Partnerships in Environmental Management for the Seas of East Asia

Regional Review:

Implementation of the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA) 2003-2011

Global Environment Faciilty

United Nations Development Programme

UNOPS
United Nations Office for Project Services

The SDS-SEA and PEMSEA

The East Asian Seas are a major economic resource for the world's demand for fishery and aquaculture products, and a natural heritage and biodiversity asset for the people of the region. The East Asian Seas harbour a significant share of the world's coral reefs and mangroves; it also produces about 40 percent of the world's fishcatch and more than 80 percent of aquaculture. But, with over 2 billion people living in the region, the human pressure on marine and coastal resources is very high, intensified by the impacts of climate change and severe weather events.

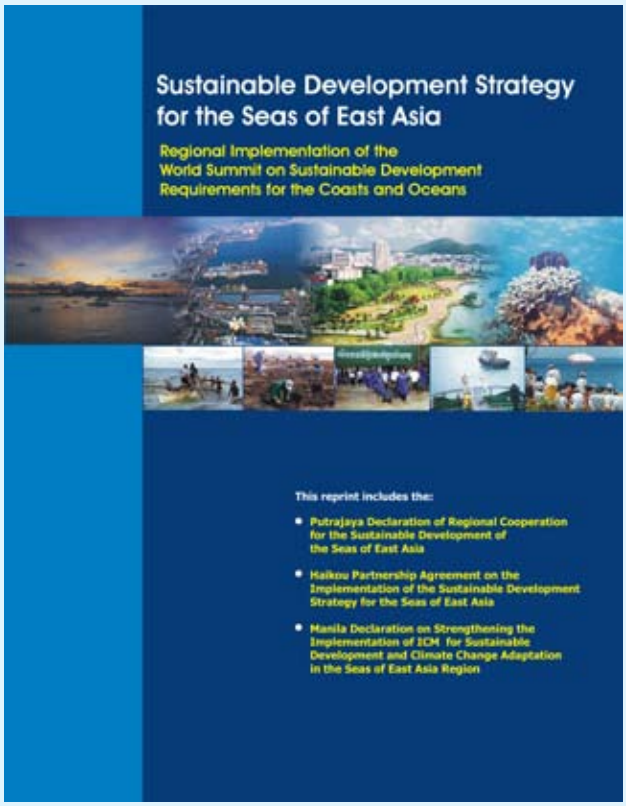
The countries of the Seas of East Asia have recognized the severity of continuous degradation of their seas, coasts and estuaries upon which the region's economies and millions of its inhabitants and economies depend. As a reflection of their concern, the governments crafted the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA) in 2003, with the support of Global Environment Facility (GEF) and the participation of United Nations Development Programme (UNDP), the World Bank and 14 other international and regional organizations. The SDS-SEA identifies common threats as well as strategic action programs to reduce the impacts of natural and manmade hazards on coastal and marine resources, as well as the people, communities and economies of the region.

The SDS-SEA also serves as a platform for achieving the goals of key international agreements and action plans, including Chapter 17 of Agenda 21, the UN Millennium Development Goals (MDGs), the Johannesburg Plan of Implementation of the World Summit on Sustainable Development, as well as other related international agreements. Above all, the SDS-SEA embodies a shared vision of countries of the region for sustainable development of coasts and oceans, and a mission to implement the strategy through partnerships.

During the First East Asian Seas (EAS) Ministerial Forum in 2003 (Putrajaya, Malaysia), 12 governments signed the Putrajaya Declaration, adopting the SDS-SEA. The countries included: Brunei Darussalam, Cambodia, China, DPR Korea, Indonesia, Japan, Malaysia, Philippines, RO Korea, Singapore, Thailand, and Vietnam. In 2006, Lao PDR and Timor-Leste also agreed to adopt and implement the SDS-SEA.

In 2006, at the Second EAS Ministerial Forum (Haikou City, PR China), countries agreed to establish the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA), a collaborative organization of countries bordering the Seas of East Asia, and their Non-Country Partners, tasked with guiding and coordinating the implementation of the SDS-SEA.

Then in 2009, the Third EAS Ministerial Forum (Manila, Philippines) recognized the international legal personality of PEMSEA, launching it as an independent regional coordinating mechanism for the implementation of the SDS-SEA. At that



Vision

The sustainable resource systems of the Seas of East Asia are a natural heritage for the people of the region, a medium of access to regional and global markets, and a safeguard for a healthy food supply, livelihood, economic prosperity and harmonious co-existence for present and future generations.

Mission

To build interagency, intersectoral, and intergovernmental partnerships for achieving the sustainable development of the Seas of East Asia.

Strategic Action Programs

- Ensure **SUSTAIN**able use of the 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 activity.
- **IMPLEMENT** international conventions relevant to the management of the coastal and marine environment.
- **COMMUNICATE** with stakeholders to raise public awareness, strengthen multisectoral participation and obtain scientific support for sustainable development of the coastal and marine environment.

Forum, the Ministers also acknowledged in the Manila Declaration the need to strengthen cooperation. In the strategy statement, integrated coastal management (ICM) was seen as paramount in addressing near-term priorities related to coastal pollution and overexploitation of fish stocks, as well as for adapting to the effects of climate variability and change, including increased storm intensity, flooding, storm surges, warming and acidification of seas and sea-level rise in coastal areas — all of which constitute major challenges for disaster risk management and food security.

Ten Years After

There has been considerable progress and achievement on the part of participating countries, local governments and a host of collaborating organizations, programs and projects since the adoption of the SDS-SEA in 2003. The good news is that the region appears to be on track to achieving four major targets as spelled out in the Haikou Partnership Agreement (2006) and further elaborated in the Manila Declaration (2009) (**Box 1**). However, the bad news is that coastal and marine ecosystems of the region are experiencing increasing threats to the services that they provide humanity. Marine pollution from land-based sources continues to be a serious problem, as evidenced by the expansion of hypoxic (dead) zones from increasing nutrient inputs from sewage and agriculture. International commitments made regarding biodiversity and marine protected areas have fallen short of expectations. Depletion of marine waters

The First Ministerial Forum in Putrajaya, Malaysia in 2003.

through overfishing and use of destructive fishing gear/ fishing practices continues. On top of it all, the multiple risks and impacts related to climate change and extreme weather events are becoming more evident.

In short, the region has not reached that elusive tipping point where reduction in pollution discharges, conservation and rehabilitation of habitats, biodiversity preservation and enhancement and economic stability have begun to shift the balance in favor of sustainable development.

But, where are we now?

Since 2006, PEMSEA has published three accomplishment reports (i.e., 2007, 2010 and 2011), which highlighted progress and achievements in SDS-SEA implementation across the region, as well as at the national and local levels. With the decision of the East Asian Seas Partnership Council in 2010 to prepare a medium-term SDS-SEA Implementation Plan, it was agreed that a collaborative interagency and multi-sectoral planning process would be conducted in each country, commencing with an SDS-SEA review from the time of adoption of the SDS-SEA. The aim of the review was to track country advancement toward agreed targets, as a starting point and foundation for the preparation of five-year national SDS-SEA Implementation Plans (2012-2016). In addition, the intention was to look at the development of sectoral policies, programs and investments at the local, national and regional levels, which will contribute to the overall vision and objectives of the SDS-SEA, including initiatives of bilateral and multilateral programs and projects.

Box 1: Targets Adopted by Countries for SDS-SEA Implementation

- Adopt and implement a self-sustained and effective regional collaborative mechanism with a mandate to pursue the implementation of the SDS-SEA through collaborative, synergistic and responsible actions and the accomplishment of the commitments of individual countries (Haikou Partnership Agreement).
- Develop and implement national policies and action plans for sustainable coastal development in at least 70 percent of the participating countries by 2015 (Haikou Partnership Agreement and Manila Declaration).
- Strengthen and accelerate the implementation of ICM for sustainable development and climate change adaptation in at least 20 percent of the Region's coast by 2015 (Haikou Partnership Agreement and Manila Declaration).
- Report on ICM progress every three years (Manila Declaration).

SDS-SEA review process

The SDS-SEA review process commenced in March 2010. All PEMSEA Country Partners and the majority of the Non-Country Partners participated in the process, which entailed: (a) a desktop review of progress and development in support of SDS-SEA objectives and targets in each participating country; (b) a survey of PEMSEA Non-Country Partners to identify initiatives that contribute, directly and indirectly, to SDS-SEA; (c) conduct of national interagency

The Second Ministerial Forum in Haikou City, PR China in 2006.

The Third Ministerial Forum in Manila, Philippines in 2009.

workshops to review and validate the country report, and to build consensus on priorities for SDS-SEA implementation in the medium term; and d) finalization of national SDS-SEA progress reports and preparation of an overall summary report for the region.

Annex A contains the summary reports for Cambodia, PR China, DPR Korea, Indonesia, Japan, Lao PDR, Philippines, RO Korea, Singapore, Thailand, Timor-Leste, and Vietnam, covering the period 2003 to 2011.

In addition, 15 Non-Country Partners submitted information on their programs and how they have been supporting the implementation of SDS-SEA during the same time period (i.e., ACB; CI-Philippines; CMC; EMECS; IOC-WESTPAC; IOI; IUCN-ARO; KMI; KORDI; NOWPAP; OPRF; OSRL; PML; SGP; and YSLME. This information is summarized in **Annex B**.

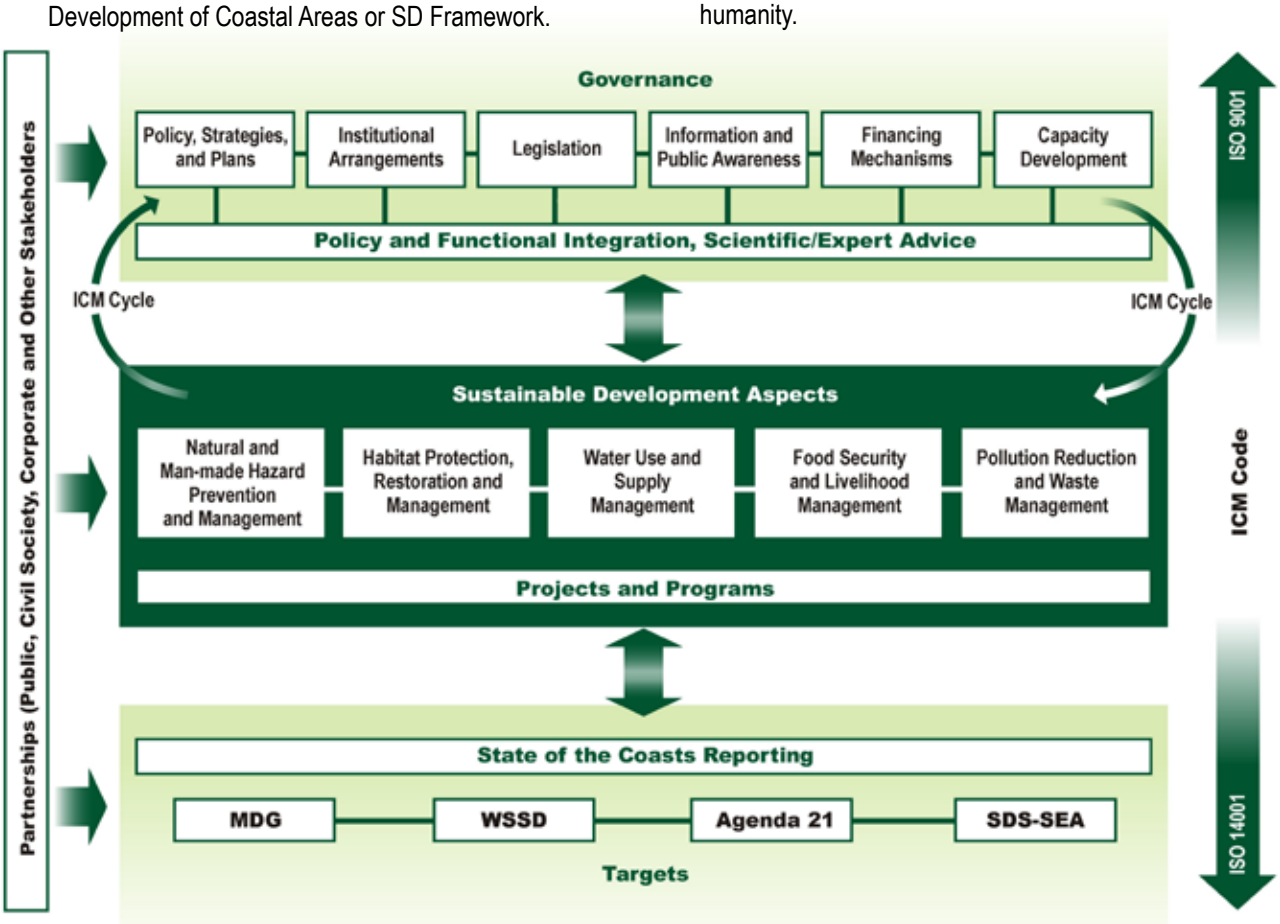
...And the answer is...

An overview of the SDS-SEA review is presented in **Figure 1**. The analysis employs 8 aspects of governance and management, and 52 measurable indicators of progress and achievement. The eight governance and management categories are largely based on PEMSEA's Framework for Sustainable Development of Coastal Areas (**Box 2**).

Box 2: PEMSEA's Framework for Sustainable Development of Coastal Areas (PEMSEA, 2007).

Over the past 19 years, the practical experiences of PEMSEA in the development and implementation of sustainable development policies, programs and initiatives at the regional, national and local levels have been consolidated into a Framework for Sustainable Development of Coastal Areas or SD Framework.

The SD Framework covers a system of governance as well as five sustainable development aspects or issue-specific programs, which are critical to achieving the overall goal of sustainable development of coastal and marine resources and the services they provide humanity.



Source: PEMSEA. 2007. PEMSEA: Partnerships in Environmental Management for the Seas of East Asia (1994-2010): A Regional Mechanism Facilitating Sustainable Environmental Benefits in River Basins, Coasts, Islands and Seas.

SDS-SEA Challenges:
Sustainable Fisheries

The region has been the world's largest producer of fish for decades and in 2008, increased its contribution to 51 percent of global capture production. Of the world's top ten producers of capture fish, six countries are in Asia and the Pacific region: China, Indonesia, Japan, India, Philippines and Myanmar. At the same time, China, Vietnam, Indonesia, Thailand, Philippines and Japan were among the top ten in aquaculture production in 2008 (Lymer, 2010).

However, the increasing production trend is masking the underlying decline in fishery resources due to increasing fishing pressure and other human activities. It was reported that the rate of fisheries collapses at the global level (catches dropping below 10 percent of the recorded maximum), has been accelerating over time, with 20 percent of currently fished species considered collapsed in 2003 (Worm et.al., 2006). Furthermore, fisheries assessments conducted by FAO, APFIC and SEAFDEC have shown varying levels of depletion among commonly fished species or stocks in the region.

Good Practices in Sustaining Coastal Fisheries: Sihanoukville, Cambodia

Preah Sihanouk Province in Cambodia has implemented a combination of approaches to protect and manage fishery resources. This includes the rehabilitation of habitats, promoting supplemental livelihood sources to reduce fishing pressure and deploying artificial reefs to prevent the intrusion of commercial fishers. In Tomnup Rolok Commune, Stung Hav District, rehabilitation and protection of mangrove areas have been conducted since 2005 with community stakeholders. About 18 hectares of mangrove have been rehabilitated and 50 artificial reefs have also been installed in critical areas to provide a breeding ground for fishes and to deter the intrusion of commercial fishing vessels. Interviews conducted in 2009 revealed an increase of about 25-30 percent in fishcatch among small-scale fishers. From a previous fishcatch of about 5-7 kg/day, fishers reported that their catch had increased to 7-10 kg/day due to reduced competition among large-scale fishing vessels and the regeneration of resources. Sightings of *dugong* (sea cow) were also reported by fishers in the community.

A combination of approaches were implemented under the ICM program in collaboration with the UNDP GEF Small Grants Programme to address the varying causes of fishery resource degradation, including zoning for small-scale fishing and deployment of artificial reefs (top), mangrove rehabilitation (center) and providing start up capital to women's groups for livelihoods.

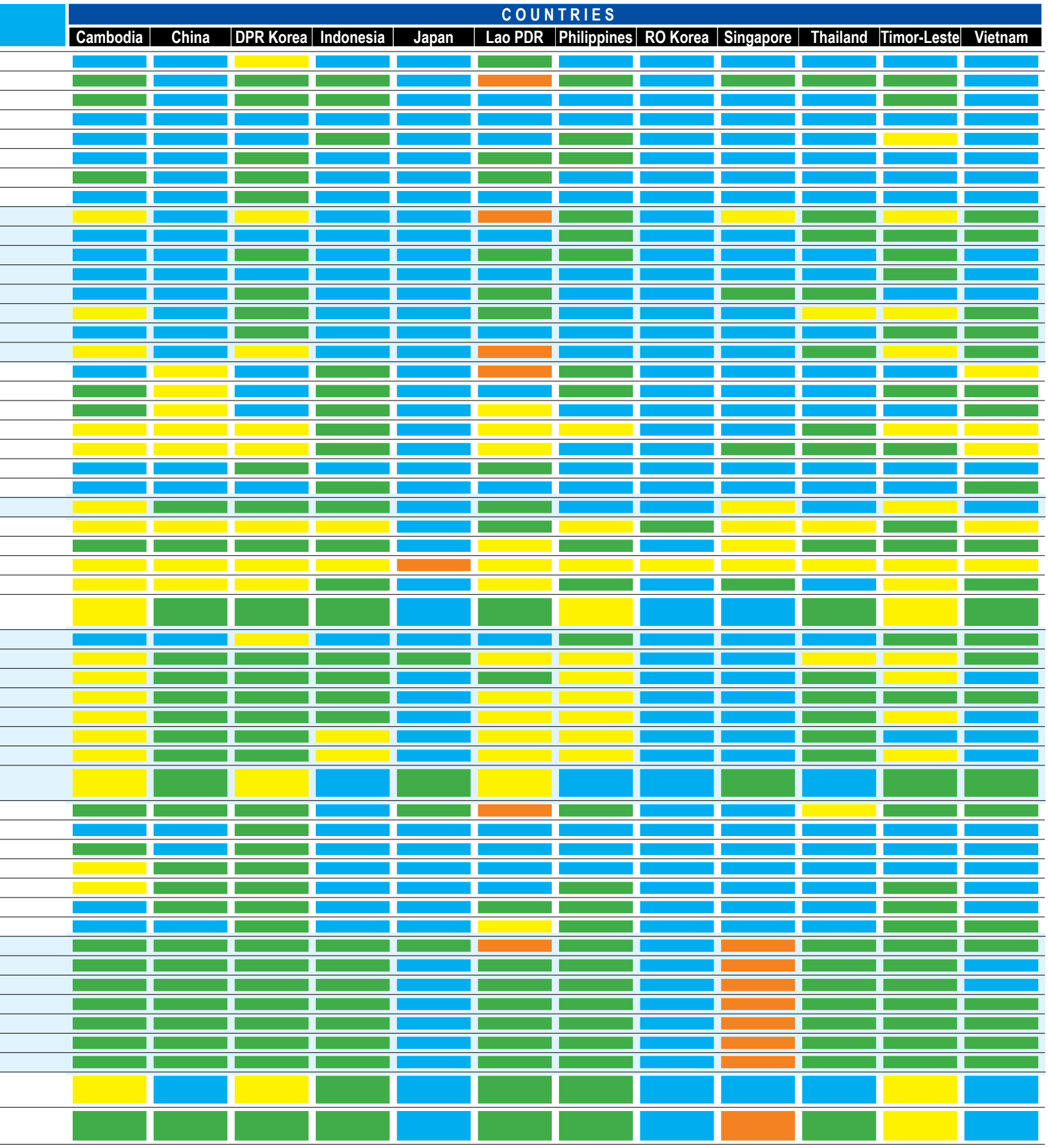
Sources:

Lymer, D., S. Funge-Smith, and W. Miao. 2010. Status and Potential of Fisheries and Aquaculture in Asia and the Pacific 2010. FAO Regional Office for Asia and the Pacific. RAP Publication 2010/17. 85 pp.

Worm, B., E.B. Barbier, N. Beaumont, J.E. Duffy, C. Folke, B.S. Halpern, J.B.C. Jackson, H.K. Lotze, F. Micheli, S.R. Palumbi, E. Sala, K.A. Selkoe, J.J. Stachowicz, R. Watson. 2006. Impacts of Biodiversity Loss on Ecosystem Services. Science 3 November 2006, Vol. 314 No. 5800.

Figure 1: Matrix showing Overview of Country Progress.

	CATEGORIES
National Policies/Strategies: A national policy or strategy that provides the vision and strategic direction for:	(a) Sustainable development
	(b) Coasts and ocean development and management
	(c) River basin/water resource development and management
	(d) Conservation and management of biological diversity
	(e) Environmental protection/pollution reduction
	(f) Sustainable fisheries
	(g) Climate change
	(h) Disaster risk reduction and management
National Legialation: National legislation/regulations covering the following management aspects:	(a) Coastal and ocean development and management, ICM or EBM
	(b) River basin/water resource management
	(c) Conservation and management of biological diversity
	(d) Environmental protection/pollution reduction
	(e) Sustainable fisheries
	(f) Climate change
	(g) Disaster risk reduction and management
	(h) Land and sea use zoning/marine spatial planning
Institutional Arrangements: A functional national interagency coordinating mechanism that is responsible for:	(a) Coastal and ocean area development and management
	(b) River basin/water resource development and management
	(c) Conservation and management of biological diversity
	(d) Pollution reduction
	(e) Sustainable fisheries
	(f) Climate change adaptation and management
	(g) Disaster risk reduction and management
Awareness and Communication	A national communication program that facilitates awareness building/knowledge sharing in coastal and ocean management
Capacity Development	A capacity needs assessment conducted to determine ICM training/education requirements at the national and local levels
	National training program that strengthens the skills and knowledge of national and local level ICM managers and practitioners
	An accreditation system that certifies training courses, institutions and individuals for ICM training of managers and practitoners
	Primary and secondary school curricula include topics on coastal and marine ecosystems
	Universities offer undergraduate and/or post-graduate courses in ICM or ecosystem-based management of watersheds and coastal areas
Sustainable Financing: Financial/economic incentive programs set up by the central government to encourage investment by subnational/local governments for:	National development plan mainstreams sustainable development of coastal and marine ecosystems into government programs
	(a) ICM development and implementation
	(b) Natural and manmade hazard prevention and management, including climate change
	(c) Habitat restoration and management, including biodiversity conservation
	(d) Water supply and use management
	(e) Food security and livelihood management, including sustainable fisheries and aquaculture
	(f) Pollution reduction and waste management
	Government policies/regulations facilitate investment by the business sector in sustainable development of the coastal and marine economy
Sustainable Development Aspects (National): A national program or plan of action that covers the following priorities:	(a) ICM development and implementation
	(b) Climate change adaption
	(c) Disaster risk reduction and management
	(d) Habitat restoration and management, including biodiversity conservation
	(e) Water supply and use management, including river basin management
	(f) Food security and livelihood management, including sustainable fisheries and aquaculture
	(g) Pollution reduction and waste management
Sustainable Development Aspects (Local): Subnational/local action plans or management programs support of the national priority objectives and targets covering:	(a) ICM development and implementation
	(b) Climate change adaption
	(c) Disaster risk reduction and management
	(d) Habitat restoration and management, including biodiversity conservation
	(e) Water supply and use management, including river basin management
	(f) Food security and livelihood management, including sustainable fisheries and aquaculture
	(g) Pollution reduction and waste management
Monitoring and Evaluation	A national monitoring and reporting system that provides regular reports on the state of land, river, coastal and marine ecosystems in the country
	A subnational monitoring and reporting system that provides regular reports on the effectiveness of ICM programs in sustaining healthy and resilient ecosystems



Not Started
no activity at this point in time

Partially
under development; being initiated in some parts of the country

In Place
policy or program in place and functioning

Not Applicable

Indications of Change

To analyze what has occurred since 2003, four questions were posed during the SDS-SEA review:

a. What changes have occurred/are occurring within countries and in subregional sea areas in accordance with the strategies and objectives of the SDS-SEA?
b. Where are the gaps and constraints in the delivery of targeted outputs?
c. What are the critical social, economic and environmental trends and transboundary concerns currently being addressed in subregional sea areas/LMEs of the region?
d. What solutions/desired targets can be identified for these issues and priorities and how can these solutions be delivered efficiently and effectively?

A. What changes have occured/ are occurring within countries and in subregional sea areas in accordance with the strategies and objectives of the SDS-SEA?

To answer this question, the four major targets adopted by PEMSEA Partner Countries (**Box 1**) serve as the indicators of progress.

Target 1:

A Self-sustained and Effective Regional Collaborative Mechanism

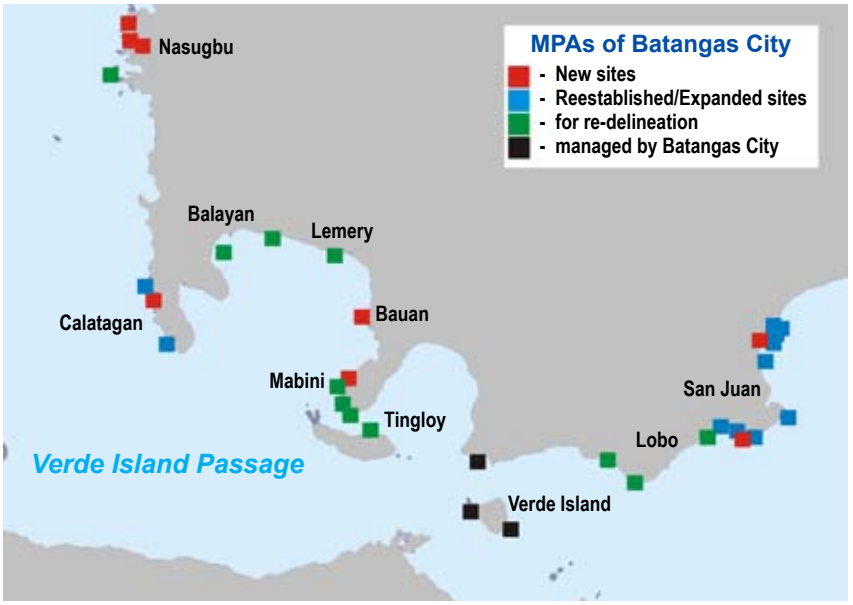
Progress and Achievements

In 2006, Country Partners recognized PEMSEA as a regional coordinating mechanism mandated to "pursue the implementation of the SDS-SEA through collaborative, synergistic and responsible actions and accomplishments of individual country commitments" (Haikou Partnership Agreement).

The Haikou Agreement defined the core components of PEMSEA, namely the EAS Partnership Council and Executive Committee, the PEMSEA Resource Facility, the EAS Congress and the Regional Partnership Fund (**Figure 2**).

PEMSEA began its transformation into an international legal entity in November 2009, when eight countries (Cambodia, DPR Korea, PR China, Indonesia, Lao PDR, Philippines, RO Korea and Timor-Leste) signed the Agreement Recognizing PEMSEA's International Legal Personality. At present, the organization is in the process of finalizing a Host Country Agreement with the Government of the Philippines, as well as the PEMSEA Rules of Governance.

SDS-SEA Challenges: Meeting the Biodiversity Targets



According to the Global Biodiversity Outlook (CBD, 2010), the 2010 biodiversity target, including its 21 sub-targets has not been met at the global level although some have been partially achieved or locally achieved. In terms of mangrove forests, the trend of reduced rate of loss has not been observed in Asia contrary to the global trend. Similarly, the Indo-Pacific region, where the vast majority of corals occur, showed a drastic reduction in the proportion of reefs with at least half of the area covered by living coral, falling from nearly two-thirds in the early 1980s to just 4 percent in 2004 (CBD, 2010).

Although efforts in protecting marine areas cannot be discounted with the growing number of marine protected areas (MPAs) in the region, this is still lagging the CBD target of having at least 10 percent of the marine ecoregions as protected areas.

Protecting the Global Center of Marine Biodiversity: Good Practices in Batangas, Philippines

Batangas Province is located along the southwestern edge of Luzon in the Philippines. The province lies along the Verde Island Passage Marine Corridor, which is considered to be the center of the global center of marine biological diversity (Carpenter and Springer, 2005). The province has established a network of marine protected areas (MPAs) within the bounds of the Verde Island Passage to promote the ecological integrity of the area. The network has been established through a Memorandum of Understanding between the Provincial Government, Batangas City, and the municipalities of Balayan, Bauan, Calatagan, Mabini, Lobo, San Juan, Nasugbu, Tingloy, Lemery and Lian. There are currently 35 MPAs in the Province covering a total area of 1,554 ha, including 295 ha of mangrove forest conservation area.

In line with the concept of forming a network of MPAs, a network of *Bantay Dagat* (sea wardens) in the coastal municipalities has also been established to consolidate coastal enforcement efforts in the province. Thirteen of the fifteen coastal municipalities (Balayan, San Juan, Calatagan, Lobo, Mabini, Nasugbu, San Luis, Tingloy, Batangas City, Bauan, Lian, Calaca and Lemery) are already part of the network. Over 300 volunteers are now patrolling the coastal waters of Batangas.

Increased fish catch and abundance, increased reports of turtle nesting, return of important species (e.g., bamboo sharks in Nasugbu MPAs), improved local involvement, establishment of new ecotourism sites, and resilient reefs were among the reported impacts of the strengthened MPA implementation and coastal enforcement in the province (CI-Philippines, 2011).

Batangas Province was one of the first two ICM demonstration sites of PEMSEA and has been implementing the ICM program since 1994. The establishment of MPAs is one of the province's strategies to protect, conserve and rehabilitate its rich marine resources.

Sources:

Carpenter and Springer. 2005. "The Center of the Center of Marine Shore Fish Biodiversity: The Philippines Islands."

CI-Philippines. 2011. Conservation International in the Verde Island Passage — A Continuing Partnership for Conservation. Batangas Environmental Response Team and Batangas Environmental Protection Council Meeting, June 17, 2011, Hotel Pontefino, Batangas City, Philippines.

Provincial Government of Batangas-Environment and Natural Resources Office. 2011. Presentation on the ICM Program during the Batangas Environmental Response Team and Batangas Environmental Protection Council Meeting, June 17, 2011, Hotel Pontefino, Batangas City, Philippines.

Secretariat of the Convention on Biological Diversity (CBD). 2010. Global Biodiversity Outlook 3. Montreal. 94 pp.

SDS-SEA Challenges:
Coastal Reclamation

Despite the lack of regional data, it is evident that countries in the region have engaged in coastal reclamation projects and foreshore developments to cope with the increasing demand for economic space brought about by development and migration to coastal cities.

Large-scale reclamation projects have been documented across the region, for example:

- **China** – reclaimed land area had reached 513.24 km^2 by 2002.
- **Hong Kong and Macau** (SAR China) – the area reclaimed from the sea comprises 5 percent and 33 percent, respectively, of the total land area.
- **Japan** – every coastal city has a highly developed port built on reclaimed land. In Tokyo, Yokohama, Osaka and Nagoya, land reclamation has moved the original waterline many kilometers away from its original location.
- **RO Korea** – has one of the largest reclamation projects in East Asia covering an area of 400 km^2 and a 33-km seawall at Saemangeum.
- **Malaysia** – coastal reclamation projects at Kedah, Perak, Selangor, West Malaysia, Sabah and Sarawak cover an area of 970 km^2.
- **Philippines** – the reclamation project in Manila Bay covers 15 km^2 of reclaimed land spanning four cities and one municipality.
- **Singapore** – 10 percent of the total land surface comprises land reclaimed from the sea. This increased the total land area by 51.5 km^2 by 1990 and is anticipated to increase by another 100 km^2 by 2030.

There is very limited information on small-scale reclamation projects, usually undertaken in conjunction with the construction or expansion of industrial and commercial facilities.

In 2008, the OSPAR Commission (i.e., Convention for the Protection of the Marine Environment of the North-East Atlantic) assessed the impacts of land reclamation activities on the marine environment, including habitats and coastal and marine resources. Some of the impacts identified included permanent loss of habitats, changes in coastal currents, adverse effects on benthos organisms and habitats from sand extraction and elevated fine silt concentrations, and reduction of coastal fishing grounds especially for local fisherfolks (OSPAR, 2008).

Good Practices in Reclamation: Semakau Landfill in Singapore

In response to the growing rate of wastes disposed in Singapore, the National Environment Agency (NEA) initiated a project creating the world's first offshore landfill site, the Semakau Landfill. Reclaiming land between the two small islands of Pulau Sakeng and Pulau Semakau, about 8 km off the coast of Singapore, created the landfill. The two islands were previously home to small fishing villages but are now mainly used for the operations of the sanitary landfill. The landfill receives about 1,400 MT of incineration ash and 600 MT of non-combustible waste everyday. The landfill is constructed in such a way that all the wastes are contained within the landfill area. The perimeter bund, lined with impermeable membrane, marine clay and rock layers, keeps the surrounding waters pollution-free, and any leachate generated within the site is treated in a dedicated leachate treatment plant. It is being managed to ensure the cleanliness of the landfill. It is also operated as an odor-free facility and aesthetically scenic in order to be in harmony with the marine ecosystem. Through landscaping and planting, the landfill has been recognized for its scenic beauty. It was opened in 2005 for tourists and recreational activities. Some of the things that can be done at the site include intertidal walking, bird watching, bait fishing, cycling, and camping. The landfill is receiving attention and positive feedback. The project was one of the efforts of the Government of Singapore to harmonize development activities with environmental conservation and sustainability.

Sources:

Critical and Emerging Issues in the Seas of East Asia, 2nd EAS Partnership Council Meeting, Agenda Item 3.0: Technical Session, July 2008.

National Environment Agency, Semakau Landfill Brochure. Available at: www.nea.gov.sg/cms/wmd/SL%20Brochure.pdf

OSPAR Commission. 2008. Assessment of the Environmental Impact of Land Reclamation. Available at: http://qsr2010.ospar.org/media/assessments/p00368_Land_Reclamation.pdf

PennWell, Waste Management World. Available at: www.waste-management-world.com/index/display/article-display/356697/articles/waste-management-world/landfill/2009/03/semakau-landfill.html.

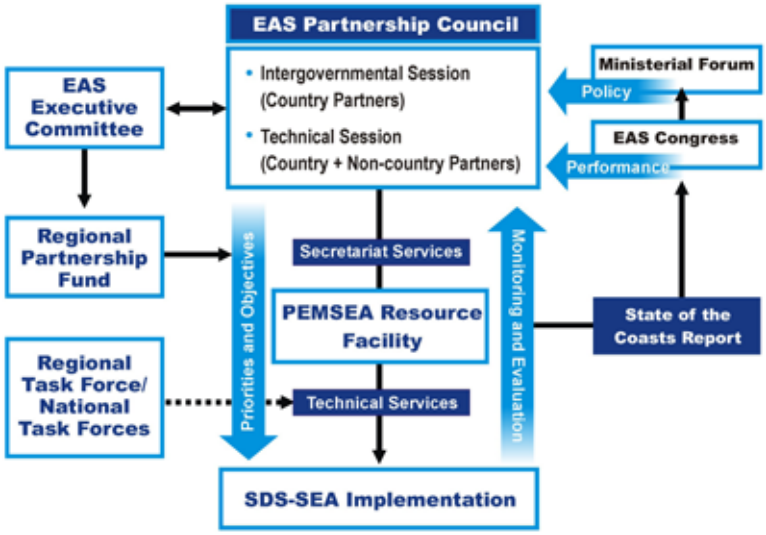
Since 2007, three countries, namely PR China, Japan and RO Korea, have been supporting PEMSEA with contributions of approximately US$ 350,000 per year for the annual operating costs of the PEMSEA Resource Facility's secretariat services. Similarly, the Philippine Government erected a new building and signed a 10-year agreement with PEMSEA in 2007, providing access and use of the PEMSEA Office Building, as well as utilities (water, sanitation and electricity), security, and building cleaning and maintenance for the duration. Timor-Leste is also doing its part to support the operations of PEMSEA. In 2009, Timor-Leste confirmed its contribution of US$100,000 per year to PEMSEA, with the funds earmarked for SDS-SEA related capacity development and knowledge sharing activities, to be undertaken jointly by the PEMSEA Resource Facility and Timor-Leste.

Other Partner Countries are contributing to PEMSEA's sustainability by hosting such events as the triennial EAS Asian Seas Congress, EAS Partnership Council and Executive Committee meetings, as well as capacity development and knowledge sharing workshops.

In addition, 29 local governments belonging to the PEMSEA Network of Local Governments for Sustainable Coastal Development (PNLG) take turns hosting and organizing the annual PNLG Forum and workshop on ICM implementation, thereby facilitating sharing of ICM knowledge, experience and good practices.

Likewise, 19 Non-Country Partners of PEMSEA are providing national and local governments with access to the region's rich intellectual capital and manpower resource for special skills training and technical assistance covering issues including: oil spill contingency planning, preparedness and response; land and sea use zoning; vulnerability/environmental risk assessment; sensitivity mapping; and total allowable pollutant load. Working across the region, the PEMSEA Non-Country Partners also have made significant contributions to achieving the objectives and targets of the SDS-SEA. Their achievements and support to SDS-SEA implementation cut across governance, management interventions, capacity development, applied research, knowledge sharing and monitoring and reporting.

Figure 2: PEMSEA Coordinating Mechanism Organization Chart.



The Partnership Agreement

11 Countries

- Cambodia
- PR China
- DPR Korea
- Indonesia
- Japan
- Lao PDR
- Philippines
- RO Korea
- Singapore
- Timor-Leste
- Vietnam

19 Non-Country Partners

- ASEAN Centre for Biodiversity (ACB)
- Conservation International (CI) - Philippines
- Coastal Management Center (CMC)
- International EMECS Center
- IOC Sub-Commission for the West Pacific
- (IOC-WESTPAC)
- International Ocean Institute (IOI)
- Asia Regional Office of IUCN, International Union for the Conservation of Nature (IUCN-ARO)
- Korea Environment Institute (KEI)
- Korea Maritime Institute (KMI)
- Korea Ocean Research and Development Institute (KORDI)
- Northwest Pacific Action Plan (NOWPAP)
- Ocean Policy Research Foundation (OPRF)
- Oil Spill Response Limited (OSRL)
- PEMSEA Network of Local Governments for Sustainable Coastal Development (PNLG)
- Plymouth Marine Laboratory (PML)
- Swedish Environmental Secretariat for Asia (SENSA)
- UNDP/GEF Small Grants Programme (SGP)
- UNDP/GEF Yellow Sea Large Marine Ecosystem (YSLME) Project
- UNEP-Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA)

Target 2:

National Policies and Action Plans for Sustainable Coastal Development in at least 70 percent of the participating countries by 2015

Countries have shown considerable progress in formulating and initiating national policies and action plans for sustainable coastal development. Since 2003, 9 of the 12 PEMSEA participating countries (i.e., Cambodia, China, Indonesia, Japan, Philippines, RO Korea, Singapore, Thailand and Vietnam) have initiated the development and/or are now in the process of adopting and implementing their respective national coastal and ocean policies and strategies. In the case of Lao PDR, a National Water Resources Strategy and Action Plan has been developed and adopted (**Table 1**). While further effort is required to complete, adopt and initiate ocean policies in some countries, it is apparent that **Target 2** will be achieved by 2015 if countries stay on course. This will ensure a solid foundation for improved governance and management of coastal and marine resources for the implementation of medium-term SDS-SEA Implementation Plans in the respective countries.

SDS-SEA Challenges: Hypoxic (Dead) Zones

Deteriorating water quality in coastal areas and LMEs is evident across the EAS region, and globally. The number of reported dead zones has been roughly doubling every ten years since the 1960s, and by 2007 had reached around 500. Dead zones or hypoxic zones are coastal sea areas where dissolved oxygen levels have dropped too low to support most marine life (Diaz and Rosenberg, 2008).

The poor management of sewage, as the case in the EAS region where a large proportion of wastewater is untreated, largely contributes to the eutrophication of coastal waters. At the same time, infrastructure development, intensive agricultural expansion, urbanization and coastal development are also contributing to the increase in the flow of sediments and pollutants into the ocean, which is observed to be most severe around Europe, the east coast of the United States, east of China and in Southeast Asia (Nelleman, 2008).

Responding to Hypoxia: The Manila Bay Initiative

Manila Bay has been identified by PEMSEA as a pollution hotspot. The Bay's watershed is home to about 26 million people. It has a catchment area of 17,000 km^2, an average depth of 17 m and is influenced largely by two major rivers, the Pasig and Pampanga Rivers. Manila Bay receives about 250,000 tonnes of BOD loading per annum.

The University of the Philippines – Marine Science Institute (UP-MSI) monitored the Bay during the northeast (cool, dry season) and southwest (rainy season) monsoons of 2010 (February and July) and 2011 (February and August). The monitoring program covered dissolved oxygen (DO) and nutrients (NH_3, NO_3, PO_4 and SiO_4), measured at 31 stations. Although conditions varied seasonally, results showed a seemingly worsening condition in the Bay, with the hypoxic layer increasing from approximately 9 m in July 2010 to about 19 m in August 2011. Coinciding with low levels of DO, elevated concentrations of nutrients (i.e., NO_3, PO_4 and SiO_4) were also observed in the midsection of the Bay. These results, although preliminary, provide a benchmark against which impacts of future management interventions can be evaluated.

A GEF-supported project has recently been initiated in Manila Bay, with the objective of modeling pollutant loadings and ecosystem response in Manila Bay, as a decision-support system for planned investments in pollution reduction and nutrient management. The project is being executed by UNEP and coordinated by PEMSEA, in collaboration with the Department of Environment and Natural Resources, Department of Agriculture, Laguna Lake Development Authority, Pasig River Rehabilitation Commission, Manila Water and Sewerage, UP-MSI, and local governments around the Bay.

Sources:

Diaz, R. and R. Rosenberg. 2008. Spreading Dead Zones and Consequences for Marine Ecosystems, Science, 321: 926-929.

Nellemann, C., S. Hain, and J. Alder, J. (Eds). February 2008. In Dead Water – Merging of climate change with pollution, over-harvest, and infestations in the world's fishing grounds. United Nations Environment Programme, GRID-Arendal, Norway. www.grida.no.

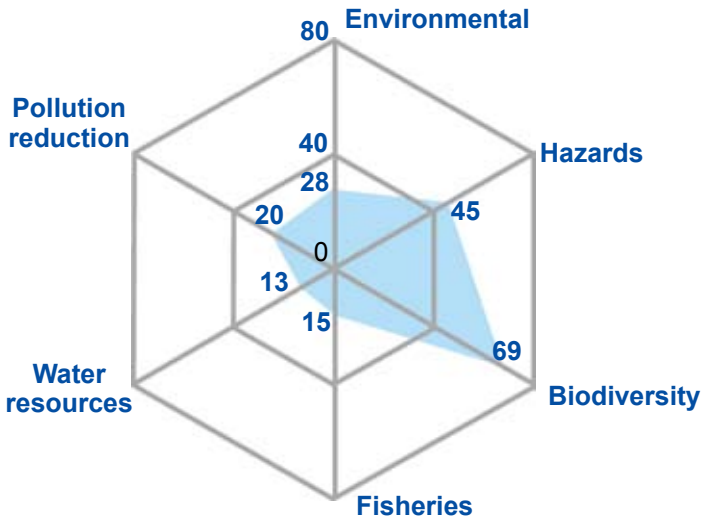


Figure 3: National Policies, Strategies and Action Programs adopted and initiated in East Asian Seas since 2003.

Table 1. Coastal and Ocean Policies, Strategies and Action Plans Under Development/In Place.

Country	Coastal and Ocean Policies, Strategies and Action Plans
Cambodia	✓ Shoreline Management Strategy (2006) ✓ Draft ICM Policy under development
China	✓ Law on the Administration of the Use of Sea Areas (2002) ✓ Law of the Protection of Sea-Islands(2009) ✓ Law on Fisheries of China (amended 2007)
Indonesia	✓ Indonesian Ocean Policy under development
Japan	✓ Basin Plan on Ocean Policy (2008) ✓ Basic Policy on Preservation and Management of Islands and Seas (2009)
Lao PDR	✓ National Water Resources Strategy and Action Plan for the Years 2011 to 2015
Philippines	✓ Executive Order 533 ICM as a National Strategy to Sustainable Development of Coastal and Marine Environment (2006) ✓ Executive Order 578 as a National Policy for protecting, conserving and sustainably utilizing biodiversity; it also revitalized the management of Sulu-Celebes Sea and the Verde Island Passage, considered as the center of marine shorefish biodiversity in the world.
RO Korea	✓ Coastal Zone Management Act amended to include zoning scheme (2009) ✓ 2nd Basic Plan for Ocean and Fisheries Development 2011-2020 ✓ 2nd Integrated Coastal Management Plan (2011-2020) ✓ 1st Marine Ecosystem Conservation and Management Plan (2009-2018) ✓ Framework Act on Low Carbon Green Growth and National Strategy for Green Growth and Five-Year Plan for Green Growth (2009)
Singapore	✓ Sustainable Singapore Blueprint (2009) ✓ Urban Redevelopment Authority (URA) Master Plan (2008) ✓ Integrated Urban Coastal Management (IUCM) Plan (2009) ✓ Singapore Green Plan (2002-2012) ✓ Strategies for Sustainable Growth (2010-2030)
Thailand	✓ Draft Bill on Promotion of Marine and Coastal Resources Management Act under development ✓ Draft National Coastal and Marine Policy under development
Timor-Leste	✓ Draft Ocean Policy under development
Vietnam	✓ Integrated Coastal Management Program for North Central and Central Coastal Region until 2010 and Orientation until 2020 (2007) ✓ Government Decree No. 25 of Vietnam on Integrated Resources Management and Environmental Protection of Seas and Islands (2009) ✓ Master Plan of Socioeconomic Development of Vietnam's Seas and Coastal Areas in the Gulf of Thailand (2009) ✓ National Plan on Island Development Towards 2020, Vision 2030 (2010)

In addition to coastal and ocean policy, various sectoral policies have been developed and adopted by governments of the region over the past 10 years, which support the objectives of the SDS-SEA. The policies, strategies and action programs cover:

- Environmental management and protection;
- Hazards (e.g., disaster risk reduction; climate change; oil spills);
- Biodiversity;
- Fisheries;
- Water resources management; and
- Pollution reduction.

Of the 190 reported developments, inputs from countries suggest that the majority of policies and action plans over the past 10 years have focused on biodiversity (e.g., habitat protection and conservation) and hazards, (e.g., extreme events), followed by environmental protection, pollution reduction, fisheries/food security and water resources management (**Figure 3**). In other words, countries are moving in the right direction, and have developed and adopted action plans to address constraints to sustainable development. While not an endpoint in the process, the plans at the very least indicate that countries are headed in the right direction.

Legislation

Over the same period, countries have enacted more than 80 pieces of legislation directly supporting the implementation of the SDS-SEA (**Table 2**). Of particular note are Indonesia, Japan and RO Korea, enacting laws supporting the implementation of ICM and coastal and ocean governance.

National Interagency Coordinating Mechanisms

National interagency coordinating mechanisms for coastal and ocean management programs have been set up and are currently operational in Cambodia, DPR Korea, Indonesia, Japan, RO Korea and Singapore, Thailand and Timor-Leste. In Lao PDR, the government has recently approved the formation of a River Basin Committee to coordinate river basin development in the country (**Table 3**). Other countries, including China, the Philippines and Vietnam, are still in the process of developing their interagency coordinating mechanisms for coastal and ocean management, and have identified this as a major outcome in their respective five-year national SDS-SEA Implementation Plans (2012-2016).

Table 2. National Legislation Supporting SDS-SEA Implementation.

Country	Legislation
Cambodia	✓ Law on Fisheries (2006) ✓ Law on Water Resources Management (2007) ✓ Law on Bio-safety (2008) ✓ Law on Administrative Management of Capital, Provinces, Municipalities, Districts and Khans (2008)
China	✓ Administrative Regulation on the Prevention and Control of Pollution Damages to the Marine Environment by Coastal Engineering Construction Projects, amended in 2004 ✓ Law on the Real Rights of China (2007) ✓ Law on Fisheries of China (2007)
DPR Korea	✓ Law of Rivers and Streams (2002) ✓ Cabinet Decision No. 28, "Water Resources Management Regulations in the Taedong River Basin" (2003) ✓ Fluvial Law of DPRK (revised 2004)
Indonesia	✓ National Act No. 7/2004 Integrated Water Resources Management at Basin Level ✓ Fishery Law No. 31/2004 ✓ National Act No. 32/2004 Local Government (Sharing of responsibilities in coastal and marine management) ✓ Act No. 33/2004 Financial Balance among National and Local-level Governments (management of income originated from environmental resources ✓ National Act No. 24/2005 on Disasters Preparedness and Mitigation ✓ National Act No. 26/2005 on Spatial Planning, including coastal and marine areas ✓ Amendment on Act on Liability for Oil Pollution Damage (2005) ✓ Emergency Plan for Preparedness and Action for Oil Spill Incidents (2006) ✓ Law No. 24/2007 Disaster Management ✓ National Act No. 25/2007 on Investment Policy in Coastal and Ocean Development ✓ National Act No. 26/2007 Spatial Planning ✓ National Act 27/2007 Coastal Zone and Small Islands Management (CSIM) (provides legal basis for ICM and mandates local governments to implement ICM following a common planning process) ✓ GR No. 60/2007 Conservation of Fish Resources Stocks ✓ Regulation No. 16/2008 Planning and Management of Coastal Zone and Small Islands ✓ Regulation No. 17/2008 Conservation Area in the Coastal Zone and Small Islands ✓ Regulation No. 18/2008 Accreditation of Programs on Management of Coastal Zone and Small Islands ✓ Biodiversity Basic Act (2008) ✓ Regulation No. 8/2009 Participation and Empowerment of Society in the Management of Coastal Zone and Small Islands ✓ Environment Act No. 32/2009 (supports the management of coastal and marine resources through risk management and ecosystem-based management principles) ✓ National Act No 45/2009 on Fisheries
Japan	✓ Law for Enhancing Motivation on Environmental Conservation and Promoting of Environmental Education (2003) ✓ National Spatial Planning Act incorporated EEZ as a management area (2005) ✓ Basic Act on Ocean Policy (2007) ✓ Act on Promotion of Global Warming Countermeasures (revised June 2008) ✓ Basic Act on Biodiversity (2008) ✓ Preservation of the Low-water Line and the Development of Basic Infrastructure of Remote Islands for Maintaining and Promoting Utilization of the Exclusive Economic Zone and the Continental Shelf (2010) ✓ Water Pollution Control Law (revised 2010 and 2011)
Lao PDR	✓ Law on Lands (amended 2003) ✓ Wildlife and Aquatic Animals Act (2008) ✓ Prime Minister Decree No. 293 on Establishment and Activities of the River Basin Committee (2010)

Table 2. National Legislation Supporting SDS-SEA Implementation (cont.).

Country	Legislation
Philippines	✓ R.A. 9275 Philippine Clean Water Act (2004), applies to water quality management in all water bodies and in the control and abatement of pollution from land-based sources ✓ DAO 2005-10: Clean Water Act Implementing Rules and Regulations (2005) ✓ Marine Ecosystem Conservation and Management Act (2006) ✓ Marine Environment Management Act (2007) ✓ RA 9843, Oil Compensation Act (2007) ✓ Renewable Energy Act (2008) ✓ Supreme Court Decision enjoining 12 government agencies to clean up, rehabilitate and restore Manila Bay (2008) ✓ RA 9993 Philippine Coast Guard Law (2009) ✓ R.A. 9729 Climate Change Act (2009) ✓ RA 10121 Disaster Risk Reduction and Management Act (2010)
RO Korea	✓ Marine Ecosystem Protection and Management Act (2006) ✓ Marine Environment Management Act (2007) ✓ Water Quality and Water Ecosystem Conservation Act (2007) ✓ Fisheries Resource Management Law (2009)
Singapore	✓ Act 4 Park and Trees Act (2005) ✓ Merchant Shipping (Civil Liability and Compensation for Bunker Oil Pollution) Act (2008)
Thailand	✓ Effluent standards for housing estates (2005), aquaculture (2006) and fish piers (2006) ✓ Disaster Prevention and Mitigation Act, B.E. 2550 (2007) ✓ Draft Water Resources Law (2010)
Timor-Leste	✓ Government Decree-Law No. 3/2004: APORTIL– Managing the port facilities and services ✓ Government Decree-Law 6/2004 and Decree Law 4/2005 – Management and Regulation of Fisheries and Aquaculture: General basis of the legal regime for the management and regulation of fisheries and aquaculture ✓ Government Decree–Law No. 12/2004 – Crime action on fishing ✓ Ministerial Order 1/2004 – Fees and Charges for Water Supply ✓ Government Decree–Law 04/2004 – Water Supply for Public Consumption ✓ Government Decree Law No. 10/2004 – Health System (sanitary surveillance and control) ✓ Government Decree No. 2/2005 – Tariff in Fisheries ✓ Ministerial Diploma 01/03/GM//2005 – Definition of Fisheries ✓ Ministerial Diploma 03/05/GM//2005 – Bycatch fishing ✓ Ministerial Diploma 04/115/GM/IV2005 – Protected aquatic species ✓ Ministerial Diploma 05/116/GM/IV2005 – Minimum fish size can be caught ✓ Ministerial Diploma 06/42/GM/II/2005 – Fisheries infringements ✓ DNF and UN FAO: Forest Management Decree (2006) ✓ Government Resolution No. 8 2007 establishedNino Konis Santana National Park ✓ Government Decree–Law No. 33/2008 – Hygiene and Public Order ✓ Government Decree–Law 05/2009 – Licensing, Commercialization and Quality of Drinking Water ✓ Government Decree – Law 05/2011 – Environmental Licensing (conduct of environmental impact assessment and pollution control measures)
Vietnam	✓ Law on Fisheries (2003) ✓ Strategic Direction for Sustainable Development of Vietnam (Vietnam Agenda 21) (2004) ✓ Forest Protection and Development Law (amended 2004) ✓ Revised Environmental Protection Law 2005 - proposes to apply the ICM approach for the coastal resources and environment protection in Vietnam ✓ Law on Biodiversity (2008)

Table 3. National Interagency Coordinating Mechanisms for Coastal and Ocean Management.

Country	Interagency Coordinating Mechanisms
Cambodia	✓ National Coastal Steering Committee
DPR Korea	✓ National Coordinating Committee for the Environment
Indonesia	✓ National Ocean Council (2007)
Japan	✓ The Secretariat of the Headquarters for Ocean Policy Cabinet Secretariat (2007)
Lao PDR	✓ National River Basin Committee (2010)
RO Korea	✓ Marine and Fisheries Development Committee under the Framework Law on Ocean and Fisheries Development (2002), chaired by the Prime Minister, and the Central Coastal Management Council under the Coastal Management Act, chaired by the Vice-Minister of MLTM
Singapore	✓ Coastal and Marine Environment Policy Committee and the Technical Committee on Coastal and Marine Environment (2008) ✓ Inter –Ministerial Committee on Sustainable Development (2008)
Thailand	✓ National Environment Board (NEB) with a Subcommittee on Marine and Coastal Resources
Timor-Leste	✓ Inter-Ministerial Working Group on Environment and Natural Resources Management

Target 3:

Strengthen and accelerate the implementation of ICM for Sustainable Development and Climate Change Adaptation in at least 20 percent of the Region's coast by 2015.

ICM is a systematized approach to governance and sustainable development and management of coastal and marine areas and the resources therein. It facilitates coordinated actions at the regional, national and local levels to address the region's greatest challenges to protecting and securing an ocean-based blue economy.

While **Table 4** indicates that countries are progressing toward **Target 3**, with ICM programs covering approximately 11 percent of the region's coastline in 2011, it is apparent that countries and their Partners need to exert greater effort, collectively and individually, if this milestone is to be achieved in the next five years.

Furthermore, it is apparent that the time is right for the roll out and application of PEMSEA's ICM Code. The primary objective of the Code is to provide assistance to local governments for planning, developing, implementing and improving an ICM system, while at the same time strengthening environmental and quality management systems consistent with two international standards, namely ISO 14001:2004 and ISO 9001:2000. The ICM Code facilitates two supplementary objectives as well, namely: (a) to enablea local governmentsto conduct a self-assessment of just how far they have progressed and how well they are doing in developing and implementing an ICM program; and (b) to provide a set of measurable indicators covering governance, stress reduction and impact/benefits (social, economic and ecological), which can be used by a third party to recognize/certify the local government's conformance to the Code.

The indicators for the Code are based in the SD Framework (**Box 2**). The Code can be applied in different political, social, environmental and economic situations, and in combination with the State of the Coasts Reporting System (see **Target 4**), facilitates assessment across ICM sites within a country and across national boundaries.

Table 4: Length of Coastline (km) with ICM Programs.

Country (Length of coastline, excluding some associated islands)	Location of ICM Program	Length of Coastline (km) (Percent of country's coastline)
Cambodia (435 km)	Preah Sihanouk Province	140.5 (32%)
China (32,000 km)	Dongying	350
	Fangchenggang	584
	Haikou	136.23
	Leting	98
	Lianyungang	204.82
	Panjin	118
	Qingdao	863
	Quanzhou	541
	Wenchang	278.5
	Xiamen	234
	Yangjiang	477
	Subtotal	3,844.55 (12%)
DPR Korea (2,880 km)	Nampho City	127 (4.41%)
Indonesia (95,161 km)	Bali	430
	Sukabumi	117
	Tomini Bay	2,500.46
	Jakarta Bay	72
	15 provinces/42 coastal districts covered by the MCRMP of MOMAF	No data
	Subtotal	3,119.46 (3.3%)
Japan (35,000 km)		No data
Malaysia (5,087.5 km)	Port Klang	101.75 (2%)
Philippines (36,289 km)	Batangas Province	492
	Boracay Island	7
	Camiguin	55
	Guimaras	470.3
	Ilocos Coast	652
	Manila Bay (Bataan, Cavite, Pampanga, Bulacan)	318
	Macajalar Bay	176
	Tayabas Bay (Quezon side)	305.7
	ICRMP (DENR, 2012)	
	Cagayan	1,057
	Cebu	868
	Davao Oriental	460
	Masbate	781
	Romblon	384
	Siquijor	86
	Zambales	272
	Subtotal	6,384 (17.6%)
RO Korea (13,509 km)		11,915 (88.2%)
Singapore (182.4 km)	Entire coastline	182.4 (100%)
Thailand (2,614 km)	Chonburi Province	160
	CHARM (Surat Thani, Phuket, Phang Nga, Krabi, and Trang)	No data
	Songkhla Lake	No data
	Kho Tao	No data
	Subtotal	160 (6%)
Timor-Leste (735 km)	Liquica and Manatuto Districts	114 (15.5%)
Vietnam (3,269 km)	Ba Ria-Vung Tau	305
	Danang	92
	Haiphong	125
	Nam Dinh	72
	Quang Nam	125
	Quang Ninh	270
	Soc Trang	72
	Thua Thien Hue	128
	Subtotal	1,189 (36%)
Total Coastline covered by ICM Programs (as of 2011)		26,820
Total Length of the Regional Coastline (including islands)		234,000
Percentage of Coastline covered by ICM Programs (as of 2011)		11.5%

Capacity Development and Information and Public Awareness

To further facilitate the development, implementation and replication of ICM programs, PEMSEA enhanced its capacity development programs to support the demands of the countries for skilled human resources, tools and instruments and services. Since 2003, PEMSEA has conducted a total of 84 training and workshop activities involving 2,311 participants in 10 Partner Countries. Major regional training workshops covered diverse topics, including: (a) ICM development and implementation; (b) ICM training-trainers; (c) project proposal development; (d) project management (including financial management); (e) oil spill preparedness and response; (f) planning, implementation and enforcement of land and sea use zoning; (g) tourism zone development; (h) shoreline assessment and oil spill cleanup; (i) total maximum daily pollutant loading; (j) sustainable fisheries management; (k) port safety, health and environmental management; (l) port auditing; (m) integrated information management system (IIMS); and (n) State of the Coasts (SOC) reporting.

PEMSEA also set up ICM Learning Centers, mobilized regional and national task forces, partnered with the Korean Maritime Institute (KMI) to establish a regional twinning network on integrated river basin and coastal area management (IRBCAM), and recognized one Regional Area of Excellence (i.e., Centre for Marine Environmental Research and Innovative Technology or MERIT, in Hong Kong). To date, seven universities have been established as PEMSEA ICM Learning Centers in six Partner Countries (**Table 5**).

Countries have also benefited from various capacity development programs supported by various international organizations, donors and partners that helpmeet the needed skills and human and technical resources to further the implementation of SDS-SEA (**Annexes A** and **B**).

In the same manner, countries in the region are continuously undertaking efforts to promote awareness related to marine and coastal, and river basin management. The experiences and lessons learned are shared among countries and other stakeholders through case studies, partnership forums (e.g., annual PNLG Forums; Twinning Workshops) and conferences (e.g., EAS Congress).

Table 5. ICM Learning and Training Centers.

ICM Learning/Training Centers	Collaborative Activities (2008-2011)
Royal University of Phnom Penh, Cambodia	• National ICM Training Course 1 in Cambodia
Center for Coastal and Marine Resources Studies-Bogor Agricultural University, Indonesia	• National ICM Training Course (2) in Indonesia • Resource person in National ICM Training Course in Cambodia and Timor-Leste • Technical Support for ICM Policy Development and Implementation in Timor-Leste and Indonesia • Training on State of the Coasts Report in Indonesia
Xavier University-Ateneo de Cagayan, Philippines	• Planning workshop for ICM Development and Implementation in Macajalar Bay
De La Salle University-Lipa, Philippines	• ICM Training of Trainers for the ICM Core Team of DLSU-LIpa • Resource person in ICM Training Course for Region 6, Philippines
University of Danang, Vietnam	• National ICM Training Course in Vietnam
Xiamen University, Xiamen China	• Regional ICM Training-Trainers Workshop, Xiamen
Kim Il Sung University, DPR Korea	• National ICM Training Course, Pyongyang

Target 4:

Report on ICM Progress every three Years.

The development of a State of the Coasts (SOC) Reporting System was initiated in 2006, for the purpose of consolidating information coming from administrative, social, economic and environmental sectors, including: (a) establishing baseline conditions in a coastal area prior to the start-up of an ICM program; (b) assessing progress, achievements and shortcomings of ongoing ICM programs by determining changing conditions with respect to governance and social and economic trends, as well as trends and/or emerging environmental issues; and (c) developing recommendations for continual improvement of ICM programs for consideration by Local Chief Executives/local governments.

In July 2011, the PEMSEA Network of Local Governments for Sustainable Coastal Development adopted the Dongying Declaration on Building a "Blue Economy" through Integrated Coastal Management. The Declarations commits the Network to apply the SOC reporting system to 100 percent of its members by 2015, to identify and validate social, economic and environmental status and changes in coastal and marine areas, and measure progress and impacts of ICM implementation among local governments of the region.

To date, SOC reports have been prepared by 11 local governments including: Preah Sihanouk (Cambodia); Dongying and Xiamen (China); Bali (Indonesia); Sedone River (Lao PDR); Batangas and Guimaras Provinces (Philippines); Changwon City (RO Korea); Chonburi (Thailand); Liquica and Manatuto Districts (Timor-Leste); and Danang (Vietnam).

B. Where are the gaps and constraints in the delivery of targeted outputs?

In spite of the number of policy and program initiatives that have been taken across the region since 2003, a number of challenges remain.

Regional

PEMSEA is in the process of transforming into a self-reliant and dynamic international organization that is relevant, effective and responsive to regional and national priorities and needs. It is presently initiating the implementation of its re-engineering, financial sustainability and communication plans, as approved by the EAS Partnership Council in 2011.

As an international organization, PEMSEA is focusing on its mandate, i.e., the implementation of the SDS-SEA, especially the advancement of five-year national SDS-SEA implementation plans, capacity development and knowledge management.

SDS-SEA Challenges:
Climate Change/Disaster Risk Reduction

In Southeast Asia, climate change vulnerability mapping conducted in 530 subnational areas in Cambodia, Indonesia, Lao PDR, Malaysia, Philippines, Thailand and Vietnam showed that the hotspots or most vulnerable areas include all the regions of the Philippines, the Mekong River Delta in Vietnam, almost all the regions of Cambodia, North and East Lao PDR, the Bangkok region of Thailand, and West and South Sumatra, and Western and Eastern Java in Indonesia. The assessment defined vulnerability as a function of exposure to five climate hazards (i.e., tropical cyclones, floods, landslides, droughts, and sea level rise), sensitivity, and adaptive capacity. Population density and extent of protected areas were used as proxies for human sensitivity and ecological sensitivity, respectively; and adaptive capacity was measured based on selected socioeconomic variables, technology, and infrastructure. Indices of vulnerability to climate change were then generated and illustrated through maps (Kjerfve, et al., *Tropical Coasts*, 2010).

In addressing disaster risks, the countries in the EAS region are signatory to the UNFCCC and adopted the Hyogo Framework of Action (HFA, 2005-2015) with the objective of reducing disaster risk by 2015. The progress of implementing the HFA indicates that national efforts remain focused on strengthening policy, legislation, institutional frameworks and capacities for disaster preparedness, response, risk assessments, and early warning (HFA Priorities 1, 2 and 5). In contrast, much more effort needs to be made in using knowledge, education and innovative outreach programs to stimulate a culture of disaster resilience, and to address the underlying drivers that configure disaster risk in social, economic and infrastructure development across rural and urban contexts (HFA Priorities 3 and 4).

Good Practices in Climate Change/Disaster Risk Reduction: Xiamen, PR China

Xiamen as a coastal municipality is vulnerable to hazards like storm surges and typhoons. To deal with the uncertainty of the magnitude and frequency of occurrence of natural hazards and disasters, the Government of Xiamen has established a mechanism to increase its resilience and adaptive capacity to respond and prepare for disasters. An Integrated Disaster Risk Management Framework is in place in Xiamen to deal with natural disasters and hazards in general and climate change impacts in particular.

Plans and programs related to marine disasters are in place with respective departments and agencies assigned responsibilities to develop, supervise and implement these various emergency response plans for typhoons and flooding, storm surges and tsunamis, and fishery sector plans against hazards and natural disasters, among others. To manage public emergencies, both natural and manmade, the Xiamen government formulated the Xiamen Municipal Overall Public Emergencies Plan in 2004. Institutional arrangements were also established to facilitate and coordinate the development of preventive measures, emergency preparedness and response, rehabilitation and reconstruction in an effective and timely manner. The Public Emergencies Committee was established to lead, organize and direct responses to public emergencies and supervise relevant departments in developing initiatives to deliver effective response and rehabilitation measures. Several working groups under the committee were created and assigned specific tasks to deal with disasters and support relevant departments responsible for implementing the various plans and programs in place.

Investments to strengthen early warning forecasting system capacity have helped Xiamen increase its resilience against marine disasters through having advanced information on the likely occurrence and magnitude of natural disasters. Cooperation among the various observation and forecasting stations of Xiamen has further enabled and strengthened its capacity to forecast and predict storm surges, typhoons and floods up to 48 hours, giving the government time to issue announcements and alert the population to make the necessary preparations to prevent damage or casualties.

Defense infrastructures were also built in risk areas to serve as a buffer against storm surges and other hazards. This includes improved flood defense project designs and strengthened sea walls, reservoirs and dikes. Natural buffers were also improved through mangrove-planting activities, cognizant that mangrove habitats serve the important function of coastal protection.

With all of these efforts, Xiamen benefitted through decreased direct losses from typhoons and other natural disasters. The direct loss of 197 million RMB from five typhoons that hit Xiamen in 2006 was far less than the direct loss of 1,938 million RMB from a single typhoon in 1999. The initiatives to reduce and manage disaster risks are strengthened by supporting activities like public awareness campaigns, regular drills and information dissemination on disaster prevention, mitigation, and self-help, which helped people respond and prepare for natural disasters. More effective dissemination of weather forecasts also empower people to protect themselves against calamities. (PEMSEA, 2011)

Sources:

PEMSEA, 2011. Integrated Marine Disaster Risk Management in Xiamen, Case Study, Vol. 2, No. 2, December 2011.

Kjerfve, B., et al., 2010, "Saving the Global Commons, Charting Our Future," Tropical Coasts, Vol. 16, No. 2, December 2010, PEMSEA, Quezon City, Philippines.

PEMSEA will continue its partnership approach in order to mobilize Country and Non-Country Partners, as well as donors and financial institutions, to invest in a sustainable "blue economy" for the Seas of East Asia. PEMSEA will also work closely with educational institutions, Regional Centers of Excellence and ICM Learning Centers to build a critical mass of broad-based, trained and educated coastal and ocean managers to undertake the enormous tasks in the region.

The challenges for PEMSEA over the next five years entail the following aspects of transformation:

1. Bringing together different regional planning frameworks, including LME SAPs (e.g. the Yellow Sea, South China Sea and the Arafura-Timor Seas) and the West and Central Pacific Fisheries (WCPF) Convention, to ensure that they are linked spatially, thematically and operationally to implement and scale up climate resilient ecosystem-based management in the East Asian Seas region;

2. Strengthening the regional partnership through inclusion of all countries of the region, as well as nongovernmental organizations, which share PEMSEA's vision, mission and goals, as Partners;

3. Developing and supporting ICM program development and implementation in coastal areas and LMEs across the region to achieve the 20 percent coastline target, through investments in knowledge-sharing, capacity development and replication of good practices in sustaining coastal and marine ecosystem services and building ocean-based blue economies, including forging partnerships under the GEF/World Bank and GEF/UNDP Platform Framework Programs, as well as with other donors and regional projects; and

4. Promoting and advocating a country-owned, self-sustaining regional mechanism through the support of PEMSEA Partners, within their respective means and capacities, including cost-sharing agreed programs, projects and capacity development initiatives.

National

From the country perspective, a number of common challenges and constraints impede the realization of the SDS-SEA, as well as the ultimate goal of a sustainable ocean-based blue economy, including:

1. Lack of intersectoral, inter-regional and interagency coordinating mechanisms;

2. National coastal and ocean policies and strategies are not yet in place, or are not fully understood and promoted across sectoral agencies and programs at the central level and sub-nationally, resulting in the continuing misalignment, conflict and duplication of effort;

3. Limited knowledge and awareness of the value of coastal and marine ecosystem services and the consequences of degradation or loss of such services;

4. Inadequate capacity to enforce regulations;

5. Insufficient mechanisms and incentives to engage local governments and the business sector in investments in conservation and pollution reduction projects;

6. Limited access to human resource development opportunities, including education and training, particularly at the local level;

7. Inadequate resources and capacity for scientifically sound environmental monitoring and reporting and lack of coordination/ integration of environmental monitoring efforts among sectoral agencies, projects and programs;

8. Inadequate funding for applied research on the social, ecological and economic values of coastal and marine ecosystem services and their contribution to sustainable development and security; and

9. Limited knowledge sharing on best practices and case studies within countries and across the region.

These issues suggest that, while there has been significant progress among countries in developing policies and supporting legislation (**Figure 2**),

the focus now needs to shift from developing plans and regulatory instruments, to improving competencies and capacities in implementation and enforcement. It also clearly indicates that coordination and priority setting are still a challenge, despite the emergence of national coordinating mechanisms in some countries. The limitation may be the planning process itself, and the capacity to integrate the many and varied aspects of the ocean sector into a comprehensive development program.

C. What are the Critical Social, Economic and Environmental Trends and Transboundary Concerns in Subregional Sea Areas/LMEs of the Region?

A GEF Stocktaking Meeting (October 2010) on priority actions and financing gaps in the EAS region highlighted key elements for scaling up on-the-ground interventions. Two of the highest investment priorities identified in existing LME Strategic Action Plans and country strategies, were confirmed as:

1. Enhance efforts to reverse coastal pollution (the Brown Agenda); and

2. Address unsustainable fisheries and the loss of critical coastal and marine habitats (the Blue Agenda).

Climate change impacts and climate variability were seen as cross-cutting issues, to be addressed by building ecosystem resilience into the management of both the brown and blue agendas, through a concerted ICM scaling up effort to which PEMSEA Country Partners had previously committed in 2009 (Manila Declaration).

This conclusion was reinforced in 2011 when the World Bank and UNDP developed their respective medium-term GEF-supported investment programs for the East Asian Seas region. Both agencies incorporated the SDS-SEA framework and PEMSEA partnership mechanism into their

Box 3: GEF, World Bank and UNDP Investment Programs Supporting SDS-SEA Implementation.

The World Bank/GEF-led program for ***Scaling up of Partnership Investment for Sustainable Development of Large Marine and Coastal Ecosystems of the East Asia and Pacific Region (2012-2018)*** is a US$ 796 million investment program, including a GEF grant of US$ 43.5 million. The program will focus on three complementary components, namely: Component 1: Pollution Reduction (the Brown Agenda); Component 2: Sustainable Marine and Coastal Resources Management (the Blue Agenda); and Component 3: Knowledge Management. The project emphasis under the program is on SDS-SEA implementation and parallel national actions in pollution reduction, habitat restoration and management, climate change adaptation, ICM scaling up and investments, as well as establishing a regional knowledge platform to promote and facilitate the replication of investments based on technically sound interventions, robust scientific evidence and agreed priorities. GEF Council approved the program in November 2011 and efforts are currently underway to develop the first tranche of investment projects in China, Indonesia, Philippines and Vietnam. PEMSEA has been requested to lead the knowledge management component.

The UNDP/GEF-led program for ***Reducing Pollution and Rebuilding Degraded Marine Resources in the East Asian Seas through Implementation of Intergovernmental Agreements and Catalyzed Investments (2014–2019)*** is a US$ 368 million investment program, including a GEF grant of US$ 20 million. The program will focus on three interrelated components namely: Component 1: Institutional and financial sustainability of regional and subregional marine and coastal governance arrangements; Component 2: Protecting habitats, implementing ecosystem approaches to fisheries and aquaculture management, reducing pollution and improving the resiliency of coastal areas and LMEs in the region to climate change and other hazards; and Component 3: Knowledge platforms for building a sustainable ocean-based green economy that will ensure that decisionmakers translate national policies and strategies into action based on the latest data and science on environment and development trends. The projects under the program will support the implementation of the SDS-SEA and Strategic Action Programmes of the Yellow Sea and the West and Central Pacific Fisheries Convention. The program will be submitted to the next GEF Council meeting (November 2012) for approval.

Program Framework Documents (PFDs), based on the commitments made by countries to implement the SDS-SEA and to institutionalize PEMSEA as a self-sustaining regional coordinating mechanism for SDS-SEA (**Box 3**).

D. What solutions/desired targets can be identified for these issues and priorities and how can solutions be delivered efficiently and effectively?

PEMSEA Partner Countries adopted four measureable and time bound targets in the Haikou Partnership Agreement and the Manila Declaration. The challenge for countries is how to utilize these four targets as a framework for a comprehensive SDS-SEA implementation program; one that encompasses both existing and emerging challenges to sustaining coastal and marine ecosystem services, while building an ocean-based blue economy, at the regional, LME/coastal sea, national and subnational levels.

A series of consultations and collaborative planning sessions were organized by PEMSEA in 2011-2012 with Partner Countries, local governments and other stakeholders to develop 5-year national SDS-SEA implementation plans. As a consequence of the interaction, an SDS-SEA implementation framework was developed, which covers the main issues and priorities identified by countries, shown in **Figure 4**.

The SDS-SEA Implementation Plan consists of 5components, namely: governance; ICM scaling up; capacity development/knowledge management; sustainable financing; and monitoring and evaluation. The governance component provides direction, coordination, process and linkage across the framework. Over the next five years, the focus of the governance component takes into account:

1. Setting up and operationalizing effective coordinating mechanisms in coastal and ocean governance at the regional, LME/coastal seas, and national levels, aligning the respective action plans and programs on a common platform, improving the effectiveness of coastal

and ocean governance at all levels, and mobilizing human and financial resources of partners, collaborators and stakeholders;

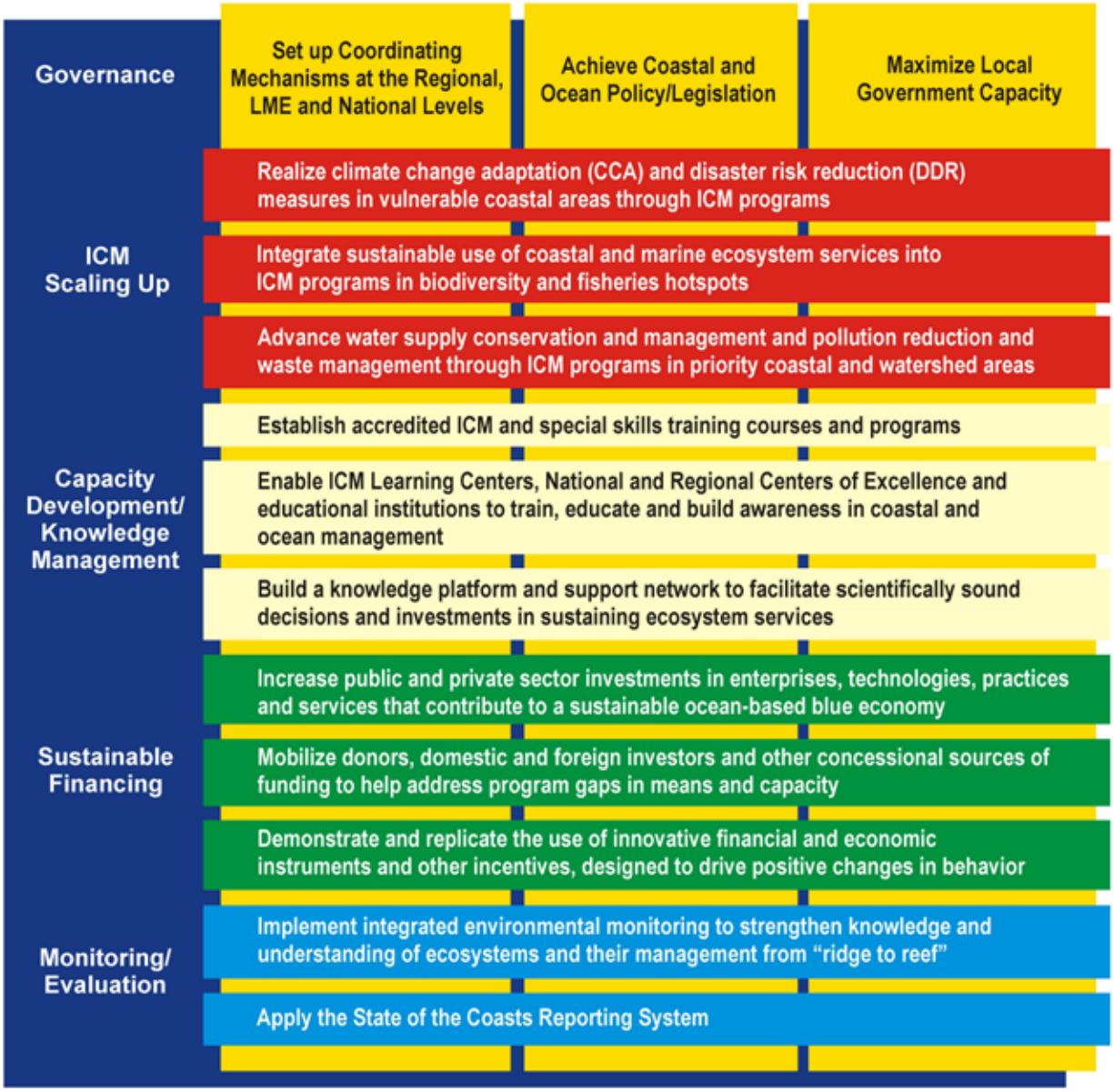
2. Accomplishing coastal and ocean policy and legislation by mainstreaming the objectives, targets, controls and actions that are agreed to in such instruments into national and subnational development and investment plans, as well as sectoral policies, laws and programs; and

3. Maximizing subnational/local government functionalities and capacities to facilitate investments and changes on the ground.

The ICM scaling up component converges sectoral initiatives and programs for: (a) climate change adaptation and disaster risk reduction; (b) conservation and redress of biological diversity and equitable and sustainable fisheries, including food security and livelihoods; and (c) protecting and improving water quality and addressing hazards associated with unsustainable development in terms of both water quality and water quantity.

The capacity development/knowledge management and sustainable financing components provide the means for scaling up ICM programs, building technical and

Figure 4: SDS-SEA Implementation Plan (2012–2016).



management capacity, strengthening information dissemination and knowledge-sharing, and enhancing investments in capital (both natural and manmade) assets of a sustainable ocean-based blue economy.

The monitoring and evaluation component entails development and implementation of a more comprehensive, scientifically sound, environmental monitoring program. The purpose of the monitoring program is to generate data and information on the health and resiliency of the ecosystem and changes and trends over time. As a knowledge sharing and decision support tool, the SOC Reporting System inform inform policymakers and managers of the progress toward desired policy, social, economic and ecological objectives and targets. It also provides insight into program gaps and emerging threats and the potential consequences, and ways and means of improving ICM program implementation.

Recognizing that all issues cannot be covered in all areas in the next five years, the strategy adopted by countries in the planning process was to concentrate ICM scaling up programs on priority concerns in so-called hotspot locations. The outcome is expected to be a core of successful projects and initiatives in integrated coastal and ocean management in countries across the region, with measureable improvements in the health and resiliency of ecosystems and coastal communities, and the skills and experience to scale up and replicate good practices and investments to other parts of the country and the region.

Regional Review:

Implementation of the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA) 2003-2011

Annnex 1:

Country SDS-SEA Summary Reports: Implementation of SDS-SEA 2003-2011


Cambodia


China


DPR Korea


Indonesia


Japan


Lao PDR


Philippines


RO Korea


Singapore


Thailand


Timor-Leste


Vietnam

Cambodia's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2011)

Basic Facts

Total Population	**14 million** (2008)
Population within 100 km of the coastline	**Approximately 30 %**
Number of coastal provinces	**4**
Land Area	**181,035 km² with more than 64 islands**
Area of territorial sea	**18,480 km²**
Length of coastline	**435 km**

National Economy

GDP per capita purchasing power parity

US$ 624 in 2008 (NSDP update 2009-2013)

GDP growth (2006-2010)

6.5% (ADB, 2012)

GDP composition by sector

Agriculture (33.4%); Industry 21.0%), Service (45.2%) (World Bank, 2010)

Employment by sector

Agriculture (72.30%); Industry (8.5%); Service (19.20%)

Economic contribution of the marine and freshwater capture fisheries to the national economy

12% of the GDP (2011)

Contribution to national employment

50% of the national employment is in the agriculture, forestry and fisheries sectors

Cambodian Rectangular Strategy and the National Strategic Development Plan 2009–2013

Under the Rectangular Strategy (2008-2013), Cambodia will continue to foster diversification and strengthen the competitiveness of the national economy by assuring a highly conducive climate for both public and private (domestic and foreign) investments for the development of the following important sectors:

(1) Agriculture;
(2) Water and Irrigation Systems;
(3) Transport Infrastructure;
(4) Electricity;
(5) Human Resource Development;
(6) Labor-Intensive Industry and Food Processing Industry for Exports;
(7) Tourism;
(8) Exploitation of Oil, Natural Gas and Other Minerals;
(9) Information and Communication Technology; and
(10) Trade" (RGC, 2008a).

- **Cambodia's national development strategy is also embodied in the:**
  - **Cambodian Millennium Development Goals**
  - **National Strategic Development Plan (NSDP) (2006-2010) and its update (2009-2013) and contains Cambodia's poverty reduction strategy.**
  - **Cambodia Socio-Economic Development Program 2001-2005 (SEDP2)**
  - **Cambodia National Poverty Reduction Strategy 2003-2005 (NPRS)**

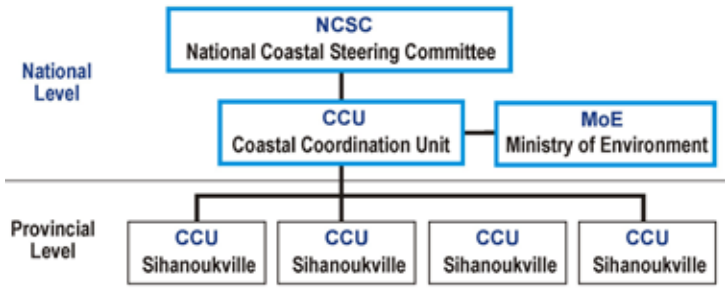
Progress in SDS-SEA Implementation (2003-2011)

National Ocean Policy and Institutional Arrangements

- Draft National ICM Policy prepared.
- National Coastal Steering Committee (NCSC) was established in 1999 as the main coordinating body among 18 line ministries and all four coastal provinces on coastal and marine resource management.
  - Chaired by the Minister of Environment and composed of: Under-Secretary of State representatives from key line Ministries; the Governors from the coastal Provinces; and representatives from the Cambodian Development Council (CDC) and from DANIDA.
  - Coastal Coordinating Unit (CCU), Ministry of Environment (MOE) serves as the Secretariat for the NCSC.
  - Provincial Working Groups (PWGs), which are chaired by the respective Governors of each Province, includes membership from provincial departments.
- For local implementation of integrated coastal management (ICM), the following have been set up at the Preah Sihanouk ICM Demonstration Site:
  - Project Coordinating Committee (PCC) was organized by the Municipality through Deka No. 080 passed on November 19, 2001. The 21-member PCC serves as the multisectoral governing body for ICM implementation in Sihanoukville. The PCC meets quarterly to discuss the implementation of activities and to provide timely advice on the resolution of issues.
  - The Project Management Office (PMO) serves as the secretariat to the PCC and a focal point for multisectoral activities for ICM development and implementation. It was established on November 13, 2001 through Deka No. 074 following the commitment of the Municipal Government to implement ICM.

The Rectangular Strategy

Figure 1: National Coastal Steering Committee.



ICM Implementation

ICM implementation in Preah Sihanouk currently covers 140.5 km or 32.3% of the country's coastline (PEMSEA, 2010).

Monitoring and Evaluation

- PEMSEA's State of the Coasts (SOC) Reporting System has been integrated into the National ICM Program
    - SOC report has been completed for Preah Sihanouk (2012)
- The State of the Environment and Socio-Economy reports have been developed by the Ministry of Environment, covering 2001 and 2005.

SDS-SEA-related legislation, policies and plans

Natural and Manmade Hazards

- Cambodia Shoreline Management Strategy (2006) aims to support planned sustainable development along the shoreline of Cambodia by controlling and managing coastal defense and protecting the shoreline through appropriate zoning and development guidelines.
- Sub-decree on the Ship and Port Security (2006).
- Sub-decree on the Establishment of National Committee for Open Sea Security (2009). In 2009, the Maritime Security Management Committee (MSMC) was created together with the General Secretariat for the Maritime Security.
- Development and implementation of the Royal Decree No. NS/RKT/ 0804/263, establishing the National Committee for Disaster Management (NCDM) (31 August 2004) to prepare and respond to natural disasters and other natural catastrophes, including:
    - Five-year Strategic National Action Plan for Disaster Risk Reduction (SNAP–DRR 2008-2013) aims to foster a multistakeholder partnership to reduce the social, economic, and environmental impacts caused by natural and human-induced hazards by incorporating disaster risk reduction into the policies, strategies, and plans across all sectors at all levels.
    - Sub-Decree No. 61 of 2006 on the Establishment of the National Committee for Disaster Management.
    - Mainstreaming into the provinces, districts, and communes:
        - The Provincial Committees for Disaster Management (PCDM) reflect the NCDM, with the Provincial Governor as the head with membership drawn from the provincial departments of the ministries as well as representatives from the police, army, gendarmerie, and the Cambodian Red Cross. This is supported by Circular No. 02 of 2001 on Reduced Preparedness and Disaster Management; Provincial *Deka* (Order) of 2007 on the Establishment of Disaster Management Commissions and Provincial Order of 2007 on the Establishment and Functioning of the PCDM (CNCDM, 2010).
        - District chiefs and relevant officers are designated members of District Committees for Disaster Management (DCDM), supported by Sub-decree No. 61 ANKr.BK, on the Establishment of Commune/*Sangkat* Committee for Disaster Management in the Kingdom of Cambodia (29 June 2006);
- Cambodia Climate Change Office (CCCO) was established in June 2003 under the Ministry of Environment, which is responsible for all climate change-related activities.

- In 2006, the National Climate Change Committee (2006) was also established through a Sub-Decree to prepare, coordinate and monitor the implementation of policies, strategies, legal instruments, plans and programmes of the Royal Government to address climate change-related issues.

Habitat Protection and Management

- Law on Environmental Protection and Natural Resources Management, which was promulgated by a Royal Decree in 24 December 1996, was formulated to effectively manage and implement the conservation of biological resources and the sustainable use of natural resources in protected areas;
- Sub-decree on the Establishment of Protected Forests, Natural Resources Conservation, Wild Life Protection Areas and Protected Forests for Biodiversity Conservation (2002 and 2004);
- National Biodiversity Strategy and Action Plan (2002).
- Law on Forestry (2002) to protect and improve existing forest covers:
- Sub-decree on Forest Community (2 December 2003).
- Commission on Monitoring and Assessing for Suppressing Encroachment into mangrove land and coastal reclamation (2004) was established by a decision of the Royal Government of Cambodia to stop the encroachment activities, to force the turn of the encroached/reclaimed land, and to order the culprit to replant the mangrove for replacing the felled/cleared mangroves.
- Law on Fisheries (2006) to promote community-based approach to fisheries management:
- Sub-decree on Management of Community Fisheries (10 June 2005);
- The Strategic Planning Framework for Fisheries (2010-2019) sets out the government's vision for the future of the fisheries sector management and describes the goals that must be reached;
- Law on Bio-safety (2008) developed to prevent adverse impact on the conservation of biodiversity and natural resources in the Kingdom of Cambodia caused by the transboundary movement, development, handling, transfer, use, storage, and release of living modified organisms resulting from modern biotechnology.
- The National Environmental Strategic Plan developed by the Ministry of Environment in 2009 reviewed existing mandates, identified key issues and stakeholders, and developed detailed programs of action for the period from 2001-2003, 2004-2008 and 2009-2013, accordingly.
- Draft National Environmental Action Plan (2011-2015) identified key issues and corresponding actions along six thematic areas: forestry, fisheries and floodplain agriculture in the Tonle Sap Region, coastal fisheries, biodiversity and protected areas, energy development and urban waste management.

Food Security and Livelihood Management

- A Strategic Framework for Food Security and Nutrition in Cambodia (2008-2012) outlines the targets and major strategies to improve food security among the population.
- The National Nutrition Strategy (NNS 2009–2015) developed in 2009 by the National Nutrition Program (NNP) of the Ministry of Health (MoH) focuses on a multisectoral approach to improve maternal and young child nutrition.

Water Use and Supply Management

- Law on Water Resources Management (2007) formulated to promote the sustainable use of water resources through an integrated approach.
- Draft Law on Water Supply and Sanitation reviewed by the Council of Ministers and undergoing revisions. Proposed new law contains significant institutional changes including:
    - Transferring responsibility for sewerage from Ministry of Public Works and Transport to the Ministry of Industry Mines and Energy (MIME);
    - Redefining the role of MIME, giving it overall responsibility for sector planning and policy making; and
    - Creating a new Water and Sanitation Authority responsible for issuing operating licenses, regulating tariffs and regulating all aspects of water supply and sewerage.

Financing

- In 2003, the percentage of budget allocation for the Ministry of Environment and Ministry of Agriculture, Forestry and Fisheries were approximately 0.27% and 1.06% of the total national budget allocated for expenditures at the central level, respectively.
- At the provincial level, the budget allocation for line departments of the two ministries represented 25.3% and 41.15 %, respectively. This figure increased in 2005 and 2006 (MoE-CBD, 2006).
- External sources of funding from donors included Global Environment Facility (GEF), United Nations Development Program (UNDP), United Nations Environmental Program (UNEP), European Union, The World Bank, Asian Development Bank, the International Monetary Fund, DANIDA and SIDA, among others.
- The ICM program in Preah Sihanouk is being implemented in collaboration with various partners, including the UNDP GEF Small Grants Programme, which contributed about US$ 150,000 for community-based initiatives.

Pollution Reduction and Waste Management

- Sub-Decree on Water Pollution Control, 6 April 1999
- Sub-Decree on Air and Noise Pollution Control, 1999
- Sub-Decree on Solid Waste Management, 1999
- National Strategic Plan for Land-based Pollution Management (2006-2010) aims to develop and implement a comprehensive strategy to address waste management in the country, including the drafting of a national law on Management of Solid Waste and Hazardous Waste.
- Sub-decree on Healthcare Waste Management (2008).

Other Laws and Strategies relevant to SDS-SEA

- Law on Administrative Management of the Capital, Provinces, Municipalities, Districts and *Khans* (2008), which provides authorities to local government units in managing local development activities.
- Law on the Land Management, Urban Planning and Construction (1994) and Land Law 2001 and Law on Investment of Cambodia (4 August 1994) defines various business processes and types of investments that can be approved at the local and national levels.

Communication/Education

- Aside from project-initiated public awareness, Cambodia has yet to institutionalize communication and public awareness for sustainable development.
- Several information and public awareness campaigns were conducted under ICM implementation in Preah Sihanouk under specific implementation activities.

Capacity Development

- Capacity development is included in the Five-year SDS-SEA Implementation in Cambodia.
- Royal Phnom Penh University was established as a PEMSEA ICM Learning Center.
- Internships with PEMSEA Resource Facility have also been conducted for two (2) local ICM staff and one (1) national ICM coordinator since 2008.
- Under the ICM Program in Preah Sihanouk Province, more than 20 regional, national and on-site trainings and workshops have been facilitated under the PEMSEA regional project with various international, national and local partners. The purpose of the training workshos was to build the capacity of government and nongovernment stakeholders participating in the ICM program.
- Coastal Resource Centers in coastal provinces established under the DANIDA CZM Project provide information on coastal management and serve as a training center for the coastal provinces.

Sustainable Development Aspects

Natural and Manmade Hazards

- Cambodia was categorized as the third most disaster-prone country in the world in 2000 and 2001. Communities situated along the two major watersheds, Tonle Sap and Mekong Rivers, are

extremely vulnerable to the effects of natural hazards.

- Floods have accounted for 70% of rice production losses between 1998 and 2002, while drought accounted for 20% of losses (NAPA Report, 2006).
- A one-meter sea level rise will result to the inundation of about 25,000 hectares in Koh Kong province. This will expand to 38 thousand hectares if the sea level rise is 2 m (draft SNC, 2010).
- Observations in Kampong Saom Bay in 2010 indicate that high tide in this area reaches more than 1 m and lasts for more than 6 hours (UN Habitat, 2011).
- National Adaptation Program of Action (NAPA) was prepared and endorsed in 2006 with 20 high priority projects focusing on:
    - Capacity building/training;
    - Awareness raising/education; and
    - Infrastructure development.
- Of these, eight (8) projects were identified in the coastal areas.
    - Under the NAPA, the following are being implemented:
    - Cambodia Climate Change Alliance (CCCA) Trust Fund, which focuses on agriculture, forestry, fisheries, water resources, meteorology, health and infrastructure;
    - Coastal Adaptation and Resilience Planning, which aims to increase resilience of coastal communities and ecosystems to climate change through adaptation planning, demonstrated targeted local interventions and provision of practical learning experience (2010-2013);
    - Promoting Climate-Resilient Water Management and Agricultural Practices in Rural Cambodia, which aims to reduce the vulnerability of Cambodia's agricultural sector to climate-induced changes in water resources availability (2010-2013);
    - Pilot Program for Climate Resilience (PPCR);
    - Climate Change Adaptation Initiative (CCAI).
- Capacity Development for the Clean Development Mechanism (CD4CDM) Phase 1 and Phase 2 implemented by MoE and UNEP to generate a broad understanding and develop institutional capacity and human capacity to "fully participate as equal partners with developed countries in the formulation and implementation of the Clean Development Mechanism (CDM)."
- Integrated Capacity Strengthening for CDM (ICS-CDM) (2003) with the Institute for Global Environmental Strategies (IGES) of Japan.
- Oil exploration commenced in 2011, increasing the potential risk of oil spills. In collaboration with the Ministry of Public Works and Transport, the Merchant Marine Department under the Ministry of Public Works and Transport and Preah Sihanouk Province are conducting a series of consultations in an effort to establish a national oil spill response (OSR) center in Cambodia. The establishment of the OSR Center will provide the necessary mechanisms to respond to oil spill incidents.
- Port Safety, Health and Environmental Management Systems (PSHEMS) are being developed in Sihanoukville Autonomous Port (PAS) and Phnom Penh Autonomous Port (PPAP) in collaboration with PEMSEA, and with the support of the German International Cooperation (GIZ).

Challenges and Opportunities: Natural and Manmade Hazards

- Climate change, while a recognized issue at the national level, has not been fully understood and promoted at the local level. Information and education on this issue, particularly at the local level is still weak.
- Several projects and programs are being implemented at the national level but need integration and mainstreaming into local planning and implementation.
- Climate change baseline information for coastal areas in Cambodia is limited, which poses a limitation for local planning and decisionmaking.
- Effectiveness of existing institutional arrangements for disaster preparedness needs to be assessed and strengthened.
- Individual and institutional capacity for oil spill preparedness need to be set in place.

- Under the ICM program in Preah Sihanouk:
    - Sihanoukville Coastal Use Zoning (CUZ) scheme has been developed, which ensures optimal use of the coastal and marine resources and promote sustainable resource:
        - The 12 zones in the Sihanoukville CUZ were identified and adopted through stakeholder consultations, to reduce multiple use conflicts and ensure the sustainable utilization of marine and coastal resources;
        - The CUZ was adopted by the National Coastal Steering Committee in May 2005;
        - Zoning enforcement has been established in beaches and protected areas, including Ochheauteal Beach (3 km), Serendipity, Otress (3.7 km) and Kampong Smach (3,000 ha)
        - Vulnerability assessment was conducted in Sihanoukville Municipality from January-June 2011 in collaboration with UN-Habitat.

Habitats and Biodiversity

- Cambodia has lost more than a quarter of its remaining forest since 2000, making the country third in the world for primary forest loss (FAO, 2005).
    - From 2002 to 2006, about 93,000 ha of forest cover per year were lost.
    - It is also estimated that by 2010, there will only be 56,000 ha of the mangrove forests, as a result of the 1.9% annual rate of degradation within 2000-2010 (CMDG Report, 2010)
- Boundary delineation, preventing encroachment and recovery of lands in protected areas
    - In 2002, the Forestry Administration has defined an additional 1,346,225 ha of protected forest areas (7.5% of the country's total area).
    - In 2005, 723 ha of land in protected areas were recovered from illegal settlers, while in 2006, 2,455 ha were recovered (MoP, 2007).
    - By 2006, 77 protected area communities had been established (MoP, 2007).
- Participatory Management of Coastal Resources (IDRC) (2005-2007) was implemented in Koh Kong.
- Environment Management in the Coastal Zone-Cambodia Phase 3 (2002-2007) was implemented to promote sustainable development of the coastal zone, including environmental protection and management of coastal resources for improving local livelihood and national welfare. This project was implemented in all four coastal provinces.
- Habitat Protection and Management was implemented under the ICM program, including the following:
    - Community-based resources management in Stung Hav was implemented under the SGP-PEMSEA Joint Communiqué, which focuses on the protection and management of mangroves and coral reefs in Stung Hav. To date, about 184,000 mangrove seedlings, covering about 18 ha, were planted in Sangkat O'tress and Sangkat Tomnub Rolok. Fifty (50) artificial reefs, were put up in the fishery management area.
    - Kampong Smach is a rich fishing ground of about 3,500 ha of mangroves and mudflats, with about 6,300 families living in the area. The following activities were conducted:
        - Baseline data gathering including basic information, socioeconomic study, zoning and mapping and biodiversity study
        - Draft zoning scheme prepared
        - Draft MPA declaration prepared
        - Implementation and enforcement of the MPA declaration (patrolling, mangrove reforestation covering about 2 ha).

Food Security, Fisheries and Livelihood

- On a national scale, 6 million people are involved with fishing and related activities.
- Fish catch is around 500,000 MT–3,500,000 MT per year with the following composition:
  - Marine fish: 85,000 MT;
  - freshwater wild fish: 405,000 MT; and
  - Aquaculture: 60,000.
- Fish and aquatic animals contribute 35% of the total Cambodian diet.
- Fishing engaged about 70-80% of the population in the coastal provinces Kampot and Kep. In Sihanoukville, while the agricultural sector occupies only 25% only of the total land area, this sector creates employment for about 30,000 people or about 51% of total employment. In Koh

Challenges and Opportunities: Habitats and Biodiversity

- **Table 2** provides specific national targets on the area of critical fisheries habitats and endangered species under sustainable management for conservation and protection of marine and coastal resources.
- Implementation and monitoring of the Royal Decree on protected areas designating 10-30% as buffer zone subject to collaboration with communities needs to be strengthened.
- Poverty and alternative livelihood is a central concern in habitat management as about three million people still live within 5 km of protected areas, putting pressure on natural resources.
- Assessment of the status of protected areas need to be done and results used to advocate further protection and management of these resources.
- Insufficient development of a management system for marine protected areas.
- Limited protection for culturally important species, which are being exploited by commercial/income-generating sectors.

Table 1: Estimated areas of major marine habitats and coastal resources in Cambodia.

Province	Coral Reefs (ha)	Seagrass (ha)	Mangroves (ha)
Koh Kong	602	3,993	62,000
Preah Sihanouk	1,198	164	13,500
Kampot	953	25,000	1,900
Kep	52	2,790	1,005
Total	**2,800**	**30,000**	**78,405**

Kong, the agriculture industry, including forestry and fisheries, is also the primary economic activity of the people and contributes about 52% of total employment for the province (MoE and DANIDA, 2002).

- The service sector, which comprises 21% of the GDP is also a major income earner for the country.
  - A large component of this is derived from the tourism sector, particularly for the coastal provinces.
  - In 2006, Cambodia established three eco-tourism destinations and two more destinations are being developed in order to promote habitat protection and, at the same time, provide a supplemental income source to communities in Peam Krasaop Wildlife Sanctuary and Botom Sakor National Park these eco-tourism sites.
- In terms of access to food at the household level, there was an improvement in 2009 where only 33 percent of Cambodians were undernourished compared to 37 percent in 2004. The quality of food consumed also improved with diversity and increased protein and fat intake.
- Under the Preah Sihanouk ICM Program, supplemental livelihood projects were also provided through a revolving fund for households to put up micro-enterprise projects and reduce fishing pressure:
  - Women and their families were encouraged to set aside a portion of their income through the savings group mechanism where members can borrow certain portions of their savings for specific livelihood projects.
  - A total savings amount of Riel 75,414,200 (estitmated US$18,853.55) is being revolved

Table 2. National targets for sustainable management of coastal resources.

Habitat	2-Year Targets (by end of 2011)	5-Year Targets (by end of 2014)	10-Year Targets (by end of 2019)
Seagrass	3,000 ha of seagrass replanted	5,000 ha of seagrass	7,000 ha of seagrass
Coral Reefs	300 ha of coral reef	500 ha of coral reef	840 ha of coral reef
Mangroves	300 ha of mangroves replanted	700 ha of mangrove are replanted	1,000 ha of mangroves are replanted
Endangered species	At least 5 endangered species increased by 20% in population	At least 4 species have been removed from the list and at least 10 species increased by 30% in population	At least 15 species have been removed

Source: Ministry of Agriculture, Fishery and Forestry.

Challenges and Opportunities: Food Security, Fisheries and Livelihood

The Strategic planning framework for fisheries (2010-2019) provides the following targets for fishery management:

- Wild fish production is stabilized and sustained at not more than 500,000 MT/year by 2019.
- Rice field fish production is increased by 15% annually, to reach 500,000 MT/year by 2019.
- Aquaculture production is increased by 15% annually to reach 185,000 MT/year by 2019.
- Implementation of new laws, policies and strategies, implementation processes and mechanisms for fisheries management are still a challenge at the local level.
- Limited sources of livelihood among coastal communities.
- Poor infrastructure and basic services, such as road and electricity, make transportation and storage of fishery produce more difficult and costly.
- Limited investment on post-harvest technologies and facilities at the local level, reduce the quality of marine and fishery products.
- Saltwater intrusion in coastal provinces reduces the area available for cultivation.
- Limited livelihood opportunities available, leading to unsustainable agricultural and fishing practices.

to members from Sangkat Kampenh, Tomnop Rolok and O'tress with 120 families benefitting from this.

Water Supply/River Basin Management

- Cambodia's water systems are divided into three: (1) the Mekong River System; (2) the Tonle Sap River System; and (3) the river system flowing into the Gulf of Thailand.
- The most heavily polluted rivers are located in the more densely populated Southeast of Cambodia, and part of coastal area near Sihanoukville and Kampot.
- About 94% of freshwater withdrawal is being used for agriculture.
- Approximately 51% of households in the coastal zone provinces have access to safe water while only 16% of households in the coastal zone provinces have access to toilet facilities.
    - Significant regional variation with the highest levels of access usually found in urban areas. In some remote communes and districts where water shortage is pronounced, access to safe water is less than 5% and sanitation facilities are virtually non-existent.
- Projects implemented under the ICM Program in Preah Sihanouk included the following:
    - Restoration of the freshwater reservoir under the Joint Communiqué between the UNDP GEF Small Grants Programme (SGP) and PEMSEA.
    - With the support from the UNDP TRAC Fund, the rehabilitation of a 5.97-ha freshwater reservoir was completed to boost agricultural production and increase food sufficiency in the community of Tomnop Rolok commune, Stung Hav District.
    - One hundred ninety-five (195) ceramic water purifiers were provided to households to ensure access to safe drinking water supply in households.
    - Seventeen (17) sanitation toilets were facilitated through use of a revolving fund.

Pollution Reduction/Waste Management

- Almost half of the waste generation in Cambodia is organic, but recycling and composting are done on a limited scale.
- Solid waste collection is available to a limited extent, in urban areas in Cambodia.
- A wastewater treatment facility was established in Sihanoukville, with a capacity of 5,700 m^3 . The system is operating at 50% of its capacity.
- Significant sources of pollution include domestic wastewater, agricultural wastes, including excessive use of chemical fertilizers and feeds.

Challenges and Opportunities: Water Supply/River Basin Management

- Integrated approach to riverbasin management is challenged by sectoral orientation of line ministries and departments
- Limited national information on water use per sector and quality of available water supply

- A project on electronic waste (E-waste) in Phnom Penh was implemented by MoE with the support of UNEP.
- Under the Preah Sihanouk ICM Program, the following have been implemented:
    - **Sangkat 4**. The project covers 1,011 households in five villages in Sangkat 4, Sihanoukville Municipality, and is implemented through the following key components:
        - Baseline data gathering to determine the existing conditions and characteristics of the target villages and design specific interventions for the villages based on their needs and capacities.
        - Capacity development and information, education and communication (IEC) campaigns among community members through training on 3Rs (reduce, reuse, recycle). About 60 village task team members have been trained on waste management. IEC campaigns are also done through village cleanup and the establishment of 'drop in-buy back' centers in the village and in the school where recyclables can be sold by community members and students.
        - Establishment of primary waste collection where households can drop their household wastes and secondary waste collection where CINTRI collects waste from the community and transports these to the dumpsite. A recycle bin is provided for every 10 households and a community worker is employed to ensure regular waste collection from the households.
        - Socialized user fee system that encourages households to pay Riel 3,000 per month for the waste collection services. Collected fees are used to support village workers and maintenance of equipment. At the same time, the community themselves is implementing a revolving fund for families to put up toilets with connections to the central sewerage system, and a women's saving fund for livelihood improvement in the community.
- Stung Hav. The project covers 987 households in three villages in Tomnop Rolok commune and implemented through the following activities:
    - Community preparation, inception workshop and training activities;

Challenges and Opportunities: Pollution Reduction/Waste Management

- Uncontrolled discharge of wastewater due to the absence of wastewater collection and treatment facility except for Sihanoukville.
- Natural occurrence of arsenic is a major challenge among households living near the Mekong River.
- Establishment of sanitary landfills and rehabilitation of closed dump sites.
- Improvement of the solid waste collection system at the community level through capacity development of local authorities and strict enforcement of local policies.
- National government support for waste management in the coastal areas, particularly the use of low-cost but effective technologies for local governments.
- Promotion of solid waste management as a revenue generation scheme for local governments and communities.
- Management of electronic wastes from used mobile phones and computers.
- Increasing quantities of waste produced being directly discharged to water bodies, due to limited wastewater and solid waste facilities
- Poor information among stakeholders on modes of segregation, recycling, recovery and reuse.
- Poor infrastructure impeding efficient and effective waste collection both for liquid and solid waste systems.

  - Baseline data gathering;
  - Wastewater management; and
  - Establishment of a revolving fund for sanitation for 17 families.

- Promoting connection to the sewage treatment facility. The ICM programme also coordinates with the Department of Public Works and Transport in encouraging households and businesses to set up connections to the existing wastewater treatment facility:

  - To date, 50 households in Village1 and 2, 152 business sectors and 10 restaurant on Serendipity Beach in Sangkat 4.

  - An onsite wastewater facility also connects 26 stall owners in Occheauteal Beach to prevent sewage discharge to the beach.

- Beach Water Quality Monitoring for human health is also being done to monitor the water quality for bathing in key tourist beaches, including the beaches of Occheauteal and Independence. Ten (10) parameters are being measured through the Sihanoukville Environmental Laboratory (SEL).

Major Challenges in Meeting SDS-SEA Objectives and Targets

- Uncontrolled discharge of wastewater due to the absence of wastewater collection and treatment facility except for Sihanoukville.

- Natural occurrence of arsenic is a major challenge among households living near the Mekong River.

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- Improvement of solid waste collection system at the community level through capacity development of local authorities and strict enforcement of local policies.

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- Poor infrastructure impeding efficient and effective waste collection both for liquid and solid waste systems.

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Priority Issues for the Next Five Years for SDS-SEA Implementation

In order to address these concerns, Cambodia's focus on SDS-SEA Implementation is on scaling up experiences in Preah Sihanouk to other coastal provinces and strengthening existing mechanisms at the national and local levels for ICM implementation. The five-year plan will address:

- Strengthening national laws, polices and institutional arrangement to ensure sustainable and effective coastal resource management. Several laws, policies, strategies and plans have been developed relevant to sustainable development in general and coastal and marine management as well, but implementation remains limited. Coordination among agencies remains weak.
- Development and implementation of the National ICM Policy to promote an integrated approach to coastal management and to consolidate and ensure coherent implementation of existing national laws, policies and strategies.
- Development of National Resource Document on Integrating Emerging Issues and Modern Management Approaches.
- Development of a Pilot Site for Coastal Spatial Planning Implementation to address climate change issues.
- Strengthening existing national and local interagency/intergovernmental coordinating mechanisms for coasts and oceans management.
- Sustainable financing instruments and measures in support of ICM programs.
- ICM Scaling up to cover 100% of the Cambodian coastline by 2016, focusing on priority issues, including:
  - Implementation of climate change adaptation measures for coastal areas, particularly vulnerable coastal communities;
  - Food security and habitat management, particularly the restoration of mangroves, seagrasses and coral reefs as well as other coastal and marine ecosystem to enhance marine productivity and biodiversity;
  - Implementation of alternative livelihood projects to promote regeneration of resources, particularly in protected areas to reduce illegal ways of resource exploitation;
  - Setting up and strengthening pollution reduction and waste management mechanisms, particularly in urban centers through community-based approaches;
  - Addressing coastal reclamation/foreshore management through effective zoning and enforcement of relevant laws, policies, and strategies to ensure sustainable use of coastal areas.
- National ICM Capacity Development Program.

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China's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2011)

Basic Facts

Total Population	**1.3397 billion (2010)** **Annual increase rate: 0.57%** (State Statistic Bureau, 2010)
Percentage of population of coastal provinces	**40% (2010)**
Number of coastal provinces and cities	**11 provinces, municipalities and autonomous regions with 53 cities**
Number of islands	**6,961 (larger than 500 m²)** (CIMA)
Area of territorial sea	**380,000 km²**
Length of coastline	**32,000 km (including islands)**

China's Marine Development Strategy in 12th Five Year Plan (2011-2015)

- **Develop and implement a marine primary functional zoning plan.**
- **Improve sea use right trading mechanism.**
- **Integrate marine environment protection and land-based pollution prevention and treatment.**
- **Control inshore resource overexploitation.**
- **Strengthen sea reclamation management.**
- **Improve disaster prevention and reduction system.**
- **Improve marine legislation and policy.**

National Economy

GDP per capita
US$ 4,500 (2010)
GDP growth (2006-2010)
8%
Growth rate of marine economy (2006-2010)
13.5% (CIMA, 2011)
Major contributing sectors to the marine economy
Tourism (33.4%); Shipping (21.1%); Fisheries (17.5%); Offshore oil and gas (9.2%); Ship-building (7.7%); Engineering (5.8%); Chemical industry (3.7%); Pharmaceuticals (0.5%); Salt (0.5%); Minerals (0.3%); Energy (0.3%); Sea water utilization (0.1%) (CIMA, 2011)
Total output value of marine economy in 2011
RMB 4.577 trillion (US$ 726 billion) (CIMA, 2011)
Economic contribution of the marine economy to the national economy in 2010
9.6% of GDP (CIMA, 2011)
Employment contribution of the marine economy to national employment
34.2 million job opportunities in 2011 (SOA, 2011)

Progress in SDS-SEA Implementation (2003-2011)

National Ocean Policy and Institutional Arrangements

Status of coastal and ocean policy

- Marine Economic Development Program (2003) — Regional coastal development plans of all 11 provinces, municipalities and autonomous regions have been approved by the State Council, and subsequently integrated into provincial level 11th Five Year Plan (FYP).
- National Marine Development Program (2008) adopted integrated ocean management and ecosystem-based management as the first and foremost principles. Now all coastal provinces, municipalities and autonomous regions have integrated the measures in the 12th FYP, and local marine development plans up to 2020 are under preparation.
- National Science and Technology Program in Support of Ocean Development (2008-2015) aims to achieve the target of contribution to 50% of marine economic growth. This will be achieved by science and technological advancement, through the transformation of science and technology innovations to support marine high-technology industries, applications of ocean-related public services, development of marine information products, capacity development, etc.
- Sea use zoning. National sea use zoning is completed, covering its inland water, territorial seas, EEZs, continental shelf and contiguous zones. User rights over 19,400 km^2 of sea have been registered, generating a user fee of RMB 2 billion (US$ 317 million) each year earmarked for ocean management, capacity development, pollution control and ecosystem conservation and rehabilitation.

Status of ICM policy/legislation

- Law on the Administration of the Use of Sea Areas, published in 2002, provides the legal basis for integrated management of coastal areas through marine functional zoning, sea user rights recognition and sea user fee system.
- Law on Protection of Sea-Islands, adopted in 2009, institutes a number of mechanisms for sustainable marine development, including a sea island protection plan, ecosystem protection, ownership of uninhabited islands, etc.
- Law on Real Rights of China, adopted in 2007, affords protection to sea areas legally acquired, and such acquisition system is provided for in the law.
- Law on Fisheries of China, as amended (2007) to take in new ideas such as desalination yield awareness, optimizing industrial structure, optimization of resource allocation, etc.
- Administrative Regulation on the Prevention and Control of Pollution Damages to the Marine Environment by Coastal Engineering Construction Projects, amended in 2004.

China's Environmental Targets in 12th Five Year Plan (2011-2015)

- **Cultivated land maintained at 120 million ha.**
- **Water use per unit industrial add-value reduced by 30%.**
- **Irrigation water use efficiency index reaches 0.53.**
- **Non-fossil energy accounts for 11.4% of primary energy use.**
- **Energy consumption per unit GDP reduced by 16%.**
- **COD emission reduced by 8%.**
- **Ammonia nitrogen and nitrogen oxide emissions reduced by 10% each.**
- **Forest coverage increased to 21.66%.**

National Coordinating Mechanisms for Coastal and Ocean/ICM Policy

- State Oceanic Administration (SOA) plays the coordinating role in ocean-related affairs, including disaster control and reduction, marine ecosystem conservation and sustainable use, marine pollution prevention and control, sea area use management, etc. At national level, Ministry of Agriculture is in charge of fisheries, while fisheries and ocean management are in most cases combined under the fishery and ocean bureau at provincial, municipal and county levels.
- No national interagency coordinating mechanism in place for coastal and ocean policy/integrated coastal management (ICM);
- Framework Agreement Concerning the Establishment and Improvement of Communication and Cooperation Working Mechanism for Marine Environmental Protection between Ministry of Environment and State Oceanic Administration, was signed in 2008 and represents the commitment of two ministries to regular consultation and sharing of data on marine environment quality.

ICM Implementation

Percentage of national coastline with ICM implementation (2010): 12%

Status of national ICM program development:

- All coastal areas at the provincial level have integrated marine economy development programs into local 11th FYPs (2006-2010), in accordance to the National Marine Economy Development Program;
- All coastal provinces are in the process of developing local marine development plans in accordance to the 2008 National Marine Development Program.

Location of ICM Program	Length of Coastline (km)
Dongying	350
Fangchenggang	584
Haikou	136.23
Laoting	98
Lianyungang	204.82
Panjin	118
Qingdao	863
Quanzhou	541
Wenchang	278.5
Xiamen	234
Yangjiang	477
Total:	**3,884.55**

Supporting Sectoral Policies and Legislation

Climate Change and Disaster Management

- In 2007, China released its National Climate Change Program, which outlines the strategies including increasing research and development (R&D), improving energy efficiency and building construction, developing renewable and nuclear energy, increasing forest cover, improving industrial policy and agriculture, and improving institutions and policies.
- National Leading Group to Address Climate Change was established in 2007. Headed by the Premier, the Group is mandated to deliberate and determine key national strategies, guidelines and measures on climate change, as well as coordinate and resolve key issues related to climate change.
- Red Tide Disaster Emergency Response Plan was revised in 2009 to further detail the responsibilities and process in the event of a red tide disaster.

Habitats and Biodiversity

- A revised National Biodiversity Strategy and Action Plan of China (2011-2030) was approved by the State Council. It identifies 35 priority areas for

marine and coastal conservations, including Bohai Sea, East China Sea and Taiwan Strait, as well as the South China Sea.

- A number of PEMSEA ICM parallel sites are located within these priority marine and coastal conservation areas, including: Dongwan coastal area of Panjin; coastal wetlands of Quanzhou; lancelet and seagrass beds of Yangjiang; coral reef and seagrass beds of Wenchang; and the mangroves of Fangchenggang.

Pollution Reduction and Waste Management

- In 2009, preparation guidelines of 12th FYP Blue Sea Action Plan in coastal provinces issued by Ministry of Environmental Protection requires the concept of "from ridge to ocean" be adopted to strengthen land-sea and river-sea linkage.
- Renewable Energy Law (1 January 2006), Clean Production Promotion Law (2003) and Circular Economy Promotion Law (2008).
- Master Plan on Bohai Sea Environmental Protection (2008-2020) was adopted, with planned investment of US$ 18.6 billion to reverse the degradation trend of the Bohai Sea.

Monitoring and Evaluation

State of the Coast (SOC) Report

- Two local governments (i.e., Dongying and Xiamen) that are implementing ICM programs have produced SOC reports, while nine other ICM sites are in the process of preparing their respective SOC reports.

National Environmental Monitoring and Reporting System

- China has already established an ocean, coastline, land and satellite-based marine monitoring system to generate, consolidate and analyze data for public use (SOA).
- 409 sections of 204 rivers monitored by the Ministry of Environmental Protection in 2010 indicates that 59.9% of sections qualify for Class I to III standards, 23.7% of sections qualify for Class IV-V standards, and 16.4% of sections qualify for levels lower than Class V standard. (State of Environment of China, 2010).
- An inventory of offshore marine resources was undertaken during the 11th FYP to enable delivery of services to coastal socioeconomic development and capacity development of the marine sector (SOA).
- 18 coastal ecological monitoring and control zones are designated for monitoring of marine ecosystems in estuaries, bays, tidal flats and coastal wetlands, mangroves, coral reefs and seagrass beds in an area of 64,000 km^2. The 18 zones in healthy, sub-healthy and non-healthy status represent 14%, 76% and 10%, respectively (SOA).
- Of the 280,000 km^2 of sea monitored in 2010, 62.7% of sea areas qualify for Class I and II standards, a decrease of 10.2% compared with 2009; 14.1% of sea areas qualify for Class III, an increase of 8.1% compared to 2009; and 23.2% of sea areas qualify for class IV or lower, an increase of 2.1% compared to 2009 (China SOE, 2010).
- Sea areas qualifying for Class I and II in Bohai Bay have decreased by 20% (China SOE, 2010).
- Water quality of monitored sections of 192 sea-bounding rivers is poor. Pollutant loadings from rivers are major contributors to sea water pollution (China SOE, 2010).
- Capacity of monitoring land-based pollution was enhanced during the 11th FYP (2006-2010) (China SOE, 2010):
  - 50 new surfacewater automatic monitoring stations were installed for real-time monitoring and accident early warning;
  - 60% of county-level environmental monitoring stations were equipped with environmental laboratories;

Financing

- The total investment in environmental protection during the 11th FYP period (2006-2010) amounted to RMB 1.53 trillion (US$ 243 billion), a 70% increase over the allocations during the 10th FYP.
- From 2006 to 2008, RMB 23.8 billion (US$ 3.78 billion) were invested by the state revenues and RMB 22.6 billion invested by local revenues for providing safe drinking water to an accumulated rural population of 109 million (State Council Information Office, 2009. China's Actions for Disaster Prevention and Reduction).
- From 2007 to 2012, a total of RMB 2.1 billion (US$ 333 million) was allocated for 211 projects to support research and studies on integrated coastal management, marine biodiversity conservation, disaster prevention and reduction, resource use, ocean observation, etc.

    - National key pollution sources were equipped with automated monitoring systems;
    - The second marine satellite was launched in 2007 to enable more effective monitoring of disasters.

Communication/Education

- Over 20 universities and colleges in China have marine programs. Partnerships are being built between the State Oceanic Administration (SOA) and these universities and colleges.
- Xiamen World Ocean Week (XWOW), jointly hosted by the Xiamen Municipal Government, SOA, UNDP China and PEMSEA since 2005, has established itself as an international platform for policy dialogue and knowledge sharing in ICM implementation.
- The annual Wenzhou International Marine Eco-Civilization Forum (since 2008) hosted by the Wenzhou Government, International Cooperation Department of SOA, and the Fujian Ocean and Fishery Department seeks to advocate behavioral changes in all stakeholder groups for a blue ocean.
- National Seas and Oceans Outreach Day has been celebrated since 2008 to raise awareness of ocean health each year.

Capacity Development

- The Xiamen International Training Center for Coastal Sustainable Development, based in Xiamen University, was recognized as a regional ICM training center by PEMSEA. The Center organized over 40 training courses for 1,000 participants from China and 17 countries.
- PEMSEA National Task Force was established in 2011.
- Annual SOA training courses on ocean management have been conducted since 2005 for city-level leaders in charge of ocean affairs in the coastal prefecture-level cities and the leaders of ocean administration agencies in the coastal provinces and municipalities.

Sustainable Development Aspects

Natural and Manmade Hazards

- More than 70 percent of Chinese cities and more than 50 percent of the Chinese population are living in areas vulnerable to serious earthquakes, or meteorological, geological or marine disasters (State Council Information Office, 2009).
- Of the 132 storm surges, surfs and red tides recorded in 2009, 33 became disasters resulting in direct loss of RMB 10 billion (US$ 1.59 billion) and the death of 59 people. In 2010, 132 oceanic disasters were recorded, leading to direct loss of RMB 13.3 billion (US$ 2.11 billion).
- Survey and monitoring of coastal erosion since 2003 indicates that a total of 3,708 km of coastlines, or 20.6% of China's continental coastline, are eroded, and the rate of erosion

Challenges and Opportunities: Natural and Manmade Hazards

- Absence of legislation related with prevention and reduction of loss from natural and manmade disasters
- Lack of consideration of disasters in coastal infrastructure
- Poor inter-sectoral coordination in disaster response measures
- Lack of adequate environmental risk assessment of large thermal power stations, nuclear stations, oil refineries, ocean-based oil and gas pipelines and oil reserves
- Put in place an emergency early-warning and response system for major environmental incidents
- Low capacity in ocean observation and forecasting for early responses to storm surges, tsunami and other marine disasters
- Strict control in drafting of ground water in coastal areas

and length is increasing in majority of the monitoring sections.

- Frequency of algal blooms declined from 116 times in 2003 to 69 times in 2010, and affected areas shrank from 25,000 km^2 in 2004 to 10,000 km^2 in 2010. In 2010, *Prorocentrum donghaiense* and *Skelotone macostatum* were the leading causative species.
- Seawater intrusion onto coastal plains of Panjin in Liaoning, Tangshan and Huanghua in Heibei, and Bingzhou and Weifang in Shangdong, with an intrusion distance of 20-30 km from the coastline.
- In July 2010, a pipeline of oil storage tanks of Sinopetro in Dalian exploded with oil leakage affecting 10 coastal bathing beaches and a nature reserve.
- Response measures to marine disasters include: (1) creation of 1 national forecasting center, three regional centers and 10 provincial centers and 8 county level centers; (2) establishment of emergency management mechanism in 2007 by SOA; (3) emergency response plans are developed in the event of storm surges, surfs, tsunami, sea ice, oil spill and red tide; and (4) strengthening of dikes and upgrading construction standards.
- National ocean observation and forecast development plan (2008-2015) was adopted. In line with the plan, equipment, infrastructure and instruments for ocean observation were upgraded during the 11th FYP period.
- In Xiamen, the direct economic loss from the strongest typhoon in Xiamen history (2006) was US$ 276 million less than the second strongest in 1999, before integrated disaster risk management system had been put in place.

Habitats and Biodiversity

- During the 11th FYP period (2006-2010), forest areas increased by 4 million ha each year through reforestation and afforestation programs.
- By September 2010, China has designated 201 marine protected areas (MPAs) and special MPAs (including marine parks) at different management levels, including 32 national MPAs covering 334,000 km^2, or 1.12% of jurisdictional sea areas claimed by China. Included in the list are over 30 special marine protection areas, 16 of which are designated as national level. (China Ocean Newspaper, 2010). In 2011, SOA, for the first time, published a list of 7 national marine parks, including 3 parks from parallel sites (Hailing Island/Yangjiang; Xiamen, Haizhou Bay/Lianyuangang).
- Monitoring of 27 National MPAs in 2010 indicated that water, sediment and status of ecosystems and targeted protected species remain stable compared with monitoring results of 2009.

Challenges and Opportunities: Habitats and Biodiversity

- Large volume of land-based pollutant discharge (CBD National Report, 2010);
- Low coverage of only 1.12% of territorial waters by MPAs (CBD National Report, 2010);
- Improved coverage of offshore areas and marine vertebrates in the MPA system and expansion of MPAs allocated for sustainable use (i.e., marine special protected areas) (SOA, 2009);
- Development of a more scientifically and systematically designed MPA network under a master plan (SOA, 2009);
- Inadequate financing (CBD National Report, 2010); and
- Lack of technical backstopping (CBD National Report, 2010).

Challenges and Opportunities: Food Security, Fisheries and Livelihood

- Decreasing fishery resources as a result of the impacts on breeding and feeding grounds of fish resources from land-based pollution, coastal reclamation and other development activities;
- Food safety and market access are affected by the lack of comprehensive aquaculture quality control mechanisms; and
- The low transformation of technological innovation inhibits the needs of sustainable aquiculture development.

- In 2010, the first regulation concerning compensation from oil spill, land reclamation and other activities resulting in damage to or alternation of marine ecosystem was adopted in Shangdong. Payment for marine ecosystem services is also reflected in Jiangsu Marine Environment Protection Regulation which provides that compensation shall be made to marine development forbidden zones and development restriction zones designated by the provincial government.
- EU-China Biodiversity Programme (EUR 30 million, 2006-2010) assisted the revision of the National Biodiversity Strategy and Action Plan (2011-2030), development of biodiversity assessment guidelines for environmental and strategic environmental assessments (EIA and SEA) and its application in assessment of the Beibu Gulf Development Plan. Eighteen (18) field projects involving over 70 national, international, government and civil society organizations contributed to the adoption of the biodiversity strategy and action plans in five (5) provinces and cities, creation of interagency coordination mechanisms in seven (7) cities, and testing various ecosystem management models using incentives (e.g., conservation agreements, certification), EIAs (e.g., tourism, mining), and community-based management in over 200 pilot sites.
- Benefiting from the cooperation with GEF and UNDP, management capacity of MPAs of Shankou, Hepu, Sanya and Nanji noticeably increased through strengthened monitoring capacity, use of ICM, adaptive management and ecosystem-based management approaches in: (1) addressing pollution to coral reef ecosystems; (2) reducing threats to mangroves and sea grass through creation of functional community conservation groups; (3) engaging private sector (ESRI, Store Enso and Yutian) in mangrove propagation, capacity development in monitoring; (4) creating an inter-provincial coordination mechanism to harmonize law and management planning and sea use zoning, and synchronize law enforcement; (5) demonstrating ways to integrate biodiversity into island master planning; and (6) demonstrating sustainable financing mechanisms for MPA management through sea user fees and admission fees.
- The population size of the Humpbacked Dolphin (*Sousa chinensis*) in Xiamen shows signs of recovery with 30-40 individuals in the west areas of Xiamen and Wuyuan Bay Estuary.

Challenges and Opportunities:
Water Supply/River Basin Management

- Low water use efficiency by agriculture and industry;
- Excessive water fragmentation in water quality, water quantity and ecosystem management;
- Underdeveloped system of water rights; and
- Excessive reliance on administrative measures rather than market-based instruments.

Challenges and Opportunities:
Pollution Reduction/Waste Management

- Data from SOA indicates that the sea areas below sea water quality standard Category I in Bohai Bay has increased by 63% from 2006 to 2010. There is pressing need for integrated river basin and coastal planning and management for pollution mitigation using ecosystem approaches;
- Need for sustainable financing mechanisms to leverage private sector investment in mitigation of pollution through public-private partnerships and adoption of market instruments;
- Unify and strengthen the pollution monitoring system; and
- Control of rural pollution from non-point sources.

- From 2008 to 2010, the Quanzhou government organized manual removal of 150 ha of the alien invasive plant species Smooth Cordgrass (*Spartina alterniflora*) and restored 134 ha of mangroves with a total allocation of US$1.5 million, leading to extension of mangrove habitat to over 500 ha in Quanzhou Bay, the largest mangrove habitat along the southeast coast of China.

Food Security, Fisheries and Livelihood

- Every year, billions of fish, shrimp and shellfish fries are cultured and released in offshore waters to replenish the fish population.
- Reducing marine catches and creating policy environment to shift coastal communities from capture fisheries to other fisheries or other economic activities are the main policies in China. By 2010, the ratio of aquaculture to capture fishery changed to 71:29 from 67:33 in 2005, an indication of optimized fishery structure.
- The policy of "zero increase" and "negative increase" in marine catches has been in place since 1999, concerning 110,000 fishing vessels and 1 million fishers. As a result, annual growth rate of marine fisheries is 0.13% from 2001-2008.
- The seasonal non-fishing policy and closed fishing season policy in the Yangtze River Basin have been in place for many years.
- Marine tropic index from 1997-2006 increased steadily, benefiting from implementation of summer fishing moratorium policies since 1995 (CBD National Report, 2010).
- The government of Yangjiang implemented a strategy of certifying quality of aquaculture as a way to achieve food safety. By 2010, 34 sites supplying aquaculture products were certified as pollution-free production sites, 46 aquaculture products were certified as pollution-free, and 42 export-oriented aquaculture farms were registered, concerning a total aquaculture area of nearly 10,000 ha, or 24.9% of aquaculture areas in the city.

Water Supply/River Basin Management

- China supports 20 percent of the world population with only 7 percent of the global water supply, and 2/3 of cities are short of freshwater.
- Water use: Municipal (10% in 2000, 16% projected in 2030); Industry (20% in 2000 and 24% projected in 2030); Agriculture (70% in 2000, 60% projected in 2030).

- From 2006-2010, nearly 100 water-related programs and plans at national and river basin levels were approved in China, among which 65 programs and plans were approved at the national level (Ministry of Water Resources).

- From 2006-2010, a total of RMB 600 billion (US$ 95 billion) were invested in water resources management nationwide, resulting in access to safe drinking water by 235 million rural people, and achievement of irrigation water use efficiency index by 0.5, and irrigation of 300 million ha of new croplands (Ministry of Water Resoures).

- Water use per unit industrial add-value reduced by 36.1%, from US$5.29/$m^3$ in 2005 to US$14.69/$m^3$ in 2010.

- From 2011 onwards, emission reduction by 10% of ammonia nitrogen and nitrogen oxide, which contributes to non-point source pollution are included as mandatory targets in the 12th FYP.

- Total pollutant loading reports of Hai River, Daling River, Luan River and Guangli River of Bohai Bay were produced, mitigation strategies and investment plans were developed, and investment projects were identified to meet the offshore water quality criteria of various marine function zones.

- Jiulong River – Xiamen Bay Ecosystem Management Strategic Action Plan was developed to implement the Xiamen ICM Strategic Action Plan adopted by the Xiamen Municipal Government in 2005.

Pollution Reduction/Waste Management
(Ministry of Environmental Protection)

- Land-based pollutants contribute to nearly 70% of pollutant loadings in coastal seas.

- Sea water quality monitoring data from 2003-2009 indicates that total areas of polluted sea tend to fluctuate, without obvious indication of increasing or decreasing trend.

- In 2010, COD emission totaled 12.381 million tons, representing a decrease of 12.45% of the 2005 level, achieving the 10% reduction target of the 11th FYP.

- From 2006-2010, a total of 822 projects failing to meet the requirements of the EIA were suspended and refused, involving a total investment of RMB 3.2 trillion (US$ 508 billion). Over 20,000 enterprises were closed up for failing to meet environmental standards.

- Water sections monitored in 7 major river basins meeting Class III standards have increased from 41% in 2005 to 59.9% in 2010.

- From 2001-2005, RMB 18.8 billion (US$ 2.98 billion) were invested to support 236 projects on wastewater and garbage treatment, eco-friendly aquaculture and mariculture, ecosystem restoration and rehabilitation, agriculture runoff control and pollution reduction from sea-based sources in Bohai Bay, as required in the Blue Bohai Action Plan. From 2006-2007, 78 wastewater treatment facilities were built with a total investment of RMB 35 billion (US$ 5.5 billion) by government and enterprises in the drainage area of Bohai Bay. In 2009, the Bohai Environmental Protection Master Plan was adopted by the State Council. The implementation of the two programs has basically reduced the rate of deterioration of water quality in Bohai Bay. However, data from SOA indicates that the sea areas below seawater quality standard Category I in Bohai Bay have increased by 63% from 2006 to 2010.

- BOT and concession agreements are the main modalities of private sector engagement in the water sector in China. Shenzhen is considered a model for market-oriented reform in the urban water sector achieving a wastewater treatment rate from 56% in 2003 to 88% in 2008. Shenzhen Water Group, a leading private sector, has expanded and invested in 17 water projects in 7 provinces.

- During the 11th FYP period, ICM parallel site Quanzhou invested in 295 projects with RMB 5 billion (US$ 795 million) to improve coastal water quality, achieving a wastewater and garbage treatment capacity of 560,000 ton/day and 3,460 tons/day respectively, 3.5 and 2.2 times the capacity in 2006 (Quanzhou ICM Report, 2011).

Priority Issues for the Next Five Years for SDS-SEA Implementation

- Develop and implement national ocean and coast sustainable development strategy and programs, and conduct strategic environmental assessment of ocean-related programs and plans.
- Develop basic ocean law, coastal management law and Bohai sea environment management law.
- Establish a national ocean affairs leadership group and local leadership groups to coordinate the development of national ocean development strategy and interagency, inter-sectoral and inter-regional issues.
- Raise the awareness on the ocean through public participation and awareness programs.
- Promote Bohai integrated river basin and coastal management and demonstration through total pollution loading control.
- Establish and implement national climate change programs and adaptation capacity development in coastal areas.
- Improve marine environmental pollution incident risk assessment and emergency response mechanisms.
- Restore and rehabilitate mangroves, seagrass, coral reefs, and prevent and control alien invasive species.
- Strengthen marine protected area network and management effectiveness.
- Scale up ICM experiences through human resources development programs, certification schemes and in-service training of professional staff.
- Prepare State of the Coast reports on a regular basis for improved management of coastal areas.
- Develop sustainable financing mechanisms including public-private partnerships to support ICM implementation and market-based mechanisms to internalize externalities of ocean-based projects.

Major Challenges in Meeting SDS-SEA Objectives and Targets

- Balancing economic development from large-scale sea-based development projects and mitigation of potential environmental risks to health and safety of communities in the event of environmental disasters.
- Lack of inter-sectoral, inter-regional and interagency coordination mechanisms, legislation and integrated strategies and monitoring programs to address land-based pollution and causative impacts on marine ecosystem health.
- Low awareness of the public about the value of marine ecosystem services and lack of participation of stakeholders and the general public in ocean-based investment decisionmaking.
- Insufficient economic incentives to engage the private sector investment in pollution mitigation and ecosystem restoration, such as public-private partnerships and market-based legal and policy instruments to internalize externalities of development activities.

The Democratic People's Republic of Korea's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2011)

Basic Facts	
Total Population	**24,052,000** (2008)
Forecast Population	**Average annual population growth rate 0.86%** (1993-2008)
No. of coastal provinces, cities, municipalities	**7 provinces (North Pyongan, South Pyongan, North Hwanghae, South Hwanghae, North Hamgyong, South Hamgyong, and Kangwon) and 2 cities (Nampho and Rason)**
Land Area	**123,138 km²**
Length of coastline	**2,880 km**

National Economy
The DPRK is a socialist industrial state based on an independent national economy. It constitutes the supreme principle of the state in its activities to steadily improve the people's standard of material and cultural living under the socialist system where the masses have become the masters of the state sovereignty and means of production.
GDP composition by sector
Agriculture: 14.6% (2007) **Industry: 46.4% (2007)**

National coordinating mechanisms for coastal and ocean/ICM policy

There are various agencies responsible for differing aspects of coastal and marine resources management. The General Bureau for Cooperation with International Organizations (GBCIO) is the agency responsible for cooperation with international organizations for the sustainable development of the country. GBCIO has the experiences in cooperation with UNDP, UNIDO, GEF, NGO and regional programmes. GBCIO has been coordinating the projects for integrated coastal management (ICM) in DPR Korea. GBCIO has been a focal point of PEMSEA programmes for over 12 years.

Under GBCIO coordination, the PEMSEA Regional Programmes have been successfully moved forward various programs such as the development and implementation of Nampho ICM Demonstration Project. Nampho ICM Demonstration Project showed good practices in proper management of coastal resources by adopting ICM approaches.

The National Coordinating Committee for Environment (NCEE) is the agency tasked to coordinate marine and coastal management affairs. The Ministry of Land and Environmental Protection (MLEP) is the main body responsible for environmental management policy in coastal

Progress in SDS-SEA Implementation (2003-2011)

National Ocean Policy and Institutional Arrangements

Status of coastal and ocean policy/legislation:

- The work of the dear respected **Kim Jong Un "On Effecting a Drastic Turn in Land Management to Meet the Requirements for Building a Thriving Socialist Nation**" on April 27, 2012 was presented and delivered to the participants in a meeting of activists of the general mobilization movement for land management.

  In the work, he called for channeling efforts into sprucing up coastal areas, underscoring the need to improve the management of coastal and territorial waters so as to protect natural disasters, add to the beauty of landscape and protect and increase marine resources. He also underlined the need to do well the work to protect marine resources and conserve environment and nature.

- DPRK Socialist Constitution Revised (2009)

  In Article 51. of "Chapter 3. Culture" of "DPRK Socialist Constitution" is specified that "State shall provide cultural and sanitary living environment and working conditions to the people by setting up a measures for preserving environment, preserving and creating natural environment and preventing environment pollution..."

- DPRK Law of the Land (1977)
- DPRK Land Planning Law (2002)
- DPRK Regulations for the Control on Land Environmental Protection (1998)
- DPRK Law on Environment Impact Assessment (2005)
- DPRK Forest Law Revised (2001)
- National Coastal and Marine Use and Development Strategy (under development)
- Integrated Coastal and Marine Development Plan of West Sea of Korea
- Integrated Coastal and Marine Development Plan of West Sea of Korea

Status of ICM policy/legislation

The country has various laws in accordance with the principles of integrated coastal management (ICM). The government acknowledges the need to have a single ICM policy/legislation in line with the already existing legislations in support of ICM activities. The SDS-SEA Implementation Plan of DPR Korea for 2012-2016 targets to establish a National ICM Policy/Legislation with the following priority actions:

- Improve enforcement of existing coastal and marine-related regulations;
- Compile existing international laws/instruments to support implementation of UNCLOS and other international ship based pollution conventions;
- Package existing national laws and regulations on coastal and marine management to improve enforcement of existing coastal and marine-related laws and regulations; and
- Enhance ICM program/SDS-SEA implementation coordinating mechanism to take measures for strict adherence to the national and local laws and regulations. Indicators of progress on this target include the implementation of national coastal and marine activities in line with international conventions, improved enforcement of existing national coastal and marine-related laws and regulations, and improved implementation of national and local laws in support of ICM and SDS-SEA.

ICM Implementation

Status of national ICM program development

The country has recognized the importance of ICM as a national strategy for sustainable development of coastal and marine areas. Under development is the country's Coastal and Marine Strategy. The country's policies, laws and regulations are in accordance with the ICM scaling up program. The experience in the implementation of the Nampho ICM project is an important initial step in the scaling up of ICM programs in the country. Some challenges, however, are present in the ICM scaling up process in the country. This includes the lengthy consultation process within the government as well as the need to build awareness and consensus among the government agencies. As a result, the scaling up process is designed to start first at applying ICM to the Taedong Riverbasin and later on at a national scale.

Percentage of national coastline with ICM implementation

Nampho City: ICM coverage 127 km or 4.41% of the country's coastline

areas developing strategic policy framework and management plan to improve and maintain sustainability of the country's coastal and marine resources. The Maritime Administration (MA)is the administrative authority for the marine affairs of DPR of Korea and the main mission of MA is to map out and control the execution of the state policy for safety of ships and human life on the sea and prevention of pollution by ships; to bear the responsibility of and arrange the coordinative work for search and rescue on the sea and the preparative and reactive work for oil pollution by ships; to proceed the exchanging and cooperative work with international organizations such as IMO and the organizations of marine affairs in other countries. The Ministry of Fisheries (MOF) is responsible agency for political governance in the protection and production of fishery resources. The Ministry of Land and Marine Transport (MLMT) is responsible for ports and other maritime affairs such as promoting sea waterway transport system development and maritime trading. The State Hydro-meteorological Administration(SHMA) has the responsibility and duty for executing "Meteorological Law" and "Environmental Preservation Law", and is carring out the coastal management activities.

The government recognizes the need to establish a mechanism to coordinate the tasks and initiatives as well as the plans and policies of these various agencies for effective management of the coasts and oceans. The setting up of a National ICM Coordinating Mechanism is identified as one of the targets in the Draft SDS-SEA Implementation Plan of DPR Korea for 2012-2016 with the GBCIO and PEMSEA as agencies identified to take charge in the process of developing the effective functioning of the coordinating mechanism that will be established. The process will include building capacity and sharing of technical know-how contributing to the management and sustainable development of the country's coastal and marine resources.

Supporting Sectoral Policies and Legislation

Climate Change/Disaster Risk Reduction

- DPRK's 1st National Communication under the UNFCCC (2000)
- National program to prevent/mitigate hazards from flooding (2006)

Biodiversity/Habitats

- National Biodiversity Strategy and Action Plan of DPRK (1998)
- ALGAS Report for DPRK (1999)
- DPRK Law on Environmental Protection Revised (2000)
- DPRK Fluvial Law Revised (2004)

Fisheries

- DPRK Law on Fishery Revised (1998)
- DPRK Fish Breeding Law Revised (2001)
- Project on Kangryong fishery protection area, Kangryong County, South Hwanghae Province, DPRK

River Basins/Water Quality

- DPRK Law on Water Resources (1997)
- DPRK Law on Rivers and Streams (2002)
- Cabinet Decision No. 28 "Water Resources Management Regulations in Taedong River Basin" (2003)
- Master Plan for Land Management and Environmental Protection of Taedong Riverbasin (2005)
- DPRK Law on Protection of Taedong River Pollution (2005)
- Assessment of current and perspective water resources (2007)
- Masterplan for Land and Environment of Taedong River, adopted by Decree No. 2816 of the Presidium of Supreme People's Assembly, DPR Korea (2008)

Pollution Reduction and Waste Management

- Cabinet Decision 15 "Control Regulations on Rivers and Streams" (1965)
- DPRK Law on Marine Pollution Prevention Revised (1999)
- DPRK Maritime Law Revised (1998)
- DPRK Law of the Land Revised (1999)
- DPRK Law on Sea Pollution Prevention (1999)
- Standard of the State Environment Protection (Standards of water quality protection in rivers) adopted by Decision No. 338 of the Cabinet, DPR Korea (2000)
- DPRK Law on Gates (2001)
- DPRK Law on Waterway (2004)
- National Oil Pollution Contingency Plan

Livelihood/Food Security

- Self-sufficiency in food is the basic principle of the Government for solving food problems.

Communication/Education

The government of DPR Korea has integrated the importance of ICM in particular and environmental protection, conservation and management in general to the various means of communication in the country. Moreover, education curriculums have adopted a mechanism to build environmental awareness among the people. Specifically, the following are the means and modes of communication and education used to build environmental awareness and enhance knowledge among the people of the value of coastal and marine resources preservation:

- Brochures on ICM published by the Project Management Office (PMO) of the Nampho ICM Demonstration project.
- Integrated Information Management System (IIMS) network in Nampho City to support the implementation of ICM Project, as well as ICM of Nampho coast.
- The Korea Nature Conservation Union, a non-government organization of the country, is giving 3 hours broadcasting through central TV and more than 1 topic through central newspapers on the importance of environmental protection in relationship to current human lives and activities.
- Yearly seminar and exhibition on integrated coastal and marine management hosted by the State Commission for Science and Technology and other line ministries and institutions in DPRK
- Regular training of ICM experts and coastal managers conducted by the National ICM Training Center, Kim Il Sung University (since 2004)
- 4 times regular meetings conducted by the Oceanography Scientific Society to provide recommendations to the government relevant to the improvement of coastal concerns from 2010, every year

Capacity Development

- Training of Trainers for ICM conducted on 11-15 July 2004, Pyongyang, DPRK (18 participants including 3 PEMSEA RPO's Officers);
- Pilot Training on ICM conducted on 1-7 November 2004, Pyongyang, DPRK (20 participants, 6 lecturers and 6 presenters);
- Consultation Workshops on the Development of Nampho Integrated Coastal Use Zoning Plan on 12-13 July 2004; 7-9 December 2004 in Nampho (18 participants);
- The 1st National ICM Training conducted on 22-27 August 2005, ICM Training Centre, Kim Il Sung University, Pyongyang, DPRK (32 participants including trainers)
- Regular National ICM Training conducted yearly according to the training program of the National ICM Training Center, Kim Il Sung University, Pyongyang, DPRK (20 participants each time)
- National Consultation Forum for the Implementation of SDS-SEA, Pyongyang, on 23-25 August 2006 (40 officials and experts and one PEMSEA RPO Senior Programme Officer)
- IIMS Networking Workshop, Nampho on 04-07 September 2006 (20 participants and one RPO technical officer)
- Workshop on IEIA for coastal and marine areas on 27-29 September 2006 (16 participants including 3 trainers)
- The National ICM Training conducted on 11-18 March 2007, ICM Training Centre, Kim Il Sung University, Pyongyang, DPRK (18 participants including trainers)
- The National integrated coastal and marine management conducted in August 2008, ICM Training Center, Grand People's Study House, Pyongyang, DPRK (105 participants including trainers)
- "National Training of Trainers ICM Course/ and ICM Course 1 Manual Translation." - The translated ICM Manual was successfully tested during the workshop for ICM Training of Trainers Course 1 conducted by the PEMSEA and GBCIO in March 2011 in Pyongyang, DPR Korea. The translated ICM Manual is being updated to include the reviews and recommendation of the workshop participants from the national and local agencies/ institutions, research institutions and universities in DPR Korea.
- PEMSEA in collaboration with the GBCIO conducted a National Integrated Coastal Management (ICM) Train-the-Trainers Course 1 on 30 March - 1 April 2011 in Pyongyang, DPR Korea.

State of the Coasts

UNEP has conducted and published, in cooperation with the MLEP and the United Nations Development Programme, a State of Environment Report on the Democratic People's Republic of Korea in 2003. This includes discussions on the country's major environmental developments and trends as well as the key issues on the country's environment and natural resources.

IIMS was a main tool/software to provide necessary data/information to policy-makers during the implementation of Nampho Project (2001-2006). PMO of Nampho Project established database using IIMS and GIS covering whole area of Nampho City being one of the PEMSEA ICM demonstration sites.

IIMS was upgraded to Local State of Coasts (SOC) reporting system. Implementation of SDS-SEA in DPRK would be followed with the use of SOC reporting system.

SOC reporting is being used by the agencies relevant to the implementation of SDS-SEA with the Nampho City. The SOC reporting system is a tool introduced by PEMSEA to monitor the status of the coasts of local government units in order to have a guide in terms of managing their resources.

Sustainable Development Aspects

Natural and Manmade Hazards

Changes in weather patterns and other natural hazards are increasingly being felt in DPR Korea. The country experiences late spring droughts while severe

Water quality in main rivers and streams in DPR Korea (Adopted from UNEP, 2003).

Rivers and Streams	Basin area (km^2)	Ca^{2+}	Mg^{2+}	$Na^{+}+K^{+}$	HCO_3^{-}	SO_4^{2-}	CL^{-}	Gross ion	Hardness
Taedong River	16,580.5	26.0	7.2	6.0	106.4	11.0	8.9	165.5	5.7
Chongchon River	5,933.1	11.9	2.6	7.7	44.0	6.7	9.6	8.25	2.0
Jangza River	5,155.0	9.7	1.8	8.9	43.1	5.0	4.4	72.9	1.8
Jangzin River	6,920.0	8.8	3.4	4.2	28.1	8.6	8.6	61.7	1.9
Hochon River	5,140.0	12.0	4.8	4.4	50.5	7.9	6.1	85.7	3.7
Sod Stream	2,392.0	8.0	3.4	3.3	38.9	4.0	5.0	61.6	2.5
Orang Stream	2,014.0	9.5	3.0	10.2	42.9	14.5	8.0	88.1	2.1
Songchon River	2,417.7	8.6	2.5	5.5	25.0	9.0	11.0	61.6	1.5
Kumya River	2,200.5	19.8	5.9	6.7	84.0	6.5	8.5	131.4	4.1
Namdae River	857.0	20.0	4.0	9.5	65.0	9.0	11.0	118.5	3.5
Rimjin River	8,129.5	23.9	4.0	9.5	78.3	9.0	12.9	137.6	3.8
Ryesong River	3,916.3	27.5	6.0	9.5	110.0	8.4	9.0	170.4	4.5

Source: DPR Korea, 1991.

flooding occurs during the summer season. In addition, typhoons are experienced during summer and early fall. There has been a general increase in the annual average temperature at the beginning of the 1990s. The warmest temperature has been recorded in 1994, the highest since 1918. Drought has struck the country in 1997 after having rainy years in 1990, 1995 and 1996.

Vulnerability assessments have been conducted in DPR Korea in response to the challenges posed by climate change. In particular, the government has conducted assessments of flood vulnerable areas. The government has also formulated various climate change mitigation programs. Under development is the program for the mitigation of damages from flood. In general, the development of mitigation programs is already in its final stage of completion. In addition, the integration of the Climate Change Adaptation and Disaster Risk Reduction in vulnerable coastal areas of the country is part of the ICM scaling up targets of the government as outlined in the country's Draft SDS-SEA Implementation Plan for 2012-2016.

Habitats and Biodiversity

DPR Korea's coasts, seas, and rivers are home to 850 species of fishes, 348 species of mollusk, 58 species of echinoderm, 30 species of marine mammals, and various seaweeds. The rich coastal and marine areas of the country are faced with threats posed by coastal development, wastewater discharge and climate change. Agricultural runoff, deforestation, sedimentation and others are among the causes of habitat degradation and biodiversity loss in the country.

The importance of conserving the coastal and marine resources of the country is well recognized by the government of DPR Korea. The establishment of the Ministry of Land and Environmental Protection (MLEP) manifests the effort to supervise and manage activities in relation to the goals of protecting and sustaining the resources of the country in general. Sustainable use of the country's resources is the central development policy.

The State of Environment report of UNEP for DPR Korea has identified some challenges to ensuring the management of habitats and biodiversity in the country. This includes problems in terms of integrating and coordinating various actions related to biodiversity such as legislation/organization, construction of facilities to protect human resources, scientific and technical development, education and training, buildup of information management systems and international cooperation. Gaps in the existing laws related to biodiversity and resources protection like lack of coverage on the genetic resources and other relevant issues and aspects of habitat and biodiversity conservation and management have also been identified as major challenges.

Food Security, Fisheries and Livelihood

DPR Korea is endowed with favorable conditions for aquaculture development. However, the fisheries resources of the country is facing pressure from fisheries exploitation and some stock are in a critical state from excessive fishing activities for the past 10 years. The increasing pressure to exploit fisheries resources is brought about by the growing population and the reduction of support to the fishery sector that has caused the weakening of the deep-sea fishery capacity. This has, in turn, increased pressure on the inshore and coastal areas fisheries resulting to the decline of shells, sea cucumbers, sea urchins and flat fish stocks.

Recognizing the need to sustain resources, at the same time meet the food demand for its population, the government has attached importance to aquaculture industry development. It has made efforts to facilitate freshwater fish culture on a large scale throughout the country and a number of freshwater fish farms have been constructed in the early 2000s to establish freshwater fish production capacity.

Water Supply/River Basin Management

DPR Korea is given abundant water resources. River basins are economically important as a major source of water in the country. However, the demand for drinking water, public water supply, agriculture, industry and others have exerted pressure on the rivers and caused the degradation of water quality.

As part of the efforts to meet the rapidly growing water demand, the government has completed its irrigation project. Various sustainable development programmes are also in place in the water sector. These include the construction of medium or small-size hydropower plants throughout the country which is in line with the policy to supplement the construction of a large-size hydropower plant with additional plants to sustain the needs of the population. It has also initiated (in 2000) and completed (in 2002) a project on the construction of a canal between Gaechon and Taesong Lake to help supply water to the agriculture areas in the West Coast part of the country.

Pollution Reduction/Waste Management

Growing population, coastal development and other activities exert pressure to the rivers of DPR Korea as the increase in water demand and the lack of wastewater treatment and sewage management cause the decrease in the water quality of the country's rivers resulting to algal blooms, red tide occurrences and their resulting health impacts. There has been an increase in the volume of untreated domestic sewage, industrial wastewater, and solid hazardous wastes for the past years causing the pollution of the Taedong River in particular. The weakened natural purification capacity caused by the construction of the West Sea Barrage has further aggravated the situation of the Taedong River. In addition, nutrients from fertilizers being used by the agriculture sector are loaded to the rivers and coasts of the country.

The government acknowledges the need to urgently deal with pollution problems particularly in the Taedong River, one of the longest rivers of the country, through developing an integrated river basin management framework in addressing the environmental issues in the river. Moreover, in dealing with the pollution problems of Taedong River, the government has adopted the Master Plan for the Land and Environment Development of Taedong River through Decree No. 2819 of the Presidium of the Supreme People's Assembly (SPA). In line with the existing laws related to pollution management in DPR Korea, the government has exerted efforts to strengthen legal control on effluent and sewage from factories, enterprises and purification plants. Part of the government initiatives is the application of the "polluter pays principle" to factories, plants and enterprises whose activities cause pollution to the country's river systems. The government has also been implementing the Master Plan for Land Development in the Metropolitan Zone since 2002 and the Master Plan for the Land and Environment in the Middle Western Region since 2004 with the objective of eliminating contaminants from land-based sources that affect the West Sea of Korea. In addition, education and awareness building initiatives on water conservation and environmental protection are being conducted through the mass media. There is a lack of investment, however, in the facilities for the treatment of wastewater and sewage. In addition, there are problems in the management and repair of existing treatment facilities. The efforts to address the issue of pollution and waste management in the country have to be centered on increasing investment on wastewater treatment facilities. Also, investments have to be concentrated on completing domestic sewage networks all over the country, ensuring normal operation of existing purification plants, and renovating old water and sewage networks to increase water use efficiency.

Priority Issues for the Next Five Years for SDS-SEA Implementation

The Draft SDS-SEA Implementation Plan of DPR Korea for 2012-2016 has outlined the main priorities and targets of the government in support of SDS-SEA. In accordance with the action programmes of the strategy, sustainable development aspects, and ICM framework, the Government of DPR Korea has set the following major targets in implementing SDS-SEA in the country:

- **Governance Targets**
  - Set up a National ICM Coordinating Mechanism;
  - Establish National ICM Policy/Legislation; and
  - Scale up ICM in Nampho, Taedong and Aprok areas.
- **ICM Scaling up Targets**
  - Integrate Climate Change Adaptation and Disaster Risk Reduction in vulnerable coastal areas through ICM programs;
  - Incorporate sustainable use of ecosystem services into ICM programs covering coastal and upland watershed areas; and
  - Reduce the discharge of untreated domestic sewage into priority upland watersheds and coastal areas.
- **Capacity-enabling Targets**
  - Establish a national ICM training program and special skills training courses;
  - Strengthen capacities in monitoring and assessing coastal and marine ecosystem services; and
  - Build awareness and disseminate knowledge products.
- **Sustainable Financing Targets**
  - Integrate SDS-SEA/ICM programs into the national and local development plans;
  - Mobilize resources from international agencies and donors; and
  - Establish and SOC Reporting System to track changes and trends in coastal and ocean management.

Major Challenges in Meeting SDS-SEA Objectives and Targets

The government of DPR Korea shares the principles and goals of sustainable development and recognizes the importance of SDS-SEA and ICM implementation in the preservation and management of its coastal and marine resources. Challenges in the implementation of SDS-SEA, however, are indispensable. These include the need to conduct baseline studies, research and field work on various aspects of coastal and marine activities or activities that affect the state of the coastal and marine resources of the country including fish farming, marine transport, reclamation of tidal land, construction of facilities, harbors and cities and agricultural production. Another challenge is the lack of investment in environmental monitoring and assessment initiatives. There is also a lack of investment in developing and building environmental infrastructure and in developing and utilizing science-based information and technology in the management of coastal and marine areas.

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Indonesia's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2011)

Basic Facts	
Total Population (2010)	237.6 million
Forecast population (2015)	247.6 million
Population growth rate (2005)	1.3%
Percentage of population within 100km of the coast	96%
No. of coastal districts	300 out of 425
No. of islands	17,500
Land area	1.9 million km^2
Total sea area	5.8 million km^2
Length of coastline	95,161 km

National Economy

GDP per capita (2010)

US$ 2,946

GDP composition by sector

Trade (16.7%); Manufacturing 28.0%); Agriculture (15%); Services (10%); Exports (39%)

Employment by sector (August 2011, Badan Pusat Statistik, BPS)

Agriculture, forestry, hunting and fishery (38.86%); mining and quarrying (1.34%); manufacturing industry (13.26%); electricity, gas and water (0.22%); construction (5.78%); wholesale and retail trade, restaurants and hotels (21.33%); transportation, storage and communications (4.63%); financing, insurance real estate and business services (2.40%); community, social and personal services (15.18%)

Major contributing sectors to the marine economy

Table 1

Major contributions to national employment

Table 1

Table 1. Contribution of marine and fisheries sector to the national economy in GVA and labor usage, 2005 (CMFSER, 2009).

Economic Categories	Gross Value Added (million IDR)	Labor Usage (person)
Fisheries	59,484,544.26	1,461,092
Oil and Gas	219,820,547.36	311,753
Manufacturing	49,724,516.72	407,963
Transportation	18,943,879.03	755,282
Tourism	99,715,383.06	2,275,370
Construction	2,492,698.44	72,380
Services	122,865,282.90	5,584,171
Non-marine and Fisheries	2,303,844,784.84	84,595,841
Total marine and Fisheries	**573,046,851.76**	**10,868,011**
Total National Economy	**2,876,891,636.60**	**95,463,852**
Marine and Fisheries percentage to National Economy	**19.92%**	**11.38%**

Note: US$ 1 = IDR 9,697.449 (2005 average) (Historic Exchange Rates).

Progress in SDS-SEA Implementation (2003-2011)

National Ocean Policy and Institutional Arrangements

- National Act (NA) No 27/2007 on Management of Coastal Zones and Small Islands puts forward the implementation of ICM.
- Draft of National Ocean Policy has been completed and undergoing review by the National Ocean Council (DEKIN).

Monitoring and Evaluation

- The State Ministry of Environment conducts monitoring and key data included in State of Environment Report (regular monitoring conducted on 30 rivers on pH, BOD and COD; fecal coliform monitored in 21 rivers; total coliform monitored in 24 rivers)
- The Ministry of Environment (MOE) adopted the State of the Coasts (SOC) reporting as a monitoring and evaluation (M&E) tool for local areas in Indonesia and SOC reporting had been initiated in 10 provinces including Bali Province and Jakarta Bay (provinces of Jakarta, West Java and Banten)

SDS-SEA-related Legislation, Policies and Plans

Coastal and Water Resources Management

- Act No. 7/2004 on integrated water resources management at the basin level
- Act No. 32/2004 on decentralization of authorities and responsibilities in coastal and marine management
- Act No. 27/2007 concerning management of coastal zones and small islands provides the framework

Indonesia National Development Plans

The current Long-term National Development Plan (2005-2025) and the National Medium-term Development Plan (2009-2014) have mainstreamed the principles of sustainable development in national development policies and programs. The following indicates the focus of these development plans in terms of sustainable development of the marine and coastal areas:

- **National Development Plan (2005–2025)**
  1. **Improving the implementation of development management, which can maintain a balance between utilization, sustainability, visibility and usability of natural resources and environment while maintaining the function, capacity, and comfort in life in the present and future, through the use of matching between the use of space for settlements, social and economic activities, and conservation efforts;**
  2. **Improving the economic utilization of natural resources and sustainable environment; improving the management of natural resources and environment to support the quality of life;**
  3. **Providing beauty and comfort of life, and improving the maintenance and use of biodiversity as a basic capital construction.**
  4. **Growing insight into the maritime community and the government of Indonesia to the development of marine-oriented economy;**
  5. **Improving human resource capacity through the development of marine science and marine technology;**
  6. **Managing the national marine areas to maintain the sovereignty and prosperity;**
  7. **Building an integrated maritime economy by optimizing the utilization of marine resources in a sustainable manner.**
- **National Medium-term Development Plan (2009-2014)**
  1. **Management of natural resources and environment conservation;**
  2. **Rehabilitation and conservation of natural resources and environmental maintenance of biological diversity and distinctiveness of the tropical natural resources;**
  3. **Spatial planning and spatial consistency;**
  4. **Improvement of national security maintenance efforts and securing natural resources of national wealth, including the territorial sea;**
  5. **Improvement in integrated marine development, including the development of marine science and technology; and**
  6. **Development of the marine industry including marine transportation, maritime industries, fisheries, marine tourism, energy and mineral resources in synergistic, optimal and sustainable manner.**

Governance-related Challenges (SDS-SEA consultation)

- Lack of national/local marine and coastal policy
- No comprehensive coastal and sea use plan
- Conflicts in municipal water boundary
- Need for an interagency, multisectoral coordinating mechanism to address the lack of coordination in project implementation at the national and local level
- Identify and secure resource commitments and clarify roles and responsibilities of agencies and stakeholders related to coastal and ocean management
- Need to strengthen information management, conduct awareness and appreciation campaigns and stakeholder consultations, and develop IEC materials related on ICM, sustainable development, agri-tourism, risk management, community-based tourism in order to address limited knowledge of coastal communities on the management of coastal resources, as well as to increase awareness and appreciation of social, economic, and environmental services
- Priorities of the government are currently not focusing on financing coastal and marine-related projects/programs

To address the said concerns, it is important to facilitate the approval of the Indonesian Ocean Policy or development and implementation of an integrated coastal and ocean management policy. The following recommendations were also identified during the SDS-SEA consultation:

- Formulate a multi-year strategic action plan
- Develop short to medium term implementation plan with timebound targets
- Look into the integration of land and sea use plan
- Enact and enforce local/national laws
- Develop and implement ICM laws
- Need for multisectoral participation
- Increase access to training opportunities
- Conduct comprehensive needs assessment
- Establish partnership arrangements and strengthen networking with various concerned agencies and related learning/research institutions

and process for integrated planning, use and management of coastal and marine areas

- Regulation No. 16/2008 Planning and Management of Coastal Zone and Small Islands (MMAF)
- Regulation No. 17/2008 Conservation Area in the Coastal Zone and Small Islands (MMAF)
- Regulation No. 18/2008 Accreditation to Programs on Management of Coastal Zone and Small Islands (MMAF)
- Regulation No. 8/2009 Participation and Empowerment of Society in the Management of Coastal Zone and Small Islands (MMAF)
- NA No 32/2009 on Environmental Management and Control supports the management of coastal and marine resources through risk management and ecosystem based management principle and the issues of climate change.

Development and Spatial Planning

- NA 25/2005 (The Development Plan Act) provides a systematic process of development planning and preparing multi-year action plans from the district, to the provincial and national level.
- NA Nos. 32 and 33/2004 on development and management of province and districts.
- National Act (NA) No 26/2007 on Spatial Planning, including coastal and marine areas.

Biodiversity and Habitat Protection

- Indonesian Biodiversity Strategy and Action Plan (IBSAP, 2003) guides the implementation of national biodiversity program until 2020
- Presidential Instruction No. 16/2005 supporting the development of marine tourism and enhancing

management and control of National Marine Park sustainability

- Biodiversity Basic Law (2008).

Fisheries

- Fishery Law No. 31/2004
- Government Regulation No. 60/2008 on Fish Conservation Management
- NA No. 45/2009 on Fisheries Management

Pollution Reduction and Waste Management

- Ministerial Decree No. 51 on Seawater Quality Standard (2004)
- Ministerial Decree No. 75 on Organization and Management of National Cleaner Production Center (2004)
- Municipal Solid Management Law No. 18/2008
- National Act No 32/2009 Environmental Control and Management.

Climate Change and Disaster Risk Reduction

- Law No. 24/2007 on Disaster Management
- Law No. 32/2009 on environmental protection and management gives high priority to the mitigation and adaptation to the effects of climate change.
- National Council for Climate Change was established in 2008 to strengthen coordination of climate change policy and to strengthen the position of the country in international forums on climate change.
- In March 2010, the government launched the Indonesia Climate Change Sectoral Roadmap (ICCSR) with the aim of further mainstreaming climate change into national development planning. The ICCSR outlines the strategic vision that places special emphasis on the challenges faced by the country in the forestry, energy, industry, transport, agriculture, coastal areas, water resource, waste and health sectors.
- National Action Plan for Disaster Preparedness and Risk Reduction (NAP-DPRR)
- National Action Plan Addressing Climate Change (2007)
- National Plan for Disaster Management 2010-2014
- National Action Plan for Disaster Risk Reduction 2010-2012

Information and Public Awareness

- The Ministry of Environment, Ministry of Marine Affairs and Fisheries (MMAF) and a number of nongovernmental organizations (TI, TNC, WWF, WCS, Walhi, etc) conduct information dissemination and public awareness on coastal and marine management as part of the implementation of specific projects (eg., COREMAP, MCRMP, etc)
- National Biodiversity Information Networks collaboration between LIPI, Universities and BAKOSURTANAL
- Establishment of National Universities Networks in Fisheries and Marine Sciences (F2PT) involving about 63 universities in Indonesia
- Coastal Management and Fisheries Journalist Networks under the coordination of Center for Fisheries and Marine Information and Data Management, MMAF.
- Establishment of Ocean Business Development Division, under coordination of the National Chamber Organization (KADIN)
- Establishment of 15 Coastal Spatial Information Centre
- Availability of 15 provinces' Coastal Data Set and Information

Capacity Development

- A number of universities have already established post-graduate degree courses on coastal and marine resources management, including Bogor Agricultural University, Riau University and Diponegoro University.

ICM Implementation

- The multi-sectoral nature of marine and coastal resources management and the need for integrated management was recognized in Indonesia in the early 90s, following awareness of environmental degradation arising from development-oriented and land-focused policies, plans and programs, and implementation of numerous projects and programs on marine and coastal resources management mostly in cooperation with various international donors.
- The sixth long-term plan (1993/94 – 1997/1998), in particular, recognized the multi-sectoral nature and importance of marine and coastal resources to the development of the country. Pilot projects on ICM were implemented, including the Marine Resource Evaluation and Planning Project (MREP) and Coastal Resources Management Project (CRMP).
- The process of ICM development and implementation in Indonesia was facilitated by the decentralization and devolution of authority for coastal resource management to provinces and districts through National Act 22/1999 (later amended to NA 32/2004 on regional governance), and the enactment of National Act 27/2007 on coastal and small islands management and National Act 32/2009 on environmental protection and control.
- NA 27/2007 mandates all coastal districts to develop 20-year coastal strategic plans, 20-year zoning plans, 5-year management plans and annual action plans through cross-sectoral cooperation and public participation.
- NA 32/2009 supports the management of coastal and marine resources through risk management and ecosystem-based management principles.
- Various projects and programs have been contributing to strengthening institutional capabilities for integrated planning and management of marine and coastal development especially at the provincial and district levels, including the:
    - Marine and Coastal Resources Management Project or MCRMP (2001-2006)
    - Coral Reef Rehabilitation and Management Program or COREMAP (1998 - ongoing)
    - PEMSEA (2000 – ongoing)
    - Bay of Bengal Large Marine Ecosystem Project or BOBLME (2009 - ongoing)
    - Arafura and Timor Sea Ecosystem Action Programme Project or ATSEA (2010 – ongoing)
    - Coastal and Marine Resources Management in the Coral Triangle: Southeast Asia (2010 – ongoing)
- Fifteen provinces under MCRMP have prepared ICM planning documents including coastal strategic plans for 42 coastal districts and 15 draft provincial spatial and zonation plans; 12 provincial coastal management regulations were enacted.
- Bali Province, PEMSEA site since 2000, established an inter-agency and multi-sectoral ICM coordination and management mechanism, and developed and adopted a coastal strategy and implementation plan and coastal use zoning plan initially for the southeastern coast. ICM implementation was later scaled up to cover the entire island. A draft updated coastal strategy for the province has been prepared and is undergoing stakeholder review and consultation.
- Sukabumi Regency, PEMSEA site since 2003, also has an interagency and multisectoral ICM coordination and management mechanism and coastal strategy in place. It is currently in the process of scaling up ICM implementation from 4 to 9 subdistricts to cover the entire coastline. An ICM training and planning workshop for 9 subdistricts was conducted on May 2012. Priority actions include updating of the coastal strategy to cover all subdistricts and integration of land and sea use plans.
- A coastal strategy for the integrated management of Jakarta Bay was prepared and adopted by the three provinces of Jakarta, West Java and Banten in 2010. Development of an ICM program focusing on pollution reduction is being demonstrated in North Jakarta.
- The three provinces surrounding Tomini Bay (North Sulawesi, Central Sulawesi and Gorontalo) also adopted a Coastal Strategy in 2009. Capacity building and development of ICM programs are being undertaken through the facilitation of MOE and MMAF.

ICM Implementation, continued.

- COREMAP is a long-term program to protect, rehabilitate, and achieve sustainable use of the Indonesian coral reefs and their associated ecosystems through integrated planning and management, implemented in three phases from 1998-2015. Phase I was implemented in Kepuluan Riau (Riau), Sikka (East Nusa Tenggara), Selayar (South Sulawesi) and Biak (Papua). Phase II is being implemented in Selayar and Pangkep (South Sulawesi), Buton and Wakatobi (South East Sulawesi), Biak-Numfor (Papua), Raja Ampat (West Papua), Sikka (East Nusa Tenggara) (ADB sites) and Lingga, Natuna, Bintan, Batam (Riau Islands), Tapanuli Tengah, Nias, Nias Selatan (North Sumatra), and Mentawai (West Sumatra) (World Bank sites).

- The Coastal and Marine Resources Management in the Coral Triangle: Southeast Asia is a transboundary initiative involving the Philippines, Indonesia, and Malaysia, which aims to promote the long-term conservation of coastal and marine resources in the Sulu-Sulawesi Marine Eco-region. Implementation in Indonesia covers Sangir Talaud, Sangihe Islands and Nunukan Islands.

- BOBLME is another transboundary initiative focusing on integrated and coordinated management of the coastal and near-shore living marine resources. The program involves eight member States bordering the Bay of Bengal: Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka and Thailand. A Regional Workshop on ICM Best Practices in Southeast Asia was conducted in January 2011. Implementation areas in Indonesia include Aceh, North Sulawesi, West Sumatera and Riau provinces.

Location of ICM Program	Length of Coastline (km)
Bali Province	430
Sukabumi Regency	117
Jakarta Bay	72
Tomini Bay	2,500.46
15 provinces and 40 coastal districts (MCRMP)	No data
Other coastal districts developing coastal strategic plans	No data
COREMAP, CTI/SSME, BOBLME, ATSEA	No data
Total	**> 3,119.5**

- ATSEA is also a transboundary initiative involving Indonesia, Timor-Leste, Australia and Papua New Guinea to develop a regional strategic action plan for ecosystem-based management of the eco-region, corresponding national action plans, and demonstration sites for implementing the plans. Implementation in Indonesia covers East Nusa Tenggara, South East Maluku, Maluku, West Papua, and Papua provinces

- In compliance with NA 27/2007 and NA 32/2009, several coastal districts are in the process of developing strategic plans and initiating ICM programs.

- Based on available coastline data, ICM is being implemented, at varying scales, in at least 3.3% of Indonesia's national coastline, one of the longest in the world.

- Center for Coastal and Marine Resources Studies (CCMRS) of Bogor Agricultural University designated as a PEMSEA ICM Learning Center

- Training Courses on ICM and State of the Coast Reporting jointly conducted by the Ministry of Environment, CCMRS and PEMSEA in 2010, and participated in by representatives from Bali Province, Sukabumi Regency, Jakarta Bay, Tomini Bay, MOE and MMAF

- ICM Training Course jointly conducted by the Environment Board of Bali Province and PEMSEA in 2010 for representatives from the provincial, regency and city government offices, government agencies, academe, private sector, NGOs and communities

- MOE Training Center is responsible for providing training and education on environmental management and relevant tools to concerned central government and local government officials, national and local politicians, and public sector employees

- Under the MCRMP and other projects, MMAF conducted capacity-building programs for government officials of 15 provinces and 40 districts

Financing Mechanisms

- Act No. 33/2004 on financial balance between national and local governments in terms of income derived from utilization of environmental resources (e.g., fisheries, forestry and mining)
- Act No 25/2007 on investment policy in coastal and ocean development
- CSR program for Small Islands Development (MMAF) (2009–ongoing)
- CSR for Jakarta Green Program, Ministry of the Environment (2008–ongoing)
- Environmental Fund for Buyat Bay BPPT and PT. Newmont Minahasa (2008–ongoing)

Sustainable Development Aspects

Natural and Manmade Hazards

- Indonesia is one of the countries vulnerable to climate-related hazards. Between 2003-2005 alone, there were approximately 1,429 disaster incidents in the country.
- National programs
  - Program of Rehabilitation and Recovery of Natural Resource Reserves (2005)
  - Volunteer Disaster Corps (Taruna Siaga Bencana) of the Ministry of Social Affairs — community participation in disaster risk reduction
  - Program of flood control and coastal stabilization (2008)
  - Mitigation of coastal disaster in West Java (2010)
- Several sites have adopted land-and-sea use development plans, such as the Coastal Use Zoning for Southeastern Coast of Bali (219 km) and Spatial Planning for Jakarta, Bogor, Depok, Tangerang, Bekasi, Puncak, Cianjur (Jabodetabekjur). Fifty of the 430 Indonesian regencies (districts) and 10 of the 33 Indonesian provinces have developed integrated coastal spatial plans.
- Tsunami scenario using a numerical model (historical tsunami data) developed for Denpasar City in Bali Province (2007).
- Micro-zoning maps of disaster-sensitive areas developed in Denpasar, Bali Province.

Habitats and Biodiversity

- The area of marine conservation areas in the country has increased in the recent years. The total area was 13.53 million ha in 2009 or 4.35% of the national territorial waters (3.1 million km^2). MMAF plans to expand the area of marine conservation area to 15.5 million ha by the end of 2014 or approximately 5% of Indonesian territorial waters, and to 20 million ha by 2020.
- National programs
  - Coral Reef Management and Rehabilitation Program (COREMAP) (three phases between 1998-2013)
  - National Program on Coral Reef Destruction Mitigation (launched December 2004)
  - Bali Reef Aware Program

Challenges and Opportunities: Natural and Manmade Hazards

- Climate change adaptation (extreme events)
- Sea level rise
- Inadequate understanding of hazards
- Delayed response to disasters
- Poorly coordinated response

Challenges and Opportunities: Habitats and Biodiversity

- Coral reef and mangrove degradation
- Illegal cutting of trees
- Siltation of rivers
- Cultural and historical sites degraded

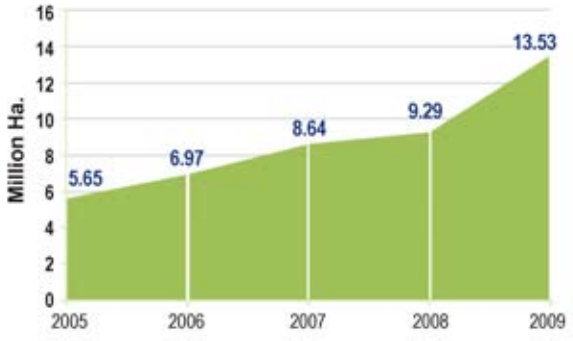
Food Security, Fisheries and Livelihood

- For fish stocks within safe biological limits, the maximum sustainable yield (MSY) for capture fisheries is estimated to be around 6.4 million tons per year, while the total allowable catch (TAC) is 80% of MSY or 5.12 million tons per year. The total production of capture fisheries in Indonesia increased from 3.72 million tons or 66.08% of TAC in 1998 to 4.7 million tons or 91.8% of TAC in 2008. The capture fisheries production is projected to be 5.12 million tons or equal to TAC in 2015. The utilization of fisheries resources, especially resources from the sea, is based on precautionary and sustainable principles so that production will not exceed safe biological limits.
    - There have been a number of national programs and projects initiated to address this aspect of sustainable development, including programs on sustainable fisheries management, environment-friendly aquaculture, and empowerment of fishers and communities through skills and livelihood development.

Water Supply/River Basin Management

- The Indonesian territory has 6% of the world's freshwater reserve or approximately 21% of water reserve in the Asia-Pacific region. However, many areas in Indonesia have suffered from difficulties of usable water availability in recent years (e.g., Java, Bali, and East Nusa Tenggara. The reduction in the water quantity and quality in Indonesia is attributed to: (1) degradation of the carrying capacity of upstream areas of water catchments as a result of uncontrolled clearing of forests; (2) uncontrolled land clearing within flooding areas, water catchment areas and riverbanks; (3) uncontrolled abstraction of water that also causes increased saltwater intrusion and land subsidence; (4) degradation of riverbeds due to exploitation of sand; and (5) increased sedimentation of river beds resulting from household solid waste and mining.
- Various national programs and projects have been initiated to address improved management of watershed areas, including the Integrated Citarum Water Resources Management Program.
- River basin management programmes are being implemented in the following areas:
    - Jakarta Bay: total surface area 490 km^2
    - Ciliwung River: total catchment area 322 km^2
    - Tomini Bay Program (2007-2012): total catchment area 59,500 km^2
    - 13 national priority rivers identified
    - River basin management plan for West Java, Siak and Riau

Areas of Indonesian marine conservation areas (2005-2009)



Source: Ministry of Marine Affairs and Fisheries (MMAF).

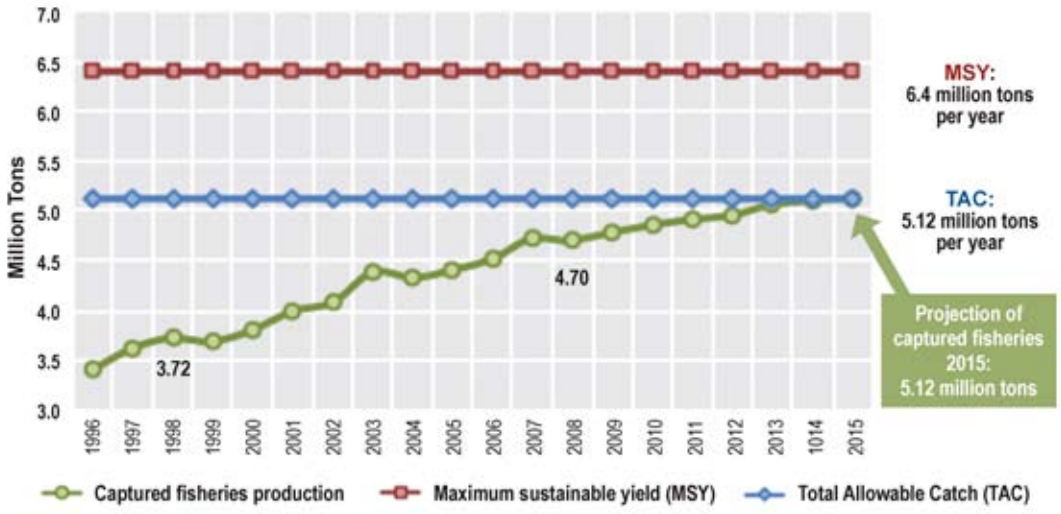
Challenges and Opportunities: Food Security

- Poverty in the coastal areas;
- Subsistence fishing vs. commercial fishing
- Illegal fishing
- Competition for coastal space
- Displacement

Challenges and Opportunities: Water Supply/River Basin Management

- Freshwater shortages
- Inadequate access to safe water by the poor
- Land subsidence
- Saltwater intrusion
- Pollution of aquifer

Capture fisheries production in Indonesia



Source: Ministry of Marine Affairs and Fisheries

Pollution Reduction and Waste Management

- In 2003, wastewater treatment systems were operating in 11 cities in Indonesia covering 14% of the population in the service areas
  - Wastewater treatment plants in Bali
    - Denpasar (33,000 customers; 3,800 connection)
    - Sanur (5,300 customers; 900 connections)
    - Kuta (12,300 customers; 2,500 connections)
- By 2004, 30 provinces were included in the Prokasih (Clean River Program), which aimed to reduce pollution discharge from households and industries.
- Various other programs and projects have been implemented in the country to address pollution reduction and waste management since 2003, including the program for Pollution Evaluation and Performance Rating (PROPER), which deals with corporate point sources that have significant impacts to the environment covering water pollution, air pollution and hazardous waste management, and the SANIMAS, a national program on community-based sanitation.
- Investments in pollution reduction include:
  - Second Water and Sanitation for Low Income Communities Project (2000-2010) - US$106.7 million WB loan and non-bank fund
  - Third Water Supply and Sanitation for Low Income Communities Project (2006-2013) - $275.1million World Bank loan and non-bank fund
  - Urban Water Supply and Sanitation Project (2009-2014) - US$23.56 million World Bank loan, other sources US$9.98 million
  - Solid waste management in and development of integrated solid waste management plant in south of Bali SARBAGITA (Denpasar Municipality and Badung, Gianyar and Tabanan Regencies): US$20,000,000 private sector financing
  - Denpasar Sewerage Development Project (DSDP): Total: US$ 54,620,879 (Breakdown: JBIC loan: US$ 45.5 million; Government of Indonesia: US$ 7,296,703; Bali Province: US$ 131,868 (land for wastewater treatment plant); Denpasar City: US$ 967,033 plus land for Sanur pumping station; Badung Regency: US$ 725,275 for Kuta pumping station).

Challenges and Opportunities: Pollution Reduction/Waste Management

- Groundwater pollution
- Improper waste disposal
- Unregulated application of pesticides on agricultural crops

Priority Issues for the Next Five Years for SDS-SEA Implementation

- Strengthening BAPPENAS functions in integrated coastal and ocean planning with the assistance from National Ocean Council (DEKIN)
- Adoption of National Ocean Policy with assistance from National Ocean Council (DEKIN)
- Scaling up the number of coastal district/municipality in the development of ICM Plans, Implementation and Management
- Increasing the capacity of local government and community in natural disasters preparadness and management
- Strengthening ICM Capacity in the context of coastal districts and municipality (MIA)
- Strengthening ICM Capacity in the village level (MIA)
- Development of Blue Economy Concept and Implementation Plan
- Increasing the economic value of MCA/MPA
- Continue program on extending MPA/MCA Area (with the target of 20,000 ha by 2014)
- Promoting the EAFM
- Rehabilitation of water sources
- Continuous facilitation and support to coastal district/municipality in reducing pollution (land-based and sea-based pollution)
- Continue the training program with regard to ICM implementation including training on coastal marine spatial zoning
- Development of regional learning center in the context of Western Sumatera Coastal Management under initiation of MoE
- Continue producing supporting materials for ICM implementation
- Continue program on strengthening CSR adoption for ICM implementation
- Implementing the CTI Program
- Development of incentive systems for water resources under initiation of Ministry of Public Works

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Japan's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2011)

Basic Facts (Statistics Bureau, 2012):	
Total Population (2010)	128,057,000
Forecast population (2015)	125,430,000
Percentage of population within 100km of the coast	**96.3 percent** (WRI, 2001)
Land Area (2011)	377,955 km^2
No. of islands	6,852
Area of territorial sea	about 430,000 km^2 (Japan Coast Guard, 2012)
Length of coastline	About 35,000 km

National Economy
GDP per capita (2011)
US$ 45,920.30 (IMF, 2012)
GDP by economic activity (2010, ESRI, 2012):
Agriculture, forestry and fishing (1.2%); Mining, construction and manufactuing (25.2%); Services, electricity, gas and water supply and others (73.6%)

Progress towards SDS-SEA Targets

National Ocean Policy and Institutional Arrangements

- Developed the Guidelines for Developing Integrated Coastal Zone Management Plans in 2000.
- Adopted the Basic Act on Ocean Policy in 2007, which states the basic plan and measures on ocean management and development.
- As part of the implementation of the Basic Act on Ocean Policy, the Headquarters for Ocean Policy was established in the Cabinet, comprising of different ocean-related ministries and agencies.
- The Basic Plan on Ocean Policy was adopted in 2008. The Basic Plan on Ocean Policy states the policy measures that the country needs to undertake.

Among such measures are:

- Promotion of the development and use of marine resources
- Conservation and preservation of the marine environment
- Promotion of development of the exclusive economic zone (EEZ) and the Continental Shelf
- Securing maritime transport
- Securing the safety and security at sea
- Promotion of marine surveys
- Promotion of research and development of marine science and technology
- Promotion of marine industries and strengthening international competitiveness
- Comprehensive management of the coastal zone
- Preservation of islands
- Securing international coordination and promotion of international cooperation
- Enhancements of citizen's understanding of the sea and fostering of human resources.

- The Basic Policy concerning the Preservation and Management of Islands and Seas was developed in 2009.
- The Act on the Preservation of the Low-water Line and the Development of Basic Infrastructure of Remote Islands for Maintaining and Promoting Utilization of the Exclusive Economic Zone and the Continental Shelf was enacted in 2010.
- At the local level, several coastal strategies have also been developed, e.g., Ise Bay Strategy and Tokyo Bay Renaissance Action Plan.
- Adopted the definition of marine protected areas and clarified the existing areas that meet this definition in 2011.

Supporting Sectoral Policies, Legislations and Strategies

Environmental Policy (MOE, 2012)

- Law 91 enacted in 1993 as the Basic Environment Law
- Law 81 enacted in 1997 as the Environmental Impact Assessment Law
- Law 100 enacted in 2000 concerning the promotion of procurement of eco-friendly goods and services by the state and other entities

Land and Sea Use Planning

- National Spatial Planning Act of 1950 was revised in 2005 to incorporate the EEZ as a management area
- Seashore Act
- Port and Harbor Law
- River Act
- Fishing Port Law
- City Planning Act

Natural and Manmade Hazards Management (MOE, 2012)

- Natural Disasters
  - Disaster Countermeasures Basic Act
  - Seashore Law
  - River Law
  - Flood Control Act
  - Basic Disaster Management Plan
  - Basic Policy for Coastal Conservation in 2000
  - Proposals of Tsunami Countermeasures Study Committee
- Manmade Disasters
  - Act on Prevention of Marine Pollution and Maritime Disaster
  - Emergency Plan for Preparedness and Action for Oil Spill Incidents enacted in 2006
  - Type approval System on Ballast Water Management System was also developed in 2008
- Climate Change
  - In 2005, the Kyoto Protocol Target Achievement Plan was formulated.
  - Act on Promotion of Global Warming Countermeasures was revised in June 2008.
  - The Guidelines for Measures to Prevent Global Warming was formulated to provide concrete policies and measures to achieve the Kyoto Protocol targets.
  - The Law Concerning the Rational Use of Energy was also enacted in the country.

Habitat Protection, Restoration and Management (MOE, 2012)

- Basic Act on Biodiversity enacted in June 2008
- Law for the Promotion of Nature Restoration
- Invasive Alien Species Act
- Nature Conservation Law
- Natural Parks Law
- Law for the Conservation of Endangered Species of Wild Fauna and Flora
- Wildlife Protection and Hunting Management Law
- Adopted the 3rd and 4th National Biodiversity Strategy in 2007 and 2010, respectively.
- Marine Biodiversity Conservation Strategy
- The Central Environmental Council, the Joint Committee on Natural Environment and Wildlife, the Natural Park Subcommittee, and the National Biodiversity Strategy Subcommittee were established to coordinate various aspects of habitat protection and biodiversity conservation in the country.

Water Use and Supply Management (MOE, 2012)

- Developed the Basic River Management Policy
- Water Resource Development Promotion Act
- National Water Resource Institute Act
- Special Act on Measures for Water Resource Area
- River Act
- Specified Multipurpose Dam Act
- Water Supply Act
- Raw Water for Water Supply Act
- Land Improvement Act
- Forestry Act

- Industry Water Act
- Industry Water Supply Act
- Water Resource for Water Supply Act
- Developed the Integrated Water Resource Management addressing climate change and other risks in 2008.
- Water Plan 21 (2010-2015) or the National Comprehensive Water Resources Plan was developed in 1999
- Water Resources Development Basic Plan was formulated for the seven river systems, namely the Tone River, Arakawa River, Toyokawa River, Kiso River, Yodogawa River, Yoshino River and Chikugo River. A combined river plan had also been developed for Tone and Arakawa Rivers.

Food Security and Fisheries

- Developed the Basic Plan for Fishery Policy based on the Fisheries Basic Act.
- Organization for the Promotion of Responsible Tuna Fisheries was established in 2000.

Pollution Reduction and Waste Management (MOE, 2012)

- Waste and recycling
  - Law on Special Measures concerning Removal of Environmental Problems Caused by Specified Industrial Wastes
  - Law for the Recycling of End-of-Life Vehicles
  - Construction Material Recycling Law
  - Waste Management and Public Cleansing Law
  - Law for the Recycling of Specified Kinds of Home Appliances
  - The Basic Act for Establishing a Sound Material-Cycle Society
  - Law for Promotion of Effective Utilization of Resources
  - Law for Promotion of Recycling and Related Activities for Treatment of Cyclical Food Resources
  - Law for the Promotion of Sorted Collection and Recycling Containers and Packaging
  - Law concerning Special Measures for Promotion of Proper Treatment of PCB (polychlorinated biphenyls) Wastes (PCB Special Measures Law)
  - Law to Promote the Development of Specified Facilities for the Disposal of Industrial Waste
  - Law for the Control of Export, Import and Others of Specified Hazardous Wastes and Other Wastes
- Water, Soil and Ground
  - Water Pollution Control Law, revised in 2010 to address water quality related accidents and effluent management. Further revised in 2011 to strengthen groundwater quality management
  - Agricultural Land Soil Pollution Prevention Law
  - Law relating to the Prevention of Marine Pollution and Maritime Disaster
  - Law concerning the Regulation of Pumping-up of Groundwater for use in Buildings
  - Law concerning Special Measures for the Conservation of Lake Water Quality
  - Johkasou Law enacted in 1983, which regulates the application of Johkasou systems for wastewater treatment
  - Law concerning Special Measures for Conservation of the Environment of the Seto Inland Sea

ICM Implementation

Integrated coastal management is currently being implemented in Tokyo Bay, Osaka Bay, Ise Bay, Hiroshima Bay and Seto Inland Sea, among others.

Financing Mechanisms

- The national government provides subsidy to local governments to ensure the implementation of required programmes, policies and relevant legislations.

    - Law for Reparation and Compensation of Damage by Oil Pollution
    - Soil Contamination Countermeasures Act
    - Law concerning Special Measures for Water Quality Conservation at Water Resources Area in Order to Prevent the Specified Difficulties in Water Utilization
    - Law concerning Special Measures for the Rejuvenation of Ariake Sea and Yatsushiro Sea

- Health and Chemicals
    - Law concerning Special Measures against Dioxins
    - Law concerning Reporting, etc., of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management
    - Law concerning the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. (Chemical Substances Control Law)
    - Law concerning Special Government Financial Measures for Pollution Control Projects
    - Pollution-related Health Damage Compensation Law
    - Law concerning the Settlement of Environmental Pollution Disputes
    - Law concerning Entrepreneurs' Bearing of the Cost of Public Pollution Control Works
    - Law concerning Provisional Measures for Promotion of Administrative Work on Certification of Minamata Diseaser

Information and Public Awareness (MOE, 2012)

- Law 130 enacted in 2003 for Enhancing Motivation on Environmental Conservation and Promoting of Environmental Education
- Law 77 enacted in 2004 Concerning the Promotion of Business Activities with Environmental Consideration by Specified Corporations, etc., by Facilitating Access to Environmental Information, and Other Measures

Capacity Development

- Several institutions in the country has been providing coastal management related trainings, including:
    - Japan Academy for Municipal Personnel
    - Training Center on Environment, National Institute for Environmental Studies

Sustainable Development Aspects

Natural and Manmade Hazards

- Japan is located in the Circum-Pacific Mobile Belt where seismic and volcanic activities occur constantly. Due to geographical, topographical and meteorological conditions, the country is also subject to frequent natural hazards such as typhoons, torrential rains and heavy snow (Cabinet Office, Government of Japan, 2012).
- On March 11, 2011, a magnitude 9.0 earthquake hit the country and triggered a devastating tsunami. More than 10,000 people were confirmed dead and several thousands of people were injured and missing.
- Environmental sensitivity maps for oil, and hazardous and noxious substances spill were completed for the entire country in 2012.
- 47 prefectures and several dozen municipalities have developed local action programs to reduce GHG emissions generated in their jurisdiction.

Challenges and Opportunities: Natural and Manmade Hazards

- Implementation of the Disaster Countermeasures Basic Act

Habitat Protection and Management

- As of June 2012, a total of 37 Ramsar sites were established in the entire country covering about 131,027 ha.
- Definition of marine protected area in Japan was defined by the Ministry of Environment in March 2011 and approved by the Headquarters for Ocean Policy in May 2011. The coverage of the area is 369,200 km^2. This is about eight percent (8%) of the total territorial waters and EEZ of the country.
- 13 model projects for creating *Sato-umi*[1] were conducted by eight local public organizations that work with the community from 2008 to 2010.

Water Use and Supply Management

- Due to rapid increases in population and economic growth, per capita water usage volume in the domestic sector has tripled between 1965 and 2008 (MLIT, 2011).
- 100 percent of the country's river basin have watershed management programs
- The municipal water supply service coverage rate (by population) of Japan exceeds 97%, but public concerns over safer and better tasting water have increased in recent years, making it imperative to improve the water quality of the rivers, lakes and reservoirs, which function as the country's main water sources (WEPA, 2012).
- A recent revision to water pollution control law strengthened measures in the event of accidents, record-keeping of effluent monitoring data, and preventive measures against groundwater pollution (WEPA, 2012).
- EQS[2] for human health have been attained with a 98.9% compliance rate in fiscal year 2010.

Challenges and Opportunities: Habitat protection and management

- Implementation of the 4th National Biodiversity Strategy 2010. The following are the main components of the Strategy:
  - Mainstreaming biodiversity in our daily life
  - Rebuilding sound relationship between human being and nature in local communities
  - Securing linkages among forests, country sides, rivers and the sea
  - Enhancing conservation and restoration of marine biodiversity
  - Taking actions with global perspective

EQS for conservation of the living environment have been achieved with an 87.8 5% rate of compliance for BOD or COD, the representative water quality indicators of organic contamination. Compliance rates by types of water bodies were recorded as 92.5% for rivers, 53.2% for lakes and reservoirs, and 78.3% for coastal waters. Although the compliance rate for rivers is high, the rate for lakes and reservoirs remains low (WEPA, 2012). The compliance rate for total nitrogen and total phosphorus for lakes and reservoirs was low at 50.4%. In contrast, the achievement rate for total nitrogen and total phosphorus in coastal waters was 81.6%, which has been the trend in recent years.

- Of the 3,733 wells that were tested in 2010, 256 (6.9%) exceeded standards for some EQS.

Pollution Reduction and Waste Management

- More than 75% is the coverage rate of sewerage treatment in Japan (WEPA, 2012).
- Japan's Five Year Plans for Sewerage Development were established in 1963, including sewage treatment facility provision objectives and

Challenges and Opportunities: Pollution Reduction and Waste Management

see Water Use and Supply Management

budget allocations for each period. This plan was completed in 2003. At present, a plan is drafted for each prefecture that establishes objectives for maintenance of domestic wastewater treatment facilities and budget, as well as an "Overall Plan for Provision of Sewers by Catchment Area" (WEPA, 2012).

- About 100% of the population have access to garbage collection services.
- According to the municipal waste statistics in 2007, the total amount and daily per capita solid waste were on a downward trend, i.e, total amount (50,820,000 tons per year) and daily per capita (1,089 grams) solid waste generation were 2.3% and 2.4% less than in 2006. The recycling rate on the other hand is steadily increasing with a 0.7% (20.3%) increase in 2007 from the recycling rate in 2006. The final disposal amount (6.35 million tons) was also 6.8% lesser than disposal amount from the previous year (Government of Japan, 2009).
- Total pollutant load control system (TPLCS), which was introduced in 1979, is being implemented in Tokyo Bay, Ise Bay, and Seto Inland Sea. In addition to COD_{Mn}, T-P and T-N became target items of the TPLCS in 2001. The 7th TPLCS basic policy was set forth in 2011.

Monitoring and Evaluation

- Japan Challenge Program launched in June 2005 is a program to facilitate the collection and dissemination of safety information of 645 Priority Information Gathering Substances selected from among existing chemical substances as needing to collect and disseminate safety information with high priority. An online database titled "J-CHECK (Government of Japan, 2009) is available for information dissemination.
- Prefectural governments carry out regular water quality monitoring in cooperation with relevant

Challenges and Opportunities: Food Security and Fisheries Management

- Based on the Basic Fisheries Plan developed in March 2012, the Government will work to establish sustainable fisheries.
- Under the measures on resource management and fishery income compensation, the Government will work to promote conservation and management of resources for sustainable use.

national government organizations based on monitoring methods specified by the Ministry of Environment (MoE). Monitoring results at approximately 7,000 locations in public water bodies nationwide are publicly released on the website of MoE (WEPA, 2012).

- About 20 to 30 substances that are potentially hazardous to human health or the ecosystem are selected and assessed annually. By September 2009, the assessment results on 250 substances have been published (Government of Japan, 2009).
- Environmental survey and monitoring of chemicals, was also launched in 2002, which is comprised of three surveys namely: the initial environmental survey; the detailed environmental survey; and environmental monitoring (Government of Japan, 2009).
- Under the revised Water Pollution Control Law in Japan in 2010, the recording of effluent monitoring results became mandatory for all pollution sources (WEPA, 2012)

[1] *Sato-Umi* – Coastal zones where the land and coastal zone are managed in an integrated and comprehensive manner by human hands, with the result that material circulation functions are appropriately maintained and both high bio-productivity and biodiversity are conserved.

[2] EQS – The Basic Environment Law set environmental quality standards (EQS) as the acceptable water quality levels that should be maintained in public waters and groundwater. Two types of EQS include: those for human health, which are uniform standards applicable to all public water bodies throughout the country; and those for conservation of the living environment, which are applied to all public water bodies according to water use classifications.

Challenges and Opportunities (WEPA, 2012): Water Use and Supply Management

- Strengthening measures to mitigate the deterioration in lake water quality, i.e., the compliance ratio to environmental standards remains at around 50%.
- Creation of better initiatives to improve/protect the water environment in response to the diverse needs of communities and recent social transitions, including ensuring an environmentally sound water cycle.
- The following targets are also identified in the Water Plan 21 (2010-2015):
    - Establishment of sustainable water use systems. To enable stable use of safe water in each area or basin, a target level for stable water utilization is to be established, and thereby comprehensive measures to increase the amount of water that can be steadily supplied are to be promoted based upon regional consensus.
    - Conservation and improvement of water environment. In order to realize multilateral functions of water, to preserve water environment by securing "water for environmental use" and to maintain the quantity and quality of water supply by preserving and developing water sources including groundwater are to be promoted.
    - Revival and fostering of water-related culture. Along with the activities indicated above, efforts to create renewed awareness among the public about the relationship between humans and water and to invite more attention to the importance of water are to be made, while encouraging voluntary participation of the public in those activities, thus paving the way for public understanding and support concerning activities for preservation and improvement of the water environment.

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Lao PDR's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2011)

Basic Facts

Total Population	6.38 million in 2011
Forecast Population	7.079 million (2015)
Land Area	236,800 km^2
Percentage of population living within the Mekong catchment in Laos:	50% (3,026,000)
Number of river basins	12 major tributaries/river basins of the Mekong which are completely or primarily in Lao PDR with the catchment areas exceeding 4,000 km^2.

National Economy

GDP per capita (year)
US$ 609.47 (2010)
GDP growth (past five year average)
4.4%
GDP composition by sector (2011 est)
Agriculture (27.8%); Industry (34.8%), Services (37.4%) (World Bank 2010)
Employment by sector
Agriculture (64%); Industry (10%); Service (26%)

Seventh National Socioeconomic Development Plan 2011-2015

The 7th National Socioeconomic Development Plan (2011-2015) identifies six priority areas where efforts, attention and resources are needed.

1. Expanding the reach of the enabling infrastructure for MDG achievement: this includes Community-based Road Construction and Maintenance; Extending Sustainable Energy Services for Poor and Vulnerable Households.
2. Sustainable practices for improved food security and environmental sustainability: it includes improving the incomes of the rural poor; improving and diversifying agricultural practices for smallholder farmers; strengthening community-based food security and entitlements; increasing the adaptive capacity of the agriculture, forestry, water and water resources and public health sectors to climate change.
3. Universal Access to Basic Education and Gender Equity: there are a number of actions here such as equitable access to education services, improved quality and efficiency of education services, ensuring equal access of girls and women at all levels of education.
4. Women's Equal Participation and Empowerment: including temporary special measures, gender equality in employment, sensitization on domestic violence.
5. Social Protection and Community Involvement for Improved Maternal and Child Health: strengthening community involvement; bringing Mother and Child health centers closer to the poor and most vulnerable groups; and improving the nutrition of women and children.
6. Safe Water Supply and Improved Sanitation for all Rural Areas and Small Towns: increase investment in physical infrastructure for water and sanitation; promoting integrated water supply and sanitation at central and local levels; promoting community-based water supply and sanitation initiatives in rural areas and small towns; promoting community-led sanitation; providing training and awareness-raising campaigns for hygiene, water supply and sanitation for all sectors of society.

Progress in SDS-SEA Implementation (2003-2011)

National Ocean Policy and Institutional Arrangements

- Policy on Water and Water Resources prepared in September 2000 for the Implementation of the Water Sector Action Plan.
- There are two institutional arrangements for coordinating water management in Lao PDR:
  - River Basin Committee manages of all major rivers and river basins both within and outside the Mekong River. It aims to coordinate with various agencies and organizations on the management of water resources.
  - Lao National Mekong Committee (LNMC) which aims to manage and coordinate sub-basin management of Mekong tributaries in Lao PDR. This body also coordinates with the Mekong River Commission on implementation of projects and programs.
- Prime Minister Bouasone Bouphavanh signed Decree No. 293 on 15 June 2010, on the Establishment and Activities of the River Basin Committee, which:
  - Sets in place an intergovernmental and multisectoral body to sustainably manage the priority river basins and sub-basins of the country.
  - The Decree on the Mandates and Obligations of the River Basin Committee (RBC) outlines the responsibilities, duties, jurisdictions, organizational structure and working methodology of the River Basin Committee to promote water resource management through systematic planning and implementation.
- International coordination of water resource management is mainly through the Mekong River Commission and the National Mekong Committees of the member countries under the 1995 Chiang Rai Agreement.
- The draft National Water Resources Policy, Strategy and Action Plan for the Years 2011 to 2015 was submitted to the National Assembly for review and consideration in July 2010.
  - Expresses the vision, mission and principles of water resources management in Lao PDR.
  - Identifies nine (9) major action programs to achieve sustainable water resource management including setting up and strengthening of a governance mechanism, including updating of the Water Law, promotion of sustainable financing through user fees and permit system for water use, capacity development, awareness building and stakeholder participation.

Water-related Supporting Sectoral Policies, Legislation

- **Figure 1** shows the relationship of major laws, policies and strategies relevant to SDS-SEA.
- Law on Water and Water Resources and Implementing Decree (LWWR)
  - Issued by National Assembly on 11 October 1996, which determines principles, rules and measures relative to the administration, exploitation, use and development of water and water resources.
  - Promotes a comprehensive and integrated approach for managing water and water resources use.
  - Presents a catchment management approach to water sources planning and management by determining three types of catchments as: the Mekong basin situated within the Lao territory; a tributary catchment of the Mekong River or other rivers situated within the Lao territory; and a branch catchment (a river that flows into a tributary of the Mekong River or into another river situated within the Lao territory).

- Introduces the concept of right for water use without priority given to any type of use. However the use of water for electricity production and for irrigation is subject to specific regulations. It is also mentioned on Funding for the Preservation of Water and Water Resources in which the developer or user must contribute.

- The responsibilities assigned by the LWWR to the Government of Lao for managing water and water resources are comprehensive, which include, among others:
  - Determination of the allocation of water and water resources (Article 12);
  - Development of water sources and management of water sources development activities (Articles 20 and 23);
  - Promotion of the establishing of water reservoirs by the population (Article 26);
  - Approval of large-scale water use and medium-scale that is important (Article 18);
  - Approval of medium-scale diversion, separation and modification of water flow (Article 27);
  - Approval of the removal of people from an area of water sources development (Article 28);
  - Protection of water and water resources, with the determination of protected and reserved areas; in this connection, a certain number of prohibitions is prescribed (Articles 29, 30 and 31);
  - Approval of the establishing of the Funds for Water Sources and Water Resources Protection (Article 24);
  - Determination of quality standards for drinking and waste water (Article 32);
  - Prevention of and fight against damages caused by water, which include: prevention of flooding, prevention of and fight against erosion and prevention of pollution (Articles 39, 40, 41 and 42);
  - Monitoring and inspection of the implementation of measures prescribed by laws and regulations relating to water resources development (Article 43);
  - International co-operation relating to the use, management, protection and development of water and water resources (Article 44);
  - Settlement of domestic and international disputes relating to water and water resources (Articles 38 and 45).

- To ensure the efficiency implementation of the LWWR, the Prime Minister Decree No. 204/PM was issued on 9 October 2001. This decree determines responsibilities of Ministries and Agencies, as well as local authorities on water and water resources management, exploitation and development the objective for sustainable use of water and water resources.

Environmental Protection

- The Environment Protection Law (LEP) was issued on 3 April 1999 to prevent any events that could potentially destroy or deteriorate the social and natural environment, and to maintain a clean, unpolluted environment with no harmful effects for human, animal and vegetal health and for ecosystem balance.

- The LEP states the obligation of individuals and organizations to protect the environment, to make rational and economical use of natural resources and to protect biodiversity.

Lands

- The Law on Lands adopted 12 April 1997 and amended on 21 October 2003. It determines the principles of land ownership, management, registration and certification, and the right of land use. It also classifies land into areas and categories, among which are lands related to water and water resources. These include lands adjacent to waters: beds, water sources banks and river banks, lake shores, islands, new lands, lands left by the drying up of rivers or lakes, or built up by alteration or diversion of river flow.

Forestry

- The Forestry Law (FL) was issued on 11 October 1996 and determines the basic principles and measures relating to the management, protection and utilization of forest resources and lands.
    - Classifies forest into categories including the Protected Forest, which is aimed at protecting water sources and preventing soil erosion.
    - Indicates that the Protected Forest must be strictly protected.
    - Persons who obtained the right to utilize forest and forest lands have the obligation to do it in accordance with the provisions of the contracts and the law, and to protect water sources, aquatic and wild animals and the environment.

Mining

- The Mining Law (ML) issued on 12 April 1997 determines the system of management, preservation, exploration, exploitation and processing of minerals for local consumption and export. It also stresses the obligation for persons conducting mining activities to protect the environment and, in case of changes to the ground, to improve and rehabilitate it.

Agriculture

- The Law on Agriculture (LA) adopted on 10 October 1998, specified principles, rules and measures regarding to organization, management and preservation of agricultural activities and production for social and economic development. This law stipulates that the use of irrigation in agricultural production must be in accordance with the provisions of the LWWR and the LEP.

Electricity

- The Law on Electricity (LE) (12 April 1997) determines the regime of management, production, transmission and distribution, including export and import of electricity through the most effective use of natural resources. The LE stipulates that investors in electricity production have the obligation to protect the environment, namely to assess the impact on the natural environment, on the ecosystem, to limit the impact on society and wildlife habitat. The law further includes environmental impact assessment which should include ways and means to limit the risks of flooding in areas below the hydropower dam — which may be high during the rainy season — by digging irrigation canals, or other means in order to divert the water flow when necessary.

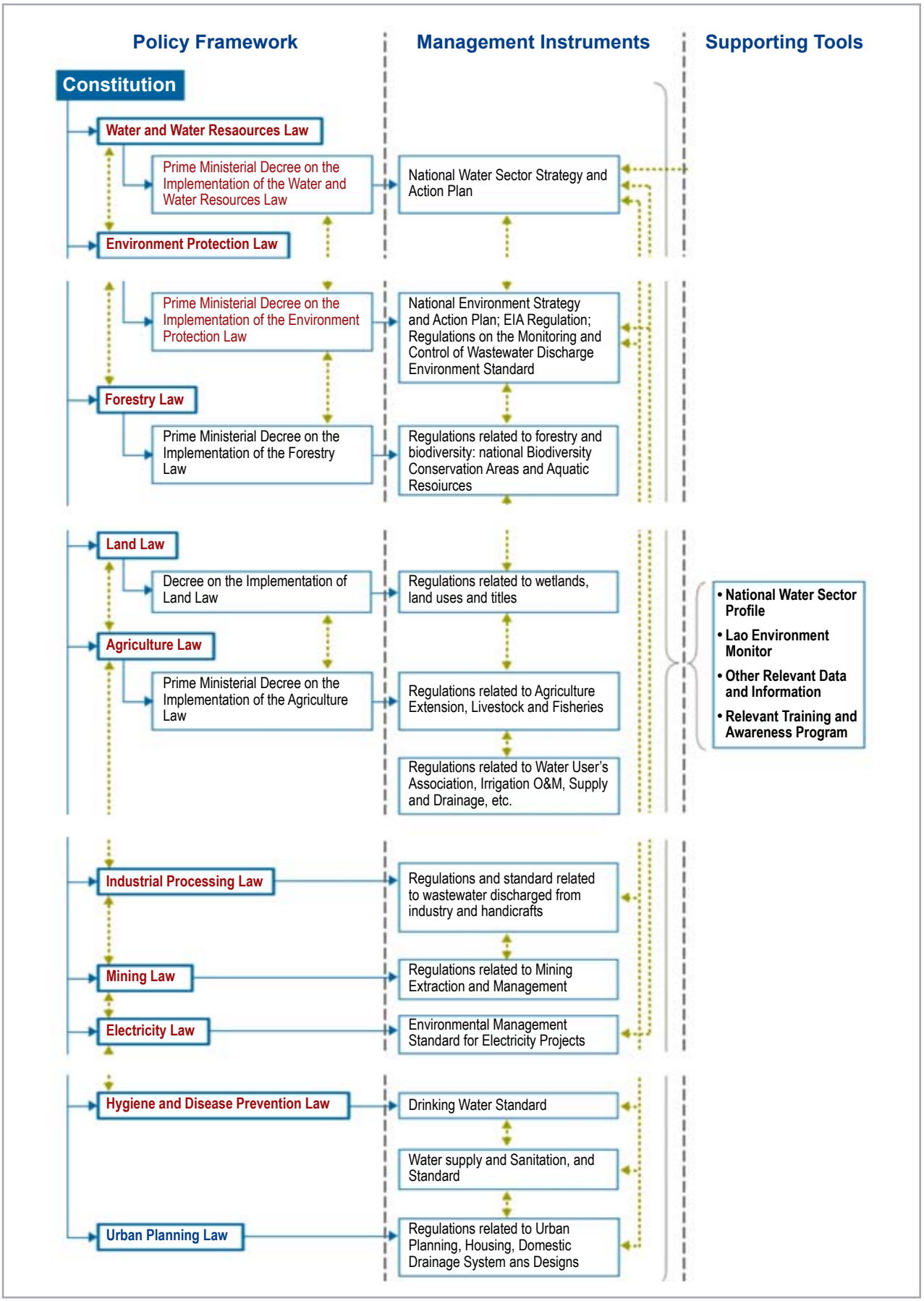
ICM Implementation

- National IWRM included in the Five-year National Water Strategy and Action Plan under consideration of the Government.
- Integrated Water/Riverbasin Management implemented in the following:
    - Sedone Riverbasin covering the three provinces of Saravanne, Champasack and Sekong with a total catchment area of 7,229 km^2 (PEMSEA)
    - Nam Ngum Riverbasin with a catchment area of 16,906 km^2
    - Nam Theun-Nam Kading with a catchment area of 14,820 km^2

Climate Change/Disaster Risk Reduction

- National Disaster Management Committee (NDMC) assignment No 097/MLSW dated 30 June 2000.
- Decree on Establishment of National Disaster Management Committee.
- A Strategic Plan on Disaster Risk Management (SPDRM) was adopted in 2003.
- The Country Strategy Note on Disaster Management No 1139/MLSW dated 18 April 2003.
- Climate change and adaptation initiative steering committee and pilot project being implemented in Savannaketh, supported by the Mekong River Commission in 2010.

Figure 1: Laws and Policies related to Environmental Management in Lao PDR.



Biodiversity/Habitats

- Forest Vision for 2020 (2000)
- 5th National Socioeconomic Development Plan (2001)
- Implementing Decree of the Environmental Protection Law (2001):
- Agriculture and Forestry Sector Development Plan (2001)
- National Environment Strategy/National Environmental Action Plan (NES/NEAP)
- National Biodiversity Strategy to 2020 and Action Plan to 2010 (NBSAP)
- National Growth Poverty Eradication Strategy (NGPES)
- National Forestry Strategy and Integrated Agriculture Development Strategy
- Establishment of the NBCA (now NPA) system
- Draft National Environmental Quality Monitoring Program (NEQMP) 2003-2010
- National Environmental Strategy up to the year 2020
- Environment Action Plan 2006-2010

Fisheries

- Wildlife and Aquatic Animals Act 2008

Water Resources Management

- National Strategy for Rural Water Supply and Environmental Health Sector (June 2004)

Pollution Reduction and Waste Management

- Industrial Waste Discharge Regulation (No.180/MIH) 1994
- Guidelines for Hospital Waste Management (1997)

Financing

- The water use fee study is being underataken by DWR to review and assess possible user fees for water use. The results of the study will pave the way for establishing a Water Fund in the future.
- The Round Table Process and its associated Round Table mechanisms facilitate meaningful dialogue on Official Development Assistance (ODA), aid effectiveness, strategic planning and alignment. The Round Table Process serves as the primary platform for aid effectiveness in the Lao PDR. It is led by the Government of the Lao PDR and co-chaired by the UNDP.

- Regulation on the Monitoring and Control of Waste Discharge (No.1122/STENO) 1998
- Industrial Law (1999)
- Decree on the Management of Solid Waste and the Cleaning of Public and Residential Areas

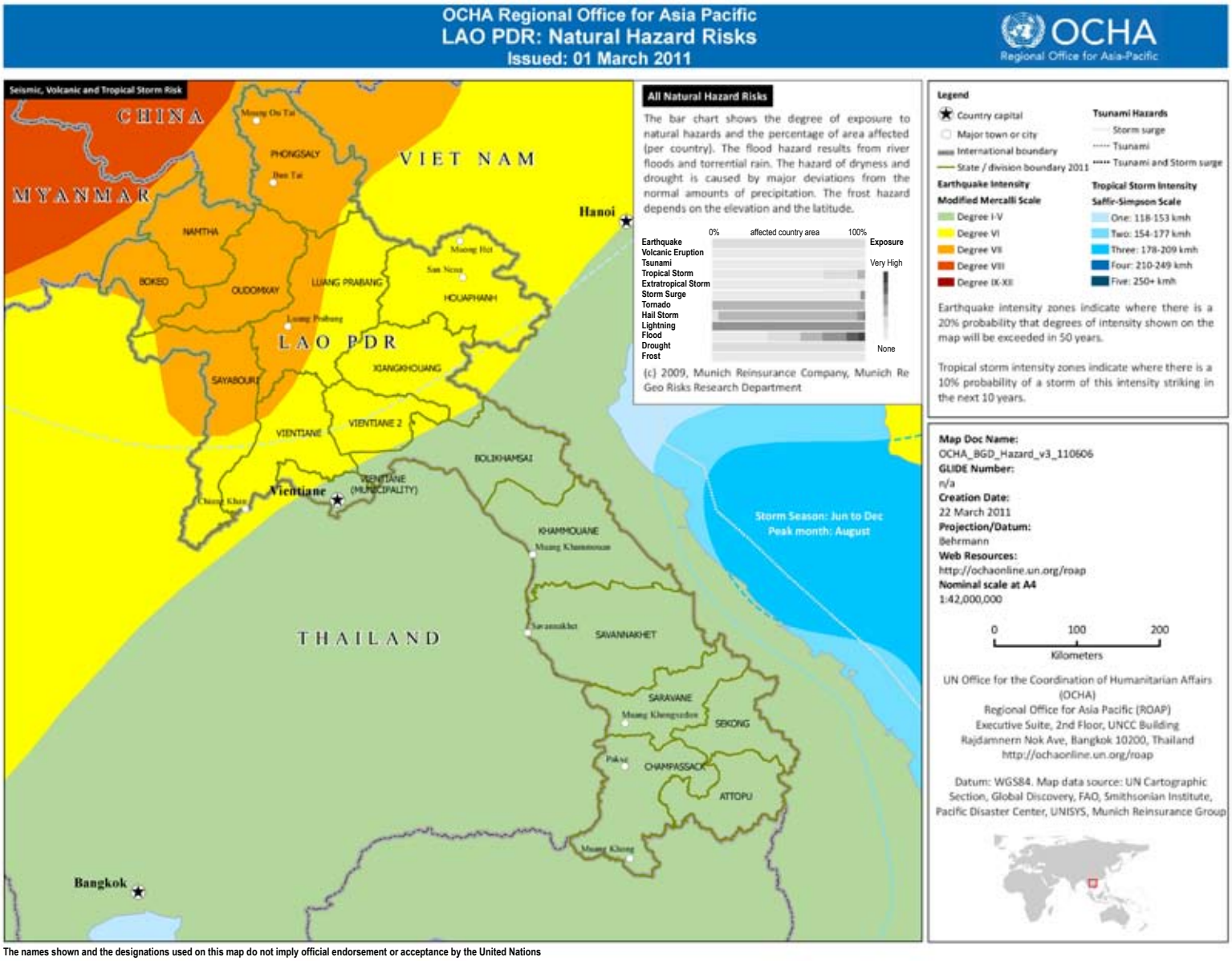
Capacity Development

- The IWRM capacity building supported by ADB is now being implemented under Department of Water Resources (DWR), MoNRE.
    - The needs assessment on IWRM is being conducted at the national and provincial levels (MoNRE) which will be the basis of the capacity development program for IWRM;
    - In parallel with that activity, the National University of Laos, including various faculties and centers, is currently working with the DWR in developing a curriculum on IWRM, as part of an undergraduate degree course.

Monitoring and Reporting

- National Water Profile developed in 2008 by the Water Resources and Environment Administration.

Figure 2: Composite Map of Hazards in Lao PDR.



- Four (4) water quality laboratories established
  - Department of Irrigation (irrigation water)
  - Nam Papa (raw water)
  - Department of Hygiene and Environment (drinking water). There are 34 monitoring stations: 4 in Mekong River, 15 in major tributaries and 10 other places.

- Local State of the Coasts/Riverbasin reports
  - State of the Riverbasin for Sedone developed in 2012 guided by PEMSEA's State of the Coasts Reporting System.
  - Riverbasin profiles have been developed for Nam Ngum Riverbasin and Nam Theun-Nam Kading and Nam Xong sub-riverbasin.

Sustainable Development Aspects

Natural and Manmade Hazards

- A 2011 report of the United Nations Office for the Coordination of Human Affairs (OCHA) details the natural and manmade hazards in Lao PDR (**Figure 2**).
- Hazard mapping and risk assessment conducted for Lao PDR.
- Development of a National Adaptation Program of Action (NAPA) with 48 priority projects.

Habitats and Biodiversity

- Lao PDR's conservation area (**Figure 3**) covers approximately 21% of the total land area, 13% of which are considered to be National Protected Areas (NPA).
- The first NPA projects in Lao (with GEF and bilateral donor support) were among the first in the world to completely embrace the concepts now generally termed Integrated Conservation and Development Projects (ICDPs).
- About 276 areas of locally significant conservation or watershed value have been designated as conservation or protection forests at the provincial and district level:
  - **Figure 4** summarizes the National Protected Area Management Structure.
  - All NPAs have been surveyed, mostly with strong local participation.
  - To date, eight (8) NPAs have received major financial and technical support over several years, eight others have received intermittent management support and four have received little or no support.

Challenges and Opportunities: Natural and Manmade Hazards

- Strengthen the National Disaster Management Committee (NDMC), which is an inter-ministerial committee responsible for policy formulation and disaster management, and the National Disaster Management Office (NDMO), the secretariat to the NDMC.
- Operationalizing Strategic Plan for Disaster Management in Lao PDR.
- Implementation of the major components of the National Flooding Plan, which includes:
  - Construction and improvement of disaster warning stations, and stations to gauge the flow of the Mekong River and its tributaries.
  - Automatic collection and dispatch of data through satellites at the 13 existing stations in the whole Lao PDR territory.
  - Refine the prediction of flooding through the installation of internet connections at the 13 stations.
  - Ensure a nation-wide system of flood mitigation.
  - Compile statistics and data logs on water levels and flow rates.
  - Water drainage construction plan in Vientiane Capital.
  - Construction flood control locks in Bolikhamsay Province
- Promote a low carbon society and building resilience of ecosystems, communities and vulnerable sectors **to adverse impacts of climate change.**

Challenges and Opportunities:
Habitats and Biodiversity

- Provincial protected areas (including Provincial Conservation Forests) have no national legal framework and variable provincial legislative framework.
    - Limited assistance or development of provincial and district PAs.
- High reliance on donors for implementation. In 1999 there were 11 ongoing management projects, but by mid-2001, there were only three or four.
- The VIII Party Resolution, NES, and NBSAP, as well as the NSEDP itself support the Forest Strategy in requiring protection, conservation and sustainable management of forest resources. At the level of actions specified in each of these documents, there appears to be a significant degree of overlap, with no indication of how responsibility for each of the recommended actions is to be allocated.

Figure 3: National Biodiversity Conservation Areas.

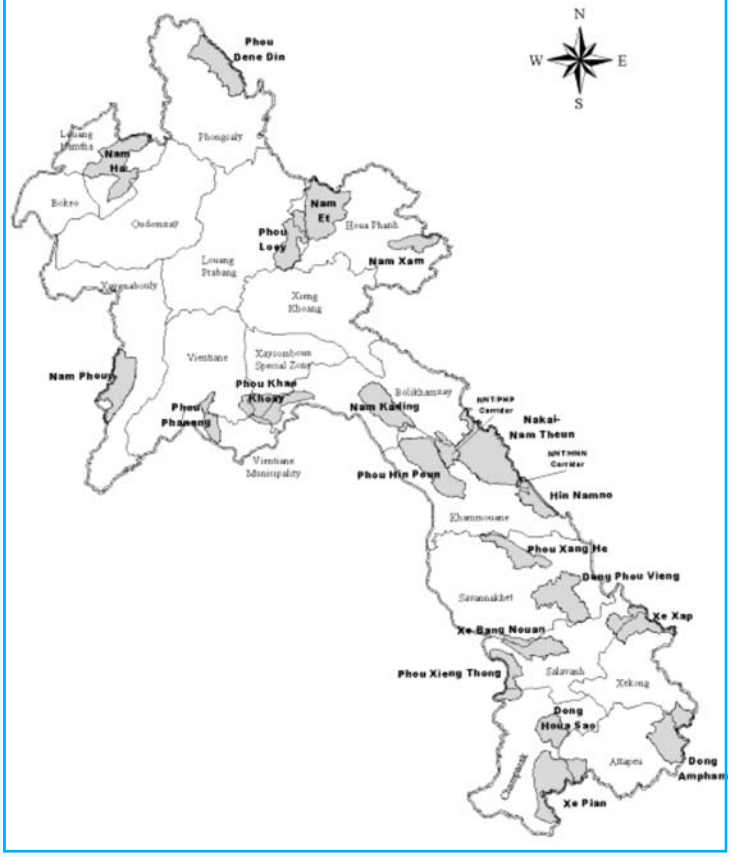
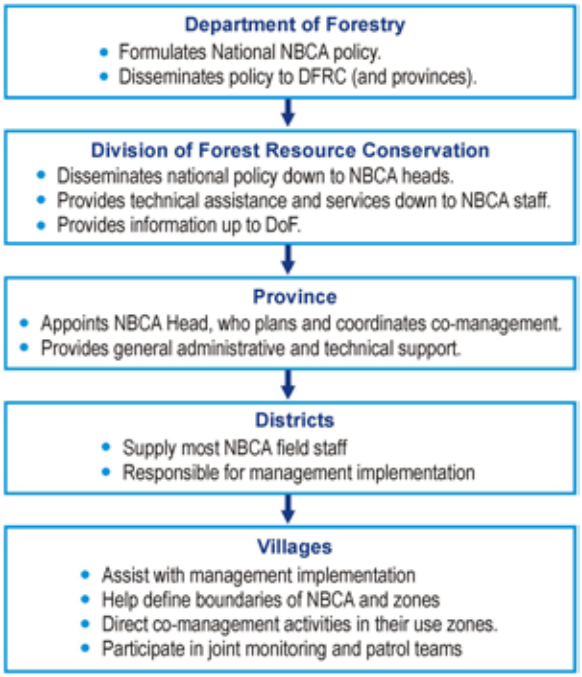


Figure 4: National protected area management structure.



- Integrated Conservation and Development Projects (ICDPs) as well as Participatory Management Projects have been piloted in at least nine (9) NPAs.

Food Security, Fisheries and Livelihood

- Rural households in Laos mainly rely on their own production as a source of food. Rice production is the main livelihood activity of the majority of rural households.
- A substantial amount of purchases at markets are made for food items (45%).
- 42% of the total animal protein intake comes from fish. Aquaculture contributes 40% of the total fish consumption.
- To date, the regulation of the fisheries sector has been treated as a subsector of forestry with fisheries regulations being adopted under the Forestry Law 1996.

- Lao PDR's food security is directly linked to environmental management, particularly the conservation of its forests and rivers.
    - Conservation and sustainable harvesting of Non-Timber Forest Products (NTFPs) and wildlife can contribute greatly to food security and thus, poverty alleviation. Nam Et and Phou Loei NPAs are good examples:
        - Each NPA household consumes an annual average of 165 kg of wild plant products and 141 kg of wild meat.
        - Valuing these home-consumed items at local market price equivalents suggests that the total subsistence value of NPA resources for Vienthong District households ranges between Kip 1.9 million (US$ 237.5) for NPA-adjacent villages to Kip 4.6 million (US$ 575) for villages that are inside the NPAs, with an average household value of Kip 3.1 million kip (approx. US$ 387.5) per year across the District.

Water Supply/River Basin Management

- The average annual rainfall is 1,935 mm or 462 km^3, and from this, average runoff is 1,055 mm or 250 km^3;
- The average river inflow to the country is 73 km^3 from China (Mekong), 9.5 km^3 from Myanmar (Mekong). The total national annual surface water supply (national runoff plus inflow from other countries) is therefore 332.5 km^3.
- Average annual river outflow to other countries is 18 km3 to Vietnam (from outside the Mekong River Basin), 29 km3 to Cambodia in the Sekong River and 330 km3 to Cambodia in the Mekong River.
- Despite abundant water supply, distribution of water is still a main problem in Lao PDR. As indicated in **Figure 5**, agriculture is the main user of water in Lao PDR, and as such, limited access will lead to serious problems in the agricultural sector.

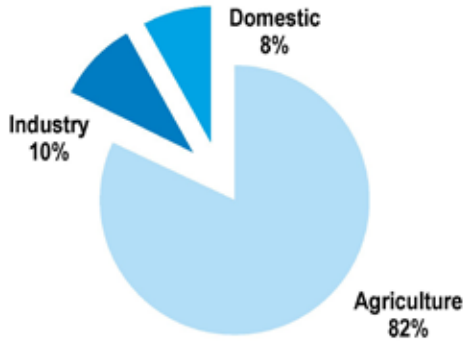
Challenges and Opportunities:
Food Security, Fisheries and Livelihood (National Water Profile)

- Large parts of the country are characterized by uplands and are only suitable for shifting cultivation and forestry development. Also, large areas of the country are unsafe as they are contaminated with unexploded ordinance (UXO).
- The Lao PDR has a very poor transportation infrastructure, which is a major obstacle to accessing markets and to developing integrated domestic markets. This also limits access to export markets.
- Government needs to look at the fishery sector and its potential in promoting food security and poverty reduction. The policy should consider:
    - Supplying more aquatic animal protein to the rural population, particularly to strengthen rural farming communities and deep pool management.
    - Contribution of fisheries to poverty reduction.
    - Gradual integration of sustainable aquaculture farming into agricultural mixed farming.
    - Supplementary food supplies to the growing urban population by promoting peri-urban semi-intensive aquaculture.
    - Measures to eliminate the use of illegal and destructive fishing gear and practices, introduction of rights-based fisheries in some important reservoirs and fishing grounds.

Challenges and Opportunities: Water Supply/River Basin Management

- Targets have been set under the Strategic Framework for National Sustainable Development Strategy for Lao PDR for water resources management, including the following:
  - Complete inventory and survey (5 million ha by 2010) for integrated water resources management
  - Develop a master plan on management and utilization of water and water resources by defining water course, watershed, water catchments, river, stream, lake, wetland and underground water areas.
  - Develop and implement policy, laws and regulations, strategy and action plan on the use and protection of water and water resources.
  - Develop legislation to deal with conflicts or disputes over ownership and use of water and water resources.
  - Develop and promote research on the use of water and water resources
  - Promote the use of technology that has minor negative impacts on water and water resources.
  - Develop environment quality monitoring and guidelines for the management of water and water resources.
  - Develop and implement environment and social assessment regulations for hydropower dam and irrigation system.
  - Develop and implement hydropower plan on environmental scientific and technological research.
  - Carry out research on protection, exploitation, and utilization of water resources to ensure sustainable development and effective economic development.

Figure 5: Water Withdrawal by Sector.



Source: FAO

  - Assess the downstream impact of catchment deforestation.
  - Assess the impact of infrastructure development.
  - Tripling of the wet season and a doubling of dry season irrigation in the longer term.
  - Modest increases of wet season (4.6%) and dry season (1.4%) irrigation are planned between 2006 and 2010 to increase the extent of high value and cash crop production.
- Implementation of the Water Supply Investment Plan (2005-2020) to:
  - Achieve geographical equity in social infrastructure provision, support rural development and stimulate economic development in the small towns;
  - Focus on poor districts and on small urban centers located in growth corridors and emerging centers; and to
  - Continue to invest in the water supply systems of Vientiane, the provincial capitals in response to the rapid urbanization in big urban centers.

Pollution Reduction/Waste Management

- Annual waste generation in 2004 was 270,000 tons.
- Domestic waste accounts for the bulk of materials generated. The average urban waste production in Lao PDR is 0.75 kg per capita per day.
- Vientiane and the four secondary towns account for 0.8-1.4 kg per capita per day.
- Approximately 70 percent of municipal solid waste consists of plastic, paper, glass, cans and metals, which have the potential to be recycled commercially, and reused in various manufacturing and industrial activities.
- Solid waste in Lao PDR comprises mainly of organic material, plastic, paper, glass, cans and other metals. Hazardous and toxic wastes such as batteries, old paint cans, aerosols and other refuse are also mixed with these wastes.
- Current scale of recycling in Lao PDR is still very modest.
- Based on survey of 57 urban areas, only Vientiane City and the four secondary towns of Luangprabang, Thakhek, Savannakhet and Pakes use landfills for solid waste disposal.
- The average collection rate for urban households in the five larger urban areas is 45 percent. Only in Luangprabang has a collection system that services more than 50 percent of the households.

Challenges and Opportunities: Pollution Reduction/Waste Management

- Collection services are limited to accessible areas and profitable target groups such as markets and high-income households. There is a need to establish waste management system in other urban areas in the country.
- Disposal areas are small, and have no leachate collection and monitoring wells. Elsewhere, open dumping and burning are common practice for waste disposal. Hazardous and infectious wastes are often disposed with municipal waste. Improper waste disposal results in environmental impacts, such as ground water contamination, leachate, odor and production of methane, which increase the risk of diseases and accidents.
- On-site wastewater treatrment and disposal facilities, mainly septic tanks, are often poorly designed, constructed and maintained and therefore perform badly. In addition, discharges from some major industrial mining establishments are also polluting water sources.
- A national policy on Integrated Waste Management is a priority.

Priority Issues for the Next Five Years for SDS-SEA Implementation in line with the country's draft National Water Strategy and Action Plan

- The National Water Strategy and Action Plan (NWSAP) addresses these key issues and focuses on five major riverbasins in the implementation of on-the-ground IWRM/IRBM. This includes:
  - Nam Ngum Riverbasin;
  - Nam Theun-Nam Kading;
  - Nam Ou;
  - Sebangfay-Sebanghieng; and
  - Sedone
- The NWSAP focuses on the following key areas:
  - Institutional strengthening and coordination
    - Support the Lao National Mekong Committee as the coordinating mechanisms on water management in the country
    - Review and Update Government Organization Roles
    - Strengthen WREA Water Resource Units and River Basin Institutional Arrangements for Water Resource Management
    - Strengthen Regional and International Coordination and Partnerships
  - Strengthening legislation, plans and implementation
    - Update National Water Legislation
    - Incorporate Water Resource Topics in National and Local Plans
    - Develop Procedures and Guidelines on Water Resource Management Topics
    - River Basin and Sub-basin Water Resource Planning
    - Develop River Basin Planning Procedures and Priorities
    - Carry out River Basin Planning, Implementation and Monitoring
  - Data collection and analysis
    - Strengthen Monitoring Capacity
    - Strengthen Water Resource Decision Support Capacity
    - Assess National Water Resources
  - Water allocation:
    - Prepare Water Allocation Procedures and Guidelines
    - Implement Water Permits
  - Protection of water quality and ecosystems
    - Assess Water Quality and Ecosystem Health Needs
    - Implement Water Quality and Ecosystem Health Procedures and Action Plan
  - Management of water resource risk
    - Manage and Mitigate Flood Impacts
    - Manage and Mitigate Drought Impacts
    - Manage Water Resources to Mitigate and Adapt to Climate Change
  - Financial aspects of water management
  - Awareness, participation and capacity development
    - Strengthen Public Awareness and Participation
    - Carry out Capacity Building for Concerned Agencies.

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The Philippines' Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2011)

Basic Facts

Total Population	**92.34 million** (2010)
Forecast Population (2015)	**103 million** (growth rate of 1.9 percent)
Percentage of Population within 100 km of the coast	**100 %**
No. of coastal provinces	**64 out of 79, coastal municipalities 822 out of 1,502**
Total Land Area	**300,000 km² with more than 7,100 islands**
Territorial sea (up to 12 nautical miles)	**679,800 km²**
Length of Coastline	**36,289 km**

National Economy

GDP per capita (current)

US$ 2,140.12 (2010)

GDP composition by sector

Agriculture, forestry, hunting and fishery (12.31%); Industry (32.57%); Services (55.12%) (2010)

Employment by sector

Agriculture, forestry, hunting and fishery (33.61%); Industry (14.73%); Service (50.84%) (as of October 2010)

Major contributing sectors to the marine economy

Fishery and forestry; Mining and quarrying; Construction; Manufacturing; Transport, communication and storage; Trade; Finance; Services (Virola, 2009)

Economic contribution of the marine sector to the national economy

Maritime industry accounts for 1.7 percent of revenues/sales of all industries; 10 percent of cost of goods sold for all industries (Virola, 2009)

In 2006, agriculture, fisheries and forestry contributed to US$ 12.9 billion in gross value added (GVA)

In 2010, these sectors generated 16.3 percent of the total GDP (ADB Country Environmental Analysis, 2008)

Annual economic benefits from the Philippine coastal ecosystems are estimated at US$ 3.5 billion (White and Cruz-Trinidad, 1998; World Bank, 2005)

Employment contribution to national employment: Maritime industry accounts for 3.3 percent of employment of all industries (Virola, 2009); in 2009, about 35 percent of the total labor force of 35.5 million was employed in the agriculture, fisheries and forestry sectors with almost 6 million classified as farmers, forestry workers and fishers (NSO).

Source: National Statistical Coordination Board. www.nscb.gov.ph. Accessed 7 May 2012; Philippines Environment Monitor, 2005.

Philippines Development Plan 2011-2016

- **To achieve prudent use of the agriculture and fisheries resources leading towards: (a) improved food security and increased rural incomes; (b) increased resilience to climate change risks; and (c) enhanced policy environment and governance (Chapter 4).**
- **To support economic growth and ensure equitable access to infrastructure services, especially those that affect the people's health (e.g., water, sanitation, sewage, flooding and drainage, solid waste and toxic and hazardous waste), education and housing (Chapter 5).**
- **To conserve the remaining natural resources and preserve a clean and healthy environment, including the development and implementation of a national ICM program (Chapter 10).**

Progress in SDS-SEA Implementation (2003-2011)

National Ocean Policy and Institutional Arrangements

- Executive Order No. 533 (2006) adopted Integrated Coastal Management (ICM) as a national strategy for the sustainable development of coastal and marine areas.
- National ICM Law is currently under review in the Philippine Senate and Congress.
- National interagency coordinating mechanism is pending passage of the ICM Law.

ICM Implementation

- ICM implementation currently covers about 17.6% of the country's coastline.
- National ICM Program (2012-2016) has been prepared, with the Department of Environment and National Resources (DENR) as lead agency in coordination with an interagency Technical Working Group.
- 193 coastal municipalities and cities have achieved basic benchmarks for coastal resource management (CRM) (budget, management, plan, law enforcement, best practices) (DENR, 2012).
- Integrated Coastal Resources Management Project (ICRMP) (2007-2013) covers 80 coastal towns/cities located in five priority marine biodiversity corridors of national and international significance with the objective of enhancing sustainable management of coastal resources and increased income of coastal communities.
- USAID's EcoGov 2 (2004-2011) assisted 150 municipalities across 13 provinces and 7 regions to reduce threats to biodiversity by helping improve management of forest and forestlands, coastal and marine areas, solid waste and waste water and address crosscutting policy and advocacy issues.

Location of ICM Program	Length of Coastline (km)
Batangas Province	492
Boracay Island	7
Camiguin	55
Guimaras	470.29
Ilocos Coast	652
Manila Bay (Bataan, Cavite, Pampanga, Bulacan)	318
Macajalar Bay	176
Tayabas Bay (Quezon side)	305.7
ICRMP (DENR, 2012)	
Cagayan	1,057
Cebu	868
Davao Oriental	460
Masbate	781
Romblon	384
Siquijor	86
Zambales	272
Total:	**6,383.99**

Monitoring and Evaluation

- PEMSEA's State of the Coasts (SOC) Reporting System has been integrated into the National ICM Program.
  - SOC reports covering ICM programs have been completed in Batangas Province (2007) and Guimaras Province (2012).
- There is no national environmental monitoring and reporting system in place. Coastal and marine monitoring and reporting is program- and project-specific:
  - National Stock Assessment Program (NSAP) of the Bureau of Fisheries and Aquatic Resources-National Fisheries Research and Development Institute (BFAR-NFRDI)

monitors commercial and municipal landings at strategic major and minor ports in 13 fishing grounds nationwide.

- Evaluation process covering primarily fisheries and habitat management set up under USAID-supported FISH project.

- The Environmental Management Bureau (EMB) of DENR has conducted monitoring of 238 water bodies through its Regional Offices from 2001-2005, either for classification or for regular water quality monitoring. Monitoring is done monthly or quarterly depending on the region's resources. Through the Beach Watch Program, 41 of the 57 priority bathing beaches were monitored in 2005, while under the Tap Watch Program, 88 shallow wells in depressed areas were monitored in 2005 (National Water Quality Status Report, 2005).

- The National Solid Waste Management Commission reviews and monitors the implementation of the 10-year solid waste management (SWM) plans and the operationalization of the SWM boards at the provincial and city/municipalities in the 17 regions of the country in support of the NSWM Framework. The Commission also provides technical assistance in the establishment of Materials Recovery Facilities and the establishment of Eco Parks.

- The Marine Environmental Protection Command (MEPCOM) of the Philippine Coast Guard regularly monitors and conducts response operations in the abatement, containment, recovery and shoreline cleanup of oil spills, noxious substances or hazardous materials and other marine pollutants within the maritime jurisdiction of the country. In particular, the MEPCOM laboratory conducts water quality testing and "finger printing" in cases of oil spills, HNS and chemical spills.

- Development of country progress reports on the Millennium Development Goals (MDGs) is spearheaded by the National Economic and Development Authority (NEDA) in collaboration with various sectors of society.

- Framework for local governments to track and measure their performance in coastal resource management (CRM) program implementation was adopted by DENR for the CRM Certification Program.

- The Marine Protected Areas Support Network (MSN), which aims to support MPA actions through collaborative efforts, builds on the Philippine Marine Sanctuary Strategy to contribute to the improvement of management effectiveness of MPAs in order to achieve at least 10 percent protection of coastal areas by 2020. The MSN mainstreams a monitoring and evaluation system by facilitating the establishment of an incentive system for good MPA governance and performance through recognition awards including the establishment of an MPA database.

- SOC reports covering MPAs have been initiated in 32 provinces.

- The Philippine State of the Coral triangle (SCTR) has been completed (DENR, 2012).

- The Integrated Information Management System (IIMS) is being adopted by all 15 coastal regions of DENR.

SDS-SEA-related legislation, policies and plans

The legislations, policies and plans support SDS-SEA implementation in such a way that there is convergence of efforts and initiatives that contribute to attaining sustainable development targets.

Disaster Risk Reduction and Management

- Disaster Risk Reduction and Management Act (2010) prescribes the development, promotion and implementation of a National Disaster Risk Reduction and Management (NDRRM) Framework and NDRRM Plan and the establishment of a local disaster risk reduction and management office (LDRRMO) in every province, city and developing and implementing an LDRRM Plan with local partners and stakeholders.

  - The Framework provides a comprehensive, all-hazards, multisectoral, interagency and community-based approach to DRRM and was approved in June 2011.

  - The Plan (2011-2028), which serves as the roadmap for DRRM, was completed in December 2011.

Climate Change

- Climate Change Act (2009) established the Climate Change Commission and prescribed the Commission to develop the National Framework Strategy for Climate Change and the National Climate Change Action Plan.
    - National Framework Strategy for Climate Change was signed on 28 April 2010 and serves as the roadmap for a climate risk-resilient Philippines. It aims to build the country's adaptive capacity and increase resilience of natural ecosystems to climate change and optimizing mitigation opportunities.
    - National Climate Change Action Plan (2011-2028) addresses a realistically achievable country-driven program of actions for integrated climate change adaptation and mitigation. It prioritizes food security, water sufficiency, ecosystem and environment stability, human security, climate-smart industries and services, sustainable energy and capacity development as the strategic directions for 2011-2028.
    - Administrative Order 1 (2010) directs local governments, particularly the provinces, to adopt and use the Guidelines on Mainstreaming Disaster Risk Reduction in Subnational Development and Land Use/Physical Planning in the Philippines (2008).

Marine Pollution Prevention and Management

- Philippine Coast Guard Law (2009) establishes the PCG as a distinct uniformed armed service attached to the Department of Transportation and Communication, which is tasked to enforce regulations in accordance with all relevant maritime international conventions, treaties or instruments and national laws for the promotion of safety of life and property at sea within the maritime jurisdiction of the Philippines and conduct port state control implementation.
- Oil Pollution Compensation Act (2007) provides for the implementation of the provisions of the 1992 International Convention on Civil Liability for Oil Pollution Damage and the 1992 International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage. The law applies exclusively to pollution damage caused in Philippine territory, including its territorial sea and EEZ and to measures to prevent or minimize such damage.
- National Oil Spill Contingency Plan: revised and promulgated in 2008 outlines the government management for a three-tiered system of response to oil spill incidents.
- Philippine Clean Water Act (2004) provides for comprehensive water quality management, specifically for abatement and control of pollution from land-based sources.
- Build-Operate-Transfer Law of 1989, which engages private sector in financing, constructing, operating and managing development and infrastructure projects, was amended in 1994 and the revised implementing rules and regulations of the amended BOT law were passed by the government in April 2006.

Renewable Energy

- Renewable Energy Act (2008) promotes the development, utilization and commercialization of renewable energy resources and for other purposes.

Biodiversity Conservation and Management

- Executive Order 578 established the national policy for protecting, conserving and sustainably utilizing biological diversity. It also revitalized the management of the Sulu-Celebes Sea and the Verde Island Passage, which are considered as center of marine shorefish biodiversity in the world.
- The National Biodiversity Strategy and Action Plan was developed in 1997 and reviewed in 2002, which resulted in a broad-based consensus on 206 conservation priority areas and species conservation priorities collectively known as Philippine Biodiversity Conservation Priorities.
- National Plan of Action for the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (2009), a 10-year plan of action that adopts the Guiding Principles of CTI laid out in the Regional Plan of Action agreed by the six countries using ICM as the overall framework for its implementation.
- National Wetlands Action Plan was developed in 1993 and updated in 2009 resulting to the NWAP for the Philippines (2011-2016), which serves as a framework and integrating tool for the conservation and wise use of Philippine wetlands in support of the overall sustainable development goals of the country,

Financing

- Public expenditure for the environment and natural resources is low. In 2010 and 2011, the DENR budget was 0.79% and 0.75% of the national budget, respectively, with about 80% allocated for personnel costs and capital outlay, leaving only a small portion for programs. The 2012 budget represents 0.94%; despite the increase, public expenditure remains low considering the expanding mandate brought about by the enactment of recent laws and executive issuances.

- Eighty (80) local government units under the Integrated Coastal Resource Management Project (ICRMP) have allocated around PhP 83 million for ICM-related projects in their localities starting in 2010. This is a step in the right direction in terms of committing local governments' limited resources for food security and habitat conservation.

- The DENR has allocated PhP 8 million for 2012 for its Coral Reef Rehabilitation and Protection Program, and has submitted a proposed budget of Php 1.1 billion for the coral reef program covering 889.636 ha for the period 2013-2016.

Source: DENR, 2012.

Integrated Water Resources Management

- National Integrated Water Resources Management Plan Framework developed in 2006 provides guidance to different stakeholders involved in water resources management by enabling and encouraging a wider adoption and localization of IWRM, across different stakeholders, at different levels. It serves a a guide to water-related government agencies and other stakeholders in ensuring that water and IWRM are mainstreamed and integrated in their respective plans, programs, and projects.

Communication/Education

- National Environmental Awareness and Education Act (2008) aims to promote national awareness on the role of natural resources in economic growth and the importance of environmental conservation and ecological balance towards sustainable development.
    - Prescribes the integration of environmental education to school curricula.

- The Environmental Education and Information Division (EEID) of DENR and the 16 regional EEIDs serves as the agency's lead arm in creating environmental awareness by spearheading year-round environmental events (e.g., World Water Day, World Environment Day, National Environmental Awareness Month, etc.), including distribution of information, education and communications (IEC) materials, recyclables collection, treeplanting and environmental exhibits.

- The Protected Areas and Wildlife Bureau-Coastal and Marine Management Office (PAWB-CMMO) of DENR undertakes IEC activities during International Coastal Cleanup, the Month of the Ocean in the Philippines, Coral Triangle Day, World Oceans Day, etc. in collaboration with partners and stakeholders.

Capacity Development

- DENR's PAWB-CMMO, in collaboration with partners, has implemented several trainings on GIS, IIMS, bio-conservation, ICM, MPA management, users fees, etc.

- Local Government Academy serves as a national training institution under the Department of Interior and Local Government for coordinating, synchronizing and rationalizing the delivery of training programs for local governments.

- ICM Learning Centers have been established in De La Salle University-Lipa (Batangas Province) and in Xavier University (Cagayan de Oro City) in collaboration with PEMSEA.

- Integrated Coastal Resource Management (ICRM) Centers prioritized in local academic institutions in five marine corridors under the ongoing GEF/ADB Integrated Coastal Resource Management Project (ICRMP) 2007-2013. The five ICRM Centers are: Cagayan State University; Central Luzon State University in Nueva Ecija with center of facility to be located in Ramon Magsaysay Technical University in Zambales; Masbate School of Fisheries; Cebu State College of Science and Technology; and Davao Oriental State College of Science and Technology.

- Several donor-assisted projects are providing capacity building and technical assistance to national agencies and local governments in support of sustaining coastal and marine ecosystem services, including ADB, World Bank, UNDP, GEF, USAID, GTZ, AUSAID, NZAID, etc.

Sustainable Development Aspects

Natural and Manmade Hazards

- Philippines is exposed to tropical cyclones, especially in northern and eastern parts of the country, as well as to other climate-related hazards, namely floods (in central Luzon and southern Mindanao), landslides (due to the terrain of the country) and droughts (Yusof and Francisco, 2009).
- Areas of highest vulnerability are the National Capital region, Southern Tagalog, Cagayan Valley, Central Luzon, the Cordillera Administrative Region, and Bicol Province.
- Typhoon damage in the Philippines ranges from US$ 212 million to US$ 269 million each year (Israel, 2009).
- About 90 percent of the country has been mapped in terms of geo-hazards (DENR-MGB).
- Vulnerability assessments for soil erosion, landslides, biodiversity loss and forest fire of 43 priority watersheds nationwide have been completed (DENR-ERDB).
- Integrated land and sea use zoning plans were adopted at the provincial and municipal levels in the Province of Bataan and Municipality of Abucay (Bataan Province), respectively.
- Albay in Action on Climate Change (A2C2) of the Province of Albay is a pioneering initiative on local climate change mitigation and adaptation.
- Five (5) local governments have prepared and implemented land-use plans covering natural and manmade hazard prevention and management.

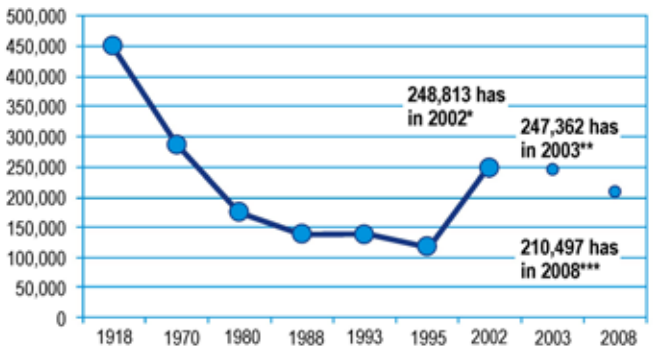
Habitats and Biodiversity

- Biodiversity conservation and protection measures have been taken in the form of cave and wetland management, proclamation of protected areas and critical habitats and establishment of protected areas and zones.
- As of 2010, both government and nongovernment sectors reforested a total of 1,958,928 ha, of which 70 percent was contributed by DENR and 30 percent by the nongovernment sector.

Challenges and Priorities: Natural and Manmade Hazards

- Compliance in incorporating climate change adaptation (CCA) and disaster risk reduction (DRR) management into the development process and updating of sectoral plans to include CCA and DRR concerns.
- Synchronizing the role of agencies and their respective mandates as provided by law.
- Budget for disaster management reflects a response-oriented perspective, not proactive efforts to mitigate the expected damages and risk from natural disasters.
- Strengthening public-private partnership (PPP), creating incentives for disaster-risk reducing behavior, instilling risk awareness at all levels of government, of households, firms and workplaces.
- Current planning system on climate change is not ecosystem-based but is more influenced by political units.
- Lack of capacity and support to local governments, which are the frontline actors in mainstreaming DRR in local development planning and actions.
- Local governments, in general, are not investing in infrastructure; there is a high dependence on grants and external support.
- Limited access to information and education.
- Lack of leadership and support in climate-proofing programs, such as the building of public infrastructure (e.g., roads, dikes, schools and other structures).
- Poor monitoring and evaluation programs/ mechanisms.
- Ineffectual enforcement of environmental laws and regulations.

Trend in mangrove cover from 1918 to 2002



* Based on NAMRIA and FMB interpretation of 2002 satellite data
** Based on Forestry Statistics 2007, citing 2003 data
*** Based on DENR-CMMO validation of satellite data

- Proportion of terrestrial protected areas to total land area has increased from 8.5% in 1992 to 13.8% in 2008 (DENR PAWB, 2008)
- Mangrove cover has increased from 120,000 ha in 1995 to 210,497 ha in 2008 based on 2002 satellite data.
- 15% of municipal waters are to be delineated as MPAs under the Fisheries Code.
- The total MPAs established to date are 1,640 located in 536 towns and cities in 60 provinces of the country. However, overall management effectiveness of these sites is estimated to be only 10% (MSN data, 2012).
- 50 MPAs were established under the ICRMP, with a total area of 5,480.20 ha, with a no-take zone of 792.65 ha, as of 2011.
- 889,636 ha of coral marine key biodiversity area (mKBA) will be included under the DENR's Coral Reef Rehabilitation and Protection Program (2012-2016).
- The Philippines participates in two major regional marine conservation programs, namely the Coral Triangle Initiative and the Sulu-Sulawesi Marine Ecoregion.

Food Security, Fisheries and Livelihood

- Growth in the fisheries sector is partly due to the expansion of aquaculture and demand for seaweeds.
- Productivity of small-scale capture fisheries has been declining due to overfishing and poor enforcement of fishery laws.

Challenges and Priorities: Habitats and Biodiversity

- Only 10-15 percent of existing MPAs are functional (NEDA, 2011).
- At the current rate of establishment of MPAs, it will take until 2076 to protect at least 10 percent of existing coral reefs, and it may be impracticable to meet the target of the 15 percent of municipal waters set under current policies (Weeks, et al., 2009).
- Efforts should be undertaken to establish MPAs in areas of high biodiversity, such as in marine biodiversity corridors.
- There is an urgent need to assess and improve the effectiveness of MPAs.
- Of the 206 priority conservation areas, 128 terrestrial key biodiversity areas (KBAs) have been identified and 66 marine KBAs are proposed as priority areas that need research and management interventions.
- Few terrestrial protected areas have been declared while deforestation continues.
- Development of MPAs has largely been dominated by local initiatives rather than through a national strategy.
- Scaling up of MPAs into networks and making them resilient to climate change is a priority, by developing or re-designing them into "climate-smart MPAs."
- There are no studies in the Philippines that actually measure the impacts of climate change on biodiversity.

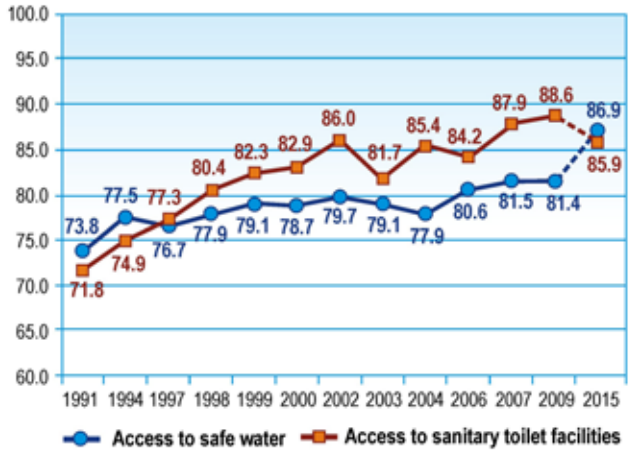
Challenges and Priorities: Food Security, Fisheries and Livelihood

- Inefficiencies along the agricultural supply chain result in postharvest losses, higher transaction and distribution costs and lower productivity.
- Limited access to credits by small farmers and fisherfolk.
- National land use policy to rationalize the optimal allocation of land for competing uses (e.g., conversion of agricultural lands to nonagricultural uses).
- Sea level rise is already being experienced in some parts of the country, reducing the productive coastal areas for agriculture and fisheries.
- Salt intrusion in the lowlands and in aquifers for irrigation and domestic uses is being experienced.
- Red tides are regular occurrences in many areas of the country and there are still no regular mechanisms to support fishers affected by the phenomenon.
- While major oil spills are uncommon, the potential damage caused by such spills could be long term.
- The identification of Strategic Agriculture and Fishery Development Zones has not been fully implemented under the Agriculture and Fisheries Modernization Act.

Source: Philippine Development Plan 2011-2016.

- The Bureau of Fisheries and Aquatic Resources (BFAR) identified that two-thirds of the 12 major fishing bays are already overfished.
- In December 2010, DA, DAR and DENR adopted a shared policy and implementation framework for the enhanced National Convergence Initiative (NCI), which serves as a strategic development approach that can contribute to sustainable development in the countryside through complementation of efforts in the rural sector; under the NCI over 1.83 million ha of land have been developed for agribusiness generating about 2.67 million jobs between 2003-2010.
- Despite positive growth and gains in productivity in some subsectors, there has been almost no change in the welfare of almost 6.4 million farmers, fisherfolks and other workers dependent on the sector.

Proportion of population with access to safe drinking water and sanitary toilet facilities (%), 1991–2008.



Water Supply/River Basin Management

- The country has 421 principal river basins with drainage areas ranging from 41 km^2 to 27,280 km^2.
- Twenty (20) river basins are considered as priority river basins, with each one having at least 990 km^2 basin area. These major river basins cover a total area of 111,269 km^2, equivalent to 37.1 percent of the total land area of the Philippines.
- The dependable surface water supply from rivers, lakes and reservoirs is estimated at 125.8 billion m^3. Groundwater potential is 20.2 billion m^3 and the reservoir has an aggregate area of 50,000 km^2 (DENR 2010).

Challenges and Priorities: Water Supply/River Basin Management

- Assuming a high economic growth scenario and without a water resource development program in place, the projections of water balances of major river basins shows that 17 of the 20 major river basins will experience water shortages by 2025.
- Limited access and coverage: assessments showed a limited overall coverage and low level of access in many areas of the country; there is a wide disparity in coverage between urban and rural areas; regional data further reveals a broad inequity of access even in rural areas.
- Low investment levels and lack of financing for waterless areas.
- Lack of sector data presents logistical challenges in the determination of waterless areas.
- Public infrastructure spending by the national government shows a bias for Metro Manila and other urban areas including spending for water supply, sewerage and septage management.
- Absence of clear monitoring system makes it difficult to assess and address the sustainability of developed infrastructure.
- Regulatory oversight has been fragmented; there are at least 30 agencies involved in the water sector with specific but often overlapping of conflicting mandates for water supply, irrigation, flood management, pollution control, watershed management, financing, policy formulation and coordination, among others.
- Effective planning, target-setting, monitoring and implementation are impeded by the lack of up-to-date, integrated, harmonized and comprehensive data on the sector.
- No clear policy framework to guide the financing of water supply programs and projects including knowledge sharing to update and improve access to information.
- Lack of new water sources to meet existing and future demand in growth centers.

Source: Philippine Development Plan 2011-2016.

Challenges and Priorities: Pollution Reduction/Waste Management

- Less than 10 percent of the population has access to sewerage facilities.
- Weak sanitation governance: many institutions have sanitation-related mandates but none takes the lead in pushing for reforms in the sector resulting to significant gaps between policy implementation and enforcement.
- Inequitable access to basic sanitation facilities and sewerage and septage management services: access to sanitation is much lower in rural areas as well as with disparity among the regions.
- Low investment levels combined with rapidly increasing population and the increasing frequency of disasters affect the sustained operation of existing sanitation facilities.
- Investments by LGUs are limited, partly due to lack of capacity to implement, operate and maintain sanitation, sewerage and septage systems.
- Private sector investments are limited because sanitation, sewerage and septage are perceived to be nonrevenue services with high capital requirements relative to any projected returns.
- Lack of awareness of the value of sanitation and its services.
- Research on innovative technologies to provide economically and ecologically efficient sanitation, sewerage and septage facilities is lacking.
- Technical capacity to plan, implement, operate and maintain the facilities is limited both at national and local levels.
- Capacities to monitor the extent and levels of service are limited affecting effective planning and budgeting for the sector.
- Lack of short- and long-term solutions to properly address problems in solid waste management.
- Adoption of relevant technologies to reduce the volume of waste (i.e., waste to energy).
- Tracking and monitoring the handling and disposal of toxic chemicals and hazardous wastes.

Sources: Philippine Development Plan 2011-2016; National Solid Waste Management Commission. Available at: http://emb.gov.ph/nswmc. Accessed 25 May 2012.

Priority Issues for the Next Five Years for SDS-SEA Implementation

- Incorporation of ICM in the national and local government medium-term development and investment plan (2011-2016) and annual budget.
- Strengthening interagency and inter-LGU collaboration at subnational levels, consistent with the national framework for implementing the national ICM program (2012-2016).
- Adoption and implementation of a national ICM Law.
- Development and promotion of a common framework and system for measuring and assessing the health and resiliency of coastal and marine ecosystems and the socioeconomic conditions of coastal communities.
- Forging a capacity development and support network in support of sectoral agencies, national and local programs or projects in sustaining coastal and marine ecosystem services at the national and local levels.
- Putting in place financing programs and economic incentive systems to make it politically and economically feasible for local governments to invest in long-term infrastructure and resource management programs, including public-private partnerships and innovative payment schemes that will capture the cost of consuming public goods.
- Development and implementation of the National ICM Program, focused on selected priority locations in order to cover issues including: CCA/DRR; improvement in MPA management effectives and networking; integrated river basin and coastal area management; fisheries management; sustainable livelihoods; and pollution reduction/waste management.
- Supporting targeted research, including economic assessment of coastal and marine ecosystem services, strengthening upstream-downstream alliances in management of river systems and coastal areas, and creating green industry among local communities.

- The Philippines has privatized water distribution in Metro Manila, which has greatly improved distribution in infrastructures and access.

Pollution Reduction/Waste Management

- The BOD levels of 10 rivers are within standards and have improved; waterways in major urban centers are unfit for human activity despite recent cleanup efforts; at least six (6) rivers in the National Capital Region (NCR), Region 3 and Region 4A fail in terms of DO and BOD.
- In Metro Manila, up to 58 percent of groundwater has been found to be contaminated with coliform.
- The Supreme Court issued a continuing mandamus in 2008 requiring 13 national government agencies to clean up Manila Bay in order to meet water quality standards that conform to fisheries and recreational use.
- There are no large-scale treatment and disposal facilities for hazardous wastes. A GEF/UNIDO project contributed in the construction and startup of a non-combustion technology to destroy polychlorinated biphenyls (PCBs) wastes in 2011. This is the first of its kind not only in the country but in Southeast Asia as well.
- Although sewerage treatment facilities cover a portion (11 percent) of Metro Manila, sewerage infrastructure is inadequate or nonexistent in other parts of the country.
- In terms of solid waste management, there are 38 operational sanitary landfills, about 643 open dumpsites, 384 controlled disposal facilities and 7,327 materials recovery facility in the country. In Metro Manila, only 70 percent of the garbage generated is collected; for the whole country, only half of the garbage is collected.

The Republic of Korea's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2011)

Basic Facts

Total Population (2010)	**49.4 million** (Statistics Korea, 2012)
Forecast Population (2025)	**51.4 million** (Statistics Korea, 2012)
Percentage of Population within 100 km of the coast	**100%** (WRI, 2001)
Administrative districts and major cities	**9 provinces, 1 special self-governing province, 1 special city and 6 metropolises** (Statistics Korea, 2010)
Land Area	**100,148 km²** (Statistics Korea, 2012)
No. of islands	**3,358** (MLTM, 2011)
Area of terrotorial sea	**443,838 km²** (MLTM, 2011)
Length of coastline	**13,509 km** (MLTM, 2011)

National Economy

GDP per capita (2010)	GDP growth (2011)
US$20,756.25 (IMF, 2011)	**3.6%** (ADB, 2012)

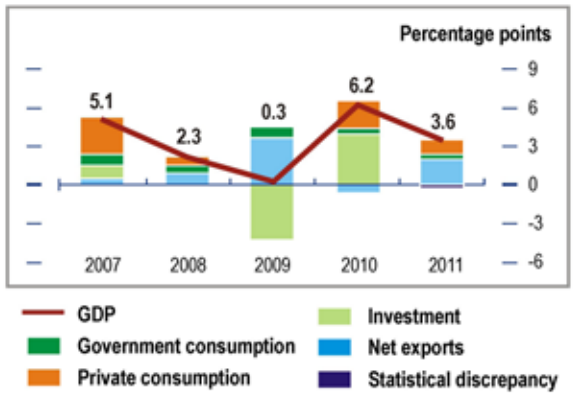
GDP composition by sector (2009, Statistics Korea, 2010)

Agriculture, forestry and fisheries (2.6%); Mining (0.3%); Manufacturing (27.7%); Electricity, gas and water supply (1.8%); Construction (6.9%); Services (60.7%)

Employment by sector (2009, Statistics Korea, 2010)

Agriculture, forestry and fisheries (7.0%); Mining and manufacturing (16.4%); Construction and services (76.6%)

Contributions to Growth (Demand).



Sources: Bank of Korea. Economics Statistics System. http://ecos.book.or.kr (accessed 1 February 2012); ADB estimates.

Coastal and Marine Economy

The output of the RO Korean marine sector is 3.25% of the total national economic output

Total gross output of matine industry (2006, KRW billion).

	Total value-added of all industry	Total value-added of marine industry	Total gross output of all industry	Total gross output of marine industry
Marine transportation		3,402,610 (0.399%)		19,872,555 (0.961%)
Harbor		2,473,783 (0.290%)		4,379,334 (0.212%)
Fishery and marine products		2,958,014 (0.347%)		10,220,020 (0.494%)
Shipbuilding		6,504,610 (0.763%)		23,222,843 (1.123%)
Other marine sectors		5,072,717 (0.595%)		9,653,175 (0.467%)
Total	851,982,152	20,411,734 (2.396%)	2,068,807,934	67,347,926 (3.255%)

Note: The numbers in parenthesis are the portion of each industry.

Progress towards SDS-SEA Targets

National Ocean Policy and Institutional Arrangements

- The Ministry of Land, Transport and Maritime Affairs (MLTM) of RO Korea is the policy center of the blue economy and ocean and coastal management. Within MLTM, two bureaus are in charge of ocean and coastal management, i.e., the Marine Policy Bureau and the Director General for Marine Environment Policy.
- For the effective management of oceans and coasts, MLTM is supported by several governmental institutions, including the Korea Hydrographic and Oceanographic Administration, the Korea Institute of Ocean Science and Technology (formerly KORDI), the Korea Institute of Marine Science and Technology Promotion, the Korea Maritime Institute and the Korea Marine Environment Management Corporation.
- Major developments of national laws and policies have included Basic Plan for Ocean and Fisheries Development (Ocean Korea 21), Marine Environment Management Plan, Integrated Coastal Management Plan, Marine Ecosystem Conservation and Management Plan and National Green Growth Strategy.
- RO Korea established the Marine and Fisheries Development Committee under the Framework Law on Ocean and Fisheries Development (2002), chaired by the Prime Minister, and the Central Coastal Management Council under the Coastal Management Act, chaired by the Vice Minister of MLTM.
- At the local level, Local Coastal Management Councils were established in 2000 and chaired by the Vice Governor or Vice Mayor.

Major National Policies related to Sustainable Development and Blue Economy

Basic Plan for Ocean and Fisheries Development (Ocean Korea 21)

- **As the highest law on coastal and ocean management and blue ocean strategy in RO Korea, the Framework Law on Ocean and Fisheries Development was promulgated in 2002. Prior to the enactment of the Framework Law, the 1st Basic Plan for Ocean and Fisheries Development (2000-2010) was formulated and has been implemented since 2000. The 1st Basic Plan encompassed seven strategies, including (1) building productive ocean territory; (2) making clean and safe marine environment; (3) enhancing ocean knowledge and industry; (4) promoting ocean-based service industries; (5) enhancing sustainable fisheries; (6) developing ocean-based minerals and energy; and (7) strengthening ocean-based diplomacy and north-south relationship.**
- **In 2010, the 2nd Basic Plan for Ocean and Fisheries Development (2011-2020) was formulated and started implementation in 2011. The paradigm has been shifted from establishing integrated ocean policy and ocean development within national jurisdiction (1st Basic Plan) to ocean development beyond national jurisdiction and globalization (2nd Basic Plan). The 2nd Basic Plan envisions RO Korea in 2020 as the leading ocean power in the world.**

RO Korea's Coastal and Ocean-related Plans and Strategies (MLTM, 2011).

Major National Policies related to Sustainable Development and Blue Economy (continued)

- The 2nd Basic Plan comprises 5 strategies and 26 actions, including: (1) ensuring healthy and safe use of ocean; (2) developing ocean science and technology as a new growth engine; (3) promoting high-quality ocean-based culture and tourism; (4) strengthening shipping and logistics in view of the growing economies of East Asian region; (5) fortifying national jurisdiction on ocean territory and securing global centers for ocean-related activities.

- The 2020 Marine Technology Road Map was formulated based on the 2nd Basic Plan. The Road Map is aiming at improving quality of life of RO Koreans through developing 13 strategic technologies and implementing 50 major projects under the themes of promotion of marine industries, broadening the understanding of global changes in climate, strengthening the response capabilities for coastal disaster, strengthening ocean territory and resource management, increasing environment-friendly and safe utilization of ocean.

Marine Environment Management Plan

- The Marine Environment Management Act was promulgated in 2007 which is an entirely revised version of Marine Pollution Prevention Act of 1972. The law acts as the framework law for marine environment management, which includes actions such as setting the marine water quality standards, managing pollution from land and ships, controlling oil pollution from ships, and creating marine environment management corporation (KOEM).

- In accordance with the Marine Environment Management Act, a comprehensive framework plan for marine environment management, was first formulated and implemented in 1996, and is renewed every 10 years.

- In 2011, the 4th Comprehensive Marine Environment Management Plan (2011-2020) was formulated and started implementation. The Plan is based on the principles of ecosystem-based management, integrated approach, local participation, and respecting global environmental standards.

- The 4th Comprehensive Plan envisions RO Korea's seas as clean and productive in 2020. The Plan encompasses five strategies, including: (1) strengthening land-based pollution management system; (2) strengthening ocean-based pollution response capacity; (3) conserving the health of the marine ecosystem; (4) ensuring marine management responding to climate change; and (5) building national capacity for marine environment management.

Integrated Coastal Management Plan

- The Coastal Management Act was enacted in 1999. Based on the Act, the 1st Integrated Coastal Management Plan (2000-2010) was formulated and implemented since 2000 as the highest plan for coastal management. The 1st Plan focused on balancing coastal development and environmental protection in order to ensure sustainable growth of the country.

- In line with the major revision of the Coastal Management Act in 2009, the 2nd Integrated Coastal Management Plan (2011-2020) was strengthened from the 1st Plan in consideration of changing environment and coastal management trends, such as wise use of coastal space and climate change. The guiding principles applied to the formulation of the 2nd Plan are: ecosystem-based management; protection of public property; enhancing transparency and predictability; responding to climate change and disaster; and enhancing effectiveness.

- The vision of 2nd Plan is creating ECHO (Ecosystem, Co-ordination, Human and Ocean) coastal areas. The 2nd Plan contains 5 strategies and 259 actions: (1) applying marine spatial planning schemes; (2) enhancing marine ecosystem health and coastal scenery; (3) responding to coastal climate change and disaster; (4) strengthening coastal governance; and (5) enhancing institutional arrangement for coastal management.

Marine Ecosystem Conservation and Management Plan

- In order to ensure systematic protection and conservation of the marine ecosystem of RO Korea, the country enacted the Marine Ecosystem Conservation and Management Act in 2006, which acts as a framework law for marine ecosystem management. It stipulates various activities including regular marine ecosystem survey, establishment of ecosystem information system, habitat and species protection, designating marine protected areas (MPAs), conserving marine biodiversity, etc.

- The 1st Marine Ecosystem Conservation and Management Plan (2009-2018) is a 10-year operational strategy of the Act. It envisions RO Korea creating future wealth by maintaining healthy marine ecosystems in Korean waters. The objective of the Plan is to maintain

Major National Policies related to Sustainable Development and Blue Economy (continued)

a balance between the use and conservation of marine ecosystems in order to promote sustainable development of marine bio-resources.

- The 1st Plan comprises five strategies including: (1) maintaining a balance between the use and conservation of marine ecosystems; (2) enhancing marine biodiversity through protection of major species and habitats; (3) applying a gradual approach to marine ecosystem restoration; (4) encouraging public participation in marine ecosystem policy implementation; and (5) policy reform for effective marine ecosystem management.

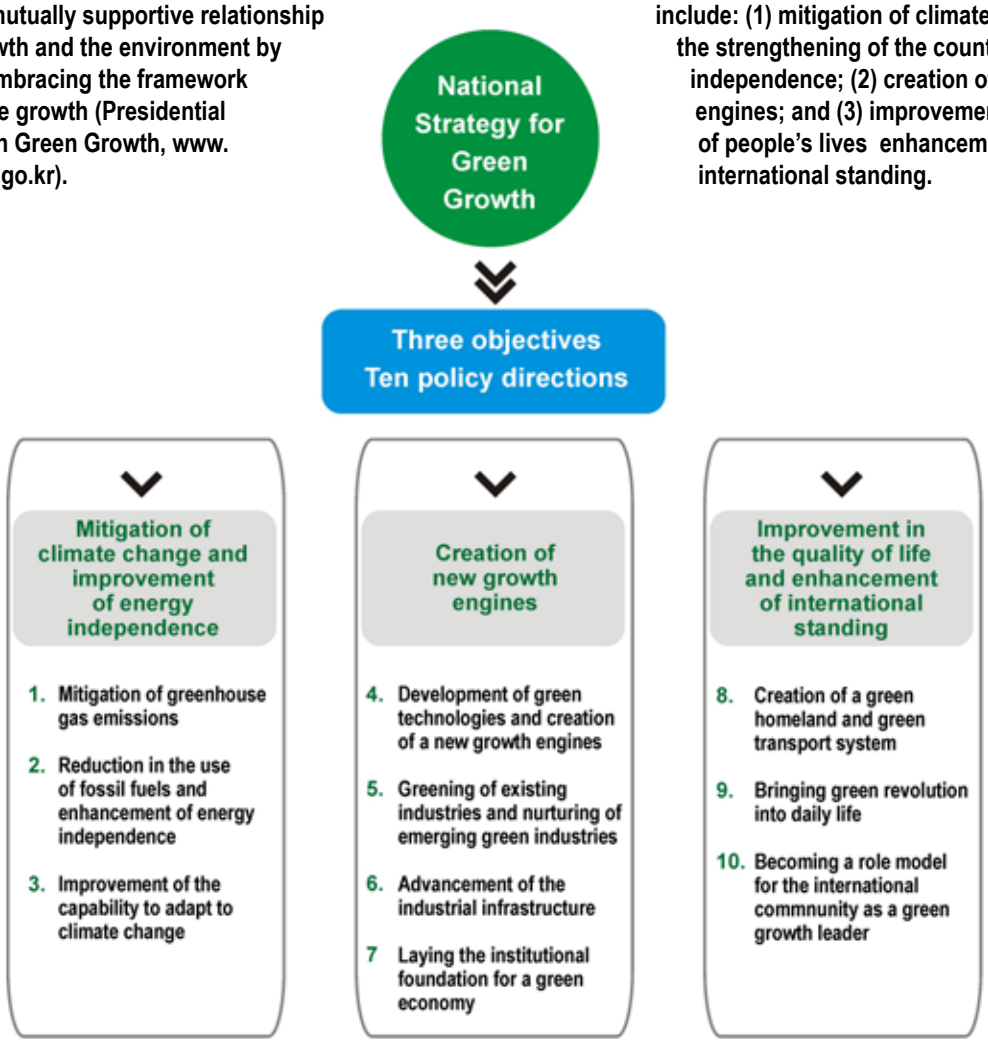
National Green Growth Strategy

- Green growth is an action-oriented paradigm that promotes a mutually supportive relationship between growth and the environment by holistically embracing the framework of sustainable growth (Presidential Committee on Green Growth, www.greengrowth.go.kr).

- RO Korean government has created an institutional framework for a great leap forward toward a green economic power. In 2009, Korea enacted a Framework Act on Low Carbon Green Growth, the first law of its kind in the world, and released a National Strategy for Green Growth and Five-Year Plan for Green Growth.

- In particular, the Framework Act represents a milestone in the national development strategy and the legal foundation of the nation's green growth policies, approaching green growth in a comprehensive and systematic manner.

- The National Strategy for Green Growth envisages three main objectives and ten policy directions, based on a consensus between social, business, academic and government stakeholders. The three objectives include: (1) mitigation of climate change and the strengthening of the country's energy independence; (2) creation of new growth engines; and (3) improvement in the quality of people's lives enhancement of Korea's international standing.



Major components of the National Strategy for Green Growth.

Supporting Sectoral Policies, Legislation and Plans

Natural and Manmade Hazards and Climate Change

- The Framework Law on Disaster and Safety Management enacted in 2004 stipulates the basics of the disaster management policies of Korea.
- The Natural Disaster Countermeasures Act enacted in 1995 and constantly revised.
- National Oil Spill Contingency Plan was developed in 2006 as part of the regional cooperation in the Northwest Pacific Action Plan (NOWPAP) region.
- National Climate Change Adaptation Plan (2011-2015) was adopted in 2010 and envisions the establishment of a safe society and support for green growth through climate change adaptation (MOE and KEI, 2011).
- The 2nd Coastal Maintenance Plan (2009-2019) was established in 2009 to protect coastal areas from erosion, flooding, typhoons, etc. and to create coastal waterfronts for enhancing quality of life.

Habitat Protection and Biodiversity

- Marine Ecosystem Conservation and Management Act enacted in 2006 and Marine Ecosystem Conservation and Management Plan (2009–2018) formulated.
- Water Quality and Water Ecosystem Conservation Act enacted in 2007
- National Environment Comprehensive Plan (2006– 2015) formulated (MOE)
- Natural Environment Protection Framework Plan (2006–2015) formulated (MOE)
- The Wetland Conservation Act enacted in 1999 and 1st Coastal Wetland Conservation Plan (2006-2010) formulated
- The Law on Conservation and Management of Uninhabited Islands enacted in 2006 and Comprehensive Plan for Uninhabited Island Management (2010-2019) formulated

Water Use and Supply Management

- Water quality and water ecosystem conservation act enacted in 1991 and its 10-year Master plan for water quality and water ecosystem conservation formulated.
- River Act enacted in 1991 and its 10-year comprehensive management plan formulated.
- Water Environment Management Master Plan (2006–2015) aims to promote ecologically healthy water environment (MOE).

Food Security and Fisheries Management

- Culture Fisheries Promotion Act enacted in 2003.
- Fisheries Resource Management Law enacted in 2009 and its 5-year Fisheries Resource Management Plan (2011-2015) formulated.
- Fisheries Law (1953) and its framework plan and local plans (by local governments in accordance with the Law) formulated.
- The Law on Fisheries Product Management enacted in 2001.

Pollution Reduction and Waste Management

- Marine Environment Management Act established in 2007 and its Comprehensive Plan for Marine Environment Management (1st: 1996–2000; 2nd: 2001–2005; 3rd: 2006–2010; 4th: 2011–2020) formulated.
- The Coastal Area Total Pollution Load Management System established since 2004.
- The 2nd Comprehensive National Waste Management Plan (2002–2011) in March 2002

serves as the master plan for waste management (MOE).

- The 1st Master Plan for Resource Recirculation (2011–2015) is the country's master plan in recycling which promoting the country for resource circulation.

Information and Public Awareness

- Coastal Management Information System (2004 – ongoing)
- Marine Environment Information System (2006 – ongoing)
- General Information Center on Maritime Safety and Security (2003 – ongoing)
- The Environmental Education and Promotion Act was enacted in 2008

Capacity Development

- The Marine Environment Education Center was established in 2010.
- The Ocean Academy under Korea Maritime Institute was established in 2009.
- The National Marine and Fisheries Training Institute to conduct capacity development for marine-related workers and fishers was established in 1998.
- The National Institute of Environmental Human Resources Development (EHRD) under the MOE to conduct training of global environment professionals in dealing with environmental issues was established in 1998.
- The APEC Marine Environment Training and Education Center, which conducts short-term training programs on environmental/coastal management was established in 2004.

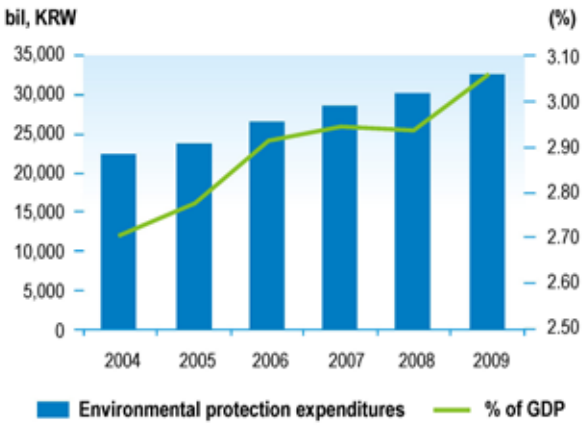
ICM Implementation

- With the Integrated Coastal Management Plan in place since 2000, the length of coastlines covered by an integrated management program increased from 70% in 2005 to 82.8% in 2010.

Financing Mechanisms

- Korea's share of GDP dedicated to environmental protection expenditures steadily rose from 2.71% in 2004 to 3.06% in 2009, a 0.35% increase (Korea Statistics, 2012).

Share of GDP dedicated to environmental protection expenditures (Korea Statistics, 2012)



Source: Ministry of Environment, Environmental protection Expenditures Account.

Sustainable Development Aspects

Natural and Manmade Hazards

- The country is frequented by natural disasters, such as typhoons, wildfires, droughts, landslides among others. The total costs of damages caused by typhoons and heavy rains over the last 10 years amounted to KRW 17.7 trillion (US$ 14.4 billion) (MOFAT, 2009). The RO Korea currently spends an average of KRW 5.3 trillion (US$ 4.3 billion) as annual investment in flood prevention and recovery expenses (UNEP, 2010).
- For coastal erosion prevention, MLTM invested KRW 433.4 billion in 232 areas during the 1st stage projects (2000–2009) and plans to spend KRW 1.09 trillion on 308 areas during the 2nd stage projects (2009–2019).

- RO Korea established the Korea Adaptation Center for Climate Change in July 2009 to ensure effective progress in the development and implementation of climate change adaptation plans and policies (MOE and KEI, 2011).
- Central and Local Disaster Committees had been established under the Framework Law on Disaster and Safety Management. A Headquarters for Disaster and Safety Management has also been established in the country.
- Vulnerability mapping has been conducted by KHOA (Korea Hydrographic and Oceanographic Agency) and NEMA (National Emergency Management Agency) for the entire country's coastline.

Habitat Protection and Biodiversity

- Since 2000, Ministry of Land, Transport, and Maritime Affairs (MLTM) designated 14 MPAs around the country (as of 2010) with the coastal wetland protected areas: 218.15 km^2 and marine biodiversity conservation areas: 70.374 km^2, a total area of 288.524 km^2.
- MLTM established an MPA Center within the Korea Marine Environment Management Corporation in 2010 to systematically manage the 14 MPAs around the country.
- MLTM established the National Institute for Marine Biological Resources in Seocheon in accordance with the Marine Ecosystem Conservation and Management Act (2006). The buildings are under construction with the target completion of November 2012.
- RO Korea is protecting and managing its land by designating Ecological and Scenery Conservation Areas and others. As of late 2010, the land protected areas are as follows: 38 Ecological and Scenery Conservation Areas (398.14 km^2), 29 Wetland Preserving Regions (332.69 km^2) and 170 Specific Islands (10.55 km^2) (MOE, 2011).
- As of December 2010, the country has a total of 79 natural parks (7,870 km^2), consisting of 4,934 km^2 of land and 2,935 km^2 of sea (MOE, 2011).

Water Use and Supply Management

- The country has four major river systems (i.e., Han, Nakdong, Geum and Youngsan Rivers). Covering about 53% of the land area of RO Korea, more than 62.2% of Korean population lives in the watersheds of the four major rivers. Five metropolitan cities (Seoul, Busan, Daegu, Gwangju and Daejon), as well as 24 small- to medium-sized cities are located near the major river systems. The restoration, management and development of these four major rivers are one of the components of the Low Carbon Green Growth Strategy of the country.
- With the implementation of the Water Quality and Ecosystem Conservation Act, 100% of the river basins in the country are under ecosystem conservation and management programs.
- The share of population with access to safe drinking water rose from 87.1% in 2000 to 94.1% in 2010 (Statistics Korea, 2012).

Food Security and Fisheries Management

- The number of people engaged in fisheries continued to decline from 1.5% of the entire population in 1985 to 0.4% in 2009 because of the transfer of workers to other industrial sectors.
- The average annual fishing household income on the other hand continued to increase from KRW 19.6 million in 2000 to KRW 33.9 million in 2009. Fisheries production also increased from 2.5 million tons in 2000 to 3.2 million tons in 2009 (Korea Statistics, 2010).

Pollution Reduction and Waste Management

- The Coastal Area Total Pollution Load Management System was introduced in 2004 in Masan Bay in order to control land-based pollution.
- The proportion of population connected to sewage treatment increased from 70.5% in 2000 to 89.4% in 2009. The government plans to increase the share of population connected to sewage treatment to 92% by 2015 (Statistics Korea, 2012).

- The ratio of recycling rose from 41.3% in 2000 to 59.8% in 2008, and wastes received in landfills continued to decrease from 47% in 2000 to 20.3% in 2008 (Statistics Korea, 2010). Incineration of municipal solid waste increased slightly from 18.6% in 2007 to 20.3% in 2009 (MOE, 2011).

- The concentration level of SO_2 in the country's seven major cities has been constantly improving in the past 10 years due to strengthened fuel regulation system. The concentration rate of particulate matter has also decreased since 2008 (MOE, 2011).

Monitoring and Evaluation

- RO Korea is regularly conducting monitoring and evaluation of coastal and ocean policy implementation as stipulated in coastal and ocean-related laws. Such monitoring and evaluation programs include Basic Coastal Survey, Coastal Erosion Monitoring System, National Coastline Survey, Coastal Wetland Survey, Marine Ecosystem Survey and MPA Monitoring System, Marine Environment Monitoring System, etc.

- The Ministry of Land, Transport and Maritime Affairs publishes an annual Land and Ocean Statistics Yearbook, which covers the following aspects:

    - Status of land and population
    - Land usage and geography
    - Urban development and buildings
    - Real estate and housing
    - Construction and technology
    - Water resources
    - Marine
        - Marine water quality monitoring results
        - Marine pollution incidents
        - Ocean dumping amount
        - Coastal wetland area
    - Transport and roads
    - Railroads
    - Maritime logistics and ports
    - Air transport

- The Ministry of Environment publishes an annual Environmental Statistics Yearbook, which covers the following aspects.

    - Air Quality
        - Emissions of air pollutants
        - Air quality in major cities
        - Emission of greenhouse gases
    - Water Quality
        - Use of water resources
        - Discharge of water pollutants
        - Water quality of rivers, streams, lakes, groundwater and drinking water
    - Land
        - Land use
        - Soil pollution
    - Biological resources
    - Waste
    - Noise
    - Production and consumption of harmful chemicals
    - National environment and health
    - Climate and disaster
    - Energy
    - Transportation
    - Industry
    - Environmental management

- The country has launched a marine observation satellite for the systematic observation of marine ecosystem, weather and climate change around the Korean Peninsula.

- ROK monitors seawater quality quarterly in 450 monitoring stations around the country. Seawater qualities at some specific sites such as Shihwa Lake are monitored by the Tele-monitoring System.

- ROK monitors rivers and lakes water quality and pollution at least quarterly in 1,476 monitoring stations nationwide, including 697 stations for river and stream (2008). Groundwater quality monitoring points in 2008 were 65,802.

- The Ministry of Environment used the Tele-monitoring System to conduct monitoring of water quality in 586 sewerage and treatment facilities (UNEP, 2010).

Challenges and Priority Issues in the Next Five Years

Challenges

- With the remarkable economic progress in RO Korea, some sustainable development challenges remain unsolved. Among them include (National Green Growth Strategy, 2008):
    - The challenge in energy sufficiency, as it imports 97% of its total energy requirements.
    - The rapid industrialization and urbanization have resulted in pressure on the environment and natural resources, such as forests and water resources, marine biodiversity and the urban environment.
    - Freshwater scarcity also remains a critical challenge.
    - The country's carbon emissions have increased rapidly during the past 15 years, making it one of the countries with the fastest growth of carbon emissions.
    - Climate change presents risks of higher levels of flooding and drought, which are already costing the country billions of dollars in damage.

Priorities

- RO Korea will pursue blue economy and sustainable development in the next five years in accordance with the activities of major plans and strategies of the country including, especially, which are introduced in the early section:
    - Basic Plan for Ocean and Fisheries Development (Ocean Korea 21)
    - Marine Environment Management Plan
    - Integrated Coastal Management Plan
    - Marine Ecosystem Conservation and Management Plan
    - National Green Growth Strategy
- RO Korea will implement the following priorities in Integrated Coastal Management in the next 5 years:
    - Applying marine coastal water zoning and conducting Coastal water suitability assessment in entire coastline of RO Korea
    - Setting a target for natural coastline conservation and management and establishing natural coastline management system
    - Formulating National Plan for Land-based Pollution Management and scale up of the Coastal Area Total Pollution Load Management System to national level
    - Expanding the critical habitats and species conservation areas and species restoration projects
    - Strengthening the coastal adaptation and response system for climate change and coastal management-related technologies
    - Developing coastal management methodologies with a new paradigm and coastal conflict management system
    - Strengthening state of the coasts monitoring and information management system
    - Increasing investment in research and development (R&D) for strengthening the coastal and ocean science and technologies
    - Increasing capacity and public awareness on coastal management and public awareness
    - Strengthening international collaboration for marine environment conservation and coastal management

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Singapore's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2011)

Basic Facts

Total Population 2011	**5,183,700** (Department of Statistics Singapore)
Percentage of population within 100 km of the coast	**100%** (WRI, 2001)
Land Area	**714.3 km²** (Department of Statistics, Singapore)
Area of territorial sea (up to 12NM)	**744 km²** (WRI, 2001)
Length of coastline	**182.4 km** (NEA, 2010)

National Economy

GDP per capita (2011)

S$ 63,050

GDP growth rate

4.9% (2011) 5.86 percent
(Average for 2007-2011, ADB, 2012)

GDP composition by sector (2010) (ADB, 2011)

Agriculture (0.0%); Industry (28.3%); Services (71.7%)

Employment distribution by sector (2011, Ministry of Manpower)

Manufacturing (16.2%); Construction (12.5%); Services (70.6%); Others (0.7%)

Coastal and Marine Economy

The offshore and marine sector has contributed strongly to manufacturing output in Singapore, increasing its share of manufacturing output from three percent (3%) in 2003 to close to nine percent (9%) in 2009. In 2010, the offshore and marine industry produced the fourth-largest manufacturing output in the country after semiconductors (21%), petroleum (15%) and pharmaceuticals (7%) (Credit Suisse, June 2011).

Sustainable Singapore Blueprint

Launched in April 2009, the Blueprint envisions Singapore to be a lively and liveable global city by 2030. The following priority strategies are identified to achieve the vision (Inter-Ministerial Committee on Sustainable Development, 2009).

- Improve resource efficiency so that we can grow with fewer resources. If we can achieve more with less, we can reduce costs and free up precious resources to continue to grow our economy. We will emerge more competitive in the long run.
- Improve the quality of the environment by controlling pollution and improving our physical landscape, so that we can continue to enjoy clean air and water, and live in a well-connected city with high public health standards.
- Build up our knowledge on how to grow in a more environment-friendly way, using technology to overcome our resource constraints, now and in the future. As we experiment and build up our knowledge, Singapore can also work with others to promote and build sustainable cities around the world.
- Encourage community ownership and participation in building a clean, green and resource-efficient Singapore. Business leaders, nongovernmental organizations and community leaders can work together to encourage people to make more environmentally responsible choices in the way they live, work, play and commute.

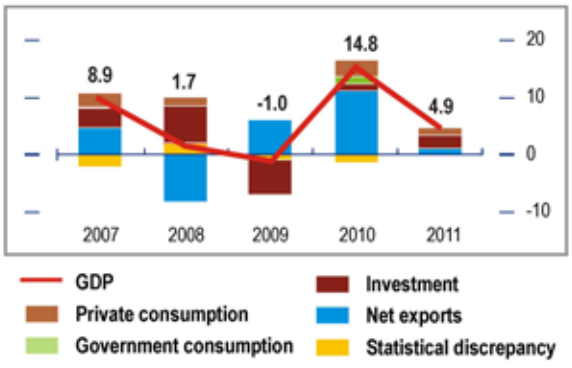
Progress in SDS-SEA Implementation (2003-2011)

National Ocean Policy and Institutional Arrangements

- The country has implemented Integrated Urban Coastal Management (IUCM) since 2009. IUCM is a unique framework for management of Singapore's coastal and marine space through the close coordination of all relevant government stakeholders and strong administrative processes governing all coastal activities. IUCM focuses on multiple use management of scarce urban coastal resources and on endeavoring to conserve marine natural resources in the face of development through science-based and consultative decisionmaking.
- Under the IUCM framework, the Coastal and Marine Environment Policy Committee (CMEPC) and the Technical Committee on Coastal and Marine Environment (TCCME), comprising members from different agencies with a stake in the marine environment were established in 2008. The CMEPC acts as a high-level ICM Programme Coordinating Committee for all coastal and marine environment-related issues in Singapore.
- The Inter-Ministerial Committee on Sustainable Development was established in 2008 to develop the national framework and key strategies for the country's sustainable development.

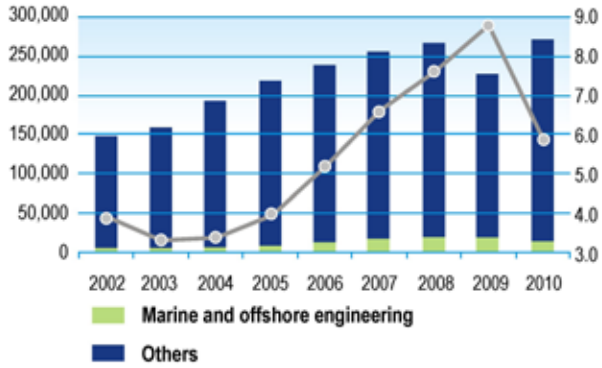
Sustainable Singapore Blueprint Goals by 2030	
Energy	Reduce energy intensity (per S$ GDP) by 35% from 2005 levels.
Waste	Improve recycling rate from 56% in 2008 to 70%
Water	Reduce total domestic water consumption from 156 L/capita/day in 2008 to 140 L/capita/day
Air	Reduce the annual mean for ambient fine particulate matter (PM2.5) levels from 16ug/m^3 in 2008 to 12µg/m^3
	Cap SO_2 levels at 15µg/m^3
Physical Environment	Achieve a park provision of 0.8 ha per 1,000 population
	Increase the length of park connectors from 100 km in 2007 to 360 km
	Increase 50 ha of skyrise greenery
	Increase reservoirs and waterways open for recreational use to 900 ha of reservoirs and 100 km, respectively
Capability Building	Build Singapore into an environmental knowledge hub
Community Engagement	Nurture an environmentally responsible community

Contributions to Growth (Demand).



Sources: CEIC Data Company (accessed 12 March 2012).

Offshore and marine industry contributes 5-9% of total manufacturing output in Singapore.



Source: Economic Development Board

Supporting Sectoral Policies and Legislation

Natural and Manmade Hazards Management

- Maritime and Port Authority of Singapore Act
- Planning Act
- Civil Defence Act (1986)
- Civil Defence Shelter Act (1997)
- Merchant Shipping Act

Biodiversity and Habitat Protection

- Act 22, 1996 on Establishing the National Parks Board
- Act 4, 2005, Park and Trees Act
- Foreshore Act
- Sand and Granite Quarries Act
- Parks and Trees Act (1975)
- National Parks Act (1990)
- Control of Vectors and Pesticides Act (1998)
- Wild Animals and Birds Act
- Destruction of Disease-Bearing Insects Act
- Control of Plants Act
- Endangered Species Act

Pollution Reduction and Waste Management

- Environmental Protection and Management Act
- Environmental Public Health Act
- Hazardous Waste (Control of Export, Import and Transit) Act
- Control of Vectors and Pesticides Act
- National Environment Agency Act
- Radiation Protection Act
- Prevention of Pollution of the Sea Act
- Merchant Shipping (Civil Liability and Compensation for Oil Pollution) Act
- Merchant Shipping (Civil Liability and Compensation for Bunker Oil Pollution) Act (2008)

Supporting Plans and Strategies

- IUCM Implementation Plan 2009
- Strategies for Sustainable Growth (2010-2030)
- Singapore Green Plan 2002-2012
- The Urban Redevelopment Authority (URA) Master Plan 2008 is the latest statutory land use plan that guides land use development of Singapore in the medium term.
- The Parks and Waterbodies Plan further details the existing and proposed green spaces and waterbodies.
- National Biodiversity Strategy and Action Plan (adopted in 2009)
- National Climate Change Strategy
- E^2 (Energy Efficient) Singapore
- Clean and Green Singapore Programme (2007-ongoing)
- Maritime Singapore Green Initiative (2011-ongoing)

ICM Implementation

Status of National ICM Program Development

Ocean and Coastal Management

- Integrated urban coastal management (IUCM) implemented since 2009
- 100% of Singapore's national coastline is under IUCM
- Institutional arrangements of IUCM formalized in 2011
- Coastal profile and a legislative review completed in 2011
- The Technical Committee for the Coastal and Marine Environment (TCCME) has initiated over 20 projects related to coastal management issues since 2009.
- Ongoing capacity building within government via courses and actual IUCM implementation

Natural and Manmade Hazards Prevention and Climate Change (NEA, 2010)

- Inter-Ministerial Committee on Climate Change was established in 2007 to oversee Singapore's climate change strategy.
- Singapore commissioned a vulnerability study to determine the long-term effects of climate change and Phase I of this study was completed in 2009.
- The development of drainage infrastructures amounting to $S 2 billion over the last 30 years, had reduced flood prone areas from 3,178 ha in the 1970s to 79 ha in 2009.

Habitat Protection and Biodiversity

- About 10% of Singapore's land area is dedicated to parks and nature reserves. Approximately 3,347 ha are legally protected as National Reserves (NEA, 2010). A network of green space, parks and park connectors, comprising an additional 4.5% of the country's land area, supports and buffers these nature reserves (National Parks Board, 2010).

- The country was able to increase its green cover from 35.7% to 46.5% between 1986 and 2007 (National Parks Board, 2009).
- The National Biodiversity Reference Centre, later renamed as the National Biodiversity Centre (NBC), was established on 22 May 2006 to serve as Singapore's one-stop center for biodiversity-related information and activities (www.nparks.gov.sg/nbc). This website acts as Singapore's Clearing House Mechanism (CHM) to the Convention on Biological Diversity (CBD).
- In May 2008, Singapore proposed the establishment of an index (Singapore Index on Cities' Biodiversity) to measure biodiversity in cities at the 9th Meeting of the Conference of the Parties to the Convention on Biological Diversity.

Water Use and Supply Management

- Singapore is water-scarce as it does not have sufficient land to collect and store water, and has no natural sources of water, including groundwater (PUB, 2012).
- Singapore has 17 reservoirs, 32 major rivers and 7,000 km of canals and drains. The ABC (Active, Beautiful and Clean) Waters Programme provides for complementary initiatives in managing catchments and waterways in Singapore (PUB, 2012).
- Integration of all water management functions (water supply, drainage and sewerage) is under a single agency, the Public Utility Board, since 2001.
- Singapore has overcome water shortages despite the lack of natural water resources by diversifying its sources of water supply through its Four National Taps program. The Four National Taps, include: imported water, water collected from local catchments, NEWater, and desalinated water (PUB, 2012).
    - Imported water – The country is importing water from Johor, Malaysia, under the 1962 Water Agreement, which will expire in 2061.
    - Local catchments – Singapore is one of the few countries in the world that harvest urban stormwater on a large scale for its water supply. The country is expanding its catchment area to maximize stormwater collection. The total water catchment area has increased to 2/3 of Singapore's land area with the completion of the three new reservoir schemes at Marina, Punggol and Serangoon over the last two years.
    - NEWater – is high-grade reclaimed water produced from treated used water. The latest and largest NEWater plant in the country was completed in 2011. NEWater can meet up to 30% of the nation's water needs.
    - Desalination – Singapore has one of Asia's largest reverse-osmosis plants, which produces 30 million gallons of desalinated water per day (136,000 m^3). Another desalination plant with a capacity of 70 million gallons is scheduled for completion in 2013.
- Water consumption declined from 156 L/person/day in 2008 to the current rate of 153 L through water conservation programs, including outreach and public awareness and education programs.
- The Public Utility Board has embarked on a 3P (People, Public, Private) approach for water management. The following programs are also being undertaken by PUB to reach out to the community (PUB, 2012):
    - The Water Network Panel engages different stakeholders in the water industry and the communities, and allows the stakeholders to provide feedback on the PUB's projects and programs.

Challenges and Priorities:
Natural and Manmade Hazards Prevention and Climate Changes

- Adaptation to climate change

Challenges and Priorities:
Habitat Protection and Biodiversity

- Implementation of the National Biodiversity Strategy and Action Plan. Main components are as follows:
    - Safeguard biodiversity
    - Consider biodiversity issues in policy and decisionmaking
    - Improve knowledge on biodiversity and natural environment
    - Enhance public education and awareness
    - Strengthen partnerships with all stakeholders and promote international cooperation

Challenges and priorities (GWP, 2011)
Water Use and Supply Management

- Meeting increasing water demand
- Reliance on imported water
- Development of alternative source of water (e.g., NEWater, desalination)
- Adaptation to sea level rise

  - The 10% Challenge and 10-Liter Challenge water conservation programs that encourage industries and households to use water wisely, and save 10% of their water consumption, and 10 liters of water per day, respectively.
  - The Watermark Award, which is an annual award that recognizes individuals and organizations for their outstanding contributions towards the water cause.
  - The Friends of Water recognizes individuals and organizations that contribute towards raising awareness about water and sustaining Singapore's water supply.
  - "Our Waters Programme" that encourages school and organizations to adopt waterbodies.

- Some S$ 2.5 billion have been invested in over 2,500 km of sewers, 139 pumping stations and 6 water reclamation plans. The MEWR also implemented Phase I of the Deep Tunnel Sewerage System (DTSS) — a network of deep tunnels comprising gravity sewers and pumping installations that intercepts used water flows in the existing sewerage reticulation system and channels (MEWR, 2012).

Food Security and Fisheries (MEWR, 2012)

- The incidence of food-borne diseases has been kept low through a comprehensive food safety system, which includes accreditation of foreign establishments and import surveillance and testing; the proportion of food outlets graded "excellent" and "good" in their hygiene standards increased from 77.3% in 2006 to 95.2% in 2011.
- As of April 2012, there are 250 farms occupying around 735 ha. There are another 119 floating fish farms occupying 93 ha of sea space.

Challenges and Priorities:
Pollution Reduction and Solid Waste Management (MEWR, 2012)

- Improving waste recycling rate
- Reducing mean annual levels of particulate matter, and other pollutants in the air

Pollution Reduction and Solid Waste Management (MEWR, 2012)

- Air quality has improved with reductions in fine particulate matter — which is linked to respiratory and cardiovascular illnesses — from 21 µg/m^3 in 2005 to 17 µg/m^3 in 2011 (MEWR, 2012).
- 100% of the population has access to waste collection services since 2007.
- Recycling rate has increased from 40% in 2000 to 58% in 2010.
- Singapore has developed an integrated waste management system that is also environmentally friendly. Pulau Semakau, Singapore's only landfill, was cited as the "Garbage of Eden" by New Scientist in 2007, and harbors rich biodiversity.

Improving Energy Efficiency and Mitigating Carbon Emissions (MEWR)

- Singapore's energy intensity (energy consumption per dollar GDP in 2005) improved by 33% between 1990 and 2010. Singapore aims to achieve a 35% reduction in energy intensity by 2030 over 2005 levels.
- Singapore switched to the use of natural gas-fired combined cycle powerplants, which are more efficient and cost-effective than oil-fired steam plants. Between 2000 and 2007, electricity produced by natural gas increased from 19% to 79% of total electricity produced, and overall generation efficiency rose from 37% to 44%.
- Singapore launched a national energy efficiency plan, E^2 Singapore, to encourage industry, buildings, transport and households to use energy more efficiently. The plan includes initiatives to raise public awareness of energy efficiency, to promote energy-saving technologies and systems, and to set minimum standards for household appliances that are major consumers of energy.

Challenges Ahead (IMCSD, 2009)

- **Managing the demands of a growing city.** The growth of the city will put more pressure on the country's limited land, water and energy resources. It will be more challenging to ensure that economic growth does not come at a high environmental price.
- **Adapting to growing resource constraints.** As a resource-scarce country, Singapore needs to use non-renewable (e.g., oil and gas) and renewable (e.g., water) resources more efficiently and sustainably.
- **Mitigating and adapting to climate change.**

- Singapore is investing in capabilities and technologies to increase its capacity to improve energy efficiency and mitigate carbon emissions, including:
  - Clean Energy Programme Office, now known as the Energy Innovation Programme Office (EIPO), was formed in 2007 to develop the clean energy industry with an initial funding of S$ 170 million. A further S$ 195 million was made available to EIPO in 2011.
  - A National Innovation Challenge on Energy Resilience for Sustainable Growth (or "Energy NIC") was announced in 2011 with S$ 300 million available for the first five years. The Energy NIC aims to develop cost-competitive energy solutions for deployment within 20 years to help Singapore improve energy efficiency, reduce carbon emissions and increase energy options.

Monitoring and Evaluation

- Monitoring of the biodiversity in Singapore's nature reserves and marine environment is ongoing. The City Biodiversity Index is also being proposed to serve as the monitoring tool for biodiversity conservation efforts in the country.
- The National Environment Agency conducts monitoring of the following aspects:
  - Air pollution – targets monitoring of sources of pollution, including industrial operations, power generation plants and motor vehicles. Emission standards are specified in the Environmental Protection and Management (Air Impurities) Regulations.
  - Monitors both drinking water and coastal and inland waters including recreational water quality in Singapore. NEA establishes regulations for drinking water quality and water quality guidelines for recreational waters.
  - The Meteorological Service Singapore (MSS) monitors climatic change and weather conditions in Singapore, in addition to atmospheric conditions and seismic activity.

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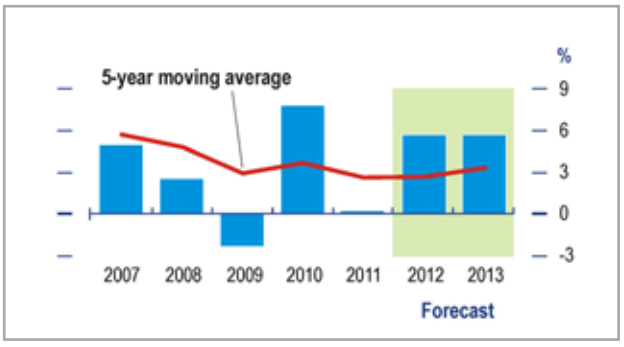
Thailand's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2011)

Basic Facts	
Total Population 2010	65,926,261
Forecast Population	68.7 million in 2015
Percentage of population within 100km of the coast	40% or 27 million
No. of coastal provinces, cities, municipalities	23 coastal provinces out of 76
Land Area	514,000 km^2
Area of territorial sea	300,000 km^2
Length of coastline	2,614 km

National Economy
GDP
US$ 317.7 billion (2010)
GDP per capita (year)
US$ 4,720.70 (2010)
GDP growth (past five year average)
7.8% (2010)
GDP 2011 growth forecast
3.5% – 4.5%
GDP Composition by Sector (percent of GDP, 2009)
Primary products and agriculture (9.2%), with 7.6% for agriculture, hunting and forestry, and 1.6% for fisheries);
Manufacturing, including mining and quarrying (40.9%);
Services (49.9%)

GDP Growth



Source: Asian Development Outlook Database.

Progress in SDS-SEA Implementation (2003-2011)

National Ocean Policy and Institutional Arrangements

Status of coastal and ocean policy/legislation

- Draft bill on management of coastal areas (Promotion of Marine and Coastal Resources Management Act) prepared in 2007 but still under consideration for endorsement to the Cabinet
- Draft National Coastal and Marine Policy prepared
- Management of coastal and marine areas in Thailand is presently governed by various issue- and area-specific policies and plans

National coordinating mechanisms for coastal and ocean/ICM policy

- The National Environment Board (NEB) is responsible for implementing environment laws, approving environment quality management plans and provincial action plans, and amending so as to improve environment laws. The NEB is chaired by the Prime Minister.
- In 2002, a new Ministry was established according to a Government Reorganization Act. Agencies involved in natural resources and the environment were placed under the Ministry of Natural Resources and Environment (MNRE).
- A Sub-committee on Marine and Coastal Resources (SMCR) was created under the NEB, with the primary task to develop the strategic policy framework and management plan that will improve and maintain the sustainability of Thailand's coastal and marine resources. The SMCR consists of representatives of various stakeholders. The Department of Marine and Coastal Resources (DMCR) serves as Secretary of the SMCR.
- At least 13 other ministries and departments are also involved in policymaking, planning and management of coastal areas within their jurisdictions. Various supporting institutional mechanisms, coordinating agencies and interagency and multisectoral coordination committees have also been set in place for implementing sectoral plans and programs.
- At the regional/sub-regional level, Thailand participates in coordinating mechanisms for sustainable development/environmental management including PEMSEA, COBSEA, the Mekong River Commission, the UNEP/GEF South China Sea and Gulf of Thailand Project, the Bay of Bengal LME Project, and Partnership in Oil Spill Preparedness and Response in the Gulf of Thailand.

Coastal and Marine Economy

Major contributing sectors to the marine economy:
Marine fisheries and aquaculture, coastal tourism, marine transportation, agriculture and major industries located along the coastline, especially on the East coast of the Gulf of Thailand, such as steel, oil refinery, petroleum chemical products, food processing factories and powerplants.

Economic contribution to the national economy (percent of GDP):

- **Fisheries (2006): 1.27%**
  Coastal tourism (2004): US$ 5,639.72 million (about 30% of national revenue from tourism)

Employment contribution to national employment:

- **The labor force was estimated at 36 million in 2006; about 43% were employed in the agricultural sector (including fisheries).**
- **The fisheries industry has also contributed directly to the growth of and employment in other related industrial activities, such as ice manufacturing, cold storage, fish processing, ship building, etc. The number of people engaged in this sector was estimated at about 2 million, of which 40 percent are fishers and fish farmers, and 60 percent are employed in other related and supporting industries.**

Supporting Sectoral Policies and Legislation

Environmental Management

- The 1997 Constitution recognized and supported "community rights in resource management" and delegated the authority and decisionmaking power to conserve, maintain, manage, and control the natural resources and environment from the central to local government local authorities.
- The Enhancement and Conservation of the National Environment Quality Act of 1992 covers the control of quality of and standards for environmental protection and conservation. It also allows the provincial and local authorities to formulate their own environmental management plans under the approval of the National Environment Board
- 20-Year Policy and Prospective Plan for Enhancement and Conservation of National Environmental Quality (1997-2016)
- Act Promulgating Local Administration Plan and Decentralization Process B.E. 2542 (1999)
- The Five-year National Economic and Social Development Plans, beginning from the 8th Plan (1997-2001) up to the 12th Plan (2012-2016) have been promoting harmony between development and environmental management and conservation, holistic and integrated approaches, and broad-base stakeholder participation.

Disaster Risk Reduction and Climate Change

- Disaster Prevention and Mitigation Act, B.E. 2550 (2007), provides authority to the provincial governor to be responsible for disaster prevention and mitigation operation within the respective provincial jurisdictions.
- National Master Plan for Disaster Prevention and Mitigation (2010-2014) provides guidelines for the formulation of operational plans of agencies responsible for management of disasters.
- National Strategic Plan on Climate Change (2008–2012) approved by the Cabinet in 2008 provides guidelines for relevant agencies to develop their respective plans to address climate change.

Biodiversity and Habitats

- Biodiversity Policy (2009) focuses on the protection and restoration of conservation areas that are important to the preservation of ecology in support of biodiversity conservation.
- National Policy, Measures and Plans on the Conservation and Sustainable Utilization of Biodiversity(2008-2012), based on the 2010 biodiversity targets and in accordance with the CBD Strategic Plan. It contains 5 strategies and 17 action plans, with a total budget of Baht 9,555.93 million (approximately US$ 280.627 million USD).

Medium-term Development Plan

- **Thailand is currently preparing the Eleventh Plan (2012-2016), which will adhere to the philosophy of Sufficiency Economy. The philosophy advocates economic stability and sustainable development over unbridled growth and promotes equitable sharing of the benefits of economic prosperity.**
- **The sixth strategy in the Eleventh Plan is targeted towards the sustainable management of natural resources and environment with the following development guidelines:**
  1. **Conserve, restore and secure natural resource and environment bases**
  2. **Shift the development paradigm and consumption behaviors towards the environment-friendly society**
  3. **Improving ecological efficiency of the production and service sectors towards the environment-friendly society**
  4. **Reinforce urban environment and infrastructure management**
  5. **Enhance adaptive capacity to achieve climate-resilient society**
  6. **Enhance good governance in the natural resource management**

Fisheries, Livelihood, and Food Security

- Master Plan of Marine Fisheries Management in Thailand (2009-2018) aims for the sustainable management of the marine environment and resources, capacity development and institutional strengthening, and promotion and application of the FAO Code of Conduct for Responsible Fisheries. (BOBLME, 2011).

Water Use and Supply Management

- Draft Water Resources Law (2010)

Pollution Reduction and Waste Management

- Action Plan for Solid Waste (2006)
- Rehabilitation plan for domestic wastewater collection and treatment systems (2006)
- Environmental Management Acton Plan for Coastal Aquaculture (2001)
- The Ministerial Regulation on Oil Spill Pollution Prevention, B.E.2545 (2002)

Communication/Education

- Thailand's approach to education and awareness on natural resources and environmental conservation includes:
    - Dissemination of information on various environmental issues to the public through different media including newspapers, radio, television, posters and other means
    - Campaigns on appropriate occasions and solicitation of public participation to the extent possible
    - Incorporation of basic knowledge on natural resources and environmental issues into the educational system
    - Direct public participation in environmental protection activities
- In Chonburi Province, as part of ICM program development, a communication plan was prepared targeting five (5) major groups: local leaders, youth, fisherfolks, teachers and restaurant owners.
- Thailand also hosts international and national conferences and forums on specific issues, including the International Symposium on Coastal Erosion and Climate Change Adaptation that was organized by the DMCR in 2011.

Capacity Development

- There are a number of universities, centers of excellence and institutions, and education and capacity-building initiatives related to marine and coastal management.
- Capacity building for marine and coastal management are also usually undertaken in relation to specific projects/programs through informal training courses.
- Regional and on-site trainings on ICM, specific tools such as environmental risk assessment, integrated information management, coastal strategy development, preparation of communication plan, coastal use zoning, environmental monitoring, and specific on-the-ground activities were undertaken as part of the development and implementation of the ICM Program in Chonburi Province; local governments in Chonburi also allocate annual budget for capacity development including study visits to other ICM sites and participation in various international workshops, conferences and forums.

Monitoring and Evaluation

- Monitoring and reporting system in place at the national level include the following:
    - Production and dissemination of Annual State of Environment Report – The National Environment Board (NEB), the country's highest environmental policymaking body) submits a report to the Cabinet on the state of the environment at least once a year.

ICM Implementation

- Major ICM initiatives in Thailand include the following:
  - Chonburi National ICM Demonstration Project (2000-present), a GEF-supported project implemented by PEMSEA in partnership with the Provincial Government of Chonburi and with the support of DMCR; started with five coastal municipalities and by 2009 covered all 26 coastal municipalities covering the entire 160 km coastline of the province. In 2010, non-coastal local governments also joined to complete the ICM coverage of the entire province. The Chonburi Coastal Strategy was adopted and interagency and multisectoral ICM coordination and management mechanism established through Provincial Order 763/BE 2549 (17 April 2006). Chonburi Province has started advocating/ introducing ICM to adjoining provinces along the Eastern Seaboard of Thailand.
  - Coastal Habitats and Resources Management (CHARM) 2002-2007, supported by the European Union, demonstrated a coastal resource management framework through the promotion of co-management between the government at all levels and the private sector, nongovernmental organizations (NGOs) and local communities in Ban Don Bay in the Gulf of Thailand and PhangNga Bay in the Andaman Sea, covering the areas of SuratThani, Phuket, PhangNga, Krabi, and Trang. ICM management plans were developed for the sites.
  - Integrated Management Plan for the Development of Songkhla Lake River Basin (2003)
  - Establishment and operationalization of PEMSEA's Port Safety, Health and Environmental Management System (PSHEMS) in Bangkok Port and LaemChabang Port.
  - The Bay of Bengal Project on Large Marine Ecosystem (BOBLME 2009-2013) focusing on integrated and coordinated management of the coastal and near-shore living marine resources. The program involves eight member States bordering the Bay of Bengal: Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka and Thailand. The project conducted a workshop on ICM Best Practices in Southeast Asia in January 2011.
- A number of community-based coastal resource management (CRM) and fisheries projects have also been implemented.

  - Production and dissemination of Annual State of Pollution Report – The Pollution Control Committee, the country's highest pollution control body, submits an annual report to the NEB on the state of pollution in the country. The Pollution Control Department (PCD) under MNRE, conducts annual water quality monitoring program in all major river basins and rivers and annual sea water monitoring at around 400 locations in the Gulf of Thailand and the Andaman Sea

- State of Environmental Governance Report in 2005
- The Office of Natural Resources and Environment Policy and Planning of the MNRE is responsible for preparing national reports to the UN Convention on Biological Diversity, UN Framework Convention on Climate Change, Ramsar Convention on Wetlands, and other Conventions. Thailand has submitted its 4th Report to the UNCBD, 2nd National Communication to the UNFCCC, and a National Report to the Ramsar Convention (2011).
- The Office of the National Economic and Social Development Board is responsible for preparing the Thailand Millennium Development Goals Report in collaboration with an interagency subcommittee.
- Data on the status of marine and coastal resources are also collected through institutions such as the:

- Phuket Marine Biological Center (PMBC) under DMCR undertakes long-term monitoring of coral reefs.
- Andaman Sea Fisheries Research and Development Center (AFRDEC) which is responsible for conducting research and development activity in the field of marine fisheries along the Andaman Coast of Thailand

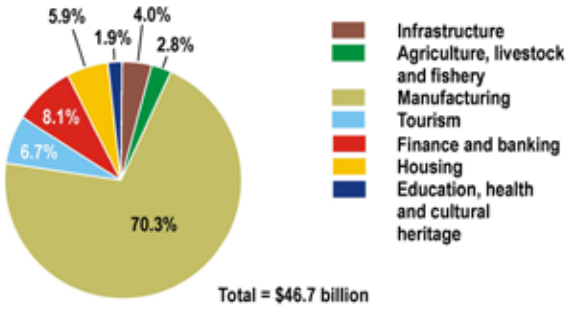
- A series of Environment Monitors prepared by the World Bank was also useful in consolidating information on general environmental trends in the country (2000), water quality management (2001), air quality management (2002), solid and hazardous waste management (2003), biodiversity management (2004), marine and coastal resource management (2006), and integrated water resources management (2011).
- At the local level in Chonburi Province, there is no comprehensive environmental quality monitoring program, except for research and monitoring being done by the PCD, Regional Environment Office, universities and research institutions and some private companies. A State of the Coast (SOC) Report was prepared by Chonburi Province using a set of 35 indicators covering governance aspects and programs relevant to management of marine and coastal areas; SOC reporting is intended to serve as a tool to monitor progress of ICM implementation.

Sustainable Development Aspects

Natural and Manmade Hazards

- Thailand is vulnerable to flood, landslide/mudflow, tsunami, windstorm, droughts, earthquake, fire, explosives and accidents.
- Widespread flooding across central and northern Thailand in August–November 2011, the worst in more than 50 years, devastated the economy. Floods disrupted industries, including agriculture, construction, transport and retail for months. The economy contracted by 9% year on year in the fourth quarter, leaving GDP for the year just 0.1% higher than in 2010.

Flood damages and losses, 2011.



Sources: Department of Disaster Prevention and Mitigation; Ministry of Finance.

- In 2004, a massive earthquake of 9.0 magnitude struck deep under the Indian Ocean and triggered cataclysmic tidal waves that devastated six (6) Andaman coastal provinces in southern Thailand, causing 5,395 fatalities and affecting 58,550 people in the six provinces; the total damage and loss was estimated at US$ 399.78 (from DDPM, MOI as presented in ADRC, 2011).
- Climate change is expected to aggravate the problems on natural disasters, such as the floods and droughts which have become more increasingly common.
- Since 2000, more than 15 climate scenario-related projects have been undertaken, mostly to enhance technical and scientific knowledge of climate change and its impacts, especially concerning uncertainty issues; Thailand has introduced climate factors into disaster management and further research and development in this area are urgently needed (2nd National Communication to UNFCCC)
- Studies on sea level rise are also being undertaken although these are still limited (2nd National Communication to UNFCCC).

Disaster Risk Management

- National Civil Defense Committee is the main policymaking body for disaster management; it coordinates all activities relevant to civil defense and disaster management, and

Challenges and Priorities: Natural and Manmade Hazards

- Integration of climate change impact with disaster mitigation to strengthen the resilience of higher-risk coastal communities
- Public awareness and education on threats posed by various types of disasters in order to improve public safety of every sector particularly those who are living with risk
- Public participation in disaster management
- Human resource development
- Efficient communication
- Establishing and operationalizing early warning systems
- Establishing more international disaster management networks
- Effective damage assessment of large-scale disasters through remote survey technology and training of staff
- Highlight on the preventive approach — shifting disaster management focus from "assistance" or "relief" to "prevention," taking into account risk reduction through both structural and non-structural measures.
- Promoting 'Unity in Management' through the application of the Incident Command System
- Livelihood rehabilitation activities to help bring normalcy to the lives of disaster victims

formulates and evaluates implementation of the civil defense master plan, organizes training courses on civil defense and disaster management, issues regulations on payment of remuneration, compensation and other relevant expenditures.

- National Safety Council of Thailand covers the prevention of chemical, occupational and road accidents, accidents in home and public venues, incidence of fire in high-rise buildings, etc.
- Department of Disaster Prevention and Mitigation established in 2002 as the principal agency for disaster risk reduction and management coordination
- Water Crisis Management Center under the Department of Water Resources conducts monitoring and provides information on flood situations in the river basins.
- National Disaster Warning Center established in 2004 to issue warnings for both natural and manmade disasters.
- Master Plan for Water Management (2012) covers upgrading warning systems, flood protection and management infrastructure, and a central agency for water resource management.
- Eleven (11) national training and education programs for disaster risk reduction and management have been established at the local and community levels.

Climate Change Adaptation and Mitigation

- The Office of Natural Resource and Environmental Policy and Planning in the Ministry of Natural Resources and Environment is the designated national focal point for climate change.The National Committee on Climate Change, chaired by the Prime Minister, is the highest climate change policymaking body.
    - Three subcommittees handling technical, negotiation and public relations functions.

- The Ministry of Natural Resources and Environment serves as secretariat for all the committees. It also coordinates operations with other public agencies, academic and research institutes, as well as NGOs and private organizations (2nd National Communication to UNFCCC).

- Programs/projects on climate change are focusing on:
  - Increasing energy efficiency, energy saving and renewable energy (geothermal, biomass, solar, wind, water);
  - Afforestation and reforestation for restoration and preservation of natural ecosystems;
  - Waste management, reduction, segregation, recycling; and
- In Chonburi, mangrove reforestation activities are contributing to the improvement in coastal protection.
- In Kho Tao, green development of the island has been emphasized.

Oil and Chemical Spills

- Marine Department of the Ministry of Transport is the focal agency and serves as the National Oil Spill Response Center for Thailand.
- Local oil spill contingency plan was developed and adopted in 2010 by Chonburi Province in collaboration with the Marine Department, Pollution Control Department (PCD), various stakeholders, PEMSEA and Oil Spill Response Limited (OSRL). The local plan outlines the multistakeholder arrangements in dealing with oil spill incidents occuring in the coastal area of the province and defines the procedures and mechanisms for response at shore including shoreline assessment, cleanup and claims for compensation from oil spills.
- Thailand, Cambodia and Vietnam established a joint spill preparedness and response in the Gulf of Thailand (2007), with the support and facilitation of PEMSEA and technical assistance from Oil Spill Response Limited (OSRL) and other partners. Annual meetings, trainings and information exchange have been undertaken since 2006.

Habitats and Biodiversity

- Every coastal province in Thailand has mangrove forests, covering approximately 36% of the coastline with an area of 1,458,175 Rais (2,333 km^2).
- Coral reefs cover an area of around 45,545 Rais (73 km^2) in the Gulf of Thailand and around 50,812 Rais (81 km^2) in the Andaman Sea.
- After the 2004 tsunami, 22% of 174 survey sites along the Andaman Sea Coast suffered while over 31% were damaged.
- Seagrass beds in Thailand cover around 153,846 Rais (245 km^2)
- Dugong, dolphin, whale, sea turtle and shark can be seen in Thai territorial waters. However, at present, the *dugong*, Irrawaddy dolphin, bottlenose dolphin, finless porpoises, marine turtles and 4 species of sharks are considered as endangered species.

Challenges and Priorities:
Habitats and Biodiversity

- Continued intense exploitation
- Land conversion
- Expansion of capture fishing, shrimp aquaculture, industry and tourism
- Public awareness and participation
- Human resources

- Hotspot mapping on coastal erosion risk, mangrove areas, seagrass area and coral reef area in Thailand cover the entire 2,614 km shoreline of the country.
- Protected marine area covers 4,317km^2 or 3.9% of territorial waters (2008), while the protected land area is 104,452 km^2 or 16.7% of the land area (2008).
- Strategic and action plans have been prepared for coral reefs, seagrass and dugong habitat, and various programs and projects on mangrove reforestation, marine turtles nursery and breeding have been undertaken.
- 11 Ramsar sites, with the wetlands of Khao Sam Roi Yot National Park in Prachuab Khirikhan Province, designated on 14 January 2008.
- In Chonburi, ICM program, activities include sea turtle protection and annual release to the sea, conservation of blue swimming crabs, mangrove rehabilitation and seagrass transplantation. Under the UNDP Small Grants Programme, a project on the Rehabilitation and Conservation of Mangrove in Chonburi Provincial Towns (Angsila, Saensuk, Muang Chonburi) was implemented in 2008-2010.
- Several mangrove rehabilitation projects are being also supported by the Mangroves for the Future (MFF).

Food Security, Fisheries and Livelihood

- Thailand is one of the top fish producing nations in the world. In 2007, total production was about 3.9 million tonnes, of which 58.2% came from marine capture fisheries and the balance was contributed from coastal aquaculture, freshwater aquaculture and inland capture fisheries at 22.9%, 13.1% and 5.8%, respectively.
- Fish is an important component in the diet of Thai people and an important source of protein. In the past decade, per capita fish consumption fluctuated around 32-42 kg/year (live weight equivalent). There are more than 2,500 fishing villages along the Gulf of Thailand and on the Thai shores of the Andaman Sea, with over 80% of fishers engaged in traditional or small-scale fisheries.
- Marine capture fisheries, however, has shown a decreasing trend, especially during the period 2002-2006, when the total catch decreased at a rate of 1.7% per year.
- Decline in marine capture fisheries due to overfishing are causing conflicts among various groups; cost of fishing has also increased while species caught fetched lower prices.
- Rapid urbanization and industrialization of the countryside and resulting impacts on natural resources, including water resources, are affecting inland capture fisheries.
- Inefficient aquaculture farm management has led to environmental degradation; various diseases, insufficient natural broodstock and increasing costs of shrimp farming have also caused problems to farmers; fish farmers, in general, lack capital and experience, especially on the use of modern and environment-friendly production technologies.
- Under the “Thai Fisheries Act,” fishery management measures have been formulated and implemented for the purpose of recovering depleted fisheries resources. The main fishery management measures include:
    - Area and seasonal closures
    - Gear restrictions
    - Stopping the issuance of new licenses for fishing vessels and requiring those with trawl and push nets to register
- Presently, there is a draft bill for a new Fisheries Law before Parliament, which addresses many of the current fisheries concerns.When the new fisheries law is issued, it is expected to be a more effective instrument for fisheries resources management.
- In Chonburi Province, various initiatives have been implemented to enhance local fisheries, aquaculture, food security and livelihood, including:
    - Establishment of floating mussel farm/raft culture;
    - Protective habitats for sprawning crabs (Crab Condominium) in Sriracha, Bangphra and Laem Chabang;

Challenges and Priorities: Food Security, Fisheries and Livelihood

- Over-harvesting of marine fisheries has reduced fishing yields by 90 percent.
- Coastal areas have been seriously degraded by expansion of capture fishing, shrimp aquaculture, industry and tourism.
- Derelict fishing gears are posing hazards to marine species.
- Assistance to subsistence fishers
- Inadequate opportunity for local communities to share in the benefits of development in the coastal zone and marine areas.
- Other issues and needs related to fisheries management in Thailand include:
  - Establishment of a comprehensive management regime at the national level; addressing overlapping mandates and promoting cooperation between concerned agencies.
  - Strengthening and developing legally enforceable decentralized management coupled with appropriate rights-based incentives to the fishing community.
  - Strengthening of data collection on gear and boats so as to have a clear understanding of the fisheries sector and its capacity.
  - Promoting the participation of local communities and the public in the development of the fisheries.

  - Community Development Fund for the establishment of long-term livelihood programs; and
  - Developing partnerships with other government agencies/institutions and the private sector to support various conservation and livelihood activities.
- A national program called One Tambon One Product (OTOP) aims to promote local Thai products for every *tambon* (town), and to facilitate the buy-and-sell processes.

Water Supply/River Basin Management

- 25 watershed areas across the country. Some 6.4 million ha are irrigated and 14.6 million ha are drained.
- Ranked as the lowest in Asia for annual per capita water availability, and ranks 14th in the world in terms of industrial organic water pollution.
- Average rainfall from 1995-2004 ranged between 1,400 and 1,600 mm/year. The amount of rainfall exceeded 800 billion m^3/year. Of the 800 billion m^3/year of rainfall, only about 200 billion m^3 is surface water that is available for utilization.
- Total water storage capacity, by different types of dams and reservoirs is about 74 billion m^3.

Challenges and Priorities: Water Supply/River Basin Management

- Absence of a water law
- Need to strengthen River Basin Committee operations, clarify roles and strengthen capacities
- Need to engage local communities and build trust among water users; support community activities that promote IWRM in priority river basins
- Identifying priority actions that meet the need of water users at national and local levels and developing investments in priority basins

However, water in the reservoirs for the summer season is only about 45 billion m^3. Most of the water is stored in large and medium-sized reservoirs which account for over 90% of storage capacity in the country.

- Demand for water continues to increase due to population growth and economic development. It is projected that by 2021 or within the next decade, the demand for water will reach 120 billion m^3.
- Projected demands, unless properly managed, would pose a serious threat to social and economic development.
- IWRM technically recognized in Thailand as a means to achieve sustainable water resources management and the concept has been incorporated in the national policy.
- Department of Water Resources (DWR) of the Ministry of Natural Resource and Environment (MNRE) assigned in 2005 to take the lead in forging effective IWRM implementation and 25 river basin committees (RBCs) have been established.
- Zoning of all areas of Thailand into 25 watershed management areas; river basin committees and sub-basin committees for each watershed zone established; implementation of integrated water resources management
- National water resource development strategy emphasizes:
    - Development of an integrated management mechanism with public participation at all levels
    - Improvement of conservation, rehabilitation and utilization of water resources, consistent with the ecological system in the area
    - Development of a participatory water watch and an early warning system
- Implementation of the strategic plan will require an investment of more than US$ 86 million (mostly for water supply enhancement)

Pollution Reduction/Waste Management

Wastewater Management

- Main sources of wastewater in Thailand include:
    - Municipal: approximately 14.5 million m^3/day (2008), including contributions from 1,687 municipalities (17%), 6,089 local administrative organizations (62%), and Bangkok Metropolitan Authority and Pattaya City (21%)
    - Industrial: Approximately 2.8 million m^3/day from >120,000 factories
    - Agriculture: Approximately 0.1 million m^3/day from pig farms and aquaculture (point sources) and 150 million m^3/day from paddy fields (non-point sources)
- Treatment capacity (2009/2010) was approximately 23% of total municipal wastewater)
- As of 2010, Thailand has 101 municipal wastewater treatment facilities, 11 of which were under construction .
- In Bangkok, the following measures have been implemented:
    - Implementation of central wastewater treatment projects
    - Improvement of 12 community wastewater treatment plants with a total capacity of 25,700 m^3/day
    - Canal water improvements through re-circulation of clean water to canals and oxygenation using aerators
- Future plans in Bangkok include:
    - Construction of three new wastewater treatment plants
    - Continued enforcement of effluent standards, public awareness and participation implementation of wastewater user charge; developing public-private partnerships for

the management and administration of wastewater facilities; and setting up of a network for routine water quality monitoring.

- In Chonburi Province, wastewater treatment plants are operational in Sriracha, Saensuk, Laem Chabang, Muang Chonburi and Pattaya, and in 2009, the percentage of population served by sewerage systems are as follows: Chonburi PAO (60-70%), Sriracha (95%), Laem Chabang (5%), Pattaya (80%), and Saensuk (100%) (Draft State of the Coasts Report for Chonburi, 2010).

Solid Waste Management

- 14.6 million tons of municipal waste generated (2007); 84% collected.
- 36% of collected wastes disposed in accordance with regulations (landfills, incinerators and integrated solid waste management facilities); 64% were disposed in open dump sites and by open burning; 22% of collected waste was recycled through Garbage Banks, municipal collectors and junk shops
- Main problems in solid waste management include:
  - Illegal/open dumping of wastes;
  - Lack of operational procedures and environmental controls for landfill operations; and
  - Co-disposal of municipal solid wastes and hazardous wastes.
- As of 2007, industrial hazardous wastes were estimated at 1.405 million tons while household hazardous wastes were estimated at 0.403 million tons; out of the total, 40% were properly managed while 60% were improperly managed
- Infectious wastes consisted 0.02 million tons of total hazardous wastes, of which 65% were disposed using hospital incinerators, 7% were disposed by private sector, and 28% were disposed by local administrative organizations (through co-disposal with MSW – 1.7%, secured landfill – 7.4%, incinerators – 2.5%, other methods – 16.5%).
- Existing municipal waste disposal facilities in Thailand include:
  - 96 sanitary landfills
  - Three (3) incineration facilities, in Phuket Province, Samui Island and Lampoon Province
  - Three (3) Integrated Waste Management Systems in Wieng Fang Municipality, Rayong Municipality, and Chonburi Provincial Adminsitrative Organization
- Facilities for infectious waste management are being operated in 11 local areas including: Bangkok, Pattaya City, Nonthaburi Provincial

Challenges and Priorities:
Pollution Reduction/Waste Management

- Increase in volumes of untreated domestic sewage, industrial wastewater and solid hazardous wastes
- Discharge of untreated wastes from shrimp farms containing various chemicals used to accelerate growth rate and prevent diseases
- Oil spills from marine transportation, including operational and accidental spills
- Aesthetic degradation and navigational hazards posed by marine debris
- Lack of clarity with respect to institutional responsibility and coordination for response and cleanup of pollution.
- Lack of public awareness on wastewater treatment and garbage management, marine litter issues, good practices for wastewater and garbage management for fishing ports

Priority Issues for the Next Five Years for SDS-SEA Implementation

- Initiate the development and adoption of a national marine policy and national interagency and multisectoral coordinating mechanism, including review of existing plans, laws and regulations and institutional reforms and restructuring to support integrated management and sustainable utilization of coastal and marine resources.
- Pursue the approval of the draft bill on Management of Coastal Areas.
- Improve enforcement of existing coastal and marine-related regulations.
- Revise coastal land use planning to support integrated coastal management.
- Integrate SDS-SEA objectives and targets into economic planning and into production landscapes.
- Harness markets and the private sector in marine and coastal resources conservation and sustainable use.
- Prepare and implement national framework strategies and action plans to address climate change, coastal erosion, natural habitat degradation, sustainable fisheries and man-made hazards from ships including oil, hazardous and noxious substances.
- Promote research and monitoring on marine and coastal resources.
- Scale up ICM implementation nationally, including supporting capacity building programs
- Conduct of State of the Coasts reporting to monitor progress of ICM implementation.

Administrative Organization, SamutSakorn Province, municipalities of Suphanburi, Chieng Mai, KhonKaen, Hat Yai, Phuket, UdornThani and Chonburi Provincial Administrative Organization

- As of 2011, more than 200 Garbage Banks have been established in Chonburi Province.

Major Challenges in Meeting SDS-SEA Objectives and Targets

- Lack of clarity in the allocation of powers and functions within the central as well as the decentralized bureaucracy.
- Lack of coordination, both vertically from the central to local authorities, as well as horizontally among authorities at all levels.
- Need to review and harmonize definitions of all terms in all laws governing resources and activities in the coastal zone and marine areas.
- No clear jusrisdiction in the coastal area; pending the approval of the Promotion of Marine and Coastal Resources Management Act.
- Inadequate opportunity for public participation in decisionmaking at all levels of government and particularly at the local level in many coastal areas.
- Inadequate opportunity for local communities to share in the benefits of development in the coastal zone and of natural resource management
- Many marine protected areas do not receive adequate budgets to protect marine resources.
- Limited funding for research, monitoring, and knowledge management.
- Inadequate regulations for the specific issues of land possession and tenure in the coastal zone, in particular, the need to establish zones for tourism and recreation to minimize the impact of tourism on coral reef, seagrass and other coastal ecosystems.
- No medium- or long-term plan for sustainable financing for marine and coastal conservation and management.
- Thailand is not a signatory to the UNCLOS.

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Timor-Leste's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2011)

Basic Facts	
Total Population (in millions)	1.09 million in 2011
Annual population growth rate	2.4% (2009-2011)
Forecast Population (2015)	1.201 million
Percentage of Population within 100km of the coast	100 percent
No. of coastal provinces	11 out of 13 districts
Land Area	14,874 km², including the eastern half of the island of Timor, the nearby islands of Atauro and Jaco and the enclave of Oecusse
Area of territorial sea	72,000 km² EEZ
Length of coastline	735 km

National Economy
GDP per capita (year)
US$ 588.427 (2010)
GDP growth (past five year average)
7.8% (2010)
GDP 2011 growth forecast
3.5% – 4.5%
GDP Composition by Sector (2011 estimates)
Agriculture (27%); Industry (18.1%); Services (54.8%); Fishery sector accounted for 1.4% of Timor-Leste's GDP in 2004
Economic contribution of the marine sector to the national economy
Agriculture, forestry and fishery (30%)
Economic contribution of the marine sector to the national economy
Economically active population in agriculture was 344,000 in 2008

GDP by Economic Sector, 2003.

Sector	Value (US$ million)	Percentage
Agriculture, forestry and fishery	104.4	30
Public administration and defense	79.9	24
Construction	55.9	17
Trade, hotel and restaurant	29.9	9
Transport and communications	27.5	8
Finance, rent and business services	23.8	7
Manufacturing	11.0	3
Mining and quarrying	3.8	1
Electricity, gas, water	3.2	.9
Private services	2.3	.7
Total:	**341.2**	**100**

Source: Ministry of Planning and Finance and IMF.

Progress in SDS-SEA Implementation (2003-2011)

National Ocean Policy and Institutional Arrangements

- Policies on coastal and marine resources management have yet to be established even with the current National Fisheries Strategy (NFS), which deals with some issues relating to coastal and marine resources.
- Consultation on the development of an academic draft of a marine and coastal policy has been recently initiated with the support of PEMSEA.
- Responsibilities for environmental protection and natural resources management including coastal and ocean governance in Timor-Leste are shared by more than 10 institutions according to their mandates. The Ministry of Agriculture and Fisheries (MAF) coordinates most activities related to coastal and marine resources development. MAF has established an integrated coordination mechanism for the implementation of various marine and coastal management programs and projects.
- Coordination with other institutions is facilitated through the Inter-Ministerial Working Group on Environment and Natural Resources Management.

Timor-Leste Strategic Development Plan 2011-2030

To achieve the broad vision of Timor-Leste in 2030 as an upper middle income country where extreme poverty has been eradicated, Timor-Leste's Strategic Development Plan provides short term (2011-2015), medium term (2016-2020) and long-term (2020-2030) policy direction that Timor-Leste is willing to undertake.

- **Environment:** Take action to manage natural resources sustainably by: (1) ensuring current laws and regulations are enforced; (2) preparing the comprehensive environmental protection and conservation legislation necessary to meet constitutional and international obligations addressing climate change, conservation of forests, land and sea areas, biodiversity, renewable energy and pollution control; (3) integrating environment and natural resource management across government; and (4) improving institutional and staff capacity in environmental management.

  Specifically by 2015, an Environmental Basic Law, National Biodiversity Law, Wildlife Conservation Law, air, noise and soil pollution regulations and vehicle emissions regulations will be in place. A Designated National Authority for the Mechanisms of the Kyoto Protocol and a National Climate Change Centre will be operational. Community-based nurseries will be planting one million trees nationwide every year, and public awareness of environmental protection will have been enhanced.
- **Water Resources:** Short-term approaches include formulating policy on nature conservation to preserve water cycle balance, and protecting the hydrologic cycle to safeguard nature conservation balance, especially the conservation of forest, river, watershed, sea and coastal areas. The middle-term strategies include utilizing water resources to fulfill the society's demand for water and energy, and exploiting water resources with the appropriate technology. In the long term, Timor-Leste aims to reduce dependency on diesel-generated power by using hydropower.
- **Water and Sanitation:** Take action to overcome the many challenges involved in improving access to clean water and sanitation across Timor-Leste, including building a major sewerage collection system in Dili, providing a safe piped 24-hour water supply to households in 12 district centers and installing water systems and community latrines in rural areas. By 2015, the MDG target of 75 percent of Timor-Leste's rural population having access to safe, reliable and sustainable water will have been exceeded, improved sanitation facilities will be available in 60 percent of district urban areas, and the improved operation and maintenance of the Dili drainage system will result in a cleaner city and reduced flooding.
- **Fisheries:** Based on Timor-Leste's Strategic Development Plan (SDP), the short term (2011-2015) policy direction that Timor-Leste is willing to undertake are to: (1) improve fisheries data and information management intended for the provision of fisheries resource database, especially marine fisheries; (2) improve facilities and infrastructure for the protection and preservation of habitats and marine resources; (3) develop or enhance the technical and managerial capacity and skills of fishers; (4) provide infrastructure and facilities for fishing and aquaculture; (5)improve fisheries production intended for the expansion of and distribution to markets; and (6) support the improvement of fisheries production quality.

ICM Implementation

- ICM programs focusing on livelihood development and sustainable use of coastal resources have been initiated in the districts of Manatuto and Liquica with the support of PEMSEA and MAF. Interagency and multisectoral coordination mechanisms were established, rapid appraisal and livelihood baseline scoping were conducted. State of the Coast reports are being prepared and trainings on ICM and livelihood development were conducted. The two districts have a total coastline of around 114 km, covering 15.5% of the country's coastline.
- At the Nino Konis Santana National Park, the Coral Triangle Support Partnership is working with national and local governments, park managers and communities to demonstrate a process for integrated terrestrial and marine spatial planning.

Monitoring and Evaluation

- There is no national environmental monitoring and reporting system in place.
- Reports on the Millennium Development Goals (MDGs) and to the Convention on Biological Diversity (CBD) have been prepared by interagency working groups with the support of the UNDP; the Ministry of Economy and Development, through the National Directorate for Environmental Services and the National Directorate for International Environment Affairs, submitted the Initial National Communication to the UNFCCC in 2008.
- Country environmental profiles have been prepared by donor-assisted programs and projects such as the ADB (2010) and World Bank (2009).
- A review of the progress, accomplishments and needs of the country related to the implementation of the SDS-SEA was conducted in 2010, covering the governance of marine and coastal areas and implementation of specific management programs (unpublished).
- PEMSEA's State of the Coasts (SOC) Reporting System has been applied in the Districts of Manatuto and Liquica, and generated baseline reports that can be updated periodically to show progress and accomplishments in ICM implementation.
- There is currently no capacity for environmental monitoring and no monitoring programs are in place.

SDS-SEA-related Legislation, Policies and Plans

Disaster Management and Climate Change

- National Disaster Risk Management Plan (2005) endorsed a multi-sectoral, multihazard, risk management approach to disaster management.
- National Disaster Risk Management Policy (2008) provides a general framework and activities for disaster risk management and the integration of activities across all sectors. It covers a shift from traditional crisis response management to disaster, conflict and climate change risk reduction. It mandates the establishment of a Disaster Operation Center and Departments for Preparedness and Formation, Prevention and Mitigation and Response and Recovery, a Inter-Ministerial Commission for Disaster Risk Management and Disaster Management Committees at district, subdistrict and village levels.
- The broad responsibility for various aspects of disaster management is spread across the Ministry of Social Solidarity and the Ministry for Economy and Development and their associated departments.
    - Within the Ministry of Social Solidarity, the National Disaster Management Directorate (NDMD) is responsible to the Secretary of State for Social Assistance and National Disasters and the focal point for management of the overall response to catastrophic events.
    - The National Directorate for Environmental Services (NDES) and the associated National Directorate for International Environment Affairs (NDIEA), within the Ministry for Economy and Development, are responsible for climate change adaptation and mitigation matters.

- Policies and institutional arrangements in the area of disaster risk management and climate change adaptation are being strengthened. An Inter-Ministerial Commission for disaster response/ management and several thematic working groups to oversee climate change planning have been established.

- National Adaptation Programme of Action on Climate Change (2010) identifies priority adaptation measures covering food security, water resources, human health, natural disasters, forests, biodiversity and coastal ecosystems, livestock production, physical infrastructure, poverty reduction and national institutional capacity development.

Habitat Protection and Biodiversity Conservation

- Regulation No. 19/2000 on Protected Places declares and protects 15 Protected Wild Areas, including terrestrial and marine, coral reefs, wetlands, mangroves, endangered species and historical, cultural and artistic sites.

- Government Resolution No. 8/2007 established the Nino Konis Santana National Park covering a total area of 123,600 ha, including 55,600 ha of the Coral Triangle.

- Regulation 17/2000 prohibits cutting and export of forest products.

- Government Resolution No. 8/2007 defines the National Policy and Strategy for Forestry.

- National Biodiversity Strategy and Action Plan (2011) provides a guiding framework for biodiversity conservation and ecosystems management.

- Timor-Leste National Action Programme to Combat Land Degradation was adopted in 2008.

- National Plan of Action for the Coral Triangle Initiative identifies priority goals and targets of Timor-Leste for protection and conservation of marine and coastal resources in line with the CTI Regional Plan of Action.

- Responsibilities for various aspects of habitat protection, restoration and management are spread across the following agencies:

    - National Directorate of Environment, Ministry of Economy and Development

    - National Directorate of Fisheries and Aquaculutre, Ministry of Agriculture and Fisheries

    - National Directorate of Forestry, Ministry of Agriculture and Fisheries

    - Secretary of State for Natural Resources

Fisheries, Food Security and Livelihood Development

- Decree-Law 6/2004 and Decree-Law 4/2005 provide the general basis of the legal regime for the management and regulation of fisheries and aquaculture.

- Law No. 12/2004 defines criminal actions related to fisheries.

- National Fisheries Strategy and Strategic Plan for Fisheries for 2006-2012 guides the management of the fisheries sector and deals with some issues related to marine and coastal resources management.

- The main agencies responsible for fisheries and agriculture management are the National Directorate of Fisheries and Aquaculture and the National Directorate of Agriculture, both under the Ministry of Agriculture and Fisheries (MAF).

Water Use and Supply

- Decree-Law 04/2004 on Water Supply for Public Consumption created two systems for water supply: one for urban areas managed by the government and another for rural areas managed by the community.

- Ministerial Order 1/2004 on Fees and Charges for Water Supply attempts to balance the need to charge user fees for financial and environmental reasons with the reality of the economic situation of the population and their right to have access to water.

- Decree Law 05/2009 regulates the licensing, commercialization and quality of the drinking water.

- Responsibilities for different aspects of water resources and supply management are spread across the following agencies:

- National Directorate of Water Resources and Sanitation, Ministry of Infrastructure
- National Directorate of Water Resources Management, Ministry of Infrastructure
- National Directorate of Environment, Ministry of Economy and Development
- Ministry of Health
- Ministry of Agriculture and Fisheries

Pollution Reduction and Waste Management

- Decree-Law 5/2011 on Environmental Licensing creates an integrated system for environmental impact assessment and pollution control to address challenges posed by future growth and investment to the environment.
- Law No. 10/2004 (24 November 2004) on the Health System includes provisions on sanitary surveillance and sanitary control.
- Decree Law 33/2008 covers Hygiene and Public Order
- Responsibilities for pollution reduction and waste management are spread across the following agencies:
  - National Directorate of Environment, Ministry of Economy and Development
  - Ministry of Health
  - National Directorate of Water Resources and Sanitation, Ministry of Infrastructure
  - District Administrations
  - Timor-Leste Port Administration
- National legislations on waste management, and fertilizer and pesticide use are being prepared/ reviewed

Communication/Education

- There are no academic institutions or training institutions offering environmental management or marine/coastal management courses in the country.
- There is limited data/information on the status of the environment, marine and coastal resources, and impacts of various activities, and lack of system to consolidate and share available data/information. Recent efforts to collect and consolidate information include:
  - Fisheries surveys and research (FAO-MAP, 2005)
  - Stock Assesment survey and oceanographic observation (Cooperation between MAFF -Thailand, 2005)
  - Marine Habitat mapping (MAFF-CDU, 2007)
  - ATSEF oceanographic survey and stock assesment (Indonesia, Australia and Timore-Leste)
  - Pacific Zonation Networking Area (CTI Pacific, 2011)
  - Inventory of national forest resources (*Universitas Tras os Montes Portugal dan Programa de Apoio ao Dezenvolvimento Rural de Timor Leste* (PADRTL), 2008).
- Stakeholder education, awareness raising and mobilization are usually undertaken in relation to specific programs and projects.

Capacity Development

- Currently, there is no national capacity development program in support of environmental management in general and marine and coastal management in particular.
- A National Capacity Self Assessment (NCSA) was undertaken in 2005 with the support of UNDP and GEF to assess the country's capacity of attaining global environmental management objectives. It highlighted the need for an integrated ecosystem approach to sustainable use of coastal and marine biodiversity and improved marine protected areas and community involvement in fisheries management and identified capacity needs at the individual, institutional and systemic levels.
- As part of the Marine and Coastal Habitat Mapping of the North Coast of Timor-Leste that was funded by MAF and undertaken in collaboration with several research institutions in Australia, trainings in field survey, marine species identification, monitoring of

Financing

- The Government of Timor-Leste has received significant financial support from several donors for development projects aimed at addressing various aspects related to the sustainable development and management of marine and coastal resources and environment, including the GEF, UNDP, UNICEF, ADB, WB, GIZ, EU, USAID, CIDA, JICA, AusAid, and international and local NGOs.
- The Government of Timor-Leste has progressively increased funding for environmental research and development programs, including allocation of:
  - US$ 2.2 million for the implementation of the 2008 program of the State Secretariat for Environment
  - US$ 520,330 for the Timor-Leste Marine and Coastal Habitat Mapping for Tourism and Fisheries Development Project, which was undertaken with the support of scientific and technical experts from Australia.
  - At least US$ 300,000 per year as national contribution to regional initiatives such as the CTI, ATSEA/ATSEF and PEMSEA.
- A Financial Strategy for the implementation of the Coral Triangle Initiative Nation Plan of Action (CTI NPOA) was developed in April 2012 with the assistance of ADB. The strategy will utilize sustainable financing modalities including Payments for Ecosystem Services and will also explore several funding sources including current donor programs, tapping potential development partners and the possibility of generating internal funding sources. It will likewise provide scenarios for establishing endowment funds and the institutional requirements for their operation.

coral reef habitats (including fish, invertebrates), and benthic habitat classification were conducted for selected personnel of MAF .

- At least 12 officers and personnel of MAF also participated in regional/overseas trainings on ICM, coastal use zoning and State of the Coasts Reporting organized by PEMSEA.
- 25 officers and personnel implementing PEMSEA, CTI, ATSEA and FAO projects participated in the Training Course on Ecosystem Approaches to Managing Coastal and Marine Resources jointly organized by MAF, PEMSEA, USAID-CTI, US Navy and CTSP in June 2011.
- 26 officers from MAF and other agencies participated in the Training Workshop on Rapid Appraisal and State of the Coast Monitoring conducted by PEMSEA in Dili in August 2011.
- 4 officers from MAF underwent an internship program at the PEMSEA Resource Facility.
- Several donor-assisted projects provided capacity building and technical assistance to national agencies, districts and communities on fisheries management, MPA establishment, watershed rehabilitation, extension and monitoring of forest area, mangrove management in support of sustaining coastal and marine ecosystem services, community-based water resources and supply management for water group users, community based coastal resource management, port management, logistics and operation and rescue operation, and international maritime conventions, including ADB, World Bank, UNDP, GEF, FAO, USAID, CTI/CTSP, GTZ, AUSAID, etc.

Progress towards SDS-SEA Targets

Sustainable Development Aspects

Natural and Manmade Hazards

- The country is very vulnerable to hazards — floods, landslides, droughts, pests, earthquakes.
- Climate change is also impacting on the country in terms of erratic rainfall, floods and drought.
- Basic systems for Disaster Risk Reduction and Management have been established in Dili, Bobonaro

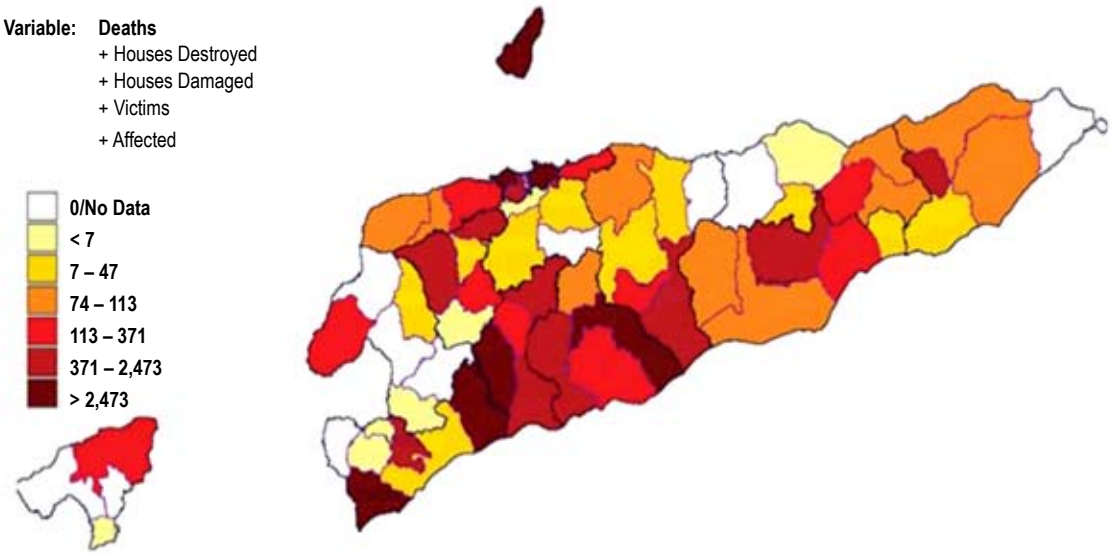
Challenges and Priorities: Natural and Manmade Hazards

- Countrywide response is still centrally managed through the National Disaster Management Directorate. District-level strucutures for disaster management have yet to be established/ operationalized.
- There is no basic monitoring system in place for meteorological, hydrological, and geophysical data collection. There is limited professional capacity to undertake monitoring and data analysis, and there is no central system for information management, storage, and access on geophysical, climatological, hydrological, and health hazards.
- Stakeholder consultations in Manatuto and Liquica identified lack of or insufficient preparedness and response system in times of disaster as among the key issues in their areas, due to lack of capacity of the government and stakeholders to prevent and mitigate effects of natural and man-made hazards and lack of awareness of stakeholders on natural and manmade hazards. These factors in turn are affected by lack of information about the hazards and actions that need to be undertaken. Lack of technology in terms of forecasting and early warning system can also contribute to insufficient preparedness and response. Budget for planning, preparedness and information dissemination is also crucial.

and Lautem in 2009-2010 under the Project on Disaster Risk Management Institutional and Operational Systems Development in Timor-Leste.

- The Government of Timor-Leste has also incorporated disaster and climate change considerations into the Strategic Development Plan (SDP) 2011-2030 and various key action plans and programs including the NBSAP, PoWPA, and sectoral plans.
- A NAPA was adopted in 2011, which includes programs to improve food security, integrated water resources management, restoration and conservation of mangrove ecosystems, awareness raising to protect coastal ecosystems exposed to sea level rise, health sector response to climate-related diseases and changes, resilient infrastructure, and institutional, human resource capacity and information management in the disaster sector in relation to climate change induced risks.
- Various programs and projects have been developed and initiated at the national and

Map of disaster-affected areas in Timor-Leste, 2001-2011 (NBSAP).



Source: NBSAP, p. 67.

local levels related to various aspects of climate change adaptation and disaster risk reduction and management since 2008, including strengthening institutional and operational systems for disaster risk management, improving planning and design of infrastructure for flood control and mitigation, and education and training programs.

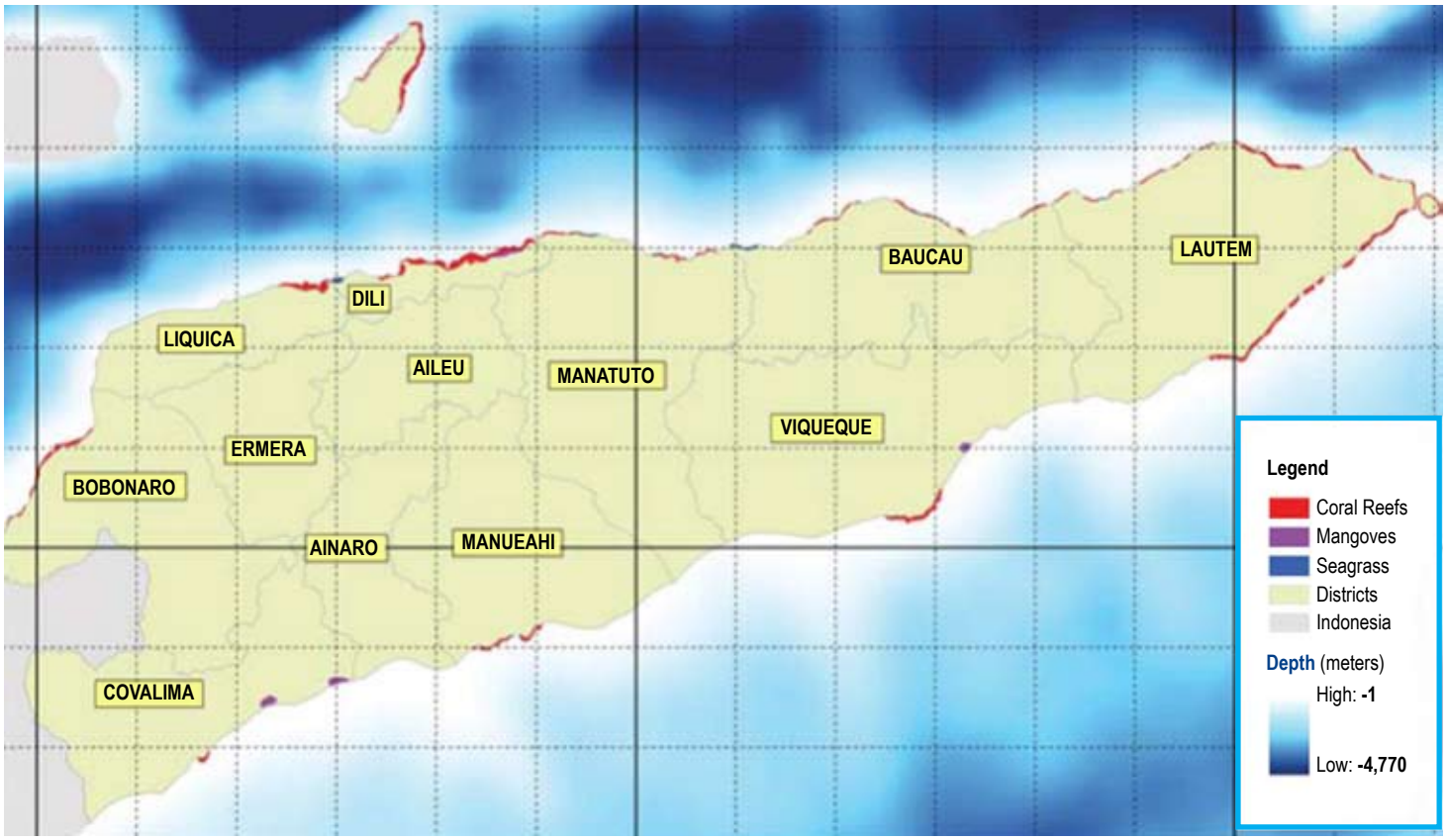
Habitats and Biodiversity

- Fringing coral reefs, characterized by narrow reef flats form an almost continuous strip along the coastal waters, west of Timor-Leste. On the eastern tip of Timor-Leste, the area of Nino Konis has been promoted as potential site of importance for coral reef conservation.
- Recent coastal mapping has revealed significant and ongoing coastal habitat loss. The total mangrove cover in 2008 was 1,802 ha, reflecting around 40% loss from 3,035 ha in 2000 and 80% loss from 9,000 ha in 1940.
- A marine megafauna survey completed in 2008 has revealed over 1,000 marine megafauna species existing in surrounding waters, including turtles, dolphins and small marine mammals, large whales and whale sharks.
- The forest area of Timor-Leste is around 50 percent of the total land area or around 745,174 ha. However, deforestation is estimated to be occurring at 1.1 percent per year.
- The Government of Timor-Leste has declared 30 protected areas and national parks in a network covering 2,000 km^2, which is about 15% of the country's land area. The largest one is the Nino Konis Santana National Park, which covers a total area of 123,600 ha (68,000 ha land and 55,600 ha sea);
- Timor-Leste also has 16 Important Bird Areas (globally recognized important habitats for conservation of bird populations).
- The Protected Area Network covers 5% of rivers, 55% of lakes, 6% of estuaries, 50% of coral reefs, 70 percent of seagrass habitats, and 50 percent of mangroves.
- In fulfillment of its obligation to the UNCBD, an NBSAP was completed in 2011 in parallel with the country's Fourth National Report to the CBD.

Challenges and Priorities: Habitats and Biodiversity

- Major threats to coastal and marine ecosystems in Timor-Leste include overfishing, conversion of coastal areas to settlement areas, agriculture, aquaculture and other uses, use of mangroves for house construction, fishing boat building, and fuelwood for households and saltmaking. Corals are being threatened with pollution and destructive means of fishing. Solid wastes are being thrown into river systems and find their way into the coast and eventually pollute the coral ecosystem. Sea turtles are threatened with overharvesting for their eggs, skin, meat and carapace for handicrafts. Some introduced mammals are also thought to have accelerated the decline of some endemic fauna although further studies are required.
- The management of marine and coastal resources are challenged by inadequate coordination among government institutions concerned in natural resources management, lack of trained personnel, lack of financial resources, insufficient information, inadequate sharing of available information among and between agencies, inadequate public awareness and participation.
- There is a need to:
  - Further collect information to better understand the status of the natural habitats;
  - Facilitate the completion, review and adoption of the relevant draft policies, action plans and legislations, and develop the legislative and institutional framework for their implementation;
  - Develop and implement programs that will promote the integrated management and protection of upland, coastal and marine areas and resources and encourage the support of communities as key partners; and
  - Develop the technical, managerial and administrative capacity to implement the relevant policies, legislations, action plans and programs.

Distribution of mangroves, seagrass beds and coral reefs in Timor-Leste.



- Prior to the development of the NBSAP, biodiversity has been mainstreamed in the SDP 2011-2030 of Timor-Leste and into development plans of education, health, energy, tourism and environment sectors in various levels.

Food Security, Fisheries and Livelihood

- Almost all fishing in Timor-Leste is subsistence or semi-subsistence. Based on the National Directorate for Fisheries and Aquaculture (NDFA) census survey results, there were approximately 5,000 fisher households in 2004 with an estimated 10,000 people engaged in some level of marine resource capture.
- The lack of reliable refrigeration, largely due to unreliable power supplies, is a major barrier to the commercial exploitation of fish.
- Fishing is commonly supplemented by other livelihoods in the agricultural sectors. Agricultural productivity, however, is also very low and suffers from insufficient diversification, technological limitations, water shortages, and lack of infrastructure, facilities and marketing strategies.
- Key programs and projects in the country related to food security and fisheries include extensions of fishing vessels and gears to fishers and development of fishing ports, fish seed centers, freshwater and brackishwater fisheries and seaweed culture.
- Preparation of Timor-Leste's Aquaculture Strategic Development Plan and Strategic Plan for Marine Capture Fisheries is ongoing.

Water Supply/River Basin Management

- The total length of the river system in Timor-Leste is about 4,286 km^2, covering a total river surface area of around 1,834.2 km^2. Very few of these rivers flow year-round and often dry out in the dry season, causing a water crisis for irrigation and clean water. River sedimentation, sewage discharges and dumping of solid wastes into the waterways also affect the water quality in the rivers. The utilization of water resources in Timor-Leste is also suboptimal because many of the irrigation and reservoir structures are not functional.

Challenges and Priorities: Food Security, Fisheries and Livelihood

- Poverty in the coastal areas
- Limited/lack of improved technologies and infrastructure to support fisheries, aquaculture and agriculture development
- Inadequate staff skills and lack of institutional arrangements to support implementation of strategies and plans for fisheries, aquaculture and agriculture
- Need to review policies and strategies based on the results and analysis of data collected over the years, as well as current information and consultations with the fisheries and concerned sectors

Challenges and Priorities: Water Supply/River Basin Management

- Decreasing quantity and quality of water resources as a result of unsustainable land uses;
- Need more effort to achieve MDG target on access to clean water in rural areas;
- Various agencies involved in the management and use of water resources; and
- Need to facilitate approval of the draft National Water Policy, development of institutional and legal frameworks, development of integrated water resource management program, and enhancement of coordination and streamlining of responsibilities among concerned agencies.

- The lack of or insufficient water supply affects sanitation, which poses a risk to health, and results in low production in agriculture, affecting the supply of food, which is already insufficient.
- Various water supply and sanitation improvement projects have been implemented throughout the country with the support of UNICEF, ADB, AusAid, JICA, Portugal, CARE Canada, Japan Community Solidarity Organization, EC-Austrian Red Cross, UNDP, ADB and other donors.

- More than 25 water resources management and supply and sanitation programs and projects are being implemented by various national agencies.

Pollution Reduction/Waste Management

- Programmes/activities on coastal and river cleanup are being done annually. However, infrastructure and facilities for pollution management are inadequate.
- Solid waste is collected in Dili, but the coverage is not complete. There is only one solid waste

Challenges and Priorities: Pollution Reduction/Waste Management

- Lack of system and facilities for solid and wastewater management especially in rural areas
- Low level of public awareness concerning proper waste management
- Direct disposal of untreated waste into water bodies
- Possible contamination of soil from use of fertilizers and pesticides
- Air pollution from burning of wastes
- Respiratory health risks from use of firewood for cooking
- No environmental monitoring programs
- Need to invest more effort and resources to pollution prevention, waste management and sanitation. This includes putting in place the appropriate policy, legal and institutional framework, and a comprehensive plan/program that will include public awareness/education on environmental issues, sanitation, waste management, hygiene and health. Developing capacity at various levels, investing in appropriate waste management systems/technologies and applying innovative financing mechanisms, including partnerships with the private sector, are also priorities.

Priority Issues for the Next Five Years for SDS-SEA Implementation

- Developing policy, legislation and plan for integrated management of marine and coastal areas and an interagency and multi-sector coordinating mechanism for coastal and ocean governance.
- Developing local capacity to implement ICM programs by strengthening existing pilot ICM sites and facilitating initiation of ICM initiatives in areas where other marine and coastal management programs are established.
- Developing ICM programs that address priority issues including:
    - Climate change adaptation and disaster risk reduction in vulnerable coastal areas;
    - Sustainable use of coastal and marine ecosystem services in biodiversity and fisheries hotspots; and
    - Water supply conservation and management and pollution reduction and waste management in priority coastal and watershed areas.
- Developing a training program for all coastal districts in Timor-Leste with focus on the districts where ICM programs will be established, including trainings on ICM and related technical tools, fisheries co-management, post harvest and marketing, livelihood development, safety at sea.
- Strengthening the National University of Timor-Leste (UNTL) in the areas of environmental, fisheries and marine sciences.
- Developing database and information management system for marine and coastal resources.
- Preparing and disseminating public awareness materials related to coastal and marine resources protection and management for specific targets.
- Mainstreaming ICM strategies and action plans into government plans and national budget plans.
- Exploring alternative sources of financing including corporate social responsibility (CSR), public-private partnership (PPP), donors and funding institutions in support of the implementation of ICM Program in Timor-Leste.

disposal site in Dili that operates through open dumping without any treatment. There is no system for collecting waste outside Dili. There is a need for domestic waste management applying the 3Rs (reduce, recyle, reuse).

- There is only one wastewater treatment facility. There is no sewerage system. Household wastes untreated and almost half of the population lacks access to sanitation facilities.
- Currently there no laws on waste management and air quality.
- Agricultural activities that contribute to pollution of rivers and coral reefs have not yet been addressed.
- The Government of Timor-Leste has implemented a program that includes urban and rural water supply and sanitation (WSS) projects, policy, planning, and administration projects and community awareness programs.
    - In October 2010, the Council of Ministers made available US$ 1.5M for the preparation of the Díli Sanitation and Drainage Master Plan (which will be completed within 2011, for implementation (construction, operation and maintenance) until 2025.

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Viet Nam's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2011)

Basic Facts	
Total Population	**86,928,000** (2010)
Forecast Population (2015)	**94,742,000** (projection by UN Statistics)
Percentage of Population within 100 km of the coast	**Over half of major cities are located in the coastal areas where more than 50 percent of the population lives.**
No. of coastal provinces	**28 of the 64 provinces are coastal provinces consisting of more than 125 coastal and 12 island districts**
Land Area	**310,070 km²**
Length of coastline	**3,269 km** (excluding islands) **and over 3,000 islands**

National Economy	
GDP	GDP Growth
US$ 1,224 (2010)	**6.7 percent** (2010)
GDP composition by sector	
Agriculture, forestry and fishing (20.58%); Industry and construction (41.10%); Services (38.32%)	

Economic and Employment Contribution of the Marine Sector to the National Economy

Coastal waters provide 80% of the country's total fishery catch, which contributed about US$ 4.5 billion to gross domestic product exports in 2010. It also contributes to about 10% of total national export value, 47% of animal protein for the people and provides millions of employment opportunities in rural areas.

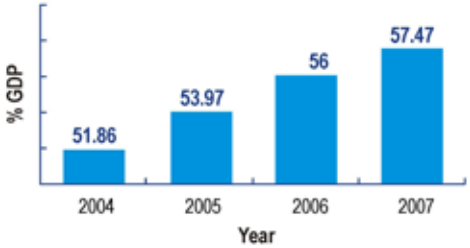
In 2005, some 19 million tons of oil and more than 6.5 billion metric tons of gas were produced resulting in US$ 7.5 billion export.

There are more than 100 potential locations for port facilities and many islands have high potential for tourism development. About 80% of the country's tourists visit the coastal areas and inshore islands with the number increasing annually (about 7 million tourists in 2010).

A considerable labor force of around 3 million is employed in the fisheries sector or around 10% of the total population derives their main income directly or indirectly from fisheries. An estimated 430,000 people are directly involved in capture fisheries of which 310,000 in coastal fisheries and 120,000 in the offshore fisheries.

Around 670,000 people are involved in aquaculture. Each year, around 26,000 people enter the capture fisheries sector. The increase in aquaculture activities and more centralized fisheries processing has opened opportunities for women, where 85% of the workers in processing factories are women.

The Contribution of Marine and Fisheries Sectors to the National Economy in GDP (2004–2007).



Sources: General Statistics Office, World Bank, Ministry of Agriculture and Rural Development.

Progress in SDS-SEA Implementation (2003-2011)

National Ocean Policy and Institutional Arrangements

- Resolution No. 09 - NQ / TW of the Fourth Conference of the Party Central Committee dated February 9, 2007 and Resolution No. 2007/2007/ NĐ-CP on Strategy for Viet Nam Seas toward 2020.
- Master Plan on Basic Survey and Management of Marine Resources and Environment until 2010 and Vision until 2020 (No 47/2006/QD-TTg).
- Decree on Integrated Management of Natural Resources and Environmental Protection of the Sea and Islands (No. 25/2009/ND-CP) prescribing the integrated management of natural resources and environmental protection in coastal areas, sea areas and islands of Vietnam and the responsibilities of agencies, organizations and individuals involved in the management, exploitation and use of natural resources and environmental protection of sea and islands.
- Integrated Coastal Management Program for North Central and Central coastal region until 2010 and orientation until 2020 (Decision No. 158/2007/ QD-TTg) focusing on strengthening capacities for the management, exploitation and efficient use of natural resources and environment, initially in 14 provinces and cities of the north central region and central coast of Vietnam through ICM.
- Master plan of socioeconomic development of Viet Nam's sea and coastal areas in the Gulf of Thailand up to (No. 18/2009/QĐ-TTg) to develop Viet Nam's sea and coastal areas in the Gulf of Thailand into a dynamic economic zone, contributing to the general prosperity of the country's southwestern sea and coastal areas and linking with other coastal areas nationwide into a quickly developing economic belt from Mong Cai to Ha Tien to help promote and push the development of inland regions.
- National plan on island development towards 2020, vision 2030 approved in 2010.
- Law of Marine Resources and Environment currently being developed.
- Law on ICM is identified in the government's list for legislation to be prepared after the approval of the Law of the Seas.
- Viet Nam Administration of Seas and Islands (VASI) established in March 2008 to coordinate the integrated and unified state management for seas and islands, including coastal areas.

Vietnam Socioeconomic Development Strategy (SEDS) 2011-2020

- **SEDS 2011-2020 gives attention to structural reforms, environmental sustainability, social equity, and emerging issues of macroeconomic stability. It defines three breakthrough areas: (1) promoting human resources/ skills development (particularly skills for modern industry and innovation); (2) improving market institutions; and (3) infrastructure development. The overall goal is for Vietnam to lay the foundations for a modern, industrialized society by 2020.**
- **Overall target of the Socioeconomic Development Plan (SEDP) for the period 2011-2015 is rapid and sustainable development: Special attention to quality efficiency and sustainability of development; harmonize the pace and quality of growth; socioeconomic development must go hand-in-hand with protection and improvement of the environment.**
- **Create a climate of peace and favorable conditions for the development of the country**
- **Maintain food security and energy security and effective operation of financial institutions**
- **Mobilize and use resources effectively**
- **Promote culture and social development in line with economic development**
- **Build a society based on openness and consensus**
- **Economic growth must be closely connected to environment protection and improvement**

Monitoring and Evaluation

- The Center for Environmental Monitoring under the Vietnam Environment Administration (VEA) of the Ministry of Natural Resources and Environment (MONRE) organizes and implements the national environmental monitoring program, manages environmental monitoring data, application of information technology in environmental monitoring, prepares reports on environmental monitoring within the framework of VEA's functions and mandates and serves as the focal point of the National Monitoring Network.
    - National Environmental Monitoring Network, established in 1996 and managed by NEA of the Ministry of Science and Technology (MOSTE) and now VEA of MONRE covers 21 stations, which carry out monitoring at 250 locations in 45 provinces.
    - The National Environmental Monitoring Programme covers the whole of Vietnam seas, where most of the stations are situated in estuaries, bay, and some in offshore waters.
    - In 2003, the Center for Environmental Information and Database was established, where one of the tasks was to develop a national database on the state of the marine environment with support from UNEP EAS/RCU. The Center was also involved in the development of the Vietnam Environment Monitor for 2003, 2004 and 2005 focusing on water, solid wastes and biodiversity, respectively.
- Other agencies involved in monitoring include:
    - Vietnam Administration of Seas and Islands (VASI) under MONRE through its various sub-ordinate units organizes basic and comprehensive surveys of marine and island environment and resources; conducts coastal, marine and islands environment and resources monitoring and control, guides coastal provinces in ICM implementation and manages the exploitation and utilization of seas and islands, including coastal areas.
    - Hydro-Meteorological Services (National Center of Hydrology and Meteorology of MONRE) maintains a network of 232 hydrological monitoring stations.
    - Agency of Geology and Minerals, MONRE, maintains a National Groundwater Monitoring Network with 310 regional monitoring stations and more than 600 observation wells across Viet Nam.
    - Department of Water Resources and Hydraulic Works, MONRE, is responsible for water resources management.
    - Ministry of Agriculture and Rural Development (MARD) monitors water quality in aquacultural areas.
    - Minitsry of Health (MOH) is responsible for monitoring quality of drinking water.
    - The Vietnam Academy of Science and Technology with 30 National Institutes plays a lead role in national scientific and technology development and conducts basic research on natural sciences.
- PEMSEA's State of the Coasts (SOC) Reporting System has been integrated into the National ICM Program; SOC reports are being developed in Da Nang, Thua Thien-Hue and Quang Nam.

SDS-SEA-related Legislation, Policies and Plans

Sustainable Development

- Strategic Direction for Sustainable Development in Vietnam (Vietnam Agenda 21) (No. 153/2004/QD-TTg) expresses Vietnam's commitment to the international community and serves as a framework strategy for ministries, sectors, localities, organizations and relevant individuals to follow during the implementation of their respective programs.
- Revised Law on Environmental Protection (No. 52/2005/QH11) provides for environmental protection; for policies, measures and resources for environmental protection; and for the rights and obligations of organizations, households and individuals for environmental protection.

ICM Implementation

- ICM currently being implemented in about 36% of Viet Nam's coastline (excluding islands).
- ICM is currently being developed at varying scales at the 14 coastal provinces in north central and central coastal region (from Thanh Hoa Province to Binh Thuan Province) and 2 coastal provinces and 1 city in the north (Quang Ninh Province, Nam Dinh Province, Haiphong City) and 3 coastal provinces in the south (Ba Ria-Vung Tau Province, Kien Giang Province, Soc Trang Province) to cover over 60% of the country's coastal provinces.
- About 480 km of national coastlines have land and sea use development plans, coastal spatial use zoning and management planning.
- About 13% of the local governments have developed their coastal strategies, namely Quang Ninh, Hai Phong, Nam Dinh, Da Nang, Thua Thien-Hue, Quang Nam, Khanh Hoa, Ba Ria-Vung Tau. All coastal provinces have developed action plans for the implementation of the Strategy for Viet Nam Seas towards 2020.
- Policies, strategies and plans on management, exploitation and sustainable use of marine and coastal areas have been developed in several provinces, applying integrated management approach, including Da Nang, Thua Thien-Hue, Quang Ninh and Hai Phong.
- Coordinating mechanisms for ICM implementation have been established in Da Nang, Nam Dinh, Hai Phong and Quang Ninh. A coordinating mechanism for ICM implementation is also currently being established in Thua Thien-Hue and Quang Nam.

Location of ICM Program	Length of Coastline (km)
Ba Ria-Vung Tau	305
Danang	92
Haiphong	125
Nam Dinh	72
Quang Nam	125
Quang Ninh	270
Soc Trang	72
Thua Thien Hue	128
Total:	**1,189**

- Provincial level, specialized divisions for sea and island management have been gradually created by the Provincial People's Committees (PPC) of the 28 coastal provinces within the Department of Natural Resources and Environment (DONRE) and were scheduled to be completed by the end of 2011.
- An integrated land and sea use zoning plan has been developed in Da Nang and is currently being developed in Thua Thien-Hue and Halong Bay, Quang Ninh.

- National Strategy on Environmental Protection until the Year 2010 and Vision Toward 2020 (No. 256/2003/QD-TTg) guides the country's environmental protection until 2020 focusing on three broad objectives for national policy: (1) preventing and controlling pollution; (2) protecting, conserving and sustainably using natural resources; and (3) improving environmental quality in urban, industrial and rural areas. The National Environmental Action Plan (2001-2005) further sets priorities in sustainable development, solid waste and water management, forest management, and strengthening environmental institutions, environmental education and community participation.
- Comprehensive Poverty Reduction and Growth Strategy (No. 2685/2002/VPCP-QHTH) is an action program that translates the Government's Ten-Year Socioeconomic Development Strategy, Five-Year Socioeconomic Development Plan as well as other sectoral development plans into concrete measures with well-defined road maps to realize economic growth and poverty reduction objectives.
- National Target Program for Poverty Reduction and Employment (Program No. 143) 2001-2005 implemented nationwide with 18 specific policies and projects focuses on the following targets: (1) elimination of chronic hunger; (2)

reducing the national poverty incidence below 10%; (3) provision of basic infrastructure to poor communes; (4) creation of 1.4–1.5 million jobs annually; and (5) reducing the unemployment rate in urban areas to below 6%, while working time in rural areas increases to 80%.

Biodiversity Conservation and Habitat Management

- Law of Biodiversity (No. 20/2008/QH12) provides for the biodiversity conservation and sustainable development; rights and obligations of organizations, households and individuals in biodiversity conservation and sustainable development.
- Law on Forest Protection and Development in 1991 amended in 2004 (No. 29/2004QH11) provides for the management, protection, development and use of forests; and forest owners' rights and obligations.
- Law of Fisheries (No. 17/2003/QH11) requires the State to adopt policies to ensure the sustainable development of fisheries; to encourage, and create favorable conditions for, organizations and individuals to exploit and rationally use aquatic resources; to secure the reproduction of aquatic resources and the development of aquaculture in the sea, rivers, lakes, marshes, lagoons and other natural water areas.
- Second National Biodiversity Action Plan to the year 2010 and Orientation towards 2020, approved in May 2007, includes conservation objectives that are made relevant to the actual socioeconomic development of Vietnam in the present period.
- Forestry Development Strategy 2006-2020 seeks to promote socialization of the forest sector, encouraging non-state actor tenure and resource access.
- Fisheries Development Strategy through 2020 (No. 1690/2010/QD-TTg) sets the targets to develop the fisheries sector according to four major sections: (1) fishing and fisheries resources protection; (2) aquaculture; (3) seafood processing and trading; (4) shipbuilding and fisheries logistic services. The strategy also focuses on developing the seafood industry in five geographical regions: (1) the Red river delta; (2) Northern Central and Coastal Central region; (3) Eastern South region; (4) the Mekong River Delta; and (5) Northern mountainous and midland and Central Highland region.

Climate Change and Disaster Management

- National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020 (No. 172/2007/QD-TTg) outlines Vietnam's approach for disaster mitigation and management, particularly focusing on floods, storms and drought. The Strategy aims to reduce disasters and their impacts on people, property, agriculture, economic well-being, environment, and sustainable development and lays down responsibilities of various implementing bodies.
- National Target Program to Respond to Climate Change (No. 158/2008/QD-TTg) establishes priorities on climate change responses nationwide and includes mitigation, adaptation including disaster risk management and crosscutting issues (e.g., monitoring implementation, financial mechanisms for implementation, awareness raising, capacity building and human resource development).

Integrated Water Resources Management

- National Water Resources Strategy Towards 2020 (No. 81/2006/QD-TTg) aims to strengthen the protection, exploitation, use and development of water resources, as well as the prevention and mitigation of adverse impacts caused by water together with 18 high priority projects for implementation of the National Water Resources Strategy for the period 2006-2010.
- National Rural Clean Water Supply and Sanitation Strategy up to Year 2020 (No. 104/2000/QD-TTg) and National Target Program in Rural Water Supply and Sanitation (NTP-RWSS) which has gone through three iterations (e.g., NTP1 for 1998-2005; NTP2 for 2006-2010 and NTP3 for 2011-2015) aims to provide all rural dwellers with access to at least 60 L/day of clean water,

Financing

- Circular No. 50 promulgated by the Ministry of Finance on 12 June 2008 provides for "Guidelines to set up, manage, use and settle expenses of State budget for implementation of the ICM Program for north central region and central coastal provinces until 2010 and orientation until 2020."

- Budget for implementing activities of the National Target Program for Responding to Climate Change for the period 2009–2015 (excluding funds for the implementation of the Action Plans of Ministries, sectors, and localities) is approximately VND 2.374 billion (approximately US$ 118.7 million): 32.2% for scientific and technological research; 6.9% for strengthening institutional framework, organizational structure; 12% for awareness raising and capacity building; 2.6% for international cooperation; 7.2% for integrating climate change into socioeconomic development plans, and 37.1% for developing action plans of ministries, sectors and provinces.

- A total amount of VND 57,400 billion (approximately US$ 2.74 billion) will be invested to implement 10 plans and projects of the Fisheries Development Strategy, which will be mobilized from the state budget, enterprises, citizens, ODA, FDI and other sources.

Source: Overseas Development Institute Working Paper 341, 2011; National Target Program to Respond to Climate Change; National Target Program in Rural Water Supply and Sanitation.

in line with the national standard, and a hygienic latrine, and with capacity to exercise personal hygiene and keep the environment in villages and communes clean.

Oil Spill Preparedness and Response

- National Plan on Coping with Oil Spill Incidents for the period 2001-2010 (No. 129/2001/QD-TTg) aims to increase readiness to cope and promptly and effectively respond to all cases of oil spill incidents, so as to minimize damage caused to the environment, as well as their adverse impacts on the economic sectors and the people's life.

Communication/Education

- Public awareness and education on sustainable development, protection of marine resources and environment, including other environmental concerns is a regular activity of many media agencies within Ministries/Departments of Natural Resources and Environment, Culture and Information, and other social organizations.

- The annual Vietnam Seas and Islands Week (1-7 June) in support of the World Ocean Day (8 June) has been approved by the Government as a communication campaign on coasts, seas and islands.

- A national program on propaganda and raising awareness on the coastal, marine and island sustainable development for the period 2010-2015 has also been approved by the Government in 2010.

Capacity Development

- ICM related courses are included in the undergraduate and graduate training curriculum in some universities, including the University of Natural Sciences of Viet Nam National University (VNU), Water Resources University, the University of Danang and the University of Nha Trang.

- ICM capacity enhancement activities are being conducted by MONRE, other sectors and universities.

- A number of central and local managers in 28 coastal provinces (about 200 persons) have been trained in ICM through ICMVieTraiNet, PEMSEA, NOAA/IUCN and the Netherlands. However, there is lack of concrete analysis and assessment on

the necessity and needs of capacity strengthening for state management of seas and islands. The present challenge also includes improving training programs, training facilities, staff, methodology, materials on coastal and marine management and governance.

- Danang University was designated as a PEMSEA ICM Learning Center in 2008.

Sustainable Development Aspects

Natural and Manmade Hazards

- National Steering Committee on the National Target Program for Responding to Climate Change was established in 2009.

Challenges and Priorities: Natural and Manmade Hazards

- Prioritize climate change issues in national policymaking:
  - National Strategy on Climate Change Adaptation (under development) aims to create a legal framework for implementing climate change adaptation and mitigation;
  - Law on Disaster Risk Management (under development); and
  - National Platform for DRR and CCA in Vietnam (under development).
- Conduct evidence-based, scientific research covering key climate change impacts, including:
  - Salinization of coastal areas in the Mekong Delta, resulting in reductions in agricultural productivity;
  - Increased incidence and severity of disasters, particularly floods and typhoons; and
  - Increased incidence of drought in the mountainous areas and in the Central Highland.
- Support integration of climate change and disaster management policies and databases, maps, and satellite imagery to facilitate forecasting and assessment of climate change impacts.
- Advocate for improved:
  - Engagement of the community and vulnerable peoples (e.g., children, women), through the provision of additional and targeted resources
  - Community awareness raising. This will support improved engagement of local people;
  - Capacity of local implementers, particularly with regard to participatory approaches and working with vulnerable peoples;
  - Guidelines that better describe methods for achieving policy objectives at the local level;
  - Program monitoring and evaluation to promote transparency and continual improvement;
  - Funding and budgeting strategies that facilitate the transparent distribution of funds and source new funds;
  - Engagement of a range of stakeholders including civil society, (e.g., Womens Union), in the climate change debate, to improve coordination of on-the-ground action and local dissemination of the policy;
  - Multistakeholder engagement in the National Platform on Disaster Risk Reduction and Climate Change Adaptation;
  - Integrated/multi-hazard approach; and
  - Emphasis on non-water related disasters and non-structural responses.

Sources: Asian Management and Development Institute, Vietnam and the Pressure Group Consultancy UK, 2011; Institute of Strategy and Policy on Natural Resources and Environment, 2009.

- Climate Change and Sea Level Rise Scenarios for Viet Nam were developed in 2009 and updated in 2011
- Action Plan Framework for Adaptation to Climate Change in the Agriculture and Rural Development Sector Period 2008–2020 (No. 2730/QD-BNN-KHCN) aims to enhance capability of mitigation and adaptation to climate change, to minimize its adverse impacts and to ensure sustainable development of the agriculture and rural development sector in the context of climate change.
- There are 93 disaster risk management programs listed from 1998-2010. The total allocattion to disaster management (structural and non-structural methods) amounts to US$ 1.68 billion, and 31 Government and donor-assisted programs on climate change and natural disaster mitigation (1997–2015) is estimated at US$ 89.8 million.
- 100% of the local governments have disaster risk management programs.
- Country's coastline has been mapped in terms of climate change vulnerability (100%) and oil spill sensitivity (almost 100%).
- Most Ministries serve as members of the Central Committee for Flood and Storm Control and have developed Action Plans for mainstreaming DRR in their sectors, while all 63 provinces have developed their Action Plans to implement the National DRM Strategy.
- Integration of DRR into the school curriculum has been considered at the ministerial level but only in some pilot provinces through projects of international NGOs.
- Oil spill contingency plan has been developed for the Gulf of Thailand. Oil spill contingency geographical plans are developed for Ba Ria-Vung Tau, and for Ha Long – Hai Phong areas with NOAA technical assistance. The Framework Programme for the Joint Oil Spill Preparedness and Response in the Gulf integrates the implementation of the OPRC Convention, the 1971 FUND Convention and the 1969 Civil Liability Convention.

Challenges and Priorities: Habitats and Biodiversity

- Guidelines for the implementation of the Biodiversity Law that clearly define the functions of biodiversity protected area management for relevant ministries, agencies and local authorities;
- Public awareness in enforcing the Biodiversity Law and building capacity of governmental managerial agencies in regard to biodiversity conservation;
- A mechanism for connection and cooperation among management agencies and law enforcement agencies in the field of biodiversity conservation and development;
- National inter-disciplinary programs to study, preserve and develop biodiversity resources in response to climate change;
- Programs for monitoring biodiversity and integrated management of biodiversity database. Conducting baseline biodiversity survey nationwide;
- Integration of biodiversity conservation into national, sectoral and local plans, programmes and projects;
- Sustainable system of protected areas;
- Role and capacity of local communities;
- National job diversification strategies to livelihood programs to reduce dependence on fishing for communities in and around MPAs;
- Investing in training for MPA sites and network staff and other relevant and provincial and national government staff; and
- Systematically applying reef resilience management and design criteria at existing and future MPAs aimed at mitigating anticipated impacts from coral bleaching.

Source: 4th Country Report Vietnam's Implementation of the Convention on Biodiversity, 2008; Vietnam Development Report, 2011.

Habitats and Biodiversity

- A system of 128 protected areas has been established and developed in all ecoregions nationwide covering an area of 2.5 million ha or about 7.6% of the territory.
- Two (2) World Natural Heritages, four (4) ASEAN Natural Heritages, two (2) Ramsar Wetlands and six (6) Biosphere Reserves have been internationally recognized.
- Adoption of a national marine protected area (MPA) system plan (No. 742/2010/QD-TTg) resulted in the establishment of a system of 16 MPAs, covering 233,974 ha of marine-based water area and 64,147 ha of inland area. The plan aims to allocate 2% of the country's marine area for biodiversity conservation by 2010. Four MPAs have been officially designated (Nha Trang Bay, Cu Lao Cham, Phu Quoc and Con Co) with two national parks with marine components (Con Dao and Nui Chua).
- Mapping and assessment of almost 70% of important coastal habitats completed.

Challenges and Priorities: Food Security, Fisheries and Livelihood

- Improving data collection and resource assessment;
- Ascension into the Western and Central Fisheries Commission as a full member nation;
- Reducing capacity for environmental sustainability and greater efficiency;
- Expanding and institutionalizing fisheries co-management;
- Market-based access and eco-certification strategies; and
- Reforming fisheries subsidies.

Source: MARD, 2012; Vietnam Development Report, 2011; MOFI and World Bank, 2005.

- About 50% of local governments with mangrove forests, coral reefs and other wetlands have developed habitat management programs.
- The list of protected areas in 2010 included 116 terrestrial protected areas, with a total area of 18,621.27 km^2 and 36 marine protected areas with a total area of 3,929.27 km^2.

Food Security, Fisheries and Livelihood

- National Food Security Program (Resolution 63) guides the development of many of the Ministry of Agriculture and Rural Development's (MARD) sub-programs including crops and fisheries planning.
- Implementation of Fisheries Sector Program Support Phase II 2006-2010, focused on: (1) strengthening of the fisheries administration; (2) strengthening of capture fisheries management; (3) sustainable development of aquaculture; and (4) strengthening of capacities for post-harvest and marketing.
- About 100 percent of local governments in coastal areas have prepared and implemented management plans covering food security and livelihood management.
- MARD implemented a project from 2007-2011 with funding support from Denmark to support the livelihood of communities in four MPAs: Cu Lao Cham (Quang Nam), Phu Quoc (Kien Giang), Nha Trang Bay (Khanh Hoa) and Nui Chua (Ninh Thuan). Positive results were generated including a shift in the structure of household income and reduced pressure on fisheries.

Water Supply/River Basin Management

- Total land area covered by the river basins is 1,167,000 km^2 with out-of-border river basin area covering 835,422 km^2, accounting for 72 percent of the total watershed area.
- There are 13 rivers with basin areas of over 10,000 km^2, of which 9 are major rivers (Red, Thai Binh, Bang Giang-Ky Cung, Ma, Ca, Vu Gia-Thu Bon, Ba, Dong Nai and Cuu Long) and 4 branch rivers (Da, Lo, Se San, Sre Pok). Ten (10) out of the 13 rivers are international rivers.

Challenges and Priorities: Water Supply/River Basin Management

- Strengthening protection of water resources and aquatic ecosystems;
- Ensuring sustainability and effectiveness in exploitation and use of water resources;
- Sustainable development of water resources;
- Mitigation of adverse impacts caused by water;
- Improvement of institutional arrangements; and
- Strengthening capacities in basic survey, scientific research and technology development.

Source: National Water Resources Strategy-Ministry of Natural Resources and Environment, 2006; State of Environment Report, 2003; Tropical Coasts, 2007, Vietnam Development Report DR, 2011

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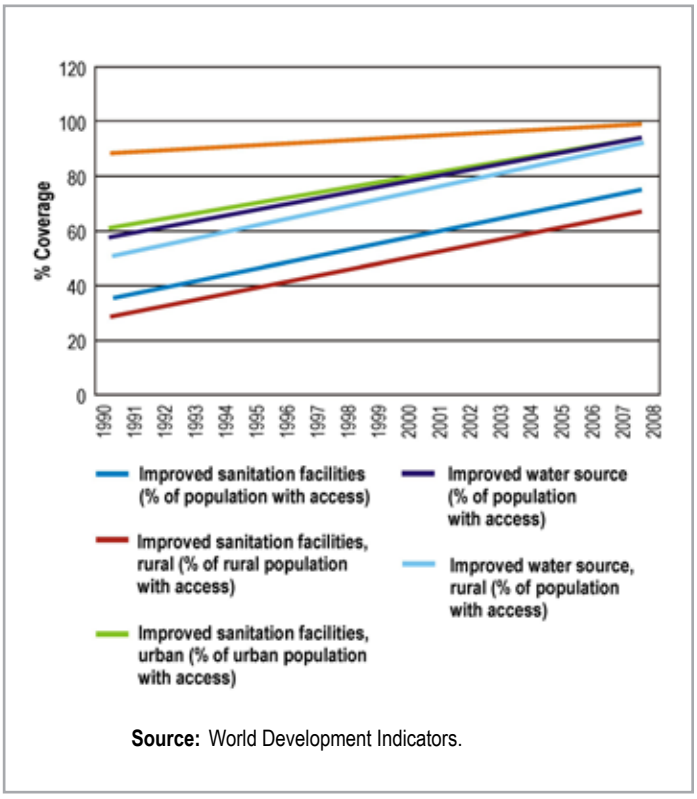

Source: World Development Indicators.

Challenges and Priorities: Pollution Reduction/Waste Management

- Regulations on the setting up and review of environmental impact assessment (EIA) reports
- Formulation and organization of the implementation of national, sectoral and local pollution control plans
- Improvement of the national and sectoral sets of environmental standards, and the adoption of clean technologies and cleaner production
- Improvement in waste management capacity and efficiency
- Resolution of industries that seriously pollute the environment
- Implementation of projects to remedy and rehabilitate heavily polluted and degraded areas and regions
- Remediation of environmental degradation as a consequence of Agent Orange/dioxin use during the Vietnam War
- Responses to environmental incidents and rapidly remedy environmental pollution consequences caused by natural disasters
- Information, education and communications (IEC) and community participation
- Strengthening of state management and human resource development
- Improvement in financial mechanisms and mobilization of various funding sources
- Research and development and application of appropriate technologies

Source: PEMSEA/COBSEA, 2006; World Bank, 2004; World Bank, 2003; Vietnam Development Report, 2011; NRWSS, 2000.

- Water resources are not evenly distributed among the different regions. Over 60% of river water is concentrated on the Cuu Long River Delta (Mekong River Basin). The remaining 40% is spread over nearly 80% of the nation's population and over 90% of production, trade and service activities.
- About 70% of the local governments in Viet Nam have multi-year action plans or management programs related to river basin management.
- Overall, groundwater meets quality standards for usage, including for domestic purposes. However, due to excessive exploitation and ill-planned use, contamination, saline intrusion and water level declines are increasing. In some areas, the groundwater has been lowered to unrecoverable levels, with the most significant cases being around Hanoi, Ho Chi Minh City, the Central Highlands and other regions in the Cuu Long river delta.

Pollution Reduction/Waste Management

- In 2004, about 2% of the population had sewer connections.
- There are 14 municipal centralized wastewater treatment plants operating in eight (8) main cities with a total capacity of about 462,320 m^3/day.
- There are 29 centralized industrial wastewater treatment plants in the main industrial parks with a total capacity of about 87,000 m^3/ day.
- In provincial towns, 75% of households are not connected to any form of local or central sewerage system. With 70.4% of the country's population still living in rural areas, slow performance in the rural water supply and sanitation sector represents a significant challenge.
- Less than 10% of the urban wastewater collected each day is treated. Where they exist, most urban drainage systems combine stormwater and untreated domestic wastewater.
- Collection of solid waste is up to 71% in urban areas, but less than 21% in rural areas. However, among urban poor, access to waste collection is only 10-20%. A 2004 report of solid waste disposal facilities identified 74 dumps and poorly operated landfills and only 17 sanitary landfills.
- Capacity for hazardous healthcare waste treatment was at 50%. A 2003 report estimated about 6 million cases of six (6) varieties of waterborne diseases registered over a four-year period and direct costs of at least VND 400 billion for the treatment of cholera, typhoid, dysentery and malaria.

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Priority Issues for the Next Five Years for SDS-SEA Implementation

- Adoption of the National ICM Program and ICM Law
- Establishment of a national coordinating mechanism for ICM
- Implementation of the national ICM scaling up program so that by 2020 all coastal provinces will be covered by ICM
- Incorporation of ICM into national and provincial socioeconomic development plans
- Integrated planning and implementation of integrated management of seas and island exploitation and utilization;
- Decision-support system in coastal management and technical tools for ICM (IEIA, SEA, risk assessment, coastal zoning, coastal and marine spatial planning and coastal use planning).
- Comprehensive public awareness programs/ plans to address all target groups; organization of communication networks across the country.
- Policy and mechanisms to develop partnerships between public and private sectors in coastal and marine concerns;
- Incentive policies and programs to encourage long-term planning and investment in the marine economy, including the development of islands
- Capacity building for state management of seas and islands
- Development of a national and local coastal database
- Development of coastal environmental monitoring and surveillance system
- Scientific research and development, technology development, and scientific surveys to better evaluate the potential of the marine economy
- Upgrading the capacity of the national ICM program, including VASI, coastal provinces and line agencies.
- International cooperation in investigating, surveying and developing the potential of the marine sector, in order to optimize opportunities for capital investment, scientific development and application of new and innovative technologies
- Adaptation to climate change impacts, including research, development and implementation of proposed solutions by authorized institutions.
- Cross-province river management to address cross-provincial water source and pollution issues, following a regional 'living rivers' mechanism that establishes common but differentiated responsibilities between provinces
- A poverty-environment decree that guides the integration of environmental concerns in development planning and poverty alleviation.
- Conservation of marine/coastal biodiversity clearly defined in law documents, including: (a) the participation of multiple stakeholders; (b) marine biodiversity monitoring, assessment and reporting; and (c) marine invasive alien species, etc.

Annex 2:

Major Activities and Achievements of Non-Country Partners and Their Contribution to SDS-SEA Implementation

Non-Country Partner	Activities/Achievements
ASEAN Centre for Biodiversity (ACB)	**National** • National Reports to the Convention on Biological Diversity (Cambodia, Lao PDR, Myanmar, Philippines, and Vietnam): Addressing Progress in Achieving the Biodiversity Target • Seminar on ASEAN Species and Protected Area Database Interfaces with the Philippine Council for Aquatic and Marine Research and Development (10 March 2011, Los Baños, Philippines). • Awarding Ceremony of the inaugural ASEAN Champions of Biodiversity, a recognition program for ongoing projects on biodiversity conservation and advocacy in ASEAN (31 May 2011, Manila, Philippines) • Corals Taxonomy Internship Programme in collaboration with the Phuket Marine Biological Center and the Government of Thailand, supported by the Japan-ASEAN Integration Fund (31 May-30 June 2011, Phuket, Thailand) • Capacity Building and Orientation Meeting/Workshop of ASEAN's GTI National Focal Points on Species and Protected Area Database Interfaces in collaboration with the Secretariat of the Convention on Biological Diversity, supported by the Japan-ASEAN Integration Fund (22 June 2011, Manila, Philippines
	Regional • Signed an LOA with PEMSEA on information exchange, capacity development, policy advocacy, and participation in EAS Congress • Regional Guidelines on Transboundary Protected Area Management. • Enhanced Regional and National Clearing House Mechanisms on Biodiversity Information Sharing Services. • Gap Analysis Studies on Protected Areas Coverage in Terrestrial and Marine Ecosystems in Southeast Asia • Co-convened the workshop on the Networking of Marine Protected Areas: Benefits, Good Practices, Standards and Next Steps during the EAS Congress in 2009 • Workshop on Enhancing the Quality of Protected Area Data: Developing and Field Testing an Expert Review Process to Improve Data in the World Database on Protected Areas in Asia (WDPA Asia Project, August 2010, Los Baños, Philippines) • Training on Corals Taxonomy in collaboration with the East and Southeast Asia Biodiversity Information Initiative (ESABII) of Japan and University Sains Malaysia, supported by the Japan-ASEAN Integration Fund (4-8 December 2010, Penang Malaysia) • Launched the United Nations Decade on Biodiversity for the ASEAN Region (30 May 2011, Manila, Philippines) • Development and implementation of course programmes on Natural Resources and Protected Area Management and Ecotourism
	Global • Launched the Biodiversity and Climate Change Project in cooperation with GIZ and the Federal Republic of Germany (September 2010) • Launched the ASEAN Biodiversity Outlook during the 10th Conference of Parties to the Convention on Biological Diversity (October 2010, Nagoya, Japan)
Conservation International (CI) - Philippines	**Local** • Protected Area Establishment in the Verde Island Passage Corridor • Science-based sites for network of MPAs identified, existing MPAs strengthened and new ones created and reached 16,503 ha of No Take Zones in the Verde Island Passage Corridor • Law Enforcement Establishment in terms of the creation of the Enforcement Network of Batangas Province (12 member municipalities looking after 33 MPAs)

Non-Country Partner	Activities/Achievements
Conservation International (CI) - Philippines (continued)	• Creation of Enforcement Network of Mindoro Province created (8 member municipalities looking after 15 MPAs). • Protected Area Establishment in the Cagayan Ridge Corridor • MPAs in Cagayancillo increased from less than 100 ha to more than 600 ha. • Policy Establishment in Cagayan Ridge Corridor • 9 Cagayancillo MPAs have adopted Management Plans • Cagayancillo *Bantay Dagat* (Sea Wardens) strengthened. • Expansion of Tubbataha Reef Natural Park buffer zone (349,307 ha) supported • Policy Establishment in the Turtle Island (Tri-National Sea Turtle Corridor) • Field station for research, training, base of enforcement has been renovated • Development of an Ecotourism Framework in the Turtle Island • 'No Take Zone' Law enforcement the Turtle Island supported in terms of training, provision of patrol boats, computers and communications equipment • Conduct of Sea turtle monitoring in Baguan in Turtle Island No Take Zone.
	Regional • One of the supporting organizations in the EAS Congress 2003 • Co-published the Tropical Coasts on "Conserving the Sulu and Sulawesi Seas", Vol. 15, No.1, July 2008. • Co-convened the workshop on Addressing Transboundary Issues through Regional/Sugbregional Seas Cooperation: Initiatives in East Asia during the EAS Congress in 2009
Coastal Management Center (CMC)	**Regional** • One of the supporting organizations in the EAS Congress 2003, 2006 and 2009 • Supported the 6th International Conference on Marine Pollution and Ecotoxicology in 2010
International EMECS Center	**Local** • JICA Training program for the central/local government officers (1990-present) • "The Integrated Water Management of Coastal Seas/Bays and Catchment Areas" training, supported by JICA (September 5 to October 30, 2010)
	Regional • PEMSEA and EMECS co-organized a special session on the Gulf of Thailand during the EMECS 2003 Conference on 18 November 2003 in Bangkok, Thailand. • EMECS8 Conference in Shanghai, China in 2008 and the Shanghai Declaration • Workshop on Indigenous Approaches to Habitat Protection and Restoration: Experiences in Sato-umi and other Community Inititaives, co-organized with PEMSEA in the EAS Congress 2009 in Manila, Philippines • Three-year programme on "Capacity Building of Biodiversity Research in Coastal Zones of the Asia Pacific Region: Phycology Taxonomy Analysis Training using Genetic Markers, in partnership with Kobe University Research Center (July 2010) • CAPaBLE program (capacity building for young researchers) supported by APN Centre (2010-present) • EMECS9 International Conference on the Environmental Management of Enclosed Coastal Seas "Ensuring Accountability and Effective Communication for Successful Integrated Management of Enclosed Seas" being organized
	Global • EMECS International Forum on "Sato Umi and Biodiversity," featured case studies from Japan, Philippines, and Thailand (February 2010) • EMECS International Seminar on "Challenges and approaches toward the implementation of the World Coastal Integrated Management" (Kobe, Japan, July 2010)

Non-Country Partner	Activities/Achievements
IOC Sub-Commission for the West Pacific (IOC-WESTPAC)	**Regional** • First Scientific Workshop on the Response of Marine Hazards to Climate Change (WESTPAC-ROSE-MaHaz), Qingdao, China (23-24 November 2008) • First Expert Workshop on the Pilot Project of SEAGOOS on the Monsoon Onsets Monitoring and its Social and Ecosystem Impacts (WESTPAC-MOMSEI), Phuket, Thailand (5- 6 March 2009) • Training Workshop on the Monitoring Techniques of Marine Oil Spills (20-23 April 2009) • Workshop on the Coral Reef under Climate Change and Anthropogenic Perturbations (WESTPAC-CorReCAP), Shanghai, China (23-26 May 2009) • Workshop on Marine Invasive Species and Management in the Western Pacific Region, Bangkok, Thailand (4-5 June 2009) • Joint Cruise on Response of Marine Hazards to Climate Change (WESTPAC-ROSE-MaHaz), SSC (15 June- 4 July 2009) • Second Expert Workshop on the Pilot Project of SEAGOOS on the Monsoon Onsets Monitoring and its Social and Ecosystem Impacts (WESTPAC-MOMSEI), Qingdao, China (8-9 August 2009) • First Brainstorming Workshop of WESTPAC Drafting Group on the Regional Ocean Research Priority Plan (WESTPAC-RORP), Bangkok, Thailand (25-26 August 2009) • Training Course on Ocean Data Portal Nodes, Seoul, Republic of Korea (31 August -4 September 2009) • Third Expert Workshop on the Pilot Project of SEAGOOS on the Monsoon Onsets Monitoring and its Social and Ecosystem Impacts (WESTPAC-MOMSEI) at the EAS Congress 2009, Manila, Philippines (25-27 November 2009) • Second Workshop on the Fluvial Sediment to the South China Sea (WESTPAC-FluSed), Shanghai, China (26-28 November 2009) • Second Scientific Workshop on Response of Marine Hazards to Climate Change (WESTPAC-ROSE-MaHaz), Qingdao, China (4-6 December 2009) • Workshop on "Enhance the Awareness on Toxic Marine Organisms", Nha Trang, Vietnam (13-15 December 2010) • Workshop on Coastal Marine Biodiversity and Conservation, Busan Republic of Korea (28-31 March 2011) • Workshop on Coral Reef under Climate and Anthropogenic Perturbations (WESTPAC-CorReCAP), Busan Republic of Korea (28-31 March 2011) • Third Scientific Workshop on Response of Marine Hazards to Climate Change (WESTPAC-ROSE-MaHaz), Busan Republic of Korea (29-31 March 2011) • Workshop on Remote Sensing for Coastal Habitat Mapping (WESTPAC-ORSP), Busan Republic of Korea (30-31 March 2011) • Second Training Course on “Water Quality and its Impact on Coral Reefs”, Sanya, Hainan, China (8-11 June 2011) • Training Course on Ocean Models, Qingdao, China (10-16 June 2011) • IOC/WESTPAC-PICES Joint Workshop on Rapid Assessment Survey Methodologies for Detecting Marine Non-Indigenous Species, Phuket, Thailand (19-21 July 2011) • Second Summer School of IOC/WESTPAC on the Monsoon Onset Monitoring and its Social and Ecosystem Impacts (WESTPAC/SEAGOOS-MOMSEI), Phuket, Thailand (15-19 August 2011) • Fourteenth Session of the IOC/WESTPAC Co-coordinating Committee for the North-East Asian Regional/Global Ocean Observing System (NEAR-GOOS), Tianjin, China (8-9 September 2011) • NOWPAP/PICES/WESTPAC Joint Training Course on Remote Sensing Data Analysis, Vladivostok, Russia (8-12 October 2011) • Second Workshop on Toxic Marine Organisms and their Toxins, Nha Trang, Vietnam (4-6 November 2011) • Workshop on “Remote Sensing for Coastal Habitat Mapping”, Johor, Malaysia (28-30 November 2011) **Global** • Eighth IOC/WESTPAC International Scientific Symposium “Ocean Climate and Marine Ecosystems” in the Western Pacific, Busan Republic of Korea (28-31 March 2011)

Non-Country Partner	Activities/Achievements
International Ocean Institute (IOI)	**Local** • Capacity Building on Ocean Governance, Policy, Law and Management at the local levels (communities/schools in 25 countries around the world since 2000 in the East Asian Sea, i.e., China, Thailand, Indonesia, and Japan).
	National • Capacity Building on Ocean Governance, Policy, Law and Management at the national (about 100 countries) since 2000 in the East Asian Sea are China, Thailand, Indonesia, and Japan). • Natural Hazard Prevention and Management in Thailand since 2005. In Thailand, institutional mechanism to promote government function levels from central, provincial, district, sub-district and village levels were used to coordinate and cooperate with local stakeholders in planning and management of tsunami early warning and mitigation system. • Publication of the IOI Children Album of Artworks: Thai Seas and Global Warming: Narrative School Children's Artworks
	Regional • One of the supporting organizations in the EAS Congress 2003 • Co-organized the workshop on Regime-building in Coastal and Ocean Governance during the EAS Congress 2006 • Consultation workshop on Shoreline Change, Erosion Management and Sea Level Rise in December 2009 in Bangkok, Thailand • Launched the Volume 16:Sharing Innovative Experiences: Example of Successful Experiences in Coastal Community Development, Special Unit for South-South Cooperation, United Nations Development Programme
	Global • Capacity Building on Ocean Governance, Policy, Law and Management at international level since 1981 in the East Asian Seas in China, Thailand, Indonesia, and Japan • Organizing the World Ocean Day Celebration by IOI Operational Centers around the world • Launched the World Ocean Review, a product of IOI's partnership with several eminent institutions and scientists to provide the first independent and comprehensive review of health and services of the ocean parallel to the IPCC report • Launched the Ocean Yearbook Volume 25 with Dalhousie University Law School • Organized the Pacem in Maribus XXXIII in Beijing, China, in September 2010, focusing on "Oceans, Climate Change and Sustainable Development: Challenges to Oceans and Coastal Cities"
Asia Regional Office of IUCN, International Union for the Conservation of Nature (IUCN-ARO)	**Local** • Replication of ICM implementation framework – Tomini Bay (Indonesia), Ranong (Thailand) • Support for LGU network Tomini Bay, Indonesia
	Regional • ICM best practice review, partnership between IUCN Asia and BOBLME project • Policy on climate change and ocean and coastal ecosystems - through Global Marine Programme (GMP) • One of the supporting organizations in the EAS Congress 2003 • Co-convened the special workshop on Opportunities for a Sustainable Regional Mechanism for Governmental/Civil Society Collaboration on ICM in the Indian Ocean Region during the EAS Congress in 2009
Korea Environment Institute (KEI)	**National** • Establishment of an environmental education center in Vietnam
	Regional • Co-organized the workshop on the Ecosystem-based Management of Interrelated River Basins, Estuaries and Coastal Seas with KMI, KORDI and MOMAF during the EAS Congress in 2006

Non-Country Partner	Activities/Achievements
Korea Environment Institute (KEI) (continued)	• Signed an MOU with PEMSEA to implement activities related to environmental planning and management in the region, focusing on knowledge sharing, capacity building, in the field of management of land-based pollution and environmental impact assessment (2006) • Co-convened the workshop on Addressing Water Crisis in Rapidly Growing Cities during the EAS Congress in 2009 • Conducted several environmental impact assessments training programs from 2004-2009 participated by Southeast Asian countries, China, DPR Korea, Lao PDR • Conducted training program on sustainable development and environmental management education participated by China, Vietnam and Lao PDR • Undertook and completed research on Policies for Sustainable Carbon Absorption in Land and Sea for Climate Change Adaptation • Research on Determination Measures according to Survey Station of Marine Organisms based by Impact Prediction of Environment Assessment in Coastal Development Projects • Research on Environmental Assessments of Ocean Energy and Environmentally Friendly Land Utilization • Undertook and completed research on Long-term Impact Assessment of Oil Spill and its Policy Implications • Research on Methods for Improving Assessment Techniques for Sea Pollution • Research on Detailed Analysis and Predictions of Sea Level Changes • Research on Socioeconomic Impact Assessment of the Rising Sea Levels in Korea • Research on Policy Implication from the Vulnerability Analysis of Rising Sea Levels
Korea Maritime Institute (KMI)	**National** • International Marine and Environmental Policy Education Program (IMEPEP) co-organized by KMI and the Ministry of Land, Transport and Maritime Affairs of RO Korea. In 2010 and 2011, training courses were conducted, respectively, for high ranking and working level officials on innovative marine and environmental policies. • National Coastal Survey, 2009 • National ICM Master Plan, 2010 • Development of the 5-Year National Plans for Shipping Industry in RO Korea; Plan for 2010-2015 • Development of the KMI Ocean Academy 1st high level course • Launch of the Marine Cluster Organization Council • Seminar in Joint Entrance to Overseas Markets with Shipping and Logistics Companies
	Regional • One of the supporting organizations in the EAS Congress 2003 • Co-organized the workshop on the Ecosystem-based Management of Interrelated River Basins, Estuaries and Coastal Seas with KEI, KORDI and MOMAF during the EAS Congress in 2006 • Signed an MOU with PEMSEA to build awareness and understanding in coastal and ocean governance, share experiences and lessons learned, and develop research and other capacity building activities (2006) • Driving Integrated River Basin and Coastal Area Management initiative, since 2008 • Signed MOA with Ministry of Land, Transport and Maritime Affairs (MLTM) and PEMSEA on the Establishment of the Twinning Secretariat (2008) • Co-organized Twinning Workshops in RO Korea (2005), China (2007), Philippines (2009), China (2011) • Supporting LDC to develop ICM scaling up, 2009 • 11th Director General Meeting of Northeast Asia Port and Port Symposium • Signed LOA with PEMSEA on the Study on Integrated Land and Sea-use Zoning in Manila Bay (2011) • Assistance to Indonesia in preparing policies and responses for the protection of the coastline from climate change 2010-present • Conducted research projects including a study on disaster prevention in the coastal areas of the Philippines and better risk management capability, and seaborne transportation and logistics development in ASEAN

Non-Country Partner	Activities/Achievements
Korea Ocean Research and Development Institute (KORDI)	**Regional** • One of the supporting organizations in EAS Congress 2003 • Co-organized the workshop on the Ecosystem-based Management of Interrelated River Basins, Estuaries and Coastal Seas with KEI, KMI and MOMAF during the EAS Congress in 2006 • Co-convened the workshop on Alternative Energy-A Solution for Energy Security for Islands and Remote Areas during the EAS Congress in 2009 • Carry out basic researches of exploring physical, chemical and geological oceanographic processes and developing a software-oriented pollution prevention system in coastal and marginal sea regions around the Korean peninsula. • Conduct researches of diagnosing and predicting the change of our sea environment and establishing ultimate strategies for the adaptation dealing with coastal disaster due to climate change • Research on Utilization and development of marine mineral resources • Conducts research programs to understand the structure and function of marine ecosystems of coastal waters as well as open and tropical waters so as to provide basic information for the sound and sustainable utilization of marine ecosystem and its living resources. • Conducts various research and development projects to enhance the value and utilization of coastal zone including port facilities, and to secure clean ocean energy resources. • Conducts in-depth research on ocean remote sensing with satellite and acoustic wave, exploration of the water mass, and observation and technology development of ocean physical characteristics. • Performs research and development in pursuit of key technologies for novel-concept and environment-friendly vessels • Develops various safety technologies for maritime accident prevention, IT-based e-navigation technology as well as salvage and pollution control technology have been developed in order to minimize the possible damages of maritime accident. • Provides key engineering technologies for the development of ocean resources and for the utilization of ocean space and energy, which are applied in the development of ocean equipments and offshore facilities. • Conducts studies on marine ecological health and environmental risk assessment as well as operating special research center for ship ballast water in addition to impacts of ballast water on coastal environment. • Finds out comprehensive oceanographic characteristics of the East Sea, otherwise known as 'the small ocean', for various fields such as ocean environment, ocean resources, coastal management. • Marine policies, international and domestic trends in ocean S&T, R&D and other ocean issues • Endeavors to develop and manage DB system, GIS and real-time data service system for systematic management of oceanographic data and their applications, and development of the marine knowledge management results, development and management of the Digital Library System. • Collaborated with PEMSEA on the provision of training opportunities to government personnel and local experts who are involved in environmental monitoring at PEMSEA sites • A training course on environmental monitoring related to oil spills was conducted with 13 participants from PEMSEA Sites from 10-23 October 2004 • Signed an MOU with PEMSEA to promote capacity-building activities in the field of marine species and technologies (2006)
	Global • Entered into various collaborative agreements, including the following: ◦ Research agreement on research education with China Maritime University ◦ Cooperative partnership with Plymouth Marine Laboratory, National Oceanography Center UK, French Research Institute for the Exploitation of the Sea

Non-Country Partner	Activities/Achievements
Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region (NOWPAP)	**Regional** • NOWPAP Regional Oil Spill Contingency Plan was developed and signed in 2004 • Co-organized the workshop on Oil and Chemical Spill Contingency Planning and Response during the EAS Congress in 2006 • NOWPAP has started activities related to Integrated Coastal and River basin Management (ICARM) since 2007, which will eventually help member states to deal with such issues as climate change adaptation and biodiversity conservation. • The Plan NOWPAP Regional Oil Spill Contingency Plan was successfully applied after a major oil spill in Korea in December 2007 which allowed member states to provide assistance • Signed LOC with PEMSEA on Cooperation for the Sustainable Development and Management of Marine and Coastal Environment of the Seas of East Asia (2007) • Hazardous and Noxious Substances (HNS) was added to the Contingency Plan in 2008 • NOWPAP Regional Action Plan on Marine Litter (RAP MALI) management was developed and adopted in 2008. RAP MALI is being implemented by NOWPAP member states since then, helping them to deal with the marine litter problem at local, national and regional level. • NOWPAP has started assessments of marine and coastal biodiversity and the situation with marine invasive species since 2009; these assessments will help member states to conserve valuable resources and protect livelihood of people depending on that resources. • Third Joint NOWPAP Oil Spill Response Exercise conducted back-to-back with Forum on Sakhalin oil and gas projects (Wakkanai, Japan, September 2010) • NOWPAP International Coastal Cleanup Campaign and Workshop on Marine Litter (Jeju, RO Korea, October 2010) • NOWPAP-originated project to investigate impacts of global warming on coastal and marine ecosystems in the Northwest Pacific received funding from the Asia-Pacific Network for Global Change Research (April 2011) • NOWPAP Medium-Term Strategy being developed, covering ICM, regular assessments, pollution prevention, biodiversity conservation, climate change and other issues (to be presented to the 16th Intergovernmental Meeting in December 2011)
	Global • Marine Biodiversity Forum in the Northwest Pacific Region held in conjunction with the 10th Conference of the Parties to the Convention on Biological Diversity (Toyama, Japan, October 2010) • NOWPAP contributed to the UNEP 2011 Yearbook (on plastics pollution as an emerging issue, February 2011)
Ocean Policy Research Foundation (OPRF)	**National** • Promotion of ICM in Japan (i) Initiated discussion on the legislation to promote ICM in Japan through establishing a committee composed of the academe (ii) Initiated support for the initiatives of the local governments on ICM, such as development of the plan, to promote ICM at the local level (iii) Established a committee to initiate the development of a draft model curriculum on ICM with the discussion on the interdisciplinary way of teaching ICM at the universities
	National • Enactment of the Basic Act on Ocean Policy • Establishment of the Basic Plan on Ocean Policy • Establishment of the Headquarters for Ocean Policy within the Cabinet Secretariat, Government of Japan

Non-Country Partner	Activities/Achievements
Ocean Policy Research Foundation (OPRF) (continued)	• Developed a draft model on the act for the comprehensive management to realize the development, use and conservation of the Exclusive Economic Zone and the Continental Shelf and requested the Government to take necessary actions • The Follow-up Committee on the Basic Act on Ocean Policy, composed of the politicians and the academe with the OPRF as the secretariat, developed a proposed entitled Urgent Proposal for the Recovery from the East Japan Earthquake from the Standpoint of the Oceanic State and submitted it to the Head of the headquarters for Ocean Policy, i.e., the Prime Minister of Japan
	Regional • Signed Letter of Intent with PEMSEA on the Promotion and Development of the Seas of East Asia (2003) • One of the supporting organizations in the EAS Congress 2003 • Co-organized the workshop on the Tokyo Declaration: Upholding the Advocacy during the EAS Congress in 2006 • Co-hosted the 2nd EAS Partnership Council Meeting and PEMSEA-Japan Joint Seminar with the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) of Japan in 2008 • Co-convened the workshop on Coastal/Ocean Policy and Legislation: Implementation and New Initiatives during the EAS Congress in 2009 • Conducted researches on the conservation of islands, climate change adaptation of islands, and the management of their surrounding oceans in cooperation with the Australian National Centre for Ocean Resources and Security (ANCORS) and Secretariat of the Pacific Community-Pacific Islands Applied Geoscience and Technology Division (SOPAC)
	Global • Introduced the experiences on the establishment of the Basic Act on Ocean Policy and the Basic Plan on Ocean Policy as examples of the materialization of the laws such as an UNCLOS and the policy, e.g., Agenda 21 at the various international ocean conferences including the Pacem in Maribus XXXIII (Beijing, September 2010) • Co-organized the Oceans Day at Nagoya with the CBD Secretariat, GEF and Global Forum on Oceans, Coasts, and Islands and developed the Nagoya Oceans Statement during the CBD/COP10 in October, 2010
Oil Spill Response Limited (OSRL)	**Local** • Assisted in the development of the Chonburi Provincial oil spill contingency plan (OSCP) • Assisted in the preparation of the guideline for the use of chemical dispersants during oil spills in Cambodia • 2010 PNLG Forum, a forum in exchanging information among its local government members from nine countries across the Asia region (Chonburi, Thailand, 21-24 November 2010)
	National • Signed the Memorandum of Understanding (MOU) with PT Slickbar, Indonesia's leading manufacturer of oil spill combating equipment, in a joint effort to improve overall capability in preparing for and responding to oil spills in Indonesia • Oil Spill Response's involvement in the incident response to a tanker collision close to the coastline of Singapore and Malaysia • Oil Spill Response's involvement in the incident response to a container ship collision which occurred in Mumbai, India and an offshore pipeline spill in Malaysia • Technical forums held in Ho Chi Minh, Jakarta and Singapore focusing on the challenges for response readiness in the oil industry (July 2010-June 2011)

Non-Country Partner	Activities/Achievements
Oil Spill Response Limited (OSRL) (continued)	**Regional** • Co-organized with ITOPF a Training Workshop on Claims Recovery, Oil Spill Contingency Planning (2003) • One of the supporting or co-convening agencies in the EAS Congress 2003 and 2006 • Conducted the Training Course on Oil Pollution Preparedness, Response and Cooperation for supervisors and On-Scene Commanders in Cambodia in partnership with Marine Department of Thailand, IESG Thailand) (December 2005) • Signed MOU with PEMSEA on the Implementation of the SDS-SEA (2008) • Supported capacity development in the implementation of the GOT oil spill preparedness and response in the Gulf of Thailand, involving Cambodia, Thailand and Vietnam • Co-convened the workshop on Government/Industry Partnerships for Effective and Consistent, Preparedness and Response to Marine Pollution in East Asia during the EAS Congress in 2009 • Regional Industry Technical Advisory Group (RITAG) inception meeting held in Singapore in September 2010 followed by the Memorandum of Understanding (MOU) signing ceremony in Beijing in December 2010, to promote greater engagement and cooperation between oil spill response organizations in the East Asia region
PEMSEA Network of Local Governments for Sustainable Coastal Development (PNLG)	**Local** • Continuous expansion of PNLG members:26 local governments across East Asia • Provided a forum for learning for the various local members through workshops, study tours and participation in various regional and international conferences or events
	Regional • 3rd RNLG Forum: Putrajaya, Malaysia, 9 December 2003 • 4th RNLG Forum: Bali, Indonesia, 20-25 April 2006 on Building Better Coastal Governance through Stronger Local Alliance with focus on Coastal Hazard Management • Inaugural meeting of the PNLG: Haikou, PR China, 13 December 2006 • Signing and adoption of the Charter of the PEMSEA Network of Local Governments for Sustainable Coastal Development in 2006 • 6th PNLG Forum: Danang, Vietnam, 5-7 September 2007 on Addressing Coastal Security by Investing in Natural and Man-made Hazards Prevention and Management • 7th PNLG Forum: Sihanoukville, Cambodia, 19-21 November 2008 on Water Resources Protection, Utilization and Management • 8th PNLG Forum: Bataan, Philippines, 23-25 November 2009 on Land and sea-use zoning: Challenges and opportunities • Co-convened the workshop on Land and Sea-use Zoning: Challenges and Opportunities during the EAS Congress in 2009 • 9th PNLG Forum: Chonburi, Thailand, 21-24 November 2010 on Strengthening Oil Spill Preparedness and Response at the Local Level • PNLG workshop on Integrated River Basin and Coastal Area Management conducted during 2010 XWOW • Draft PNLG Secretariat operating guidelines prepared • Draft PNLG Strategic Action Plan presented at the 2010 PNLG General Assembly; workplan and timetable for review and finalization of PNLG SAP adopted • 10th PNLG Forum: Dongying, PR China, 25-27 July 2011 on Achieving Sustainable Blue Economy through Integrated Coastal Management • Signing and adoption of the Dongying Declaration on Building a “Blue Economy” through Integrated Coastal Management in 2011

Non-Country Partner	Activities/Achievements
Plymouth Marine Laboratory (PML)	**National** • Assist local people of the Laem Son National Park region of Thailand, after the devastation of the tsunami in December 2004, in understanding the effects of the tsunami and provide training in the management of their changed environment (2004-2009) • Ocean Acidification awareness raising (2 workshops Haikou and Guangzhou and published document for national policymakers in China in 2008) and Environment and Human Health workshops (Yantai and Shenzhen, China 2008), participated by policymakers, fishermen, general public (Cafe Scientifiqué) and scientists • Monitoring and Forecasting Management System for Southern China, supported by Chinese Government
	Regional • Signed MOU with PEMSEA on the Implementation of the SDS-SEA (2005) • One of the co-convveners in EAS Congress 2006 • Co-convened the workshop on The Science in Ecosystem-based Management during the EAS Congress in 2009 • Environmental Change Impacts on Global Fisheries (NERC QUEST - Earth System Processes and Prediction) Quest-Fish. The main objective is to elucidate how climate change will affect the potential production for global fisheries resources in the future and to estimate the added vulnerability of these effects on national and regional economies in fishery-dependent areas and on specific elements of the fishery system at different scales (2007-2010) • Chemical safety in coastal regions and Rapid Assessment of Marine Pollution - training on approach and implementation in Vietnam, China and Thailand (and India). Most recent training took place in Guangxi province in China, 2010. • PML hosts the POGO secretariat. POGO is a forum created recently by directors and leaders of major oceanographic institutions around the world to promote global oceanography, particularly the implementation of an international and integrated global ocean observing system. Likewise, PML hosted the Global Ocean Ecosystem Dynamics (GLOBEC) International Project Offi ce. GLOBEC is a programme with the aim to advance our understanding of the structure and functioning of the global ocean ecosystem, its major subsystems, and its response to physical forcing so that a capability can be developed to forecast the responses of the marine ecosystem to global change. Accomplishments of GLOBEC include over 3,500 publications to date, including 30 special issues of primary journals. • Post-doc exchange starting in June 2011, focusing on applying the PML's ecosystem modeling to the YSLME, sponsored by YSLME • A KORDI-PML Implementation agreement signed in April 2011, leading to the establishment of a KORDI-PML Science Office (KPSO) in Plymouth • Beyond Science- A 12-minute film has been developed by PML and commissioned by the Natural Environment Research Council (NERC), focusing on "Ocean acidification: Connection science, industry, policy, and public." PML is reviewing the possibility of a translation into Korean with KORDI
	Global • Environmental Change Impacts on Global Fisheries (NERC QUEST) – Earth System Processes and Prediction) Quest-Fish, to elucidate how climate change will affect the potential production for global fisheries resources in the future and to estimate the added vulnerability of these effects on national and regional economies in fishery-dependent areas and on specific elements of the fishery system at different scales (2007-2010) • Global Partnership Fund (GPF), RO Korea, focused on biogeochemistry/ocean acidification, Earth sustained observations and biotechnology

Non-Country Partner	Activities/Achievements
Swedish Environmental Secretariat for Asia (SENSA)	**National** • Facilitating the development of a sister city relationship between Stockholm and Xiamen • Provided co-financing for the conduct of the PEMSEA ICM Training in DPR Korea and translation of ICM Manual course into Korean language
	Regional • Participated in the 2007 PNLG Forum in Danang, Vietnam • Mekong cooperation (SENSA represents SIDA in the Mekong River Commission Joint Contact Group; Supported the Study on Cooperation Opportunities between ADB and Mekong) • Supported the conduct of the East Asian Seas Youth Forum as well as the participation of representatives from least developed countries during the East Asian Seas Congress 2009 • Co-convened the workshop on the Impacts of Climate Change at the Coastal and Ocean Areas of the East Asian Seas Region during the EAS Congress in 2009 • Working with various other agencies and with 13 Asian countries on the Regional Climate Change Adaptation Knowledge Platform for Asia. In October 2010, SENSA was part of the Asia Pacific Climate Change Adaptation Forum 2010 focusing on mainstreaming adaptation into development planning • Co-financed the publication of the Special Tropical Coasts issue on EAS Congress 2009 • Provided co-financing for the conduct of PEMSEA Regional ICM Training of Trainers in Danang, Vietnam • Provided co-financing in the printing of the special issue of *Tropical Coasts* magazine
UNDP GEF Small Grants Programme (SGP)	**Local** • Several community-based projects focusing on climate change adaptation, food security, biodiversity, POPs, land degradation, and solid waste management currently being implemented in China, Indonesia, Malaysia, Philippines, Thailand, and Vietnam
	• Implementation of the following projects: A. Cambodia: Sustainable Community-based Coastal Resource Management Project; and Reservoir Utilization and Community-based Sustainable Eco-Tourism Development in Stung Hav District, Sihanoukville B. Philippines: Multi-partnership Building for Sustainable Resource Management of Balayan Municipal Waters C. Thailand: Habitats for Crab (Crab Condominium) in Chonburi Province; Rehabilitation and Conservation of Mangrove in Chonburi Province; and Re-use/Recycle of Community Waste and Production of Organic Compost in Chonburi Province D. Vietnam: Development of Models on Socialization of Urban Tree Planting in Danang City E. China: SGP supported project, Environmental Sustainable Development in Yingxi Village, Yanchi County, Ningxia Hui Autonomous Region, won an award at the 2010 Conservation and Environmental Grants in China by the Ford Motor Company

Non-Country Partner	Activities/Achievements
UNDP GEF Small Grants Programme (SGP) (continued)	**Regional** • Signed an MOU/Joint Communique with PEMSEA in implementing community-based projects sponsored by the SGP within the Seas of East Asia • Co-organized the Community in Sustainable Development Workshop during the EAS Congress 2006 • Co-convened the special workshop on Local Action, Global Contribution: Best Practices on Community-based Approaches to Sustainable Coastal and Marine Ecosystems Management during the EAS Congress in 2009 • Co-convened the PEMSEA PMO and SGP Partnership Meeting during the EAS Congress in 2009 • Provided grants/ support to NGOs and CBOs in the following areas: A. Biodiversity B. Climate Change C. International Waters D. Land Degradation E. Persistent Organic Pollutants F. Climate Change Adaptation
	Global • Catalogue of biodiversity-based products from SGP's Latin American and Caribbean portfolio demonstrating linkages between sustainable use of biodiversity, community empowerment and poverty reduction launched at the GEF/SGP event at the COP 10
UNDP GEF Yellow Sea Large Marine Ecosystem (YSLME) Project	**Regional** • One of the supporting organizations/co-convener in the EAS Congress 2003 • Signed LOC with PEMSEA on Cooperation for the Sustainable Development of Marine and Coastal Resources and Governance of the Seas of East Asia (2006). • Co-organized the workshop on Large Marine Ecosystems during the EAS Congress 2006 • Co-convened the workshop on Innovation in Biodiversity and Habitat Conservation during the EAS Congress in 2009 • Strategic Action Programme (SAP) demonstration activities finalized, a total of 21 demonstration activities were successfully completed • The proposal for YSLME II with the total budget of US$ 9.5 million from GEF and the total cofinancing budget of US$ 2.5 billion mainly from the participating countries was submitted to GEF • Findings of co-operative cruises summarized providing significant scientific knowledge covering the entire basin of the Yellow Sea • Summary book preparation initiated to collate the activities implemented during the YSLME Project's first phase • First annual meeting of MPA Network organized to strengthen the co-operation among participating MPAs • Joint efforts initiated with the local government, NGO, and the private sector in conserving biological diversity, including the Liaoning provincial government of China and WWF/YSESP. The provincial government and Panasonic, a multi-national corporation producing consumer electronics, individually provided one million Chinese yuan in support of the project

Non-Country Partner	Activities/Achievements
UNDP GEF Yellow Sea Large Marine Ecosystem (YSLME) Project (continued)	• "YSLME Regional Workshop on Regional Network for Ecosystem Monitoring and Assessment" • Fund-raising workshop organized to build and strengthen national capacity of implementing conservation activities in a financially sustainable manner • "Workshop on mainstreaming economic considerations in ecosystem conservation" organized • Project promotional video, "The Yellow Sea- A Sea of Co-operation, Peace, and Prosperity: Conservation Actions taken by UNDP/GEF YSLME Projects," released • Regional database mirror site developed to further facilitate the effective use and management of data and information concerning the Yellow Sea
	Global • Model United Nations 2011 co-organized with Korea University for approximately 370 high-school and university students • Voluntary Internship Programme in co-operation with Stanford University, provided the student with hands-on experiences in implementing and contributing to the Project's activities
UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA)	**Regional** • Supported a Workshop on Land-Based Pollution during the EAS Congress in 2003 • Signed MOU with PEMSEA on Cooperation and Sharing of Experiences in the Governance of regional seas and oceans and sustainable development of marine and coastal resources (2003) • Signed LOA with PEMSEA on the organization of the GPA 2nd Intergovernmental Review Meeting and EAS Congress 2006 • Mobilized private sector participation in support of pollution reduction investments • Secured the governments' commitments on the development of National Programmes of Action for the protection of the marine environment from land-based activities • Supported the publication of issues of *Tropical Coasts* and other public awareness/outreach activities • Co-convened the Workshop on Mainstreaming Marine and Coastal Issues into National Planning and Budgetary Processes during the EAS Congress in 2009 • Co-sponsored the EAS Congress 2009 Partnership Night
	Global • Organized the Global Partnership on Nutrient Management to identify ways to reduce the amount of excess nutrients in the environment without hindering global development. • Developed and initiated a global project on nutrient management, with funding support from GEF and in partnership with various international organizations, universities, private sector and national governments. Manila Bay was identified as a demonstration site for one component of the project.

Annex 3:

Resource Mobilization

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Resource Mobilization

PEMSEA's Country and Non-Country Partners continue to commit human and financial resources in support of various activities for SDS-SEA implementation. In addition to the catalytic funding provided by the GEF, national and local governments have been providing counterpart project funding totaling US$ 73,002,089, accounting for about 94 percent of the non-GEF resources that have been mobilized in the region for SDS-SEA implementation since 2003. On top of this, the Governments of China, Japan and RO Korea have been co-financing the operation of the PRF Secretariat Services since 2007, to aid PEMSEA's transformation into a full-fledged international organization. At the same time, the Government of the Philippines through the Department of Environment and Natural Resources (DENR) contributed to the construction of the new PEMSEA Office Building in 2007, and signed a 10-year agreement with PEMSEA to host the office.

The resources mobilized vary from in-kind support to direct in-cash contributions. The in-kind support (i.e., hosting of project offices, meetings and workshops; provision of technical support and expertise; knowledge materials; etc.) has contributed significantly, particularly in matters related to capacity development and knowledge transfer, including the triennial East Asian Seas (EAS) Congress. These have been essential aspects of strengthening the enabling capacities of national and local governments, coastal managers and practitioners at the national and local levels and in building the regional partnership.

Source of Funds	Amount (US$)
GEF Project Contribution (1999-2013)	28,724,000
Counterpart investment by Countries and Local Governments for SDS-SEA Implementation (2003-2011)	73,002,089
Partners' and collaborators' investments in regional cooperation (e.g., capacity development; applied research; EAS Congress; etc.) (2003-2011)	2,112,666
Support from Japan, PR China and RO Korea for the PRF Secretariat Services (2006-2011)	2,062,468
Philippines' support for hosting the PEMSEA Resource Facility (2003-2011)	378,000
TOTAL	106,279,223