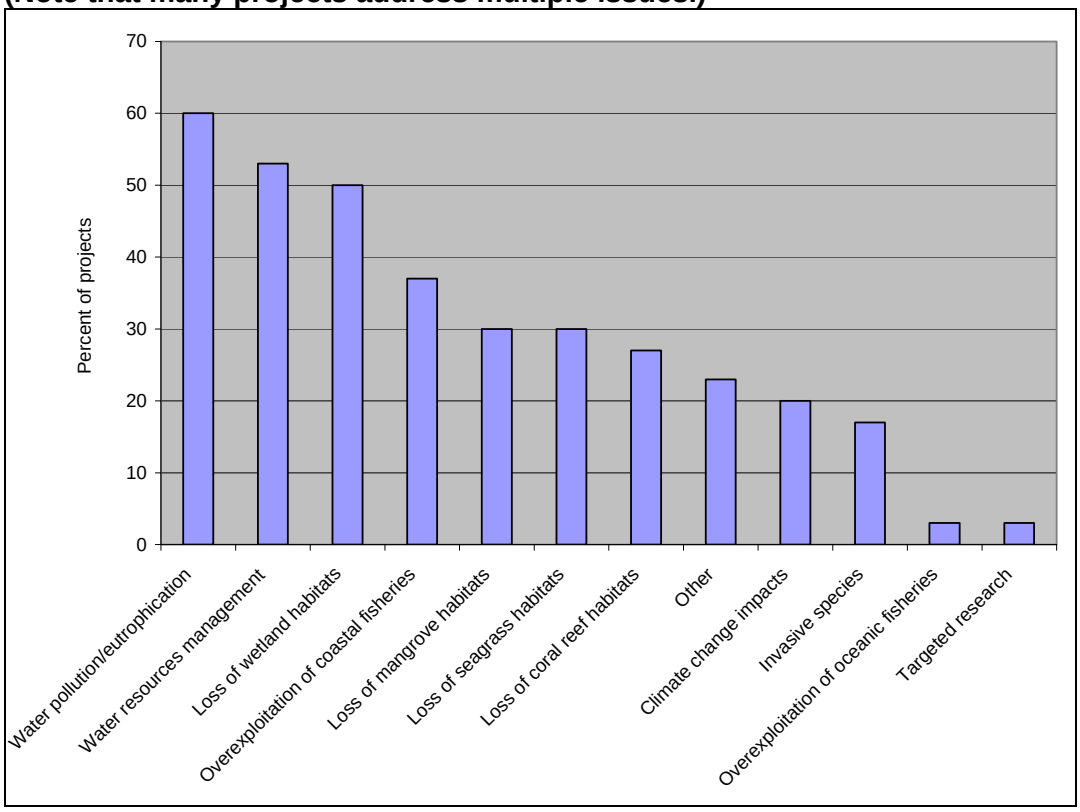
Transboundary Initiatives	National Govern-ment	Local Govern-ment	GEF	IFIs	Multi-lateral Agency	Bilat-erals	NGOs/ Research Inst.	Economic instru-ments	Private sector, PPPs	Total funding (US$ Million)
Sub-total			**122.34**							**708.3**
2. National Projects										
Hai River Basin Integrated Water Resources Management	x	x	17.0	x						130.34
Pearl River Delta Development (2004-)	x	x	10.0	x						432.38
Ningbo Water and Environment Project - Investment Fund (2006-)	x	x	5.0	x						145.5
Coastal Cities Environment and Sanitation Project - under Investment Fund (2006 -)	x	x	5.0	x						27.03
Manila Third Sewerage Project (MTSP) – under Investment Fund (2007-)	x	x	5.35	x						93.16
Liaoning Medium Cities Infrastructure – under Investment Fund (2007 -)	x	x	5.0	x						193.05
Second Shandong Environment - under Investment Fund (2007 -)	x	x	5.0	x						206.85
Shanghai Agricultural and Non-Point Pollution Reduction project (SANPR) - under Investment Fund (2010 -)	x	x	4.79	x						34.89
Demonstration of Sustainable Management of Coral Reef Resources in the Coastal Waters of Ninh Hai District, Ninh Thuan Province, Viet Nam (2008 -)	x	x	0.41				x			0.94
Demonstration of Community-based Mgt of Seagrass Habitats in Trikora Beach East Bintan, Riau Archipelago Province, Indonesia (2007 -)	x	x	0.40				x			0.79
Participatory Planning and Implementation in the Management of Shantou Intertidal Wetland (2007	x	x	0.40				x			0.92
Ship Waste Disposal (1992-1997)	x		30.0	x						64.8
Sub-total			**88.35**							**1,330.65**
Total			***210.69***							***2,038,95***

*Not included in total – individual projects under the Investment Fund counted instead.
BD – funding from the Biodiversity focal area; MFA – funding from multiple focal areas.

4.3 Extent to which GEF Projects have addressed Transboundary Issues in the EAS Region

Annex 1 provides an analysis of the transboundary issues addressed and the approach taken by GEF projects in the EAS region. Figure 4 below summarizes the findings from the analysis of transboundary issues. The most common issues addressed by 50% or more of GEF projects are water pollution/eutrophication, water resources management and loss of wetland habitats. This is followed by overexploitation of coastal fisheries and other types of coastal habitats that are addressed by between 37 and 27 percent of projects. Climate change impacts and invasive species have received less attention and are only addressed by 20 and 17 percent of projects, respectively. Overexploitation of oceanic fisheries and targeted research are the issues with the lowest number of projects.

Figure 4: Transboundary issues addressed by GEF projects in the EAS region. (Note that many projects address multiple issues.)



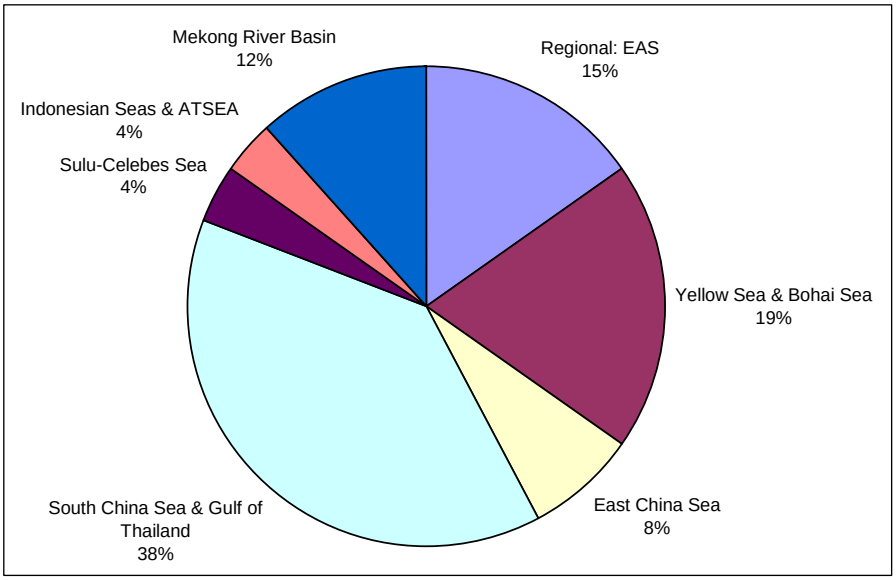
Many of the projects addressing water **pollution and/or eutrophication** are funded under the World Bank/GEF Pollution Reduction Investment Fund and are concentrated in the Yellow Sea and the South China Sea. Projects that are addressing **water resources management** issues are found in the Mekong basin in addition to coastal areas, while projects addressing **threats to habitats** are concentrated in the South China Sea with new projects emerging in the Sulu-Celebes Sea and the Arafura-Timor Seas. **Overexploitation of fisheries** is mainly addressing coastal fisheries and only one project deals with oceanic fish stocks**. Climate change impacts** are a relatively new issue in the EAS region and are most prominently integrated into projects that are dealing with coral reef management**. Invasive species** are mainly addressed by projects

dealing with shipping, such as the GloBallast Partnership. Comparing Figure 2 on the ranking of the transboundary issues across the LMEs in the EAS region by order of importance, and the priority given by GEF projects, fisheries stands out as the issue not given adequate attention by GEF in relation to its importance and in comparison to other transboundary concerns, such as pollution and habitat loss. This becomes even more evident looking at the amount of funding that has been allocated to fisheries management projects compared to pollution reduction, water resources management and habitat management, as several fisheries projects are only medium-sized projects.

One global **targeted research** project with relevance for the EAS region was also included in the analysis, namely the Coral Reef Targeted Research and Capacity Building for Management. Research carried out by the project indicates that coral reefs, as we have known them, will not likely survive the rapid increases in global temperatures and atmospheric CO_2 that are forecast this century. Of the 109 countries with significant coral reef communities, at least 93 are experiencing damage. Many designated protected areas on coral reefs have reached such a state of decline that they can no longer be considered as coral reefs. Coral reef research targeted at management actions and policy change is therefore highly relevant. In addition, the project created models and tools to predict the impact of coastal developments and climate change on coral reefs, including developing a regional model for the Philippines that could be used in other projects with coral reef components.[17]

Annex 2 assigns each GEF project to one or several LMEs in which it is being implemented. This analysis indicates that the South China Sea has the largest number of GEF projects followed by the Yellow Sea. The only international river basin in the EAS region that has received GEF support — the Mekong — discharges into the South China Sea, and these projects can thus also be seen as benefitting this LME. The Indonesian Seas, the Sulu-Celebes Sea and the East China Sea have very few GEF LME projects, but countries bordering those LMEs are benefitting from EAS regional GEF projects under PEMSEA, COREMAP II (being implemented in the Indonesian Sea with GEF Biodiversity funding), as well as fisheries-related projects (Figure 5).

Figure 5. Percentage of GEF projects in the EAS region (excluding global projects) covering the different LMEs. All projects covering more than two LMEs are classified as Regional EAS.



4.4 Contribution of GEF Projects to Ecosystem Approach and Tools

The analysis of the approach taken/methodology applied by the GEF projects covers broad approaches such as:

Ecosystem-based Management (EBM) approach to LMEs – EBM has many definitions in scientific literature, but general criteria normally include sustainability, ecological health and inclusions of humans in the ecosystem. Ecological criteria focus on one or more aspects of ecosystem complexity and recognize that ecological processes occur on a variety of temporal and spatial scales. Human dimension criteria integrate economic factors and stakeholders into the ecosystem planning processes. Management criteria include diverse approaches to administration, such as co-management and the precautionary approach, as well as the use of science and technology.[18]

Integrated Coastal Management (ICM) – ICM is based on three principles: adaptive management; integration and interrelationships; and ecosystem-based management. ICM evolved from the practical need to plan and manage the various economic activities that occur in coastal areas, regulate human behaviour, coordinate policy and management interventions, and integrate the use of coastal waters into land use planning. The ultimate purpose of ICM is, therefore, to increase the efficiency and effectiveness of coastal governance in terms of its ability to achieve the sustainable use of coastal resources and of the services generated by coastal ecosystems.[19] As can be seen in Annex 1, several programmes and projects in the EAS region have adopted ICM as an approach to coastal management. These initiatives often have a bottom-up character, as the entry point for action is at the local level with, for example, PEMSEA working with local governments across the region on ICM.

Integrated Water Resources Management (IWRM) – IWRM is defined by the Global Water Partnership as: coordination of development and management of water, land and other resources for maximizing of economic results and social welfare with no compromise on the environment.[20] The central principals of IWRM are participation, integration of the resources, institutions and stakeholders for sustainable water resources management. Recent analysis of IWRM worldwide has shown that IWRM plans consist of four components: policy; water management along hydraulic boundaries; participation; and management instruments. ICM and IWRM are often implemented jointly in coastal areas and PEMSEA's demonstration projects in the Mekong River Basin provide a good example of this.

GEF support also includes planning tools such as the Transboundary Diagnostic Analysis (TDA) and Strategic Action Programs (SAPs) used in LME projects, as well as place-based management tools, such as fisheries *refugia* and marine protected areas (MPAs) that can be useful EBM tools. **TDAs** are science-based analyses of transboundary water-related concerns and opportunities that exist in multi-country surfacewater, groundwater, and coastal/marine water systems. They are used to identify priorities for joint action, root causes and scope for the concerns or opportunities, and serve as the basis for reforms and investments included in the action programmes. A **SAP** is an agreement among participating countries on actions needed to resolve priority threats to international waters, including actions for the national benefit of each country, actions addressing transboundary issues and institutional mechanisms at regional and national levels for implementation of those actions. To implement SAPs at the national

level, support has also been given to the development of National Action Plans and establishment of National Inter-Ministry Committees (NICs). For example, the South China Sea project was very successful in establishing sustainable NICs. The Third Overall Performance Study (OPS3) of the GEF observed that the TDA/SAP tool is a good mechanism for harmonizing the International Waters scientific approach with a policy approach, and a positive by-product is capacity building.[21]

Both the ICM and TDA/SAP approaches promote integrated approaches to coastal and marine planning and management and enhanced exchange of information and experiences. They also promote ecosystem-based management at different scales. ICM initiatives often start at the local level and gradually build up to achieve regional impacts, while TDA/SAP driven initiatives tend to start at the regional level before initiating action at the local level through demonstration projects. Some new initiatives, such as the Sulu-Celebes project are combining the two approaches.

Fisheries *refugia* is defined by SEAFDEC as "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 lifecycle, for their sustainable use." In other words, the approach aims to reduce the loss of habitats and biodiversity as a result of open access fishing. It is a rights-based approach to fisheries where 'group user rights' are promoted under co-management systems.[22] This concept has been spearheaded in the South China Sea and Gulf of Thailand project and further up-scaling is anticipated in the SAP implementation phase.

Marine Protected Areas (MPAs) are defined as "any areas of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment."[23] MPAs are considered essential to conserve the biodiversity of the oceans and to maintain productivity, especially of fish stocks. The Sulu-Celebes and the Southeast Asia CTI projects are expected to strengthen the MPA systems in the CTI that is part of the EAS.

Figure 6. Number of GEF projects applying different IW approaches and methodologies. Note that several projects are using multiple approaches (Annex 1).

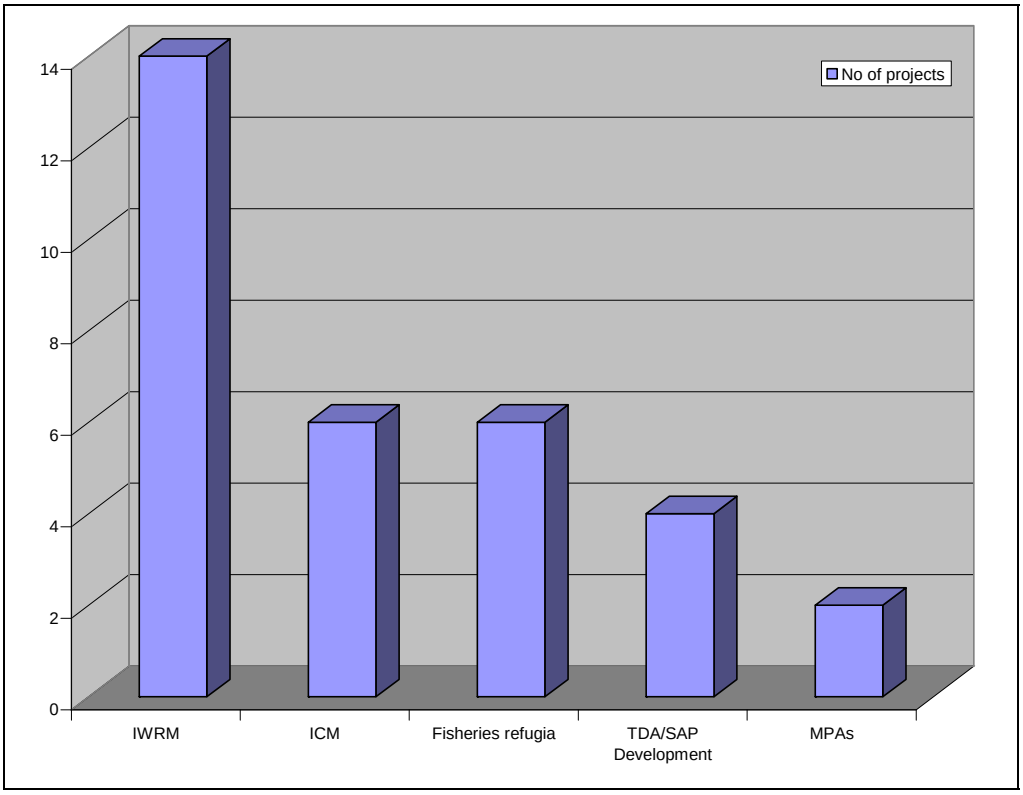


Figure 6 is providing an overview of how frequently the different tools for EBM are applied in GEF projects. IWRM is the most common approach and is often linked to one or several of the other approaches. However, it is difficult to analyze the extent to which individual GEF projects are applying EBM. Rather, GEF support needs to be looked at in its totality, as all projects form part of planning frameworks for LMEs that are based on EBM principles, such as the SDS-SEA, the SAPs for SCS and YSLME, Action Plans for CTI, etc. The question should instead be asked as to what extent these different planning frameworks are linked spatially and operationally and what the governance mechanism is for coordinated implementation of EBM across the EAS region. In order to provide an answer to this question, the next chapter will first review the existing governance mechanisms for the EAS region, before any conclusions can be drawn with regard to EBM at the LME and EAS regional scales.

5. REVIEW OF REGIONAL COORDINATION AND GOVERNANCE MECHANISMS FOR LME MANAGEMENT

This section is reviewing GEF and non-GEF funded mechanisms and programmes that have played a coordinating role in the EAS region based on political and/or technical mandate and geographical coverage.

EAS regional mechanisms for coastal and marine management

Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) started out as a regional pilot programme on Prevention and Management of Marine Pollution in the East Asian Seas from 1994-1999 funded by the GEF, implemented by the United Nations Development Programme (UNDP) and executed by the International Maritime Organization (IMO), which was followed by a second phase on Building Partnerships in Environmental Management for the Seas of East Asia (PEMSEA). PEMSEA focused on integrating local, national and international initiatives to address coastal and marine issues and resulted in the adoption of the non-legally binding Sustainable Development Strategy for the Seas of East-Asia (SDS-SEA), which provides a framework of actions for achieving the goals of key international agreements and action plans related to coasts, islands and oceans. Starting in 2008, PEMSEA's third phase, which focuses on the implementation of the SDS-SEA, runs for three years and is funded by the GEF, PEMSEA member countries and other donors. A series of indicators have been developed to assess progress across the region regarding implementation of the SDS-SEA. PEMSEA has also contributed to the establishment of the **World Bank/GEF Partnership Investment Fund (IF) for Pollution Reduction in the LMEs of East Asia**. The objective of the fund is to reduce land-based pollution discharges that are degrading the seas of East Asia by leveraging investments in pollution reduction through the removal of technical, institutional, and financial barriers to them. The Fund is thereby contributing to the implementation of the SDS-SEA and is closely coordinating its activities with PEMSEA. According to the latest progress report of the IF, it has made good progress in launching projects with high demonstration value and these projects have high co-financing with an average ratio of 1:20, exceeding by far the average of 1:10 for the entire EAS portfolio in International Waters.[24]

The terminal evaluation of the second phase of PEMSEA[25] concluded that PEMSEA is an innovative effort to integrate local, national and international initiatives to address coastal and marine issues on habitat degradation, unsustainable rates of resource use and resource use conflicts, hazards and the conditions of poverty. It has been highly successful, evidenced by the success at its six demonstration sites in implementation of integrated coastal management (ICM) with replication at a dozen more sites with 100 percent funding from national and/or local governments and, in some cases, the private sector. Environmental stress reduction in terms of reduction in pollutant discharges have been achieved at the demonstration sites at Xiamen (China) and Batangas (Philippines) coupled with an overall improvement in environmental quality. PEMSEA has also been instrumental in the integration of ICM principles and strategies in the national policy frameworks of member countries. PEMSEA's efforts to foster Public-Private Partnerships (PPP) to create investment opportunities in support of ICM in, for example, solid waste management facilities and water treatment and sewerage systems, have more mixed results.[26] PEMSEA has a number of collaborative and partnership activities established from local to national and regional levels. A key example is PEMSEA's continuous support to the annual planning and organization of the Xiamen World Ocean

Week (XWOW) in China together with the State Oceanic Administration of China, the UNDP, and the Xiamen Government. The XWOW is an important initiative that is already gaining regional and international recognition.

The regional governance arrangements of PEMSEA comprises the East Asian Seas (EAS) Partnership Council and its Intergovernmental Session, which is composed of PEMSEA member countries; its Technical Session, which also include Non-Country partners; and the PEMSEA Resource Facility (PRF), based in Manila, Philippines. The PRF provides secretariat and technical services related to SDS-SEA implementation to the EAS Partnership Council. PEMSEA's governance mechanism also includes a triennial East Asian Seas Congress and Ministerial Forum, which ensures wide stakeholder participation and knowledge exchange. Further, a PEMSEA Network of Local Governments for Sustainable Coastal Development (PNLG) was set up, which in 2006 adopted its own Charter and established a secretariat, hosted by the Xiamen Municipal Government. The Third Ministerial Forum (Manila, 26 November 2009) recognized the international legal personality of PEMSEA and established PEMSEA as an independent regional mechanism mandated for the implementation of the SDS-SEA.

The Regional Seas Programme (RSP) was launched by the United Nations Environment Programme (UNEP) in 1974 in the wake of the 1972 United Nations Conference on the Human Environment. It aims to address the accelerating degradation of the world's oceans and coastal areas through the sustainable management and use of the marine and coastal environment, by engaging neighbouring countries in comprehensive and specific actions to protect their shared marine environment. Currently, there are 18 Regional Seas programmes of which 6 are operating under UNEP. Two cover the EAS region: the Coordinating Body on the Seas of East Asia (COBSEA) and the Northwest Pacific Action Plan (NOWPAP). Another neighbouring Regional Seas Programme is SACEP/SAS (South Asian Seas). Unlike most other Regional Seas, the two EAS regional programmes do not have regional conventions and they operate under their respective Action Plans.

The Coordinating Body on the Seas of East Asia (COBSEA) that operates the "Action Plan for the Protection and Development of the Marine and Coastal Areas of the East Asian Region"[27] was approved in 1981 and was initially subregional, involving only five countries of ASEAN, with five more welcomed in 1994. Today, COBSEA has ten member countries. COBSEA activities are implemented and coordinated by the COBSEA Secretariat which is located in the UNEP Regional Office for Asia and the Pacific in Bangkok and overseen by its biennial Intergovernmental Meetings. There is no regional convention but instead the programme promotes compliance with existing environmental treaties and is based on member country goodwill.[28] The State of the Marine Environment Report for the East Asian Seas that was published in 2009 serves as a periodical assessment review of the marine environment in the region.[29] In 2008, the 19th Intergovernmental Meeting (IGM) adopted the *COBSEA New Strategic Direction 2008–2012*. The strategy has four components: information management; national capacity building; strategic and emerging issues; and regional cooperation; and it identifies three priority areas: marine and land-based pollution; coastal and marine habitat conservation; management and response to coastal disasters.[30]

COBSEA is modestly funded by nominal voluntary contributions from its member countries and is also often supported by UNEP and external donors. COBSEA has provided an institutional platform for the GEF-funded project for the South China Sea

that was completed in 2009. The Terminal Evaluation rated the project as overall satisfactory with its main achievement being the development and endorsement of a Strategic Action Programme (SAP) for the SCS. The project also led to improved management of coastal and marine habitats at demonstration sites and fostered excellent stakeholder participation. However, the Terminal Evaluation also points to the lack of coordination with PEMSEA with regard to selection and management of demonstration sites, and with COBSEA with regard to the coordination mechanism for the implementation of the SCS SAP, which has implications for the sustainability of the institutional structures established by the project.[31] At present, COBSEA's activities focus on a limited number of emerging issues identified by its member countries namely: spatial planning in the coastal zone (supported by SIDA); a regional programme on marine litter; a regional strategy on marine invasive species; and a regional programme on coastal erosion..

The Northwest Pacific Action Plan (NOWPAP) and three supporting resolutions including five priority projects were adopted in 1994.[32] In addition, NOWPAP member countries established four Regional Activity Centres (RAC) in 2000-2002 and a Regional Coordinating Unit (RCU) was established in 2005, co-hosted by Japan and the Republic of Korea. The NOWPAP Regional Oil Spill Contingency Plan was adopted in 2003 and the Regional Action Plan on Marine Litter was adopted in 2007. So far, NOWPAP has not been directly responsible for any GEF-funded project, but plays an active role in both PEMSEA and the YSLME project.

The Regional Seas Programme also provides an important platform for coordinated regional implementation of the **Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA)** that was adopted in 1995. UNEP provides the Secretariat for the GPA and the status of the implementation of the GPA is reviewed in Intergovernmental Review Meetings.[33] The GPA is designed to be a source of conceptual and practical guidance to be drawn upon by national and/or regional authorities for devising and implementing sustained action to prevent, reduce, control and/or eliminate marine degradation from land-based activities. It involves:

i. Applying integrated coastal area management approaches, including provisions to involve stakeholders;
ii. Recognizing the basic linkages between the freshwater and marine environment through, application of watershed management;
iii. Recognizing the basic linkages between sustainable development of coastal and marine resources, poverty alleviation and protection of the marine environment;
iv. Applying environmental impact assessment procedures in assessing options; and
v. Integrating national action with any relevant regional and global priorities, programmes and strategies.

The Investment Fund for Pollution Reduction in the LMEs in the EAS, mentioned above, is contributing to the implementation of the GPA in the region.

ASEAN Senior Ministers on the Environment (ASOEN) and Vision 2020 – The ASEAN established the Ministerial Meeting on the Environment in 1981 and created Vision 2020 for sustainable natural resources and development. The vision is realized through strategic action plans. The ASEAN has adopted the Hanoi Action Plan (1999-2004) which called "for the development of a framework to improve regional coordination for the integrated protection and management of coastal zones, development of a

regional action plan for the protection of the marine environment from land-based and sea-based activities, and promotion of regional coordination to protect Marine Heritage Parks and Reserves." The Vientiane Action Program (2004-2010) followed the Hanoi Action Plan and "describes the goals and strategies towards realizing the ASEAN Community, which comprises of three pillars, the ASEAN Security Community (ASC), the ASEAN Economic Community (AEC) and the ASEAN Socio-Cultural Community (ASCC). The ASEAN Working Group on Coastal and Marine Environment (AWGCME) is implementing the Vientiane Action Program, where the continued work in implementing the ASEAN Marine Water Quality Criteria and the ASEAN Criteria for Regional and National Marine Protected Areas have been identified as its priorities. The ASEAN has realized the transboundary nature and impacts of threats to its coastal and marine environment and is now developing the ASEAN Charter to discuss environmental issues.[34] This will be a rules-based approach that provides legal backing for solutions without interfering in the internal affairs of each country.

ASEAN Center for Biodiversity (ACB): The ACB was created by the ASEAN Member States (AMS) in 2005 with the mandate to facilitate cooperation and coordination among 10 member countries of the Association of Southeast Asian Nations, other governments, and regional and international organizations on: the conservation and sustainable use of biological diversity; and the fair and equitable sharing of benefits from sustainable use of natural resources. The creation of ACB was ratified by 6 of the 10 member states and it is hosted by the Philippines. The AMS has also approved the establishment of the ASEAN Biodiversity Fund, with support from KfW, Germany. The ACB has a regional *Strategic Organizational Plan 2010-2020* and its annual workplans are approved by the AMS. ACB implements activities in 12 thematic areas, including climate change and biodiversity conservation; ecosystem and biodiversity conservation; valuation of ecosystem services and payment schemes; support for the Program of Work on Protected Areas; managing biodiversity information and knowledge; and business and biodiversity in the 10 countries. ACB has flagship programs on:

- ASEAN Heritage Parks
- Biodiversity Information Sharing Service
- Joint Research/Initiatives on Biodiversity
- Capacity-building
- Public awareness
- Partnerships

Coral Triangle Initiative (CTI): The Coral Triangle region is located along the equator at the confluence of the Western Pacific and Indian Oceans. Covering only 1.6 percent of the planet's oceanic area, the Coral Triangle represents the global epicentre of marine life abundance and diversity. CTI officially launched a Regional Plan of Action for the CTI at the World Ocean Conference in Manado, Indonesia, in May 2009. The action plan has five overall goals covering priority seascapes, ecosystem approach to management of fisheries and other marine resources, marine protected areas, climate change adaptation and threatened species.[35] In addition, each of the six participating countries has drawn up a National Plan of Action. The GEF is providing funding to the CTI in collaboration with the Asian Development Bank (ADB) and other GEF agencies, such as UNDP, and it is under this program that some of the LME/subregional projects receive

their funding. Several bilateral donors are also supporting the CTI, such as the U.S.A. and Australia.

Regional governance arrangements for CTI include a CTI Secretariat that is based in Manado and national coordinating committees. The final framework and architecture of the regional secretariat is expected to evolve from being based in a government agency, while institutional options are being identified and analyzed, into a semi-autonomous organization that will still be linked to government agencies to ensure political support and high-level engagement. A monitoring and evaluation system for the CTI is under development.

Mangroves for the Future (MFF) was launched by former US President Bill Clinton in Phuket, Thailand, in December 2006, and focuses on the countries worst affected by the tsunami, including Indonesia and Thailand in the EAS region. MFF has also initiated dialogue with other EAS countries, and Vietnam has recently joined the program. The initiative uses mangroves as a flagship ecosystem, but MFF also includes other coastal ecosystems, such as coral reefs, estuaries, lagoons, sandy beaches, seagrasses and wetlands. MFF objectives are to: (a) strengthen the environmental sustainability of coastal development; and (b) promote the investment of funds and efforts in coastal ecosystem management, which will be promoted across four components: regional cooperation; national program support; private sector engagement; and community action).[36]

MFF was initiated by the International Union for Conservation of Nature (IUCN) and UNDP, but has grown to include other UN agencies such as the Food and Agriculture Organization (FAO) and UNEP, as well as international development organizations such as CARE and Wetlands International that are implementing the MFF Programmes of Work (PoW) in partnership with national governments. At the regional level, implementation of the PoWs is monitored by the MFF Regional Steering Committee co-chaired by IUCN and UNDP, with national government representatives and institutional partners as its members. The PoW includes a component on Management Assessment and Monitoring that applies ecological and socioeconomic assessment and monitoring mechanisms for key MFF actions.The MFF Secretariat is hosted by IUCN's Regional Office in Bangkok.

Subregional mechanisms for coastal and marine management

Yellow Sea Commission (proposed) – The adopted SAP for the YSLME suggests that a YSLME Commission be established to enhance the environmental governance of the YSLME. The SAP states that the YSLME Commission would be a soft, non-legally binding and cooperation-based institution. It would be comprised of a Steering Committee, a Secretariat that implements the decisions of the Steering Committee, and Sub-Commissions of experts responsible for technical issues.[37] A monitoring and evaluation framework for implementation of the SAP that includes process, stress reduction and environmental status indicators has also been developed.

Sulu-Sulawesi Marine Ecoregion (SSME) Tri-national Committee – The SSME TriCom was established in 2006 by Indonesia, Malaysia and the Philippines following the ratification of the Ecoregion Conservation Plan for SSME and with the support from the World Wide Fund for Nature (WWF) and with subsequent capacity development support from Conservation International (CI). The SSME TriCom has Sub-Committees on: (a)

Threatened, Charismatic and Migratory Species; (b) Marine Protected Areas (MPA) and Networks; and (c) Sustainable Fisheries. The TriCom has approved three regional Action Plans for Threatened and Highly Migratory Species, Marine Protected Areas and Networks, and Sustainable Fisheries for simultaneous implementation by the governmental agencies. A GEF project[38] for the SSME was developed by the Sub-Committee on Sustainable Fisheries[39] under the 2008-2012 Action Plan and is now being implemented and executed by UNDP/UNOPS.

Brunei-Indonesia-Malaysia-Philippines East Asia Growth Area (BIMP-EAGA) – The BIMP-EAGA was formed in 1994 by the governments of Brunei, Indonesia, Malaysia, and the Philippines for the sustainable development of the sub-region. The BIMP-EAGA has three focal areas for cooperation: facilitating free movement of people, goods, and services; making best use of infrastructure and natural resources; and taking fullest advantage of economic complementation. The Sulu-Sulawesi Marine Ecoregion and the Heart of Borneo environmental programs were adopted by the BIMP-EAGA under the natural resources cluster of activities as their flagship programs.

Arafura-Timor Sea Expert Forum (ATSEF) – Stakeholders from Australia, Indonesia and Timor-Leste formed ATSEF during the Preparatory Committee IV for the World Summit on Sustainable Development (WSSD) held in Bali, Indonesia, in June 2002. ATSEF has agreed on the following priority foci in an action plan: (a) deter, prevent, and eliminate illegal and unsustainable fishing; (b) maintain sustainable fish stocks, biodiversity and marine and coastal habitats; (c) identify/develop alternative sustainable livelihoods with indigenous and coastal communities; (d) research and monitor the systems dynamics of marine, coastal and catchment ecosystems, oceanography and climate change; and (e) improve capacity for information management and sharing among ATSEF member nations.

Regional fisheries management mechanisms

The Western and Central Pacific Fisheries Commission (WCPFC) was established by the Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPF Convention) which entered into force on 19 June 2004. The WCPF Convention draws on many of the provisions of the UN Fish Stocks Agreement (UNFSA) while, at the same time, reflecting the special political, socioeconomic, geographical and environmental characteristics of the Western and Central Pacific Ocean (WCPO) region. The WCPFC Convention seeks to address problems in the management of high seas fisheries resulting from unregulated fishing, over-capitalization, excessive fleet capacity, vessel re-flagging to escape controls, insufficiently selective gear, unreliable databases and insufficient multilateral cooperation in respect to conservation and management of highly migratory fish stocks. A framework for the participation of fishing entities in the Commission which legally binds fishing entities to the provisions of the Convention, participation by territories and possessions in the work of the Commission, recognition of special requirements of developing States, and cooperation with other Regional Fisheries Management Organizations (RFMO) whose respective areas of competence overlap with the WCPFC reflect the unique geo-political environment in which the Commission operates. The Commission supports three subsidiary bodies: the Scientific Committee; Technical and Compliance Committee; and the Northern Committee, that each meets once during each year.

Oceanic tuna stocks in the EAS are currently partially managed under the auspices of the WCPFC and the Commission, with assistance from an ongoing GEF project (WPEA)[40]. WCPFC is in the process of strengthening the governance framework for highly migratory fish stocks in the EAS.

The Asia-Pacific Fishery Commission (APFIC) was established under the APFIC agreement as the Indo-Pacific Fisheries Council in 1948 by the Food and Agriculture Organization of the United Nations. The Secretariat is provided and supported by FAO. The Governing Body of APFIC is the Commission, which is advised by its Executive Committee. The Commission may establish Committees and working parties to assist its work. The function of APFIC is described in the APFIC agreement and more recent sessions have elaborated that APFIC will act as a Regional Consultative Forum that works in partnership with other regional organizations and arrangements and members. It provides advice, coordinates activities and acts as an information broker to increase knowledge of fisheries and aquaculture in the Asia-Pacific region to underpin decisionmaking.

The Southeast Asian Fisheries Development Center (SEAFDEC) is an autonomous intergovernmental body established in 1967. SEAFDEC was mandated to develop the fisheries potential of the Southeast Asian region by rational utilization of the resources to provide food security to the people through transfer of new technologies, and to conduct research and information dissemination activities. SEAFDEC is comprised of 11 Member Countries and operates through the Secretariat located in Thailand and has four technical Departments, namely, the Training Department, the Marine Fisheries Research Department, the Aquaculture Department, and the Marine Fishery Resources Development and Management Department. SEAFDEC is currently the executing agency for several GEF-funded fisheries projects in the EAS.

River basin mechanism

The Mekong River Commission (MRC) was formed in 1995 by an agreement between the governments of Cambodia, Lao PDR, Thailand and Viet Nam. The four countries signed *The Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin* and agreed on joint management of their shared water resources and development of the economic potential of the river. In 1996, China and Myanmar became Dialogue Partners of the MRC and the countries now work together within a cooperation framework.

The MRC is an international, country-driven river basin organization that provides the institutional framework to promote regional cooperation in order to implement the 1995 Agreement. The MRC supports the Mekong Programme, a Regional Cooperation Programme for the Sustainable Development of Water and Related Resources in the Mekong Basin owned by its member countries. The four goals for 2006-2010 are to:

i. Promote and support coordinated, sustainable, and pro-poor development;
ii. Enhance effective regional cooperation;
iii. Strengthen basin-wide environmental monitoring and impact assessment; and
iv. Strengthen IWRM capacity and knowledge base of the MRC bodies.

The Mekong River Commission Secretariat, which is based in Vientiane, Lao PDR, provides technical and administrative services to the MRC Council and Joint Committee. GEF has supported several projects with MRC, and PEMSEA has initiated pilot activities on integrated coastal area and river basin management in the Mekong River basin in Lao PDR.

Analysis of strengths and weaknesses of coordination and governance mechanisms in the EAS

1. Regional EAS Mechanisms: PEMSEA, COBSEA, NOWPAP, ASEAN-AWGCME, CTI, MFF

In terms of level of collaboration, almost all regional mechanisms have a monitoring program and action plan in place, while only ASEAN-AWGCME is linked to a legally binding agreement for regional cooperation, and only PEMSEA has attained legal personality as a regional institution. All regional mechanisms except ASEAN-AWGCME have a sustainable financing plan and funding to support a Secretariat, at least in the short to medium term, but some also have longer term financing. However, funding to programs and activities is more insecure and all regional mechanisms are dependent on mobilization of external resources to implement their action plans, as very little core funding from member countries is available. PEMSEA and the ACB/ASEAN-AWGCME are in the process of developing a sustainable financing mechanism to support their mandates.

As can be seen in Table 4, the involvement of riparian countries in the different regional mechanisms is strong. PEMSEA has the largest number of members, although none of the mechanisms include all countries in the EAS region. An analysis was also conducted of the involvement of national stakeholders and a weakness with most of the regional mechanisms is that they only work with one institution and sector in the member countries, although efforts are made to also consult with sectors outside of environment and/or marine affairs and fisheries areas. Several of the mechanisms, in particular PEMSEA and MFF also have strong participation of local governments and civil society in their activities on the ground. During the active phase of the South China Sea and Gulf of Thailand project, this was also the case for COBSEA.

2. Subregional/LME Mechanisms: ATSEF, SSME, YSLME

All the subregional mechanisms in place or under development in the EAS have fostered strong collaboration at the LME level and all have adopted subregional action plans and support monitoring programs and information sharing among the riparian countries. The SSME is the only subregional mechanism that is based on a legally binding agreement, but it does not have sustainable financing for its Secretariat and its programs and activities. ATSEF has sustainable financing for its Secretariat from its member countries, but not for its programs and activities. The YSLME has recently secured funding from China and the Republic of Korea to fund a Commission mandated to implement the SAP for the YSLME. The South China Sea is a special case where a sub-committee of COBSEA has assumed the role of the coordination mechanism for the SCS LME.

Only the SSME and the SCS sub-committee of COBSEA include all the riparian countries of the LME under its remit. All the subregional mechanisms are working with

multiple sectors, but multisectoral coordination at the national level is a challenge encountered in all participating countries. Local governments and civil society are participating in activities at the LME level, most often through demonstration projects.

3. Regional Fisheries Management Mechanisms: WCPFC, APFIC, SEAFDEC

All of the mechanisms related to the management of fisheries are supporting monitoring programs and information sharing activities and have action plans in place. The WCPFC is based on a legally binding agreement and both the WCPFC and SEAFDEC are established institutions for collaboration in fisheries matters.

4. River Basin Management Mechanisms: MRC

The Mekong River Commission is to date the only regional organization mandated from the highest political level to deal with resources management in the basin in a holistic manner. As discussed above, strengthening monitoring and impact assessment in the basin is a top priority and engagement with civil society groups in the basin has been made routine.[41]

As can be seen in the above overview and analysis, there is a complex overlap of mandates and geographical coverage between different initiatives and mechanisms at the regional level in the EAS region, while subregional mechanisms with an LME focus have more clearly defined niches in terms of geographical coverage and institutional mandates. In particular, there has been a lack of synergies between the Regional Seas and South China Sea interventions, on the one hand, and the PEMSEA interventions, on the other. This is also reflected in lack of coordination at the national level in cases where there are different national partner agencies that do not interact.[42] There is also a need to strengthen the coordination between regional fisheries commissions and technical partners in fisheries with mechanisms for coastal and marine management in the EAS. All initiatives are trying to influence national policies and institutions on marine and coastal management, indicating the need for strengthened national coordination between all initiatives that are present in a given country.

The regional architecture for the governance of the EAS has recently become further complicated by the addition of the CTI and MFF initiatives and it therefore seems urgent that EAS countries should agree on common coordination arrangements for marine and coastal initiatives in the region in order to maximize impacts and avoid wasteful duplication of efforts and of financial support from scarce resources. The main findings from the review and analysis of coordination and governance mechanisms for LME management in the EAS can thus be summarized as follows:

- MRC, WCPFC and SEAFDEC emerge as the most mature institutions and mechanisms in their respective fields, but none of them have a broad mandate for coastal and marine issues in the EAS;
- PEMSEA emerges as the strongest regional mechanism with a mandate to promote ICM of coastal and marine ecosystems in the EAS;
- Lack of legally binding agreements for sustainable management of coastal and marine resources in the EAS and sustainable financing appear to be the main challenges facing regional and subregional mechanisms;

- ACB and PEMSEA are two regional mechanisms for biodiversity conservation that are currently developing sustainable mechanisms for their respective mandates and, as such, any delineation of priority areas and coordination of activities particularly on marine protected areas and coastal zone management are necessary;
- PEMSEA, SSME, and YSLME are developing institutions and coordination of actions on non-legally binding agreements, which is an innovative way of strengthening regional collaboration on coastal and marine management in the EAS;
- With the enhanced sharing of information, experiences and lessons learned in the EAS, there is a need to strengthen collaboration and coordination at two levels:
    - Enhanced vertical coordination between different coordination and governance levels is required, i.e., between regional mechanisms with a mandate to work with all countries in the EAS, such as PEMSEA and COBSEA, ASOEN, and subregional mechanisms focused on a particular LME, such as YSLME, SSME and ATSEF;
    - Enhanced intersectoral coordination between mechanisms with different mandates, which could include strengthened collaboration between ICM and LME related mechanisms, and regional fisheries management mechanisms.

Table 4: Transboundary Issues Addressed by Regional Governance Mechanisms.

Transboundary issue addressed by Regional Body	Water pollution/ eutrophication	Loss of habitat	Overexploitation of fisheries		Climate Change impacts	Invasive Species	Targeted Research/ Other (specify)	Member Countries
			Coastal	Oceanic Riparian				
1. Regional EAS Mechanisms								
PEMSEA	**x**	**x**	**x**		**x**	**x**	x/oil spill preparedness and response and compensation for damage	Cambodia, China, DPR Korea, East Timor, Indonesia, Japan, Lao PDR, Philippines, RO Korea, Singapore, Thailand, Viet Nam
Partnership Investment Fund for Pollution Reduction, Tranche 1	**x**	**x**						Regional
COBSEA	**x**	**x**	**x**		**x**	**x**		Australia, Cambodia, China, Indonesia, RO Korea, Malaysia, Philippines, Singapore, Thailand, Viet Nam
NOWPAP	**x**	**x**	**x**		**x**	**x**		China, Japan, RO Korea, Russia
ASEAN (AWGCME)	**x**	**x**						Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam
ASEAN - ACB		**x**			**x**		taxonomy, endangered species	Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam

Transboundary issue addressed by Regional Body	Water pollution/ eutrophication	Loss of habitat	Overexploitation of fisheries		Climate Change impacts	Invasive Species	Targeted Research/ Other (specify)	Member Countries
			Coastal	Oceanic Riparian				
CTI Regional Secretariat/SOM/ MM		**x**	**x**	**x**	**x**			Indonesia, Malaysia, Papua New Guinea (PNG), Philippines, Solomon Islands, Timor-Leste
MFF		**x**			**X**			India, Indonesia, Maldives, Seychelles, Sri Lanka, and Thailand.
2. Subregional/LME Governance Mechanisms								
ATSEF		x	x		x			Indonesia, Timor-Leste, Australia
BIMP-EAGA			x					Brunei, Indonesia, Malaysia, Philippines
SSME		x	x		x			Indonesia, Malaysia, Philippines
YSLME Interim Commission	x	x	x		x	x		China, RO Korea
3. Regional Fisheries Governance Mechanisms								
WCPFC				x	x		x	Asia-Pacific
APFIC			x	x				Asia-Pacific
SEAFDEC		x	x					Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Viet Nam
SSME Sub-committee on Sustainable Fisheries		x	x					Indonesia, Malaysia, Philippines

Transboundary issue addressed by Regional Body	Water pollution/ eutrophication	Loss of habitat	Overexploitation of fisheries		Climate Change impacts	Invasive Species	Targeted Research/ Other (specify)	Member Countries
			Coastal	Oceanic Riparian				
4. River Basin Governance Mechanisms								
MRC		x	x		x		Water allocation from dams	Cambodia, Lao PDR, Thailand, Viet Nam

6. COMMITMENT OF THE COUNTRIES IN SOLVING TRANSBOUNDARY ISSUES IN THE EAST ASIAN SEAS

6.1 Environmental Legislation and Policies relevant to transboundary issues in the Large Marine Ecoregions in the East Asian Seas

Many of the countries in the East Asian Seas have ratified the Convention on Biological Diversity.[43] As Parties to the Convention, the countries are urged to adopt the Ecosystem Approach for sustainable management. The Integrated Coastal and Marine Area Management[44], Integrated Water Resources Management, Mountains to River, 5 Steps to Implementation of the Ecosystem Approach, and the Ecosystem Approach to Fisheries Management[45] are examples of the interpretation and guidelines in the implementation of the Ecosystem Approach. The Countries in the East Asian Seas have agencies, institutes, or groups that are members of the IUCN that support the governments in the implementation of its commitments to the Convention. The countries vary in meeting their obligation to the CBD. Most of the countries meet their commitments by developing legislative frameworks and preparing their respective national policies and action plans.

Convergence and harmonization of environmental legislations and policies are happening in the ASEAN[46] under the ASEAN Socio-Cultural pillar. The ASEAN Countries have convergent legislations for environmental protection, however, not all have policies and regulations on ICM, or variations thereof, in the management of the coastal zone. Table 5 provides a list of laws and policies in support of ICM in the EAS countries.

The ICM approach for transboundary management of International Waters has begun but will need more efforts to manage. A policy on integrated coastal zone management may be in place in the countries but coordinating mechanisms are yet to be established (e.g., Malaysia, Philippines) or strengthened. Merging agencies for environmental protection and resources management is insufficient[47] to integrate sectoral agencies and mandates. The Philippines has the Integrated Coastal Management as a National Strategy (Executive Order 533, 2006) but it lacks a body to coordinate the bureaus and agencies under the Department of Environment and Natural Resources. Integration of sectoral regulations remains a challenge.

Table 5. Coastal and Ocean Policies, Strategies and Action Plans under Development or in place in the EAS region.

Country	Coastal and Ocean Policies, Strategies and Action Plans
AUSTRALIA	• Intergovernmental Agreement on a National System for the Prevention and Management of Pest Incursions 2005 • National Ocean Policy 1998
BRUNEI	• National
CAMBODIA	• Shoreline Management Strategy (2008) • Law on Tourism (2008) • Law on Protected Areas (2008) • Fisheries Law (2004) • Draft ICM Policy
CHINA	• Law on the Prevention and Control of Water Pollution; Marine Environment Protection Law
INDONESIA	• Draft Indonesian Ocean Policy • National Plan of Action in the Coral Triangle • SSME Action Plans on Sustainable Fisheries, Marine Protected Areas and Networks, and Threatened and Charismatic Species
JAPAN	• Basic Plan on Ocean Policy (2008) • Basic Policy on Conservation and Management of Islands for Ocean Management (2009)
KOREA, REPUBLIC OF	• Coastal Zone Management Act amended to include zoning scheme (2009) • Natural Environment Protection Act 1991 • Environmental Policy Act 1990
LAO PDR	• Draft National Water Resources Strategy and Action Plan for the Years 2011 to 2015
MALAYSIA	• Draft National Ocean Policy • Sabah Shoreline Management Plan (2008) • National Plan of Action in the Coral Triangle • SSME Action Plans on Sustainable Fisheries, Marine Protected Areas and Networks, and Threatened and Charismatic Species
PHILIPPINES	• Executive Order 533 ICM as National Strategy to Sustainable Development of Coastal and Marine Environment (2006) • National Plan of Action in the Coral Triangle • SSME Action Plans on Sustainable Fisheries, Marine Protected Areas and Networks, and Threatened and Charismatic Species
SINGAPORE	• Lively and Livable Singapore: Strategies for Sustainable Growth (including ocean and coastal aspects)
THAILAND	• Draft Marine and Coastal Resources Management Act
VIETNAM	• Government Decree No. 25 of Vietnam on Integrated Resources Management and Environmental Protection of Seas and Islands (2009)

Table 6. Ranked priorities identified by countries in the LMEs within their Exclusive Economic Zones (EEZs). Numbers are the rank by order of priority.

Country	Priorities
AUSTRALIA	not available
BRUNEI	not available
CAMBODIA	1 - Water pollution from land-based sources 2 - Unsustainable exploitation of fisheries – coastal and oceanic 2 - Protection of riverine, coastal, and other marine habitats 2 - Invasive species 2 - Climate change impacts in the coastal zone and marine waters
CHINA	1 - pollution 2 - Protection of riverine, coastal, and other marine habitats 3 - Unsustainable exploitation of fisheries – coastal and oceanic 4 - Invasive species 5 - Climate change impacts in the coastal zone and marine waters
INDONESIA	not available
JAPAN	not available
KOREA, REPUBLIC OF	not available
MALAYSIA	not available
PHILIPPINES	1 - Unsustainable exploitation of fisheries – coastal and oceanic 2 - Protection of riverine, coastal, and other marine habitats 3 - Climate change impact in the coastal zone and marine waters 4 - Water pollution from land-based sources 5 - Invasive species
SINGAPORE	not available
THAILAND	<u>Ministry of Natural Resources and Environment (MoNRE)</u> 1 - Unsustainable exploitation of fisheries – coastal and oceanic 2 - Protection of riverine, coastal, and other marine habitats 3 - Water pollution from land-based sources 4 - Climate change impacts in the coastal zone and marine waters 5 - Invasive species
	<u>Department of Marine and Coastal Resources (DMCR)</u> 1 - Protection of riverine, coastal, and other marine habitats 2 - Climate change impacts in the coastal zone and marine waters 3 - Water pollution from land-based sources 4 - Invasive species 5 - Unsustainable exploitation of fisheries – coastal and oceanic
TIMOR-LESTE	1 - Water pollution from land-based sources 2 - Unsustainable exploitation of fisheries – coastal and oceanic 3 - Protection of riverine, coastal, and other marine habitats
VIETNAM	1 - Water pollution from land-based sources 2 - Unsustainable exploitation of fisheries – coastal and oceanic 3 - Climate change impacts in the coastal zone and marine waters 4 - Protection of riverine, coastal, and other marine habitats 5 - Invasive species

Priority Issues of Countries

PEMSEA conducted in 2009 national interagency workshops in its member countries (i.e., Cambodia, Indonesia, Philippines, Thailand, Timor-Leste, Vietnam) on the implementation of the Sustainable Development Strategy for the Seas of East Asia. The result was based on a multiagency consensus. One of the questions asked was on emerging environmental issues in the region.[48] The Country Partners identified climate change as the number 1 environmental threat and showed strong agreement that the priority concern for the next five years is climate change adaptation, with a particular focus on the impact of extreme events (i.e., intensive tropical storms/typhoons; storm surges; flooding; droughts) in coastal areas. Other highly ranked issues were:

2 - pollution reduction;
3 - biodiversity conservation:
4 - urban development;
5 - sustainable water supply; and
6 - sustainable fisheries.

However, ranking of environmental issues based on the questionnaire for this background paper (5 respondents only, Table 6) is different. Cambodia identified land-based sources of pollution as the main threat while the rest of the issues are secondary and of equal importance. Vietnam likewise identified land-based sources of pollution as the primary threat to their marine environment. Philippines and Thailand (MONRE) identified overexploitation of fisheries as the number 1 issue in managing the marine environment but its Department of Coastal and Marine Ecosystems has identified protection of riverine, coastal, and other marine habitats.

Priority Issues of Non-Country Members

Under the 2009 PEMSEA survey, its Non-Country members have identified a different set of priority issues than that of Member Countries. The priority response was: 1. biodiversity conservation, followed closely by 2. good governance. The good governance priority appears to be a direct reflection of Non-Country Partners' perspective on the key gaps and constraints to SDS-SEA implementation. Other priority issues identified as the focus by Non-Country partners were: 3. climate change adaptation; 4. sustainable fisheries; 5. pollution reduction; 6. population/sustainable livelihood; and 7. overexploitation of natural resources.

The solutions to improving application of integrated coastal zone management were identified by Country and Non-Country Partners as follows:

1. National interagency/intergovernmental coordinating mechanism for coasts and oceans management
2. Scaling up ICM program implementation among local governments
3. Integrated environmental monitoring and reporting system
4. Land- and Sea-use zoning of coastlines; and
5. Vulnerability assessment/risk assessment of coastlines

6.2 Country Priorities and Progress in Implementing National Action Plans (NAPs) linked to SAPs

Countries participating in the Yellow Sea LME and South China Sea LME projects have also developed and adopted National Action Plans (NAPs) that support the implementation of the SAPs for the YSLME and SCSLME. For the **Yellow Sea**, China's NAP (or national SAP) is expected to be included in the next 5 year national development plan, and the ROK NAP will be implemented within the national framework in order to ensure consistency with national plans.

For the **South China Sea**, the majority of the NAPs have been approved within the ministries responsible for the environment and in all instances recommended priority actions from the NAPs have been incorporated into the recurrent budgets of the appropriate operational or line departments of the Central Government or Provincial Governments:

- In the case of Cambodia, all National Action Plans have been approved by the Ministry of Environment in 2007 in the case of land-based pollution, mangroves and wetlands and by the Ministry of Agriculture, Forestry and Fisheries in 2006 in the case of the seagrass and coral reefs components.
- In China, all four national action plans were approved by the Inter Ministry Committee and the Ministry of Environment in 2007. Many actions and efforts related to the SAP, interventions for habitat management in the Pearl River are currently being implemented by different sectors with funding from the Central Government.
- In Indonesia, the NAPs for six components have all been approved at varying levels and incorporated into the operational plans of the appropriate government departments with some currently being under implementation.
- In Malaysia, the contents of the NAPs for seagrass, wetlands, coral reefs and land-based pollution are deemed consistent by the Ministry of Natural Resources and Environment with the national priorities and development plans and will be implemented with national budgets enabling Malaysia to meet the SAP targets.
- In the case of the Philippines, the activities of the NAPs are consistent with ongoing activities of the Department of Environment and Natural Resources (DENR) and the Medium Term Development Plan for the Philippines. In addition, the legal basis for the implementation of the NAPs is Executive Order 533 issued by the President of the Philippines in June 2006, adopting ICM as a national strategy and establishing supporting mechanisms for its implementation. A national ICM program is currently under development, which, when approved, will integrate the various action plans for the priority themes under one management framework.
- In Thailand, the NAPs for the habitat sub-components were combined with the National Biodiversity Strategy and Action Plan approved by Cabinet, while the NAP for land-based pollution had been incorporated into the five-year plan of the Department of Pollution Control.
- The NAPs in Vietnam were all completed in 2007 and an integrated NAP is expected to be issued soon. The priorities identified in these NAPs have been integrated into national policy and programs, for example, the program for vulnerability assessment of coastal resources and environments, national projects on mangrove rehabilitation, and the government program regarding international co-operation on marine issues and also in the Biodiversity Law. One

of the important steps in the implementation of these NAPs is the establishment of the Viet Nam Administration for Marine and Islands Affairs.

7. TRANSBOUNDARY ISSUES THAT NEED TO BE ADDRESSED

Table 7 presents the results of the analysis of which transboundary issues remain to be further addressed in the EAS, based on the following scoring:

- **Urgency** – (based on consensus statement – Pacific synthesis[49]); highest score – indicates greatest urgency
- **Government priority** – the rankings were given the following weights; the highest score was given the highest percentage: 1 – 5 pt; 2 – 4 pt; 3 – 3pt; 4 – 2 pt; 5 – 1 pt
- **Level of investment** – the least investment is considered a gap; thus, the least investment therefore was given the highest percentage score
- **"tipping point" effect**[50]

Table 7: Analysis of Transboundary Issues.

Environmental concern	Urgency (25%)	Government priority (25%)	Level of investment (25%)	"Tipping point" (25%)	Total (%)
Habitat destruction of riverine, coastal, and marine ecosystems	25	15	10	20	70
Pollution – land-based sources	25	25	5	25	80
Unsustainable exploitation of marine resources	25	20	20	15	80
Invasive species	12.5	5	25	5	47.5
Climate change	25	10	20	10	65

It appears that pollution reduction from land-based sources and unsustainable exploitation of marine resources are the two most pressing issues in the EAS, closely followed by habitat destruction. The urgency of addressing climate change issues is also high with growing awareness among governments of the need for action. Problems of invasive species in the EAS are also growing, but this issue has so far been given a low priority by most governments.

8. CONCLUSIONS AND RECOMMENDATIONS

As stated in Chapter 3, the purpose of the stocktaking review is to: (1) assess the accomplishments of projects undertaken under GEF 1-4 in addressing transboundary issues, that were identified in the TDAs of the LMEs in the East Asian Seas; (2) identify geographical and thematic gaps and future investment needs in the East Asian Seas; (3) identify governance mechanisms and their mandates; and (4) identify emerging issues in the EAS and recommendations for future actions. The conclusions and recommendations are hence clustered around these four objectives and summarized in bullet form when possible:

1. The accomplishments of projects undertaken under GEF 1-4 in addressing transboundary coastal and marine issues in the EAS

Assessments and development of strategic planning frameworks:

- Priority transboundary issues have been identified for all LMEs in the EAS by GIWA. In addition, more detailed Transboundary Diagnostic Analyses have been completed for the South China Sea and the Yellow Sea.
- The South China Sea and the Yellow Sea also have completed Strategic Action Programs that have been approved/adopted by the riparian countries.
- TDAs and SAPs are under development for the Sulu-Celebes Sea (SSME), and the Arafura-Timor Seas that cover part of the Indonesian Seas.
- Most EAS countries are signatories to the non-legally binding Sustainable Development Strategy for the Seas of East Asia with a target of covering 20 percent of the region's coastline by ICM programs by 2015. It is estimated that countries have already scaled up ICM programs to cover between 9 to 10 percent of the coastline of the region.

Investments:

- Total GEF funding committed to the EAS since its inception amounts to about US$211 million, spread over almost 30 projects, which is equivalent to approximately 20 percent of total GEF IW funding. This has in turn leveraged around US$2 billion in co-financing.
- Most of the GEF funding has been invested in regional initiatives, followed by national initiatives.
- National projects have been most successful in leveraging co-financing and the overall GEF to co-financing ratio is 1:15 with projects funded under the Pollution Reduction Investment Fund have co-financing ratios of 1:20.
- Regional projects have co-financing ratios of around 1:6.

Thematic and geographical coverage and approach used:

- The most common issues addressed by 50 percent or more of GEF projects are water pollution/eutrophication, water resources management and loss of wetland habitats.
- Overexploitation of coastal fisheries, and other types of coastal habitats, such as mangroves, seagrass beds and coral reefs, are addressed by between 37 to 27 percent of projects.
- The South China Sea has the largest number of GEF projects followed by the Yellow Sea.

- Integrated Water Resources Management is the most common approach used by almost 50 percent of projects, but is often linked to one or several other approaches, such as Integrated Coastal Management and TDA/SAP development.
- The foundation (TDA/SAP process) for LME-wide regional management in the SSME is supported by GEF. The Ecosystem Approach to Fisheries (EAF) management, incorporating ICM, is for the first time supported by GEF in the SSME through demonstration at local scales.

Strengthening of coastal and marine governance mechanisms:

- The establishment of PEMSEA as an independent regional institution with a mandate to oversee the implementation of the SDS-SEA and to scale up ICM in the EAS region is a major GEF-supported accomplishment.
- Agreement on establishment of a Yellow Sea Commission in the YSLME SAP is also the result of a GEF project.
- Most of the countries surrounding the LMEs in East Asia have demonstrated their intention to improve environmental management in accordance with ICM principles through, e.g., adoption of NAPs linked to SAPs or other policy reforms, and there has been substantial progress in development of policy, legislation and implementing capacities in the region as a consequence of GEF intervention. However, there still remains a gap between legislation, policy, and implementation within countries.

2. Geographical and thematic gaps and future investment needs in the EAS

From the above summary, it can be concluded that the region is comprehensively covered by assessments and TDA/SAP processes, including recent initiatives in the Sulu-Celebes Sea and Arafura-Timor Seas, with the exception of the East China Sea, which could benefit from such a process to better identify the key transboundary issues related to rapid coastal development. However, the main focus for the future should be to implement the existing SAPs for the South China Sea and the Yellow Sea and related NAPs, as well as other existing planning frameworks, such as the SDS-SEA, in order to move from planning to implementation and scaling up of investments. Future support will also be required for implementing the SAPs under development for the Sulu-Celebes Sea and the Arafura-Timor Seas

In terms of the transboundary priorities identified by GIWA assessments or TDAs in the LMEs in the EAS, and the priority given by GEF projects, fisheries stands out as the issue not given adequate attention by GEF in relation to its importance and in comparison to other transboundary concerns, such as pollution and habitat loss. This becomes even more evident looking at the amount of funding that has been allocated to fisheries management projects. This is also supported by the analysis that is combining national priorities and investments levels, with scientific consensus statement related to urgency and tipping points (see Table 7). Fisheries issues are crucial in view of growing populations, the need to secure food supply from the sea, and to alleviate poverty. The fishery-related targets to meet Millennium Development Goals will be difficult to meet without GEF support in addressing management of exploitation of fisheries stocks which are likely shared stocks in LMEs. The Ecosystem Approach to Fisheries (EAF) management, under the Code of Conduct for Responsible Fisheries[51] agreed upon by most countries in the EAS region urgently needs promotion by way of demonstration or undertaking the step-wise guidelines prepared by FAO to types of fisheries (e.g., coral reef fisheries, trawl demersal fisheries, small pelagic fisheries, large pelagic fisheries).

ICM could provide the necessary framework and process for addressing conflicts and changing behavior of the concerned stakeholders.

It can also be concluded that in order to scale up investments and to leverage larger amounts of co-financing to future GEF projects, there should be an increased emphasis on funding to single country projects, as they are on average mobilizing many more times as much co-financing as regional projects. The implementation of the SDS-SEA has already been split into a regional project with PEMSEA, and single country projects funded under the World Bank/GEF Pollution Reduction Investment Fund. Similar arrangements could be considered for the implementation of the SAPs for the South China Sea and the Yellow Sea in order to scale up investments to key components of the SAPs. This approach may also speed up policy reform at the national level in support of ICM and other integrated approaches, as closer attention can be paid to national coordination across sectors in projects only dealing with one country. However, the main challenge with such an approach is to ensure effective coordination and collaboration between the national, subregional/LME-wide, and regional levels.

3. How to enhance governance of coastal and marine issues in the EAS

GEF and partners have made substantial investments in the EAS Region and yet there is no regional agency that collates information and conducts harmonized monitoring of results gathered by the riparian countries in all LMEs. A coordinating mechanism and agreed procedures and methodologies are necessary to monitor improvement of the status of the LMEs in the EAS as a result of interventions and to ensure the sharing of experiences and lessons across all LMEs and countries. In this regard the institutionalization of PEMSEA provides an opportunity to provide such a service to the region. PEMSEA is already working closely together with several LME/subregional projects, such as the Yellow Sea and Sulu-Celebes projects, and vertical integration can be further strengthened by forging closer linkages with COBSEA and the South China Sea program and with ATSEF for the Arafura-Timor Seas. Establishment of close linkages between PEMSEA, CTI and MFF should also be a priority to avoid duplication of efforts and to promote sharing of information. In terms of enhancing sectoral integration, collaboration could also be strengthened with regional fisheries management bodies, such as SEAFDEC and the WCPFC.

Better coordination of GEF support to the EAS region would also strengthen the extent to which ecosystem-based management could be applied in the EAS and interventions harmonized from local to national to regional levels. Different planning frameworks, such as the SDS-SEA and the South China Sea SAP, should be linked spatially and operationally to ensure that different EAF and EBM tools, such as ICM, IWRM, and MPAs and fisheries refugia are applied in an integrated and coordinated manner.

With the ratification of the Convention on Biological Diversity (CBD), governments are urged to implement the Ecosystem Approach for biodiversity conservation and sustainable development.[52] All countries have acted on their commitments to the Convention by passing legislation or developing policies in ecosystem-based management and tools such as the Integrated Coastal Management framework (see Table 6). However, there is still a gap in the implementation of these legislation and policies. Coordinating mechanisms are still being developed or unclear.[53]

Strengthened regional coordination of interventions in the EAS also need to be reflected in better governance at national level and inter-sectoral coordination in coastal and marine management to enable countries to better respond to transboundary management challenges, such as monitoring the management interventions on marine pollution, fisheries recovery, or habitat improvement. The lack of resources and the difficulty in changing governmental structures are some reasons why establishing coordinating mechanisms have not progressed significantly. New policies that meet present issues, such as transboundary pollution, poaching, etc., require fiscal allocations; otherwise the policy remains an academic document. Financial resources are inadequate or lacking for implementation. This scenario is common to many riparian countries (see the results of PEMSEA's national intersectoral workshops and this study).

4. Emerging issues in the EAS and recommendations for future actions

A wide range of emerging issues that are affecting the EAS have been identified by different agencies, forums and by the countries themselves. The countries are concerned with land-based sources of pollution, habitat destruction and community modification, fisheries issues, and climate change, while invasive marine species is only considered to be a major issue by Australia. The results from PEMSEA showed that climate change is the number one issue while our survey, albeit with limited response, is contrary to PEMSEA's results. However, climate change and population growth are the main drivers of many of the emerging problems or worsening trends in the EAS environmental status.[54] There is hence a need to address climate change impacts both in terms of adaptation needs and possible mitigation actions, building on the scenarios produced by the Intergovernmental Panel on Climate Change and following the guidelines in National Action Plans for Climate Change. GEF is investing in the Climate Change Strategic Action Plan under the Coral Triangle Initiative but more investments are needed to expand these measures, particularly in science-based soft-engineering in the coastal zone (e.g., rehabilitation of riparian and coastal forests). Mitigation measures that can be implemented range from rehabilitation of 'blue forests' (e.g., mangroves and other coastal wetlands, and seagrass beds) to developing renewable energy from rhythmic tidal movements and currents.

It is estimated that additional annual investments and financial flows needed by 2030 to cover costs of adaptation to climate change in the coastal zone amount to US$11 billion globally[55] and could be up to three times as high if sea-level rise is higher than projected by the IPCC[56]. A recent report by ADB on the economics of climate change in Southeast Asia concludes that the costs to countries in the region could be equivalent to a loss of 6.7 percent of GDP by 2100, which is more than twice the world average[57].

Sustainable use of resources in LMEs should be addressed at both the supply side of and the demand side for natural resources. It takes 15-40 years for a coral reef to be populated by target fishes[58] but per capita demand for fish increases with population growth which is about 2 percent each year (the so-called Malthusian overfishing). On average, the per capita consumption of fish in the region is about 30 kg per year and this could increase to 50 kg per year (e.g., Malaysia). With increasing demand and population growth, there will be greater pressure to expand exploitation of natural fish stocks or increase aquaculture production. Growth of human population should thus be managed in parallel with efforts on environmental and resources management.

Annex 1. Focus of GEF Projects in the East Asian Seas Region.

Transboundary issue addressed by Project	**GEF Agency**	**Water pollution/ eutrophication**	**Loss of habitat* (specify type)**				**Overexploitation of fisheries**		**Climate Change impacts**	**Water resources manage-ment**	**Invasive Species**	**Targeted Research (specify)**	**Other (Specify)**
			M	S	C	W	Coastal	Oceanic					
Global Projects													
Global International Waters Assessment	UNEP												Comprehensive and integrated assessment of international waters
Reduction of Environmental Impact from Tropical Shrimp Trawling	UNEP/ FAO						x						Sandy-muddy substrate of embayments
Coral Reef Targeted Research and Capacity Building for Management	IBRD/ WB	x			x		x		x	x	x	Resilience and vulnerability of coral reefs; differentiating climate change factors versus anthropogenic ones	knowledge management and dissemination
Building Partnerships to Assist Developing Countries to Reduce the Transfer of Harmful Aquatic Organisms in Ships' Ballast Water (GloBallast Partnerships)	UNDP										x		
Removal of Barriers to the Introduction of Cleaner Artisanal Gold Mining and Extraction Technologies	UNDP/ UNIDO	x				x				x			
Sub-total		**2**	**0**	**0**	**1**	**1**	**2**		**1**	**2**	**2**	**1**	**3**

Transboundary issue addressed by Project	**GEF Agency**	**Water pollution/ eutrophication**	**Loss of habitat* (specify type)**				**Overexploitation of fisheries**		**Climate Change impacts**	**Water resources manage-ment**	**Invasive Species**	**Targeted Research (specify)**	**Other (Specify)**
			M	S	C	W	Coastal	Oceanic					
Regional Projects													
PEMSEA (Phase 1-3)	UNDP	x	x	x	x	x	x		x	x	x		Aquaculture; oil spill preparedness and response
South China Sea and Gulf of Thailand	UNEP	x	x	x	x	x	x						
YSLME	UNDP	x		x		x	x		x		x		
Sulu-Celebes	UNDP	x	x	x	x	x	x						
Arafura-Timor	UNDP	x	x	x	x	x	x		x				
Southeast Asia CTI	ADB	x	x	x	x	x	x		x	x			
Western Pacific East Asia Oceanic Fisheries Management Project (WPEA)	UNDP							x					
Bycatch Management	FAO						x						
Mekong River Basin Water Utilization Project	World Bank		x			x				x			
Mekong River Basin Wetland Conservation and Sustainable Use Program	UNDP					x				x			Biodiversity loss
National Performance Assessment and Sub-Regional Strategic Environment Framework in the Greater Mekong	ADB		x			x			x	x			
Livestock-Waste Management in East Asia	World Bank/ FAO	x								x			
CTI-IW Learn	ADB												Coordination and Knowledge Management of CTI
Marine Electronic Highway Demonstration		x	x	x		x					x		Improving efficiency in

Transboundary issue addressed by Project	GEF Agency	Water pollution/ eutrophication	Loss of habitat* (specify type)				Overexploitation of fisheries		Climate Change impacts	Water resources manage-ment	Invasive Species	Targeted Research (specify)	Other (Specify)
			M	S	C	W	Coastal	Oceanic					
	IBRD/ WB												shipping and navigation as preventive measure
Sub-total		**8**	**8**	**7**	**5**	**10**	**7**	**1**	**5**	**6**	**3**		**4**
National Projects													
Hai River Basin Integrated Water Resources Management	IBRD/ WB	x								x			
Pearl River Delta Development	IBRD/ WB	x				x				x			
Partnership Investment Fund for Pollution Reduction, Tranche 1:	IBRD/ WB												
Ningbo Water and Environment Project - Investment Fund	IBRD/ WB	x				x				x			
Coastal Cities Environment and Sanitation Project - under Investment Fund	IBRD/ WB	x	x	x	x	x				x			
Manila Third Sewerage Project (MTSP) - under Investment Fund	IBRD/ WB	x								x			
Liaoning Medium Cities Infrastructure - under Investment Fund	IBRD/ WB	x								x			
Second Shandong Environment - under Investment Fund	IBRD/ WB	x								x			
Shanghai Agricultural and Non-Point Pollution Reduction project (SANPR) - under Investment Fund	IBRD/ WB	x								x			

Transboundary issue addressed by Project	GEF Agency	Water pollution/ eutrophication	Loss of habitat* (specify type)				Overexploitation of fisheries		Climate Change impacts	Water resources manage-ment	Invasive Species	Targeted Research (specify)	Other (Specify)
			M	S	C	W	Coastal	Oceanic					
Demonstration of Sustainable Management of Coral Reef Resources in the Coastal Waters of Ninh Hai District, Ninh Thuan Province, Viet Nam	UNEP				x		x						
Demonstration of Community-based Mgt of Seagrass Habitats in Trikora Beach East Bintan, Riau Archipelago Province, Indonesia	UNEP			x			x						
Participatory Planning and Implementation in the Management of Shantou Intertidal Wetland	UNEP					x	x						
Sub-total		**8**	**1**	**2**	**2**	**4**	**3**	**0**	**0**	**8**	**0**	**0**	**0**
TOTAL		**18**	**9**	**9**	**8**	**15**	**12**	**1**	**6**	**16**	**5**	**1**	**7**

*Habitat type: Mangroves (M), Seagrass beds(S), Coral reefs (C), Wetlands (W)

Annex 2: IW Approach in the East Asian Seas Region.

IW Approach	TDA/SAP (Indicate LME – e.g. YSLME. SCS, covered (x)or affected)	ICM (km of coastline and/ or no. of demonstration sites)		IWRM (river basin/ groundwater management)		Fisheries refugia (km^2 covered/ No. of sites)		MPAs (km^2 covered/ no of sites)		Countries (when global, indicate countries included in the EAS)
		km	*No.*	*RB*	*GW*	*km^2*	*No.*	*km^2*	*No.*	
Global Projects										
Fostering a Global Dialogue on Oceans, Coasts, and SIDS, and on Freshwater-Coastal-Marine Interlinkages		x		x						Global – thematically covers all approaches listed
Global International Waters Assessment (GIWA)										Global – Includes assessments of: Yellow Sea; East China Sea; South China Sea; Sulu-Celebes Sea; Indonesian Seas,
Reduction of Environmental Impact from Tropical Shrimp Trawling										Global (IND, PHI)
Coral Reef Targeted Research and Capacity Building for Management										Global (PHI)
Building Partnerships to Assist Developing Countries to Reduce the Transfer of Harmful Aquatic Organisms in Ships' Ballast Water (GloBallast Partnerships)										Global (CHI)
Removal of Barriers to the Introduction of Cleaner Artisanal Gold Mining and Extraction Technologies	(Indonesian Seas, Mekong River Basin)			x	x					Global (IND, Lao PDR)
Sub-total			**1**	**2**						
Regional Projects										
PEMSEA	(EAS – all 6 LMEs)	Ni22, 658 km (10% of EAS) coast	8 demonstration sites; 20 parallel sites; 15 other sites	7	0					Regional (CHI, IND, CAM, Lao PDR, PHI, THA, TIM Leste, VIE; Lao PDR; Singapore; RO Korea; DPR Korea)

IW Approach	TDA/SAP (Indicate LME – e.g. YSLME. SCS, covered (x)or affected)	ICM (km of coastline and/ or no. of demonstration sites)		IWRM (river basin/ groundwater management)		Fisheries refugia (km^2 covered/ No. of sites)		MPAs (km^2 covered/ no of sites)		Countries (when global, indicate countries included in the EAS)
		km	*No.*	*RB*	*GW*	*km^2*	*No.*	*km^2*	*No.*	
South China Sea and Gulf of Thailand	x SCS & Gulf of Thailand						x			Regional (CHI, IND, CAM, MAL, PHI, THA, VIE)
Reducing Environmental Stress in the Yellow Sea Large Marine Ecosystem	x YSLME		x				x			Regional (CHI, Republic Of KOR)
Sulu-Celebes Sea	x Sulu-Celebes		x						TBD	Regional (IND, MAL, PHI)
Arafura-Timor Seas	x ATSEA (Indonesia Seas, Arafura Sea, Timor Sea)					x	TBD			Regional (IND, Papua New Guinea, TIM Leste)
Southeast Asia CTI	(EAS)		x	x					x	Indonesia, Malaysia, Philippines,…
WPEA	(EAS)									Regional (IND, PHI, VIE)
Bycatch Management	(EAS)									Regional (IND, Papua New Guinea, PHI, THA, VIE)
Mekong River Basin Water Utilization Project	(Mekong River)			x	x					Regional (CAM, Lao PDR, THA, VIE)
Mekong River Basin Wetland Biodiversity Conservation and Sustainable Use Program	(Mekong River)									Regional (CAM, Lao PDR, THA, VIE)
National Performance Assessment and Sub-Regional Strategic Environment Framework in the Greater Mekong	(Mekong River)			x						Regional (CAM, Lao PDR, THA, VIE)
Livestock-Waste Management in East Asia	South China Sea				x					Regional (CHI, THA, VIE)
CTI/IW: Learn										SE Asia
Marine Electronic Highway Demonstration	South China Sea		x							Regional (IND, MAL)
Sub-total	**4**		**5**	**4**			**3**		**2**	

IW Approach	TDA/SAP (Indicate LME – e.g. YSLME. SCS, covered (x)or affected)	ICM (km of coastline and/ or no. of demonstration sites)		IWRM (river basin/ groundwater management)		Fisheries refugia (km^2 covered/ No. of sites)		MPAs (km^2 covered/ no of sites)		Countries (when global, indicate countries included in the EAS)
		km	*No.*	*RB*	*GW*	*km^2*	*No.*	*km^2*	*No.*	
National Projects										
Hai River Basin Integrated Water Resources Management (2004 -)	(Bohai Sea – YSLME)			x	x					China
Pearl River Delta Development	(South China Sea)			x						China
Partnership Investment Fund for Pollution Reduction, Tranche 1	(See individual projects)									Regional
Ningbo Water and Environment Project - Investment Fund	(East Asian Seas, South China Sea, Yellow Sea)			x						China
Coastal Cities Environment and Sanitation Project - under Investment Fund	(South China Sea)			x						Vietnam
Manila Third Sewerage Project (MTSP) - under Investment Fund	(South China Sea)			x						Philippines
Liaoning Medium Cities Infrastructure - under Investment Fund	(Bohai Sea-YSLME)			x						China
Second Shandong Environment - under Investment Fund	YSLME			x						China
Shanghai Agricultural and Non-Point Pollution Reduction project (SANPR) - under Investment Fund	(East China Sea)			x						China
Demonstration of Sustainable Management of Coral Reef Resources in the Coastal Waters of Ninh Hai District, Ninh Thuan Province, Viet Nam	(South China Sea)					x				Vietnam

IW Approach	TDA/SAP (Indicate LME – e.g. YSLME. SCS, covered (x)or affected)	ICM (km of coastline and/ or no. of demonstration sites)		IWRM (river basin/ groundwater management)		Fisheries refugia (km^2 covered/ No. of sites)		MPAs (km^2 covered/ no of sites)		Countries (when global, indicate countries included in the EAS)
		km	*No.*	*RB*	*GW*	*km^2*	*No.*	*km^2*	*No.*	
Demonstration of Community-based Mgt of Seagrass Habitats in Trikora Beach East Bintan, Riau Archipelago Province, Indonesia	(South China Sea) _					x				Indonesia
Participatory Planning and Implementation in the Management of Shantou Intertidal Wetland	(South China Sea)					x				China
Sub-total	**0**	**0**		**8**		**3**		**0**		
Total	**4**	**6**		**14**		**6**		**2**		
	Total no of projects									
Regional EAS	4									
Yellow Sea and Bohai Sea	5									
East China Sea	2									
South China Sea & Gulf of Thailand	10									
Sulu-Celebes Sea	1									
Indonesian Seas, Arafura Sea, Timor Sea	1									
Mekong River Basin (links to South China Sea)	3									

Annex 3 – Questionnaire on Environmental Management and Emerging Issues in the East Asian Seas region

Country:

_____

Large Marine Ecosystem/s within Exclusive Economic Zone:

_____

_____

Agency (responding to this questionnaire):

_____

Questions:

1. What national policy or legislation supports the execution of your agency's mandate?

2. Does your agency have any collaboration/s with other countries in the East Asian Seas to address common environmental issues? What is/are this/these?

3. Has your agency participated in a project funded by the Global Environment Facility? If so, what is the project (title or name)? In what way has the project influenced your agency's mandate or operations?

4. Does your agency conduct monitoring of:

    a. The productivity of coastal and offshore waters;
    b. Fish diversity, stocks, and fisheries landings;
    c. Pollution and water quality of coastal and offshore waters;
    d. Socioeconomic conditions of coastal communities?
    e. Climate change impacts, e.g., storms, flooding, temperature, salinity, acidity of coastal waters?

5. Since when did your agency begin monitoring?/ When will your agency plan to begin monitoring?

6. Does your agency provide reports on the status of the coastal and marine waters, coastal habitats, or marine fishery resources to any regional or international body? Please provide briefly information on the topic, regional/body, and Memorandum of Understanding, agreement, treaty, or convention?

7. Is your agency monitoring and regulating water pollution from land-based sources, e.g., agriculture, aquaculture, industries, coastal households and settlements, etc?

What management approach is your agency adapting to regulate water pollution of rivers and coastal and marine waters?

8. What agency/ies is/are responsible for water resources uses and management in coastal zones and small islands, including groundwater? Is there a management plan, policy, legislation, or regulations in place for the use of these water resources ? What is the management concept or principle in use (e.g., ecosystem-based management, ecosystem approach, integrated coastal management, integrated coastal zone management, integrated water resources management, and others?

9. Is your agency involved in any way in the conservation of coastal and marine ecosystems, mangrove forest, seagrass beds, coral reefs, coastal waters in any way? How and for what objective?

10. Is your agency involved in controlling invasive species from ballast waters, from aquaculture (importation of broodstock, fingerlings, aquarium trade, etc)?

11. Of the following environmental issues, which are the top priorities of your agency/government? Please rank 1 as highest priority and 5 as the lowest priority.

- Water pollution from land-based sources
- Unsustainable exploitation of fisheries – coastal and oceanic
- Protection of fisheries habitats
- Invasive species
- Climate change impacts in the coastal zone and marine waters

12a. What LME/s within your jurisdiction is/are needing urgent attention?

12b. Based on your agency's assessment, what is/are the urgent environmental issue/s within your EEZ that requires immediate action ? How can this/these be addressed?
Please provide, if possible, articles, reports, publications that your agency has published in the last 15 years.

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