



REGIONAL REVIEW

Implementation of the Sustainable
Development Strategy for the Seas of
East Asia (SDS-SEA) 2003-2015





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November 2015

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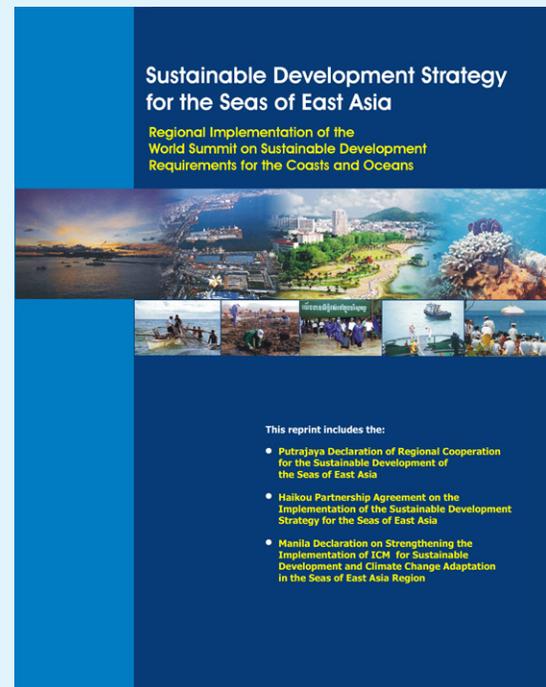
“The East Asian Seas, an area covering 14 countries and six large marine ecosystems, is one of the regional seas of the ocean system of the Planet Earth. The vast resources in these coastal waters and oceans are a priceless and unique feature of the region. The natural assets are the food supply, a source of employment and livelihood, a medium for transportation, and a living web that links and influences social, cultural and economic behaviour in our everyday lives. These coastal and marine resources are more than natural commodities. They are part of our history, and a safeguard to economic prosperity and peaceful and harmonious co-existence for present and future generations.”

Sustainable Development Strategy for the Seas of East Asia 2003

I. The SDS-SEA and Implementation Targets

The East Asian Seas are a major economic resource to meet the demand for fishery and aquaculture products, and a natural heritage and biodiversity resource for the people of the region. The region harbours a significant share of the world’s coral reefs and mangroves; it also produces about 55 percent of the global fish catch and more than 91 percent of aquaculture in 2011. With over 2.1 billion people living in the region, the human pressure on marine and coastal resources remains 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 millions of the region’s inhabitants 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 the Global Environment Facility (GEF) and the participation of UNDP, the World Bank and 14 other



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.

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 (MDG), the Johannesburg Plan of Implementation of the World Summit for 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.

Following the adoption of the SDS-SEA in 2003, the countries in the East Asian Seas region identified and committed to achieving four regional strategic targets by 2015 through the Haikou Partnership Agreement in 2006 and the Manila Declaration in 2009 (**Box 1**). Since 2003, the EAS countries and PEMSEA Non-Country Partners and collaborating organizations have undertaken steps to implement the Strategy and move towards achievement of the targets through their respective programs. This was further supported by the adoption of the SDS-SEA Implementation Plan

Box 1: SDS-SEA Implementation Targets

- **Target 1:** 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).
- **Target 2:** 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).
- **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 (Haikou Partnership Agreement and Manila Declaration).
- **Target 4:** Report on ICM progress every three years (Manila Declaration).

2012-2016 through the Changwon Declaration 2012. With patronage from GEF, UNDP and RO Korea, Cambodia, China, DPR Korea, Indonesia, Lao PDR, Philippines, Thailand, Timor Leste and Vietnam have developed and implemented their respective multi-year national SDS-SEA Implementation Plans.

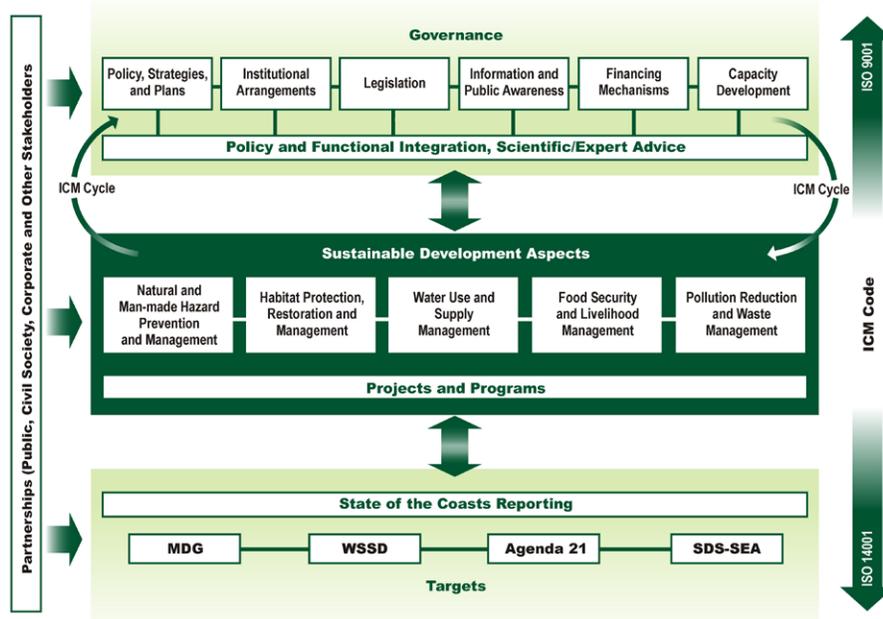
As the end of target year is approaching, PEMSEA as the regional coordinating mechanism for SDS-SEA implementation has collaborated with Country and Non-Country Partners in conducting this review. This updated regional review (2003-2015) provides a consolidated report and assessment on the status of achievement towards the four strategic targets, and serves as the baseline for the SDS-SEA post-2015 strategic targets. The updated regional review is also meant to serve as a key reference document in the development of the updated 5-Year SDS-SEA Regional Implementation Plan for 2016-2021.

II. The Implementation of the Strategies and Objectives of the SDS-SEA

In Manila Declaration (2009), PEMSEA Partner Countries agreed to report on progress of ICM programmes every three years, including the measures taken for climate change adaptation. In line with this, 12 countries initiated review of status of country progress with implementation of the SDS-SEA in 2011 using PEMSEA's Framework for Sustainable Development of Coastal Areas (**Figure 1**) as key indicators and categories. Country review reports were then consolidated into a regional report that highlights the overall progress at regional and country levels. From 2014 to 2015, country review reports of 2011 were updated (**Annex H**), serving as the basis of this regional review.

Overall Progress from 2011 to 2015

The summary overview of this regional report, as shown in **Figure 2**, has updated that of the regional report of 2011 using the same framework and indicators. The assessment framework covers 9 Categories and 52 Sub-categories. The Categories of framework cover: policy/strategies; legislation; institutional arrangements; awareness and communication; capacity development; sustainable financing; sustainable development aspects at national and local levels, and monitoring and evaluation. Positive changes in the implementation status and color reference from 2011 to present are highlighted with upward arrows.

Figure 1. PEMSEA's Framework for Sustainable Development of Coastal Areas


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.

In summary, the following changes can be observed in **Figure 2:**

- 12 countries have made progress in at least 1 of the 52 indicated areas
- 10 countries have developed and implemented national policies, strategies, action plans and programs in coastal and ocean management and river basin management
- 3 countries (Cambodia, Philippines and Singapore) have new national policies covering different aspects of sustainable development
- 9 countries have established national interagency and inter-sectoral coordination mechanisms for coastal and ocean management and river basin management (Lao PDR)
- 6 countries (Cambodia, China, Indonesia, Lao PDR, Timor Leste and Vietnam) now have interagency and inter-sectoral coordination mechanisms covering five aspects of sustainable development
- 7 countries have put in place coast and ocean related legislation
- 1 country (Philippines) has developed legislation in biodiversity
- 3 countries (China, Indonesia and Singapore) have made marked progress in awareness and communication
- 5 countries (China, DPR Korea, Indonesia, Philippines and Singapore) have made improvements in capacity development
- 6 countries (Cambodia, China, Indonesia, Lao PDR, Philippines and Thailand) have progressed with regard to sustainable financing initiatives
- 3 countries (Cambodia, China and Vietnam) have progressed in sustainable development initiatives at national and local levels
- 1 country (Timor Leste) has improved its capacity in monitoring and evaluation programs

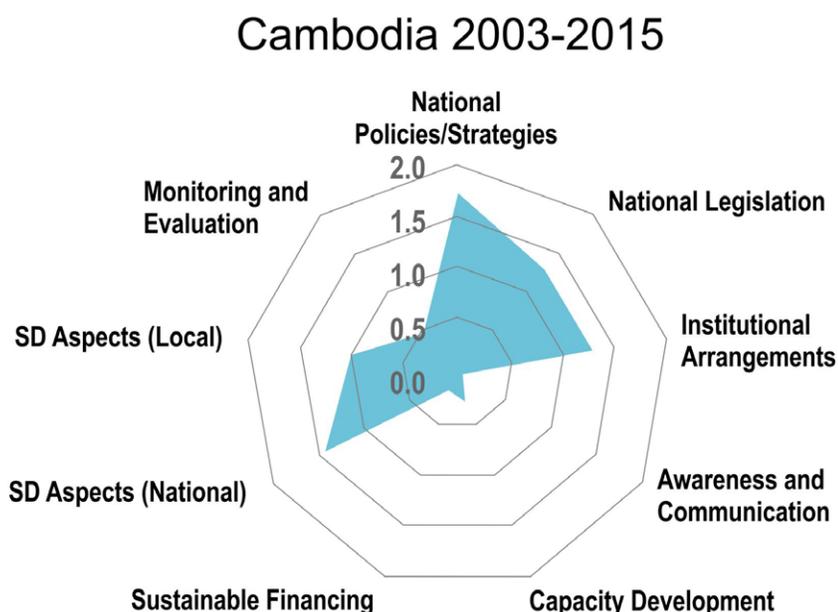
Status of SDS-SEA Implementation by Countries (2003-2015) and Highlights of Progress since 2011

Figure 3-1 to Figure 3-12 illustrate the current status of SDS-SEA implementation by country in 9 areas from 2003-2015 using the methodologies shown in **Annex A**. Highlights of progress since 2011, drawn from the national review reports and accounting for changes in status of implementation, are specified in a table under each figure. Where there is no room to indicate positive changes in status of implementation, as with the cases of Japan and RO Korea, highlights of progress are also indicated for recognition of their contribution to achievements of SDS-SEA targets.

Figure 2: Overview of Country Progress as of 2015.

CATEGORIES	
<p>National Policies/Strategies: A national policy or strategy that provides the vision and strategic direction for:</p>	(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
<p>National Legislation: National legislation/regulations covering the following management aspects:</p>	(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
<p>Institutional Arrangements: A functional national interagency coordinating mechanism that is responsible for:</p>	(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
<p>Capacity Development</p>	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 practitioners
	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
	National development plan mainstreams sustainable development of coastal and marine ecosystems into government programs
<p>Sustainable Financing: Financial/economic incentive programs set up by the central government to encourage investment by subnational/local governments for:</p>	(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
<p>Sustainable Development Aspects (National): A national program or plan of action that covers the following priorities:</p>	(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
<p>Sustainable Development Aspects (Local): Subnational/local action plans or management programs support of the national priority objectives and targets covering:</p>	(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
<p>Monitoring and Evaluation</p>	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

Figure 3.1 Cambodia’s SDS-SEA Implementation Status from 2003 to 2015.



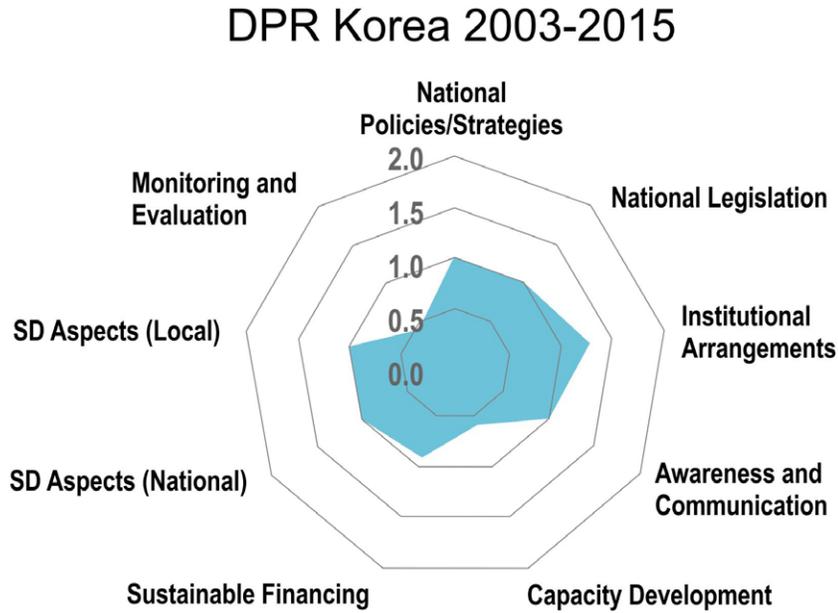
Categories	Sub-categories	Progress
National Policies/Strategies	Climate Change	The Cambodia Climate Change Strategic Plan 2014-2023 was adopted in 2013.
Institutional Arrangements	Sustainable Fisheries	The Cambodia Fisheries Law (2006) requires the creation of a fisheries committee. Specifically, Chapter 4, Article 14 states that “To effectively study and determine the National Fishery Policy, the Royal Government shall establish the National Fishery Policy Formulation Committee headed by the Minister of Agriculture, Forestry and Fisheries with members from relevant Ministries.”
Sustainable Financing	Natural and manmade hazard prevention and management, including climate change	The Cambodia Climate Change Alliance (CCCA) Fund was established as one of the eight (8) projects under the National Adaptation Program of Action (NAPA) in 2006 to support activities on agriculture, forestry, fisheries, water resources, meteorology, health and infrastructure.
	Pollution reduction and waste management	The Cambodian Climate Change Alliance (CCCA) Trust Fund was developed in 2010 as a funding mechanism to support strengthening government technical and institutional capacity regarding climate change. It operates as a ‘pooled’ fund where donor contributions are not earmarked for specific activities, but are to be allocated in accordance with five established outputs of the CCCA project. UNDP is the Fund Manger and it operates within the Ministry of Environment through call for proposals.
Sustainable Development Aspects (National)	Water supply and use management, including river basin management	Cambodia has developed and implemented eight projects under NAPA from 2010 to 2015 to build resilience of agricultural, fisheries, water resources sector to impact of climate change. Such projects include Promoting Climate-Resilient Water Management and Agricultural Practices in Rural Cambodia, Coastal Adaptation and Resilience Planning, etc., with a total funding of US\$110 million.

Figure 3.2 China's SDS-SEA Implementation Status from 2003 to 2015.


Categories	Sub-categories	Progress
Institutional Arrangements	Coastal and Ocean Development and Management	The China National Oceanic Committee is a national high-level inter-agency mechanism established in 2013 to coordinate the development and implementation of national marine strategy and other major ocean-related initiatives.
	Conservation and Management of Biological Diversity	China established National Biodiversity Coordination Committee in 2011, headed by Vice Premier in charge of environment.
	Sustainable Fisheries	China Coast Guard was established in 2013 to serve as national enforcement body for laws related with coasts and oceans, including sea use, fishery, sea-based trafficking, etc.
Awareness and Communication	A national communication program that facilitates awareness building/knowledge sharing in coastal and ocean management	National Seas and Oceans Outreach Day has been celebrated since 2008 to raise awareness on ocean health each year. State Oceanic Administration of China has established a National Ocean Day office to plan, organize and celebrate National and World Ocean Day.
Capacity Development	National training program that strengthens the skills and knowledge of national and local level ICM managers and practitioners.	<ul style="list-style-type: none"> Marine Human Resource Development Plan was adopted in 2011 and it is currently implemented. China-PEMSEA Sustainable Coastal Management Cooperation Center was established in 2014 to support implementation of SDS-SEA in China and facilitate project cooperation between China and other PEMSEA Country Partners
	An accreditation system that certifies training courses, institutions, and individuals for ICM training of managers and practitioners.	Marine Function Zoning Accreditation System for Consultancy Firms is in place since the adoption of Law on the Administration of the Use of Sea Areas (2001).
	Universities offer undergraduate and/or post-graduate courses in ICM or ecosystem-based management of watersheds and coastal areas.	Twenty universities and colleges in China already have marine programs.

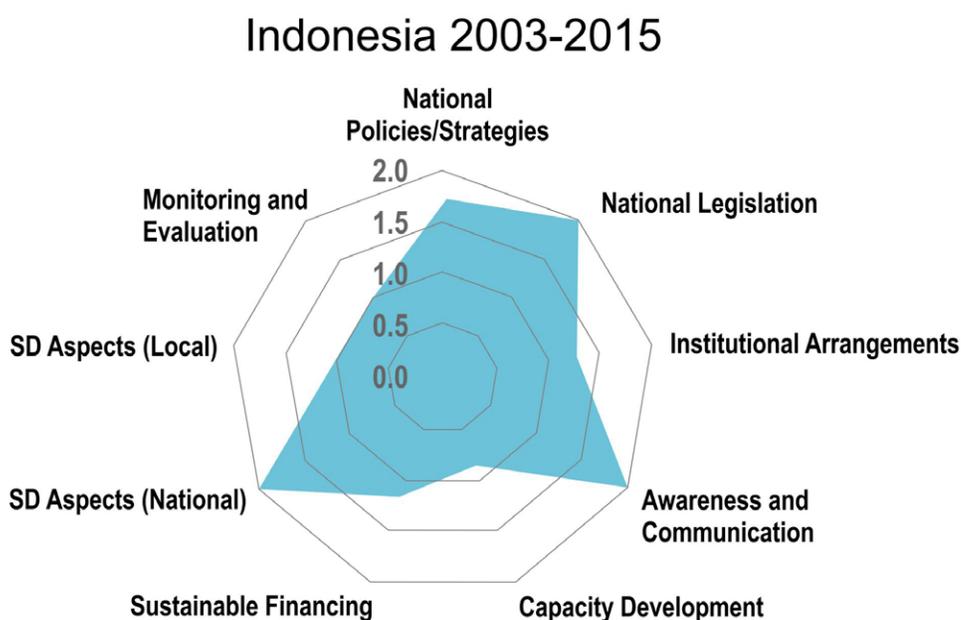
Categories	Sub-categories	Progress
Sustainable Financing	National development plan mainstreams sustainable development of coastal and marine ecosystems into government programs: ICM development and implementation	Since 2002, sea-user fees are levied at the municipal (county) level. In 2013, US\$1.77 billion were levied to support coastal environment management and ecosystem conservation and ICM implementation.
	Pollution reduction and waste management	The Circular on Promotion of PPP that was adopted in China in 2014 is facilitating financing to sewage treatment, waste to energy and other mitigation projects.
	Government policies/regulations facilitate investment by the business sector in sustainable development of the coastal and marine economy	Levy of sea user fee was made statutory in Law on the Administration of the Use of Sea Areas (2001).
Sustainable Development Aspects (National)	Habitat restoration and management, including biodiversity conservation	State Key Function Zone Plan was adopted in 2010 which identifies 25 key ecological function zones (EFZs) that must be protected and managed sustainably. Fiscal transfer becomes the primary economic tool to finance the conservation of these EFZs.
Sustainable Development Aspects (Local): Subnational/local action plans or management programs support of the national priority objectives and targets covering:	Habitat restoration and management, including biodiversity conservation	Local governments are required to develop provincial Key Function Zoning Plan including financial instruments such as fiscal transfer.
	Water supply and use management, including river basin management	In 2012, the State Council issued Circular on Implementation of the Strictest Water Resource Management System which sets total water use quota and water function zone pollution standards compliance rate for 2015, 2020 and 2030 for each province. A performance assessment mechanism is also in place to ensure compliance.

Figure 3.3 DPR Korea’s SDS-SEA Implementation Status from 2003 to 2015.

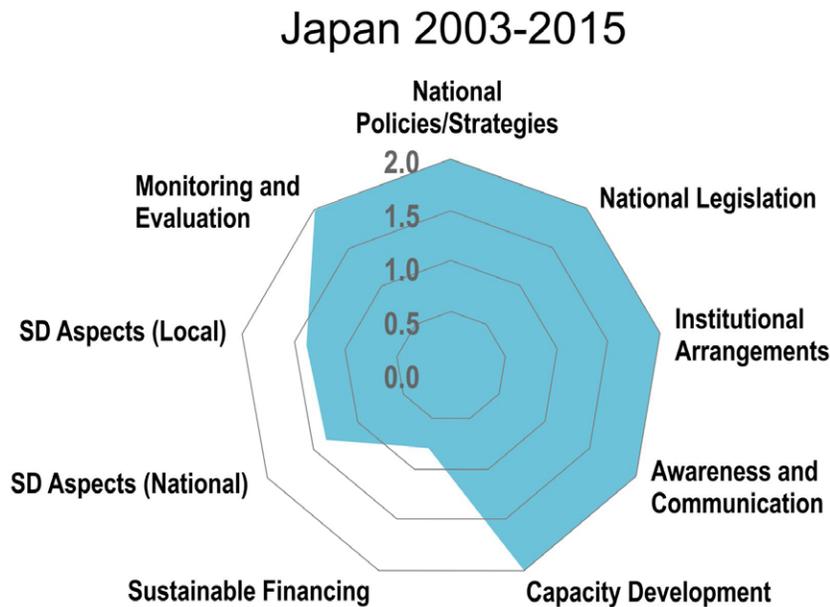


Category	Sub-category	Progress
Capacity Development	National training program that strengthens the skills and knowledge of national and local level ICM managers and practitioners.	From year 2004 to 2011, at least 5 national training workshops were conducted on ICM and IIMS Orientation facilitated by PEMSEA and Kim Il Sung University participated by over 300 officers

Figure 3.4 Indonesia’s SDS-SEA Implementation Status from 2003 to 2015.

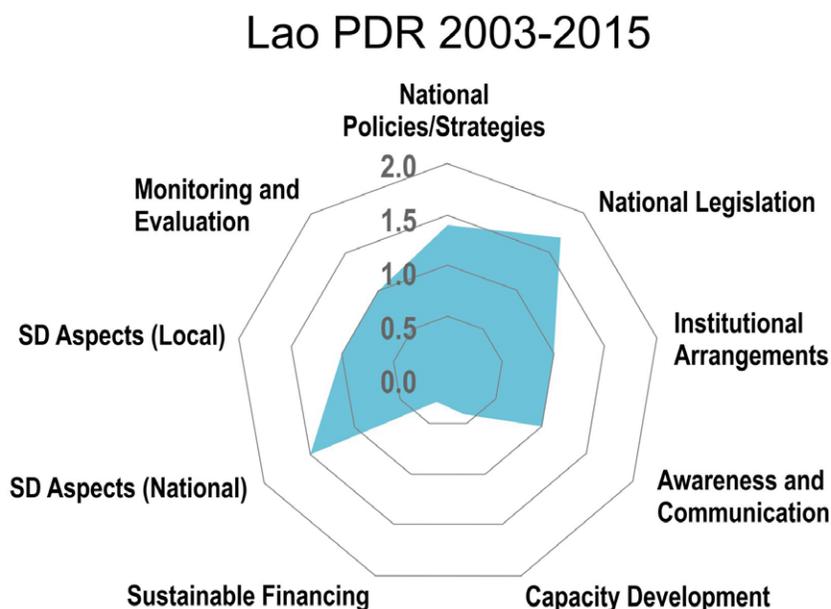


Categories	Sub-categories	Progress
National Policies/Strategies	Coasts and Ocean Development and Management	The National Ocean Policy was adopted in 2014.
Institutional Arrangements	Coastal and Ocean Development and Management	The National Ocean Council was established in 2007. In addition, Sea Partnerships is also established by the Law Concerning the Management of Coastal Zones and Small Islands (2007).
Awareness and Communication	A national communication program that facilitates awareness building/knowledge sharing in coastal and ocean management	Chapter 12, Article 63 of Law Concerning the Management of Coastal Zones and Small Islands (2007) require the national and local government to empower the public for efficient and effective management of coastal zones and small islands.
Capacity Development	National training program that strengthens the skills and knowledge of national and local level ICM managers and practitioners.	The Ministry of Environment 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.
Sustainable Financing	Habitat restoration and management, including biodiversity conservation Pollution reduction and waste management	Law No. 32/2009 on Environmental Protection and Management, in Article 43, requires the development of guarantee funds of environmental restoration, funds for pollution and/or damage mitigation, and conservation trust funds.

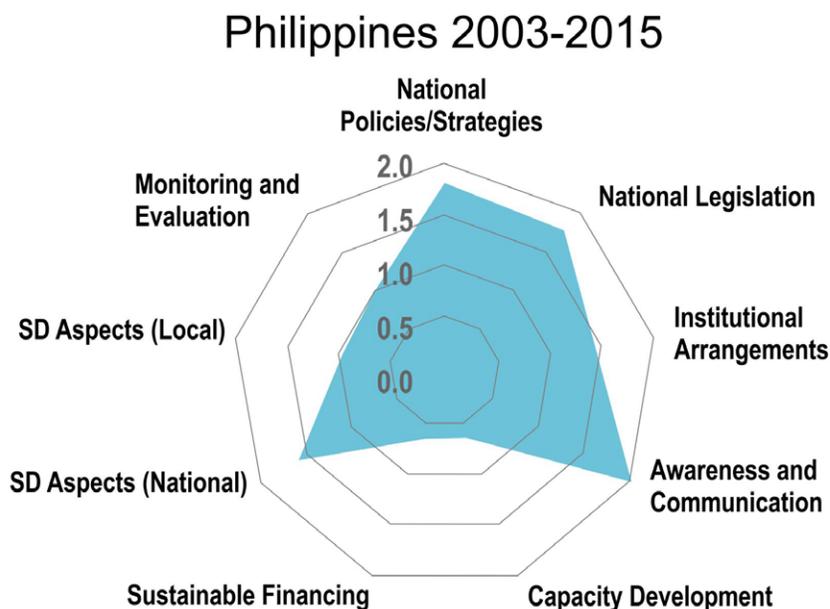
Figure 3.5 Japan's SDS-SEA Implementation Status from 2003 to 2015.


Categories	Sub-categories	Progress
National Policies/strategies	Coastal and Ocean Development and Management	Basic Plan of Ocean Policy was revised in 2013.
National Legislation	Environmental protection/pollution reduction	A comprehensive legal system in place to regulate the manufacture, treatment, disposal and handling of pollutants from industrial wastes, food resources, dioxins, chemicals and other sources.
Capacity Development	Universities offer undergraduate and/or post-graduate courses in ICM or ecosystem-based management of watersheds and coastal areas.	Ocean Policy Research Institute, Sasakawa Peace Foundation (OPRI-SPF), has been supporting education of undergraduate and postgraduate levels in ICM in collaboration with a number of universities in Japan.
Sustainable Development Aspects (Local): Subnational/local action plans or management programs support of the national priority objectives and targets covering:	Water supply and use management, including river basin management	Total pollutant load control system (TPLCS) is being implemented in Tokyo Bay, Ise Bay and Seto Inland Sea.

Figure 3.6 Lao PDR's SDS-SEA Implementation Status from 2003 to 2015.

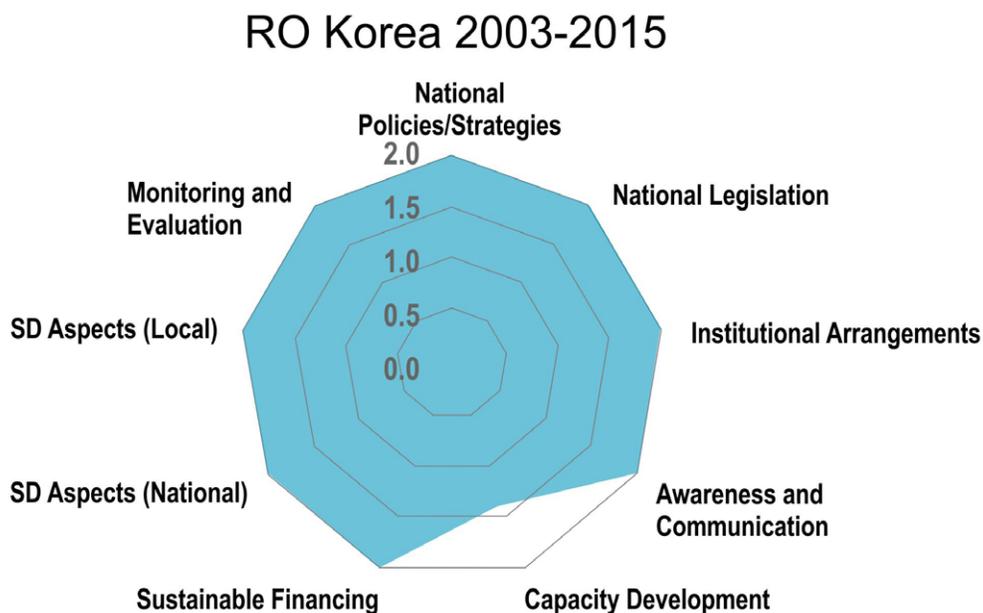


Categories	Sub-categories	Progress
National Legislation	Conservation and management of biodiversity	Accession to CITES in 2004
Institutional Arrangements	Conservation and Management of Biological Diversity	The Wildlife and Aquatic Animals Act (2008) assigns Ministry of Agriculture and Forestry as the central agency in coordinating national policies, strategies, and other measures for wildlife and aquatic life.
Sustainable Financing	Habitat restoration and management, including biodiversity conservation	The Wildlife and Aquatic Animals Act (2008) has identified sources of funds for preservation and protection of aquatic life as well as management and use of funds

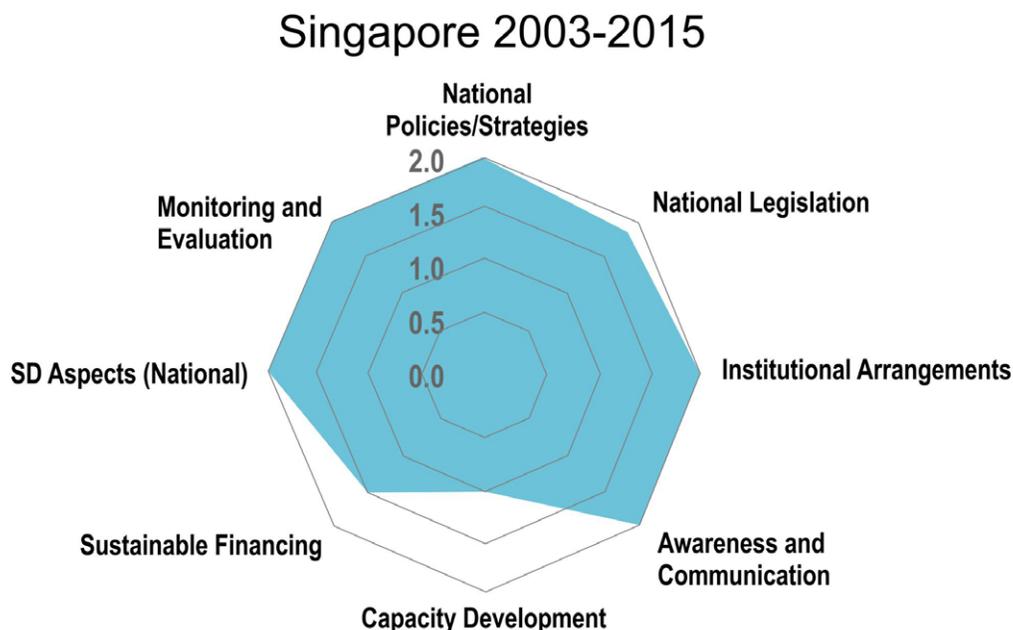
Figure 3.7 Philippines's SDS-SEA Implementation Status from 2003 to 2015.


Categories	Sub-categories	Progress
National Policies/Strategies	Coasts and Ocean Development and Management	The Executive Order No. 533 (2006) adopted Integrated Coastal Management (ICM) as a national strategy for the sustainable development of coastal and marine areas.
National Legislation	Conservation and Management of Biological Diversity	Marine Ecosystem Conservation and Management Act was adopted in 2006.
Capacity Development	National training program that strengthens the skills and knowledge of national and local level ICM managers and practitioners.	Integrated Coastal Resource Management (ICRM) Centers were designated in five (5) universities across the five (5) marine corridors.
Sustainable Financing	Habitat restoration and management, including biodiversity conservation	The National Integrated Protected Areas System Act of 1992 has established the Integrated Protected Area Fund (IPAF). Total IPAF income from 1996 to 2013 accrued to nearly PhP 300 million.
	Food security and livelihood management, including sustainable fisheries and aquaculture	With the adoption of the Philippines Fisheries Code, a number of fisheries financing facilities have been established including the Municipal Fisheries Grant Fund, Fishery Loan and Guarantee Fund, Fishing Vessel Development Fund, Special Fisheries Science and Appropishtech Fund, and Agriculture Investment Fund.
Sustainable Development Aspects (National)	ICM development and implementation	The Department of Environment and Natural Resources has been implementing a National ICM Program in line with EO No. 533, which include the National Greening Program, the National Coral Reef Program and the Integrated Coastal Resources Management Project.

Figure 3.8 RO Korea's SDS-SEA Implementation Status from 2003 to 2015.

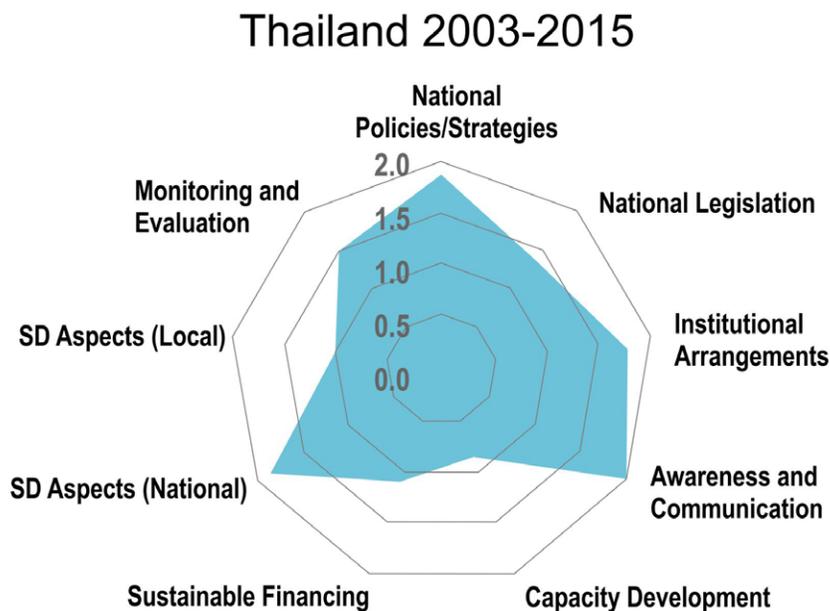


Categories	Sub-categories	Progress
National Policies/strategies	Coastal and Ocean Development and Management	The 2nd National ICM Plan (2011-2020) applied the principles of ecosystem-based management, protection of public property, enhancing transparency and predictability, responding to climate change and disasters, and enhancing effectiveness of coastal policies.
National Legislation	Conservation and management of biodiversity	Law on Conservation and Uses of Biodiversity was adopted in 2013
Sustainable Development Aspects (Local): Subnational/local action plans or management programs support of the national priority objectives and targets covering:	Water supply and use management, including river basin management	<ul style="list-style-type: none"> Total pollutant loads management system (TPLMS) initially demonstrated in Masan Bay Special Management Area is now being scaled up to Shihwa and Busan Special Management Areas. 74 local coastal governments have implemented Local Coastal Management Plans in accordance with the Coastal Management Act and National Integrated Coastal Management Plan.

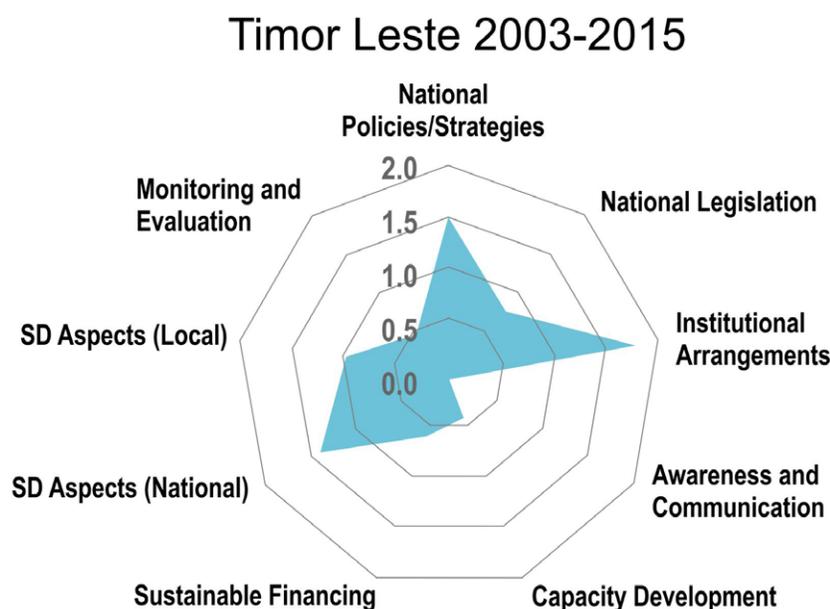
Figure 3.9 Singapore's SDS-SEA Implementation Status from 2003 to 2015.


Categories	Sub-categories	Progress
National Policies/Strategies	Coasts and Ocean Development and Management	The Sustainable Singapore Blueprint (SSB) was refreshed as SSB 2015 with a vision of a Liveable and Endearing Home, a Vibrant and a Sustainable City, and an Active and Gracious Community.
National Legislation	Coastal and ocean development and management, ICM or EBM	Since 2003, 9 acts have been enacted and revised to strengthen the IUCM legal framework. Newly enacted acts since 2011 include Sand and Granite Quarries Act (2013) and Transboundary Haze Pollution Act (2014). Sewerage and Drainage Act and National Parks Board Act were revised in 2012.
Institutional Arrangement	Sustainable fisheries	Agri-Food and Veterinary Authority in charge of fisheries management is a member of the Technical Committee on the Coastal and Marine Environment, an interagency committee comprising of 10 agencies. Sustainable fisheries management issues are within the mandate of the Committee.
Awareness and Communication	A national communication program that facilitates awareness building/knowledge sharing in coastal and ocean management	Various initiatives are designed by different government authorities to actively engage the public and private sector through awards, outreach, and recognition of individuals and organizations that contributes that contributes to awareness-raising.
Capacity Development	National training program that strengthens the skills and knowledge of national and local level ICM managers and practitioners.	Capacity building within government is ongoing year-round via talks, workshops and actual IUCM implementation activities.
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.	The state of Singapore's coastal zone was documented in Singapore's Coastal Profile in 2010. More recently the State of the Coasts Report system has been adopted to provide an analysis of the status, trends and threats related to the coastal and marine environment.

Figure 3.10 Thailand's SDS-SEA Implementation Status from 2003 to 2015.



Categories	Sub-categories	Progress
National Legislation	Coastal and Ocean Development and Management, ICM or EBM	The Promotion of Marine and Coastal Resources Management Act was adopted and took effect in 2015.
Sustainable Financing	Pollution reduction and waste management	Enhancement and Conservation of National Environmental Quality Act has established the Environmental Fund from which resources will be drawn to combat environmental incidents and to enhance environmental protection efforts like research and training, disbursements of loans and grants, education, NGO funding etc. The fund provides grants to governmental agencies and low-interest loans to the private sectors who are engaged in the activities related to the improvement of the environment.
Sustainable Development Aspects (National): A national program or plan of action that covers the following priorities	ICM development and implementation	Coastal Habitats and Resources Management (CHARM) 2002-2007 supported the development of ICM Management Plans in coastal resource management 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.

Figure 3.11 Timor Leste's SDS-SEA Implementation Status from 2003 to 2015.


Categories	Sub-categories	Progress
Institutional Arrangements	Pollution Reduction	The Decree Law No. 05/2011 on Environmental Licensing requires the establishment of the Assessment Committee consisting of representatives from different government departments in licensing of certain types of projects.
	Sustainable Fisheries	The Decree Law No. 6/2004 on General Bases of the Legal Regime for the Management and Regulation of Fisheries and Aquaculture requires the establishment of co-management committees or similar bodies.
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 national water quality sampling program is being developed and implemented.

Figure 3.12 Vietnam's SDS-SEA Implementation Status from 2003 to 2015.



Categories	Sub-categories	Progress
National Legislation	Coastal and Ocean Development and Management, ICM or EBM	<ul style="list-style-type: none"> The Vietnam Law of the Sea was adopted by the National Assembly in 2013. Law on Natural Resources and Environment of Sea and Islands (Law No. 82/2015/QH13) ratified on June 25, 2015 during the 9th Session of the 13th National Assembly.
Sustainable Development Aspects (National)	ICM development and implementation	The Integrated Coastal Management (ICM) Program for North Central and Central Coastal Region 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.
Sustainable Development Aspects (Local)	Food security and livelihood management, including sustainable fisheries and aquaculture	Almost 100 percent of local governments in coastal areas have prepared and implemented plans covering food security and livelihood management.

III. Implementation Updates on the Four Strategic Targets of the SDS-SEA

This section reviews the progress across the region with regards to the four strategic targets for SDS-SEA Implementation (**Box 1**).

TARGET 1: A SELF-SUSTAINED REGIONAL PARTNERSHIP MECHANISM FOR THE IMPLEMENTATION OF THE SDS-SEA

Status: In progress

Good progress has been made in achieving the full functionality of PEMSEA through the establishment of an international organization with its own legal personality and governance system.

Building PEMSEA into a Fully-Functional Partnership Mechanism

From a project of the GEF, PEMSEA evolved as a regional mechanism for sustainable development in coastal areas in the Seas of East Asia, starting with the adoption of the Putrajaya Declaration and the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA) in 2003. PEMSEA was recognized as the regional coordinating mechanism for SDS-SEA implementation in 2006. Over the years, PEMSEA partnership grew (**Table 1**) to its present membership of 11 Country Partners and 20 Non-Country Partners.

PEMSEA's transformation from a project-based entity into an international organization with its own legal entity has been unprecedented. In a span of three years since PEMSEA was recognized as the regional coordinating mechanism for the implementation of the SDS-SEA in the Haikou Partnership Agreement 2006, PEMSEA was able to enter into contracts and directly receive and manage funds in its own name in 2009 with the signing of the Agreement Recognizing PEMSEA's International Legal Personality by eight PEMSEA participating countries.

Table 1. Country Partners, Non-Country Partners, and year of accession to PEMSEA.

Date	Access to PEMSEA
December 12, 2003 First Ministerial Forum	First Ministerial Forum adopts Putrajaya Declaration of Regional Cooperation for the Sustainable Development of the Seas of East Asia, signed by Brunei Darussalam, Cambodia, PR China, DPR Korea, Indonesia, Japan, Malaysia, Philippines, RO Korea, Singapore, Thailand and Viet Nam
December 16, 2006	Lao PDR and Timor Leste join PEMSEA The two countries join PEMSEA as Country Partners and agree to implement the SDS-SEA
December 16, 2006	Inaugural Meeting of the EAS Partnership Council The Partnership Council endorsed the Partnership Operating Arrangements, signed by CI Philippines, CMC, UNDP/GEF SGP, IOC WESTPAC, KEI, KMI, KORDI, ORSL/EARL, UNEP GPA, OPRF, PML and YSLME
July 17, 2007	IOI, NOWPAP and SENSA join PEMSEA International Ocean Institute, Northwest Pacific Action Plan and Swedish Environment Secretariat for Asia join PEMSEA as Non-Country Partners and sign agreement with PEMSEA supporting the SDS-SEA implementation
July 14, 2008	EMECS joins PEMSEA International EMECS Center of Japan joins PEMSEA as Non-Country Partner and signed LOC Regarding Cooperation for the Sustainable Development of Marine and Coastal Resources and Governance for the Seas of East Asia
November 26, 2009	PEMSEA gains International Legal Personality Agreement Recognizing the International Legal Personality of PEMSEA signed by Cambodia, China, DPR Korea, Indonesia, Lao PDR, Philippines, RO Korea and Timor-Leste
July 13, 2012	KOEM joins PEMSEA Korea Marine Environment Management Corporation (KOEM) joins PEMSEA as Non-Country Partner

In July 2012, PEMSEA signed the Headquarters Agreement with Philippine Department of Foreign Affairs, which was ratified by Philippine President on November 22, 2013. On May 25, 2015, the Philippine Senate ratified the Headquarter Agreement, thus granting PEMSEA the privileges and immunities necessary to enable it to effectively perform its mandate and functions as an international organization based in the Philippines.

To build PEMSEA into a full-fledged international organization that is compliant with international fiduciary standards, PEMSEA Rules of Governance were adopted by the EAS Partnership Council in 2011. In 2013, the PEMSEA Resource Facility financial management system was certified as compliant with international standards by KEMP Philippines, an independent audit firm.

In support of PEMSEA's secretariat operations and implementation of the SDS-SEA, voluntary financial contributions from China, Japan and RO Korea have continued since 2007, while Singapore started to provide annual contributions in 2014. The Philippine Government's 10-year agreement with PEMSEA (2007-2017) supports the PEMSEA Office Building, as well as utilities, security, and building cleaning and maintenance. Timor Leste since 2009 has contributed 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 East Asian Seas Congress, EAS Partnership Council and Executive Committee meetings, as well as capacity development and knowledge sharing workshops. **Table 2** and **3** list dates, places and outcomes of EAS congresses and EAS Partnership Council meetings.

Recognizing the expanding coverage (geographically and functionally) and operational needs of PEMSEA, the EAS Partnership Council in its 6th Meeting (June 2014) approved the Strategy and Implementation Plan to Sustaining PEMSEA, a document that reorients PEMSEA's sustainability by delivering products and services that are geared toward addressing the needs of Country Partners, local governments, private sector and international organizations.

Programming for the Implementation of the SDS-SEA

Implementation of the SDS-SEA requires the collaborative efforts of Country Partners, Non-Country Partners, international organizations, donors, business community, private sector, local governments and academe. To accelerate the implementation of the SDS-SEA, the Fourth Ministerial Forum in 2012 adopted the regional SDS-SEA Implementation Plan (2012-2016). Corresponding country 5-year implementation plans were also developed by the nine countries in the region (Cambodia, China, DPR Korea, Indonesia, Lao PDR, Philippines, Thailand, Timor Leste and Vietnam).

In executing the regional medium-term plan, a broad-based partnership was established with the donor community through: (a) the World Bank/GEF program for Scaling up Partnership Investment for Sustainable Development of Large Marine and Coastal Ecosystems of the East Asia and Pacific Region (2012-2018); and (b) the UNDP/GEF program for Reducing Pollution and Rebuilding Degraded Marine Resources in the East Asian Seas through Implementation of Intergovernmental Agreements and Catalyzed Investments (2014-2019). Under these investment programs is the GEF/UNDP/PEMSEA project on Scaling up the Implementation of the SDS-SEA which officially commenced in August 2014. At the same time, PEMSEA signed a Project Cooperation Agreement with UNDP which authorizes PEMSEA to provide project implementation service to the UNDP/GEF Project on Scaling up the Implementation of the SDS-SEA. A medium-sized project with GEF/WB on Applying Knowledge Management to Scale up Partnership Investments for Sustainable Development of LMEs of East Asia and their Coasts (2013-2016) is also currently being implemented by PEMSEA.

Cooperation in project development to scale-up regional and national efforts to implement SDS-SEA is on-going. Key areas of collaboration cover expanding MPA coverage and strengthening management effectiveness through ICM (ACB), design and development of a blue economy fund (SOA, China) to support demonstration and replication of investment projects for blue economy development, promotion of ICM in APEC region (APEC), etc.

Table 2. Ministerial Forums, Date, Place, Outcome document, and guidance to PEMSEA.

Ministerial Forum	Date and Place	Outcome document
9–13 July 2012 Changwon, RO Korea "Building a Blue Economy: Strategy, Opportunities, and Partnerships in the Seas of East Asia"	12 July 2012, Changwon City, RO Korea 4th	Changwon Declaration toward an Ocean-based Blue Economy: Moving Ahead with the Sustainable Development Strategy for the Seas of East Asia
23–27 November 2009 Manila, Philippines "Partnerships at Work: Local Implementation and Good Practices"	26 November 2009, Manila, Philippines 3rd	Manila Declaration on Strengthening the Implementation of Integrated Coastal Management for the Sustainable Development and Climate Change Adaptation in the Seas of East Asia Region
12-16 December 2006 Haikou, PR China "One Ocean, One People, One Vision"	15 December 2006, Haikou, Hainan, PR China 2nd	Haikou Partnership Agreement on the Implementation of Sustainable Development Strategy for the Seas of East Asia and Partnership Operating Arrangements Implementation of Sustainable Development Strategy for the Seas of East Asia
8–12 December 2003 Putrajaya, Malaysia "Regional Partnerships in Action."	12 December 2003, Putrajaya, Malaysia 1st	Putrajaya Declaration of Regional Cooperation for the Sustainable Development of the Seas of East Asia

Table 3. EAS Partnership Council Meetings, date and venue (2003-2015).

EAS Partnership Council Meeting	Date	Place
1st	17-20 July 2007	Manado City, North Sulawesi, Indonesia
2nd	14-17 July 2008	Tokyo, Japan
3rd	26-29 July 2010	Dandong, Liaoning Province, PR China
4th	11-14 July 2011	Busan City, RO Korea
Special EAS PC Meeting	11 July 2012	Changwon City, RO Korea
5th	9-11 July 2013	Manila, Philippines
6th	23-25 June 2014	Makati, Philippines
7th	23-25 June 2015	Puerto Princesa, Palawan, Philippines

Building a Larger Constituency for ICM as an Effective Approach to Achieving Blue Economy Development

In the Seas of East Asia stocking-taking meeting held in 2010, PEMSEA and the SDS-SEA were recognized to serve as regional governance mechanism, framework and platform for integrated and collaborative planning, coordination, and monitoring and reporting of outputs and impacts of regional, subregional and national projects for sustainable management of the seas of East Asia, as well as to promote knowledge management and associated good practices.

With these expectations, PEMSEA has advocated ICM, SDS-SEA and blue economy development

in various forums and events to build a larger constituency of partners and collaborators.

For example, PEMSEA exemplified its approaches in developing into a self-sustaining organization at the 45th GEF Council Meeting in 2013 as part of PEMSEA's communication strategy for the celebration of its 20th anniversary. The PEMSEA anniversary publication, *Perspectives on Building a Regional Mechanism for Coastal and Ocean Governance in the Seas of East Asia*, was introduced to the GEF Council and presented to the GEF CEO, Dr. Noaka Ishii. The success of ICM in protecting and restoring coastal and marine ecosystem services and managing use conflicts and its wide acceptance at national and local levels in EAS region have been recognized as a useful and complementary approach in the GEF international water portfolio for continued support and expansion into other regions.

PEMSEA's advocacy efforts have contributed to wider recognition of ICM by the international community, in particular APEC. In the wake of adoption of *Changwon Declaration: Moving Ahead with the SDS-SEA toward an Ocean-Based Blue Economy*, the City of Xiamen and PEMSEA Network of Local Governments (PNLG) shared their experiences in implementing ICM as the approach toward achieving an ocean-based economy at the 2nd APEC Blue Economy Forum, jointly organized in 2012 by State Oceanic Administration, APEC Secretariat and PEMSEA. In the *Xiamen Declaration - Towards New Partnership through Ocean Cooperation in the Asia Pacific Region*, the outcome document of the 4th APEC Ocean-related Ministerial Meeting held in 2014, ICM is recognized as one of the measures and tools to scale up ecosystem-based management approaches to implementing APEC commitments in the priority area of coastal and marine ecosystem conservation and disaster resilience.

In addition to these high-profile events, PEMSEA also facilitated the sharing of PNLG members' experiences in ICM implementation with countries in East Asian Sea region, Africa and SIDS in the Pacific island states through the jointly-funded policy dialogue

platform – Xiamen World Ocean Week in 2013. Such platform refreshed commitments to supporting an ocean-based blue economy in the EAS region, and bolstered ties with partners in pursuit of future initiatives in marine cooperation.

Growing Partnerships and Support Networks

The PEMSEA Network for Local Governments for Sustainable Development (PNLG) is one of the most important partnership networks created by PEMSEA that aims to support the implementation, strengthening and scaling up of ICM programs at the local level. Through various knowledge and experience sharing activities, and annual gathering, the PNLG members are able to share their experiences in ICM program development and implementation in areas of common concern, ranging from coastal hazard, water resource and use, land and sea use zoning, oil spill preparedness and response, marine protected areas and blue economy (**Table 4**). Since its transition from a regional network to PEMSEA Network in 2006, the PNLG embraces 37 regular members and two associate members as of May, 2015 (**Figure 4**).

Table 4. Date, place and themes of PNLG annual forums (2001-2014).

No.	Date	Place	Theme
1	15-16 March 2001	Shihwa, RO Korea	N/A
2	20-23 September 2002	Xiamen, PR China	N/A
3	9 December 2003	Putrajaya, Malaysia	N/A
4	20-25 April 2006	Bali, Indonesia	Building Better Coastal Gov via Stronger Local Alliance with focus on Coastal Hazard Management
5	13 December 2006	Haikou, PR China	Inaugural meeting of the PNLG
6	5-7 September 2007	Danang, Vietnam	Addressing Coastal Security by Investing in Natural and Man-made Hazards Prevention and Management
7	19-21 November 2008	Sihanoukville, Cambodia	Water Resources Protection, Utilization and Management
8	23-25 November 2009	Bataan, Philippines	Land and sea-use zoning: Challenges and opportunities
9	21-24 November 2010	Chonburi, Thailand	Strengthening Oil Spill Preparedness and Response at the Local Level
10	25-27 July 2011	Dongying, PR China	Achieving Sustainable Blue Economy through Integrated Coastal Management
11	8-10 July 2012	Changwon, RO Korea	Monitoring, Reporting and Forecasting: Applications, Benefits and on-the-ground Applications
12	30 September - 2 October 2013	Shima, Japan	Achieving the Aichi Biodiversity Targets, New Satoumi and Vitalization of Coastal Areas via ICM
13	8-10 September 2014	Selangor, Malaysia	Governance and Participation in ICM

Figure 4. PNLG Membership (2011-2014).



TARGET 2: NATIONAL COASTAL AND OCEAN POLICIES AND SUPPORTING INSTITUTIONAL ARRANGEMENTS IN PLACE IN AT LEAST 70 PERCENT OF PARTNER COUNTRIES BY 2015
Status: Achieved

- 10 of the 12 countries, or 84% of the countries, have developed and implemented national policies, strategies, action plans and programs in coastal and ocean management and river basin management; and
- 9 out of 12 countries, or 75% of the countries, have established national interagency and inter-sectoral

coordination mechanisms for coastal and ocean management and river basin management.

The concept of ICM was developed in the 1970s. Since it was recognized as an approach in the management of coastal zones and ocean areas under national jurisdiction in Chapter 17 of the Agenda 21 in 1992 at the UN Conference on Environment and Development (UNCED), ICM became widely embraced by nations around the globe. The Sustainable Development Strategy for the Seas of East Asia (SDS-SEA), adopted in 2003 by 12 participating countries of PEMSEA in the East Asian region, was a direct response to Johannesburg Summit 2002 on

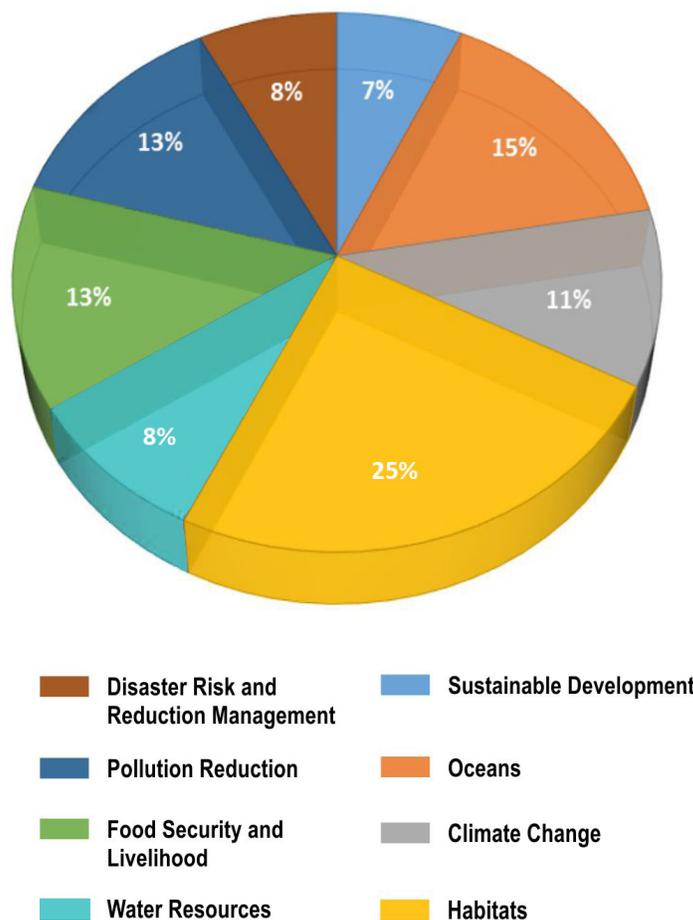
Sustainable Development to restoring the healthy ocean and coasts and achieving the objectives of various multilateral environmental agreements. To monitor the implementation of SDS-SEA, the Haikou Partnership Agreement (2006) targeted the formulation and implementation of national coastal and ocean policies and putting in place supporting institutional arrangements in at least 70 percent of the participating PEMSEA countries by 2015.

From 2003 on, countries in the East Asian seas region have adopted and implemented numerous coastal and ocean policies, strategies, action plans, legislation and interagency coordination mechanisms in coastal and marine affairs. The following sections provide a snapshot of the progress of Country Partners.

National Policies, Strategies, Plans and Programs

Countries have continued to show improvements in initiating and formulating national policies, strategies, action plans and programs for sustainable coastal development. Based on SDS-SEA implementation reviews of 12 countries, a total of 264 relevant policies (excluding legislation) are developed and implemented, with 65 (25%) policies on habitats, 39 (15%) on oceans, 35 (13%) on food security and livelihoods, 34 (13%) on pollution reduction, 29 (11%) on climate change, 21 (8%) on water resources, 21 (8%) on disaster risk reduction and 20 (7%) on sustainable development. **Figure 5** provides a summary of the policies by sector.

Figure 5. Representation of different sectoral policies adopted by countries since 2003.



A list of consolidated policies, strategies, action plans and programs reported in the national SDS-SEA reviews by the 12 countries since 2003 is provided in **Annex B**.

Table 5 indicates that a total of nine Country Partners have developed and implemented national policies, strategies, action plans and programs for marine and coastal development since 2003. In the land-locked Lao PDR, a National Water Resources Strategy and Action Plan has been developed and adopted while Vietnam has developed a Strategy for ICM to 2020 and orientation to 2030 in 2014. This implies that a total of 10 countries, or 84 percent of Country Partners, have developed and implemented national ocean and coastal policies or national water resource management strategy and action plans.

Ocean and coastal policies generally seek to achieve a wide range of policy objectives, ranging from establishment of institutional mechanisms, promotion of science and technology, advocacy for a new

development paradigm such as marine spatial planning and ocean economic development.

In the Philippines, Executive Order No. 533 on adopting ICM as a national strategy has been transformed into an ICM bill that has been approved by the Philippine Congress and currently under review by the Senate (**Case Box 1**). Sectoral policies can significantly bolster ICM program development and implementation. In the case of China, a new PPP policy in 2014 has greatly promoted the financing of environmental services by the private sector. (**Case Box 2**).

Ratification of Conventions and Treaties

Accession, approval and ratification of international conventions and agreements by Country Partners are crucial for effective implementation of international legal instruments and addressing the environmental issues such as mitigation in GHG emissions, trade

Table 5. Number of coastal and ocean-related policies and strategies since 2003.

COUNTRY	Sustainable Development	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Disaster Risk Reduction and Management	Total No.
Cambodia	1	4	3	7	6	3	3	3	30
China	2	4	2	11	1	1	7	6	34
DPR Korea	1	1	0	0	4	0	1	1	8
Indonesia	0	5	6	5	0	6	4	0	26
Japan	1	5	2	3	1	1	0	2	15
Lao PDR	0	0	1	9	2	3	2	2	19
Philippines	1	2	3	5	1	1	2	2	17
RO Korea	1	10	4	8	2	5	4	3	37
Singapore	5	1	1	2	0	1	0	0	10
Thailand	1	0	1	3	1	2	6	0	14
Timor Leste	1	0	1	5	2	9	0	2	20
Vietnam	6	7	5	7	1	3	5	0	34
TOTAL	20	39	29	65	21	35	34	21	264

in commodities containing threatened species, protection of migratory species, etc. The “Implement” strategy of the SDS-SEA specifically endeavours to implement international instruments relevant to the management of the coastal and marine environment by urging national governments to accede to and comply with international conventions and agreements, fostering regional cooperation in integrated implementation of international instruments, and executing obligations.

Annex C(1) and **C(2)** summarize the signature, accession, approval and ratification of the 23 international conventions, agreements, protocols, treaties, framework and program of actions by 14 countries in the EAS region.

UNFCCC, Kyoto Protocol, Convention on Biological Diversity, UNCCD, Montreal Protocol and Vienna Convention for the Protection of Ozone Layer are the six international instruments participated by all PEMSEA Country Partners and Thailand.

Case Box 1 | Philippines Executive Order No. 533: Adopting ICM as a National Strategy

In 2006, Philippine President signed Executive Order No. 533: Adopting ICM as a National Strategy to Ensure the Sustainable Development of the Country’s Coastal and Marine Environment and Resources and Establishing Supporting Mechanisms for Its Implementation.

Section 4 requires implementation of ICM programmes to take into account coastal strategies and action plans; public awareness programmes; mainstreaming ICM programmes into national and local governments’ planning and socio-economic development programmes and allocating adequate financial and human resources; capacity building programmes; integrated environmental monitoring; and investment opportunities and sustainable financing mechanisms.

In addition, Section 4 requires that ICM programmes promote the application of best practices in coastal and marine use zonation as a management tool; sustainable fisheries and conservation of living resources; protection and rehabilitation of coral reefs and other habitats, particularly through implementation of MPAs; development of upland, watershed, catchment areas and basin wide management approaches; integrated waste management; integrated management of port safety, health, security and environmental protection; and involvement of the private sector/business sector as a partner in ICM.

Under this policy, a number of programs have been developed and implemented at the national

level, including National Greening Program (2011-2016), Integrated Coastal Resource Management Project (ICRMP) (2007-2014), Mangrove and Beach Forest Development Project, etc. More than 880,000 ha of coral marine key biodiversity area (mKBA) are included under the Coral Reef Rehabilitation and Protection Program (2012-2016) of the Department for Environment and Natural Resource of the Philippines. With the ICRMP, 50 MPAs were established as of 2011, covering an area of about 5,480 ha, with more than 790 ha as no-take zones. The National Green Program, which significantly supports ICM implementation, has successfully reforested more than 680,000 hectares of open, denuded, and degraded lands in just three years, 9,447 hectares of reforested lands were planted with mangroves. The program has also generated more than 1.18 million jobs for poor people living in upland and coastal areas (PEMSEA, 2014).

The ICM Bill, which captures the elements of EO No. 533, is under review by the Philippine Senate. If enacted, it will be known as An Act to Adopt Integrated Coastal Management as A National Strategy to Ensure the Sustainable Development of the Coastal and Marine Environment and Resources and to Establish Supporting Mechanisms for its Implementation and Provide Fund Therefor and for Other Purposes.

Reference:

PEMSEA, 2014. *Welcome Remarks of Hon. Ramon J.P. Paje, Secretary, Department of Environment and Natural Resources, Philippines, in Proceedings of the Sixth East Asian Seas Partnership Council Meeting.*

Of the 19 international instruments in place before the adoption of the SDS-SEA, 11 are participated by Country Partners and Thailand since 2003. In other words, no country has joined any of the six international instruments since 2003, i.e. Ramsar Convention, Migratory Species Convention, World Heritage Convention, Basel Protocol on Liability and Compensation, Global Programme of Action for the Protection of Marine Environment from Land-based Activities.

Table 6 below gives an overview of the level of participation in the 23 international instruments by the 14 countries. China, Japan, Philippines and RO Korea are the most active countries in joining international agreements on environmental protection, followed by Cambodia, Indonesia, Thailand and Vietnam. Since 2003, the 14 countries have been active in joining these international legal instruments and framework. Lao PDR has pared with China and Philippines in joining 7 of the 32 instruments in particular Convention on International Trade in Endangered Species (CITES), a “hard” international law.

Table 6. Number of international legal instruments and frameworks ratified by the 14 participating countries

Countries	No. of instruments joined since 2003	Total No. of instruments joined
Brunei Darussalam	4	11
Cambodia	6	18
China	7	20
DPR Korea	5	11
Indonesia	6	18
Japan	5	20
Lao PDR	7	15
Malaysia	4	18
Philippines	7	20
RO Korea	6	20
Singapore	4	13
Thailand	6	17
Timor Leste	4	7
Vietnam	5	17

Case Box 2 Engaging Private Sector in Infrastructure Financing in China

Public private partnership (PPP) has proven to be useful approach to mobilizing financing and expertise of the private sector to enable public sector to deliver improved public services. PPP has numerous forms including a performance-based management framework that ensures the quality of public services and reduction in costs. An enabling policy, legal and institutional environment for PPP development at the national level is critical.

In September 2014, the Ministry of Finance of China issued the Circular on Promoting PPP. With this policy, infrastructure projects such as railways, public hospitals, vocational schools or universities, and urban public services including urban transportation, waste water treatment facilities and energy infrastructure are expected to receive stronger support from PPP initiatives in China.

In the same year, Ministry of Finance established China PPP Center to oversee the PPP development in China through development of policies, technical

guidelines, capacity development and promotion of PPP at different administrative levels. Following the circular, the Ministry of Finance issued a PPP Guideline to streamline the process of project identification, preparation, procurement, implementation, transfer and other matters related with projects.

According to a study by a consultancy firm, this policy facilitated investment of \$130 billion in 500 projects in 17 sectors. Roughly \$6.5 billion were invested in over 130 projects for treatment of waste water and solid waste, and for building and operating waste-to-energy power plants.

The potential of PPP projects to directly address the key challenges to coastal and marine environment in China for a blue economy development still needs to be fully explored. Facilitation of partnership building between finance and oceanic administration and between public and private sector will be a good starting point to this end.

Annex D (1) and **D (2)** illustrate the participation by 14 Countries in international conventions related to the maritime sector (IMO Conventions).

Of the 32 protocols, conventions, annexes of MARPOL, London Convention, CLC, FUND, SOLAS, etc, the 14 countries have ratified a total of 13 legal instruments that were in place since 2003. **Table 7** provides the status of countries in ratification of the 32 legal instruments. China, RO Korea, Japan, Singapore, Malaysia and Cambodia are the key countries that have participated in the conventions addressing marine pollutions. Since 2003, Malaysia ratified 9 IMO conventions related with marine pollution, followed by Korea (8), China (6), Japan (5), Singapore (4), Vietnam (3), Cambodia (2), Lao PDR (2), Philippines (2), DPR Korea (1) and Thailand (1).

Legislation

From 2003 to 2015, countries have adopted or revised 121 national laws by legislature (**Table 8**), represented by habitats (30, or 25%), pollution reduction (19, or 16%), oceans (17, or 14%), food security and livelihoods (16, or 13%), water resources (15, or 12%), climate change (11, or 9%), disaster risk reduction (11, or 9%) and marine spatial planning (2, or 2%). **Annex E** lists all laws enacted by Country Partners related with sustainable development aspects since 2003.

At the country level, Indonesia (23) has enacted or revised the most coastal and ocean-related laws since 2003, followed by RO Korea (19), Japan (15), China (11), DPR Korea (11), Singapore (10), Timor Leste (9), Philippines (7), Vietnam (6), Cambodia (4), Lao PDR (4) and Thailand (2) (**Table 9**). Based on SDS-SEA national review report, Japan appears to have established a comprehensive legal mechanism to regulate the generation, treatment, disposal and handling of pollutants from industry, food resources, chemicals and other sources which would otherwise end up in coastal areas.

Taking into account the coastal and ocean laws enacted before 2003, it turns out that 7 of the 11 littoral countries (China, Indonesia, Japan, RO Korea, Singapore, Thailand and Vietnam) have put in place their respective national legislation to facilitate governance of coastal and ocean development (**Figure 2**).

As early as in 2002, China enacted the Sea Use Management Law which provides the legal basis for marine function zoning, payment of sea use

Table 7. Number of IMO conventions ratified by the 14 participating countries.

Countries	No. of IMO conventions (related with marine pollution) joined since 2003	Total No. of IMO conventions (related with marine pollution) joined
Brunei Darussalam	4	9
Cambodia	2	15
China	6	23
DPR Korea	1	10
Indonesia	0	6
Japan	5	22
Lao PDR	2	2
Malaysia	9	16
Philippines	2	11
RO Korea	8	23
Singapore	4	18
Thailand	1	4
Timor Leste	0	0
Vietnam	3	10

Table 8. National laws enacted by Country Partners since 2003.

Sector	Number of Laws	Percentage (%)
Oceans	17	14
Climate Change	11	9
Habitats	30	25
Water Resources	15	12
Food Security and Livelihood	16	13
Pollution Reduction	19	16
Marine Spatial Planning	2	2
Disaster Risk Reduction and Management	11	9
Total	121	100

fees and access rights and use of the sea. In Japan, the Basic Act on Ocean Policy, which took effective on July 20, 2007, provides the legal framework for principles, basic plan and basic measures, including integration of activities on land and sea, and integration of disaster risk management. Singapore passed the Merchant Shipping Act in 2008.

A number of ocean laws have been enacted since 2011. In RO Korea, Maritime Safety Act was enacted in 2012. Indonesia has adopted the Law on the

Table 9. Number of laws enacted or revised by the 12 participating countries related with coastal and ocean governance since 2003.

Country	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Marine Spatial Planning	Disaster Risk Reduction and Management	Total No.
Cambodia	1	0	1	1	1	0	0	0	4
China	1	4	0	2	2	0	0	2	11
DPR Korea	0	1	5	2	2	1	0	0	11
Indonesia	5	0	2	4	3	4	2	3	23
Japan	2	2	6	0	1	4	0	0	15
Lao PDR	0	0	4	0	0	0	0	0	4
Philippines	1	2	1	0	0	2	0	1	7
RO Korea	2	3	5	2	4	0	0	3	19
Singapore	1	0	4	2	0	3	0	0	10
Thailand	1		0	0	0	0	0	1	2
Timor Leste	1	0	0	2	2	4	0	0	9
Vietnam	2	0	2	0	1	1	0	0	6
TOTAL	17	11	30	15	16	19	2	11	121

Sea (National Act No 32) in September, 2014, the basic ocean law of Indonesia delineating the marine resource use, conservation and protection, and horizontal and vertical cooperation in policy implementation. It also establishes marine spatial planning as the tool to manage spatial use of coasts and oceans.

In Thailand, the Promotion of Marine and Coastal Resource Management Act took effect on June 24, 2015. The Vietnam Law of the Sea, which took effect on January 1, 2013, regulates marine economic development and management and protection of seas and islands.

Several countries are in the process of developing their basic ocean law. For example, the Chinese People's Congress initiated the process of developing its ocean basic law in

2013. In the Philippines, a bill for an ICM Law was submitted for review by the Senate in 2015 (**Case Box 1**).

Laws with Provisions on Integrated Tools and Instruments in Coastal and Ocean Management

Based on the reported laws enacted by the legislature in the national SDS-SEA review by the 11 countries, legal provisions containing integrated tools and mechanisms of 46 laws from the 11 countries with English translations were examined, i.e. ICM, marine spatial planning, environmental assessment, economic valuation of ecosystem services, economic, financial and fiscal instruments, ecosystem approach to fishery management, MPA, and natural resource access rights.

Case Box 3 Marine Spatial Planning in EAS Region

Marine spatial planning (MSP) is a tool frequently employed by countries for the purposes of promoting rationale coastal development, sustainable use and conservation of sea areas, safeguarding the legitimate rights and interests of users, strengthening the management of sea areas and resolving sea use conflicts. In the EAS region, countries are at different stages in formulating policies and legislation in support of application of MSP.

In RO Korea, Chapter III of the Coastal Management Act (1999) on designation and management of sea areas for coastal use classifies the coastal sea areas into use, conservation, special and management coastal waters. The four uses are further broken down into 19 functional districts. According to the newly introduced institutional mechanisms, coastal zoning mechanisms are incorporated into local ICM plans since 2009. The implementation of local ICM plans including the coastal zoning plans has resulted in the proportion of coastal waters for “Swimmable and Fishable Uses” increasing from 79% in 2007 to 88% in 2012.

With Law on the Administration of the Use of Sea Areas adopted in 2001, China has established the marine functional zoning, sea area use right and fee system for the use of sea areas. In accordance with statute, marine function zoning plans at national, provincial and municipal (county) levels are developed and approved. In support of implementation, specific regulations are developed and adopted, including technical directives for the division of marine functional zonation, and regulations on accreditation of entities to conduct surveys, exploration and assessment of sea use projects. In 2013, the third version of national marine function zoning plan was adopted by the State Council, which has targeted to leave intact at least 35 percent of national coastlines and to designate 5 percent of its coasts and seas under MPAs by 2020. The Plan has left room for MPA expansion, which only covered 3.23 percent of its jurisdictional sea areas as of June 2014. Marine functional zoning plans have been prepared and revised in the all coastal provinces and cities.

For example, Liaoning Province of China adopted the Liaoning Coastal Conservation and Development Plan in 2014. The plan covers 2,110 km of coastline, with 10 km landward and 12 nautical miles seaward, and 14,500 km² of land area and 21,000 km² of sea areas involving 28 counties in six coastal cities. According to the plan, land and sea areas within the boundary areas of the plan will be zoned as priority conservation areas and priority development areas. Focusing on conservation of biodiversity and ecosystem services, priority conservation areas allow agroforestry, fishery and tourism practices, while priority development areas are zoned for industries, ports and urban development. Minimum areas in square kilometres for coastal priority conservation zones and priority development zones are also specified in the Plan.

The Law of the Sea of Vietnam adopts dividing maritime zones as one measure to plan for maritime economic development. The marine spatial planning was affirmed in the Decision on Approval for Vietnam’s ICZM by 2020 and a Vision by 2030 issued by the Prime Minister in December 2014. In the Decision, building up, deploying and implementing functional zoning for national and provincial coastal areas and harmonization of development plans of sectors, coastal provinces and cities with marine zoning plans will be pursued, with the objective of exploiting marine resources and coastal space more reasonably and effectively.

Cambodia does not have any national policy on marine spatial planning. However, with assistance from PEMSEA and other international organizations, Sihanoukville Coastal Use Zoning scheme has been developed and adopted by the National Coastal Steering committee in May 2005. The zoning scheme includes 12 zones, and zoning enforcement has been implemented in beaches and protected areas.

In the Philippines, ECOFISH Project is working in 8 marine key biodiversity areas (mKBAs), using MSP as tool for ecosystem-based approach to fisheries management (EAFM). In Batangas Province, which borders the Verde Island Passage, application of MSP is being undertaken under the framework of ICM.

Based on the review, 10 of the 11 countries have legal provisions on environmental impact assessment and MPA. Most countries applied spatial planning (**Case Box 3**), economic instruments and natural resource access rights in their national legislation. Application of economic valuation of ecosystem services and ecosystem approach fishery management have legal basis in half of the countries. Except Indonesia, all other countries have not yet enacted an ICM law to manage coastal zones. **Figure 6** provides a visual diagram to show the strength and weakness of countries in legislation with integrated management approaches.

The Law No. 27/2007 regarding the Management of Coastal Area and Isles, adopted on 17 July 2007, and its amendment in 2014 of the Indonesia represent a good example of an ICM law in the EAS region. Without making specific reference to ICM, the law defines coastal management as “a coordination of planning, utilization, monitoring, and control of coastal resources and the small islands of the Government and Local Government, between sectors, between terrestrial and marine ecosystems, as well as between science and management to improve the welfare of the people.” Its amendments in 2014 deal with several articles specifying administrative and legal proceedings for managing coastal areas and small islands meeting environmental requirements for the following purposes: conservation, education and training, research and development, mariculture, tourism, environmentally friendly fisheries and maritime business and fishery industry, organic agriculture, husbandry, state defense and security.

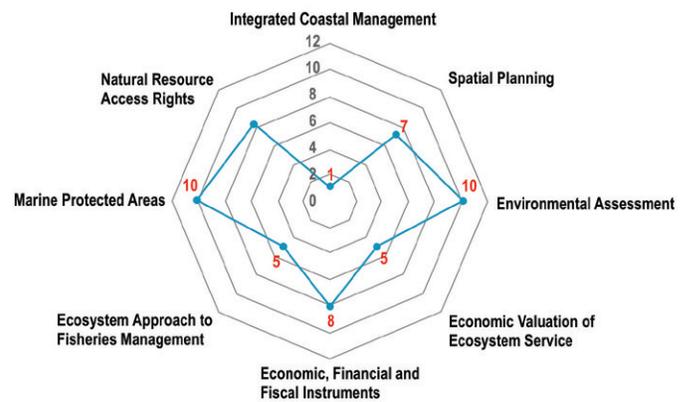
Institutional Strengthening of Ocean Ministries

Since 2011, there are new developments in national institutional set-up for ocean administration and management.

China established its Coast Guard in 2013 as a functional unit of State Oceanic Administration. It has unified the law enforcement roles of China Marine Surveillance, the coast guard forces of the Ministry of Public Security, the fisheries law enforcement command of the Ministry of Agriculture, and the maritime anti-smuggling authorities of the General Administration of Customs.

The Ministry of Maritime Affairs and Fisheries of RO Korea (MOMAF), which was established in 1996, was rebuilt as Ministry of Oceans and Fisheries (MOF) in 2013 to strengthen integrated ocean and fisheries management.

Figure 6. Strength and weakness of countries in legislation with integrated management approaches.



In Indonesia, Ministry of Environment and Forestry took over the previous functions of the Ministry of Environment and Ministry of Forestry since October 27, 2014.

These new institutional set-ups have strengthened the institutional capacity to coordinate and implement legislation and policies related with oceans and coasts in the respective countries.

Interagency Coordination Mechanisms

Setting up and operationalization of national interagency, multi-sectoral coordination mechanisms enables national governments to oversee and coordinate coastal and ocean policies and governance and their effective implementation. Meanwhile, the mechanism is also considered as a critical approach to involving concerned stakeholders in planning, implementing, evaluating and continually improving programs for sustainable development through ICM applications.

Table 10 lists the interagency coordination mechanisms of the 12 countries for coastal and ocean area development and management, river basin and water resource management, conservation and management of biodiversity, pollution reduction, sustainable fisheries, climate change adaptation and disaster risk reduction. National interagency coordinating mechanisms for coastal and ocean management programs have been set up and are currently operational in 8 of the 11 littoral states, i.e. Cambodia, DPR Korea, Indonesia, Japan, RO Korea, Singapore, Thailand and Timor Leste. In Lao DPR, the River

Basin Committee is already in place to coordinate basin development in the country. This indicates that 9 out of the 12 countries have operationalized their national inter-agency and intersectoral coordination mechanisms for coasts and oceans and watershed management.

Since 2012, there are new developments in establishing national inter-agency and intersectoral coordination mechanisms among the countries. With the adoption of the Royal Decree No. NS/RTK/0212/079 in 2012, Cambodia has established the National Committee for Management and Development of Cambodian Coastal Area.

In 2013, the People's Congress of the China adopted the proposal of the State Council to establish the National Ocean Committee to coordinate marine affairs in the country.

Philippines and Vietnam are still in the process of developing their national interagency coordinating mechanisms for coastal and ocean management as a major outcome in their respective 5-year national SDS-SEA implementation plans (2012-2016).

Under respective national contexts and governance architecture, most countries have also established national interagency coordination mechanisms under different aspects of sustainable development. For example, Cambodia, China, Indonesia, Philippines, Thailand and Singapore have established and operationalized their national climate change coordination mechanisms. National interagency coordination mechanisms for climate change and other aspects of sustainable development play critical roles in coordinating national policies and program development in coastal areas and marine sectors.

Table 10. National interagency coordinating mechanisms for coastal and ocean management.

Country	Coordinating Body	Main Task/s
Cambodia	National Committee for Management and Development of Cambodian Coastal Area (2012)	Promote sustainable management of coastal areas through integrated planning and monitoring of development activities along the coasts
	National Coastal Steering Committee (NCSC)	Coordinating body among 18 line ministries and all four coastal provinces on coastal and marine resource management
	National Committee for Disaster Management (NCDM)	Prepare and respond to natural disasters and other natural catastrophes, including a Five-year Strategic National Action Plan for Disaster Risk Reduction (SNAP-DRR 2008-2013)
	National Climate Change Committee (2006)	Prepare, coordinate and monitor the implementation of policies, strategies, legal instruments, plans and programmes of the Royal Government to address climate change-related issues
	Commission on Monitoring and Assessing for Suppressing Encroachment into Mangrove Land and Coastal Reclamation (2004)	Prohibits 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
China	China National Oceanic Commission (2013)	National high-level coordination body for marine policy and strategy development
	China Coast Guard (2013)	National enforcement body for laws related with coasts and oceans, including sea use, fishery, sea-based trafficking, etc
	National Leading Group to Address Climate Change (2007)	Deliberate and determine key national strategies, guidelines and measures on climate change, as well as coordinate and resolve key issues related to climate change.
	National Committee on Biodiversity Conservation	Established in 2011 with membership from 25 ministries to review and adopt key biodiversity policies and programs. Currently the Committee is chaired by a Vice Premier in charge of environmental issues.
DPR Korea	National Coordinating Committee for Environment (NCEE)	Coordinate environmental issues including marine and coastal management affairs
	National Emergency Disaster Commission	Established in 2014 to coordinate various ministries in disaster risk reduction.

Country	Coordinating Body	Main Task/s
Indonesia	National Ocean Council (2007)	Coordinate ocean-related affairs
	National Council for Climate Change (2008)	Strengthen coordination of climate change policy and to strengthen the position of the country in international forums on climate change.
	Sea Partnerships (2007)	Established by the Law Concerning the Management of Coastal Zones and Small Islands (2007) as a forum for cooperation between the Government, the Local Government, universities, non-governmental organizations, professional organizations, prominent figure of the community, and/or the industry.
Japan	The Secretariat of the Headquarters for Ocean Policy Cabinet Secretariat (2007)	Implement the Basic Act on Ocean Policy which includes efforts to implement ICM based on independence of individual regions and offer assistance to regions that strive to formulate their own plans
	Central Environmental Council, Joint Committee on Natural Environment and Wildlife, Natural Park Subcommittee, and National Biodiversity Strategy Subcommittee	Coordinate various aspects of habitat protection and biodiversity conservation in the country.
Lao PDR	River Basin Committee	Manage all major rivers and river basins both within and outside the Mekong River and coordinate with various agencies and organizations on the management of water resources
	Lao National Mekong Committee (LNMC)	Manage and coordinate sub-basin management of Mekong tributaries in Lao PDR; coordinates with the Mekong River Commission on implementation of projects and programs
	National Disaster Management Committee (NDMC)	Responsible for policy formulation and disaster management
	National Wildlife and Aquatic Life Coordinating Mechanism	The Wildlife and Aquatic Animals Act (2008) assigns the Ministry of Agriculture and Forestry as the central agency in coordinating national policies, strategies, and other measures for wildlife and aquatic life.
Philippines	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.
	Climate Change Commission	Develop the National Framework Strategy for Climate Change and the National Climate Change Action Plan.
RO Korea	Marine and Fisheries Development Committee	Established under the Framework Act on Ocean and Fisheries Development
	Central Safety Control Committee	Established under the Framework Law on Disaster and Safety Management
	National Committee on Coastal Management	Established under the Coastal Management Act
	Fisheries Mediation Committee	Fisheries Act
	Presidential Committee on Green Growth	Framework Act on Low Carbon, Green Growth
Singapore	Inter-Ministerial Committee on Sustainable Development	Develop the national framework and key strategies for the country's sustainable development.
	Technical Committee for the Coastal and Marine Environment (TCCME), since 2009	Undertake studies, provide technical inputs for policy making, and build capacity in areas related to the coastal and marine environment.
	Inter-Ministerial Committee on Climate Change	Oversee Singapore's climate change strategy development and implementation.
	Coastal and Marine Environment Policy Committee (CMEPC)	Provides coordinated, holistic and strategic policy direction for development activities, port and shipping activities, navigational freedom, and environmental sustainability and endorses the adoption and implementation of Singapore's IUCM framework.

Country	Coordinating Body	Main Task/s
Thailand	National Environment Board (NEB)	Responsible for implementing environment laws, approving environment quality management plans and provincial action plans, and amending so as to improve environment laws
	Sub-committee on Marine and Coastal Resources (SMCR)	Develop the strategic policy framework and management plan that will improve and maintain the sustainability of Thailand's coastal and marine resources
	National Civil Defense Committee	Coordinates all activities relevant to civil defense and disaster management, and 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 Committee on Climate Change	Highest climate change policymaking body with three subcommittees handling technical, negotiation and public relations functions
	Strategic Committee for Water Resource Management (SCWRM)	Formulate the Master Plan on Sustainable Water Resource Management which includes measures for the short- and long-term to reduce the impact of floods and droughts
Timor Leste	Coordination mechanism for the SDS-SEA, CTI and ATSEA projects	Senior level national coordinating committee not in place. The project coordination mechanisms engage representatives from relevant agencies to participate in meetings and be part of specific TWGs/Task Teams.
	Assessment Committee	The Decree Law No. 05/2011 on Environmental Licensing require the establishment of the Assessment Committee in regulating the licensing of certain types of projects including public consultations, technical analysis, and decision-making on EIA license. The Committee consists of representatives from different government departments.
	Fishery Co-management Committee	The Decree Law No. 6/2004 on General Bases of the Legal Regime for the Management and Regulation of Fisheries and Aquaculture requires the establishment of co-management committees or similar bodies with functions on compliance with conservation and management measures of fishery resources, protection of the marine environment, and participation in meetings of the National Consultative Commission.
Vietnam	Vietnam Administration of Seas and Islands	Coordinates the integrated and unified state management for seas and islands, including coastal areas.

TARGET 3: ICM PROGRAMS FOR SUSTAINABLE DEVELOPMENT OF COASTAL AND MARINE AREAS AND CLIMATE CHANGE ADAPTATION COVERING AT LEAST 20 PERCENT OF THE REGION'S COASTLINES BY 2015

Status: In progress

As of June 2015, ICM programs cover more than 14 percent of the regional coastline. Achieving this target is promising in the next few years. In 2014, the countries committed to scale up ICM programs over the next 5 years to cover at least 25 percent of the regional coastline by 2021.

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, including: climate variation and change and severe weather events; biodiversity loss; pollution

of rivers, coastal seas and LMEs; overexploitation of fisheries and other natural resources; food, water and energy shortages; poverty and economic instability.

The priority target of implementation of ICM program in at least 20 percent of the region's coasts by 2015 was established in Haikou Partnership Agreement in 2006. In the past eight years, countries in collaboration with PEMSEA Non-Country Partners and collaborators have adopted new policies and legislation to enable the implementation and scaling up of ICM programmes in the coastal and watershed areas of their respective countries. National capacity building programs are established and implemented to create the knowledge base for ICM implementation. Raising the awareness of the public about the value and benefits of sustainable coasts and ocean contributes to the understanding and participation in beach clean-up, mangrove planting and other activities and events at national and local levels to nurture a sense of stewardship of oceans and coasts in the Seas of East Asian region.

Strengthening the Institutional and Individual Capacity for ICM Program Development and Implementation

Scaling up ICM implementation across the EAS region requires the strengthening of individual capacity of ICM managers and practitioners of national and local governments and institutional capacity of training institutions. This section discusses the capacity development initiatives of PEMSEA, national governments, and PEMSEA Non-Country Partners and collaborators to build the critical mass of expertise for ICM implementation and coastal and marine resource management.

PEMSEA capacity development initiatives

At the regional level, PEMSEA has enhanced its capacity development programs to support the demands of the countries for skilled human resources, tools and services to promote the development, implementation and replication of ICM programs.

Since 2003, PEMSEA has conducted a total of 130 training and workshop activities involving about 3,500 participants from the PEMSEA Partner Countries. Major regional training workshops covered diverse topics, including:

- ICM development and implementation;
- ICM training-trainers;
- Project proposal development;
- Project management (including financial management);
- Oil spill preparedness and response;
- Planning, implementation and enforcement of land- and sea-use zoning;
- Tourism zone development; conservation; fisheries
- Shoreline assessment and oil spill clean-up;
- Total maximum daily pollutant loading;
- Sustainable fisheries management;
- Port safety health and environmental management;
- Port auditing;
- Integrated information management system (IIMS);
- ICM Code and certification;
- State of the Coasts (SOC) reporting;
- Environmental sensitivity mapping;
- Environmental risk assessment;
- Resource valuation; and
- Natural resource damage assessment.

PEMSEA also recognized ICM Learning Centers (ICM LCs), mobilized regional and national task forces and partnered with two Regional Centers of Excellence (RCOE): Centre for Marine Environmental Research

and Innovative Technology (MERIT) in Hong Kong and University of the Philippines Marine Science Institute (UP MSI) to further support coastal and marine as well as river basin management in the region. To date, 8 universities in 6 Partner Countries have been recognized as PEMSEA ICM LCs. **Table 11** details the various supporting activities undertaken by the RCOEs and ICM LCs. MERIT also provided opportunities to local government environmental monitoring specialists for targeted training in monitoring of heavy metals and other pollutants. Six other universities also participated in PEMSEA regional training workshops as potential new ICM LCs to enable them to deliver training workshops and provide technical assistance to local governments in their ICM program development and implementation.

National initiatives

At national level, Japan and RO Korea have developed national training programs and mobilized training centers or universities to strengthen the skills and knowledge of national and local level ICM managers and practitioners. Similarly, China, Indonesia, Philippines and Vietnam have also designated institutions to conduct training courses in coastal and ocean management. A noteworthy undertaking in China is a marine human resource development plan launched in 2011. The plan seeks to increase the ocean-related human resource base from 2 million people in 2010 to 4 million by 2020 in the area of scientific research, ocean engineering, marine resource development and use, public services, ocean management, high-tech and international cooperation. Coastal and Ocean Management Institute of Xiamen University of China now offers post-graduate degree programs for coastal and ocean management. In addition to PEMSEA ICM Learning Centers, Riau University and Diponegoro University in Indonesia developed post-graduate degree courses on coastal and marine resource management. In the Philippines, integrated coastal resource management (ICRM) centers were designated in 5 universities to facilitate transfer of knowledge and skills to the five marine corridors with assistance from ADB and the GEF.

Countries have reported sporadically about progress in capacity needs assessment and integration of coastal and marine ecosystem into primary and secondary school curricula. In spite of the policy and legal development in ICM in the EAS region, there are still no reporting of setting up accreditation systems at national level to certify training courses, institutions and individuals for ICM training of managers and practitioners.

Table 11. Supporting activities of ICM Learning Centers.

Collaborative Activities (2008-2015) for updating	
Regional Centers of Excellence (RCOEs)	
Centre for Marine Environmental Research and Innovative Technology (MERIT)	<ul style="list-style-type: none"> Held a 3-month long training for monitoring of heavy metals and other pollutants participated by three representatives from ICM sites.
Marine Science Institute of University of Philippines	<ul style="list-style-type: none"> Scoping of ICM priority sites in the Philippines Conducted Total Pollutant Loading modelling in Manila Bay
ICM Learning/Training Centers	
Royal University of Phnom Penh, Cambodia	<ul style="list-style-type: none"> National ICM Course in Cambodia Technical support in Lao PDR project on solid waste management.
Center for Coastal and Marine Resources Studies-Bogor Agricultural University, Indonesia	<ul style="list-style-type: none"> National ICM 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	<ul style="list-style-type: none"> Planning workshop for ICM Development and Implementation in Macajalar Bay Technical assistance, including research and outreach to LGUs in Macajalar Bay for ICM related concerns Resource person for IIMS training in the Mindanao area
De La Salle University-Lipa, Philippines	<ul style="list-style-type: none"> ICM Training of Trainers for the ICM Core Team of DLSU-Lipa Resource person in ICM Training Course for Region 6, Philippines Technical Working Group of the Batangas Bay Watershed Rehabilitation and Sustainable Development Project Host the Batangas Province IIMS ensuring its operationalization and sustainability
University of the Philippines, Visayas, Philippines	<ul style="list-style-type: none"> Membership in the Scientific Advisory Group of the Guimaras ICM Program and in the Habitat Protection, Restoration and Management Sub-Committee of the Guimaras ICM Program Conduct of research and outreach programs in the Taklong Island National Marine Reserve
University of Danang, Vietnam	<ul style="list-style-type: none"> National ICM Training Course in Vietnam
The Coastal and Ocean Management Institute (COMI) of Xiamen University, PR China	<ul style="list-style-type: none"> Shared research and project experiences in the regional ICM training workshop, Xiamen (2014) Resource persons in PEMSEA regional training workshop in Xiamen, China, and Bogor, Indonesia. (2015)
Kim Il Sung University, DPR Korea	<ul style="list-style-type: none"> Established ICM Training Center in 2005 Conducted the 1st ICM training course in DPR Korea in 2005, and in 2007, 2008, 2011, to nearly 300 representatives from national and local agencies, research institutes and universities

Initiatives of Non-Country Partners

Collaborative trainings with PEMSEA Non-Country Partners can maximize the expertise of resource persons to meet the needs of trainees in coastal and ocean management. The OPRI-SPF has supported ICM replication at local level through education for undergraduate and postgraduate levels in collaboration with universities (**Case Box 4**). Another example is the joint training workshop conducted in 2014 by Korean Maritime Institute and PEMSEA Resource Facility to further develop the skills and capacity of senior national officials from PEMSEA Country Partners in using INVEST and other ecosystem assessment tools in marine spatial planning (**Case Box 5**).

The comparative advantage and experiences of Non-Country Partners have contributed to the replication and scaling up to a larger PEMSEA constituency. For example, the annual International Coastal Cleanup (ICC) campaign and workshop on marine litter management can be replicated to other PEMSEA Partner Countries to join NOWPAP's initiative to combat marine debris as an emerging issue identified in the Future We Want. Similarly, the IOC/WESTPAC training workshops can greatly benefit the Regional Centers of Excellence and ICM Learning Centers by sharing knowledge on harmful algal blooms, marine toxins and seafood safety, marine alien species, coral reef conservation and restoration, and onset monitoring and its social and ecosystem impact (MOMSEI).

Enhancing Stewardship of Coasts and Oceans through Raising Public Awareness

Awareness of the public about the status of the coasts and oceans and the linkage with their welfare and life determines the level of their participation in coastal policy making and as well effectiveness and efficiency of ICM program implementation. To achieve this, countries seek to raise awareness of oceans and coasts through the celebration of ocean day.

Case Box 4 Replicating ICM Application at the Local Level through Networking and Education in Japan by the Ocean Policy Research Institute, Sasakawa Peace Foundation (OPRI-SPF)

The Ocean Policy Research Institute, Sasakawa Peace Foundation (OPRI-SPF), formerly known as the Ocean Policy Research Foundation, has long promoted ICM in Japan and at the regional level.

Japan's Basic Act on Ocean Policy was enacted in 2007 and includes "Integrated Management of the Coastal Zone" as one of its basic measures. OPRI-SPF contributed to the establishment of the Act, and has spearheaded the capacity development in the implementation of ICM along with the Basic Plan of Ocean Policy (2008, 2013).

Five OPRI-SPF demonstration sites are now enhancing community strength and adaptability through their ICM programs. Shima City, which has been implementing an ICM action plan from 2011 and operationalized a multi-stakeholder ICM council from 2012, joined the PNLG in 2013 and hosted the PNLG Annual Forum the same year.

OPRI-SPF has organized domestic ICM symposiums, network workshops, and training courses for the sharing of experiences among coastal cities nationwide. Especially successful measures to enhance capacity of local cities were the interactive "Power up Workshop for ICM" and the "Network Meeting for ICM".

Another ongoing initiative is ICM education for the undergraduate and post-graduate levels, including a collaborative course, "Integrated Coastal and Ocean Management (ICOM)," with the Shikoku Five Universities Partnership, led by Kochi University. Also, an online ICM lecture is underway by the Open University of Japan.

Along with these efforts, OPRI is now working to create new model sites.

The State Oceanic Administration of China has established a National Ocean Day office to plan, organize and celebrate National and World Ocean Day with a host city as well as the award granting to top 10 individuals, public sector, NGOs, private sector with recognized achievements in ocean conservation, research and awareness-raising. Japan has designated the National Ocean Day by law which requests the State and local governments to hold events that enable citizens to have better understanding and deeper interests of the oceans. The Philippines celebrates the Month of the Ocean in the country in May and the World Oceans Day on June 8. In Vietnam, the annual Vietnam Seas and Islands Week (1-7 June) is celebrated in support of the World Oceans Day as an outreach campaign on coasts, seas and islands. In 2010, the Prime Minister approved the Master Program on Communication and Public Awareness in the field of marine and island protection, management and sustainable development.

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

Case Box 5 Promoting Ecosystem Valuation as a Tool for Marine Spatial Planning by Korea Maritime Institute (KMI)

Korea Maritime Institute (KMI) is collaborating with PEMSEA Resource Facility (PRF) to develop the national capacity of ecosystem service valuation and its application to marine spatial planning and management in East Asian region.

The 1st training program and international workshop on marine ecosystem valuation and spatial management tools were conducted on September 1-5, 2014 in Seoul, RO Korea. Over 40 experts and practitioners from China, RO Korea, Vietnam and ICM learning centers shared experiences in application of several tools on ecosystem services valuation and spatial planning and management tools, in particular Marine INVEST, MARXAN with zones, EMERGY-based spatial planning and Marine Suitability Assessment.

For continuously spreading out the valuation-based planning and management and enhancing its application capacity, the 2nd training program is scheduled to take place at the EAS Congress in Danang, Vietnam, to be held on November 16-21, 2015.

Forums) and conferences (e.g., EAS Congress, Xiamen World Ocean Week).

As a collaboration with Xiamen Municipal Government, PEMSEA and other founding members jointly organize the Annual Xiamen World Ocean Week (XWOW) since 2006. The XWOW Organizing Committee makes regular programs for promotion of science and technology, yachting championship, beach festivals, sports fishing and music festivals, making XWOW not only an ocean policy dialogue, international coastal management

knowledge sharing and marine industry promotion forum but an awareness raising week participated by nearly 100,000 people during the week-long event.

In DPR Korea, an annual seminar and exhibition on integrated coastal and marine management is hosted by the State Commission for Science and Technology and other line ministries and institutions. While in Indonesia, an ICM Forum is held every three years to promote integrated approaches in coastal and ocean management.

Case Box 6 National ICM Programs in Indonesia, Singapore and Vietnam

The Law no. 27/2007 of Indonesia on Management of Coastal Area and Isles 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. In conformance with this law, Indonesia has implemented the Marine and Coastal Resource Management Project (MCRMP) wherein 15 provinces have prepared ICM planning documents including coastal strategic plans for 42 coastal districts and 15 draft provincial spatial and zonation plans. Under the Project, 12 provincial coastal management regulations were enacted. MoMAF conducted capacity-building programs for government officials of 15 provinces and 42 districts. Integral to this ICM Program is the National Act No. 32/2004 on the Decentralization of Authorities and Responsibilities in Coastal and Marine Management, which provides the legal basis for preparing and adopting spatial and zonation plans at provincial level. With this national ICM Program, the coverage of coastlines by ICM programs has increased to over 46% in Indonesia. (Annex F)

Singapore has adopted a whole-of-government approach in implementation of integrated urban coastal management, or IUCM, 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 (The Technical Committee on the Coastal and Marine Environment. 2013). Since 2009, IUCM implementation plan obtained high level endorsement. Now IUCM is used to contribute to the achievement of the Sustainable Singapore Blueprint (SSB 2015) which shares the vision for a Livable and Endearing Home, a Vibrant and Sustainable City, and an Active and Gracious Community.

In Vietnam, the Prime Minister approved the national ICM Program in the North Central and Central coast until 2010 and orientation until 2020 (Nguyen *et al*, 2014; Mangrove for the Future, 2011). The Program focused on strengthening ICM capacities for the management, exploitation and efficient use of natural resources and environment, initially in 14 provinces and cities in the designated area. About 200 central and local managers in 28 coastal provinces have been trained in ICM through ICM VietTraiNet, PEMSEA, NOAA, IUCN and Netherlands. In 2014, the Prime Minister approved Vietnam's ICZM Strategy for ICM toward year 2020 and vision to 2030. (Vietnam National Review Report of SDS-SEA Implementation, 2015)

Reference:

- *Nyuyen Quoc Cuong & Nguyen Van Cu. 2014. Integrated Coastal Management in Vietnam: Current Situation and Orientation. Journal of Marine Science and Technology; Vol .14, No. 1; 2014:89-96.*
- *Mangrove for the Future Phase II, revised July 19, 2011. Vietnam National Strategy and Action Plan (2011-2013).*
- *The Technical Committee on the Coastal and Marine Environment. 2013. Singapore's Integrated Urban Coastal Management, 18 pages.*

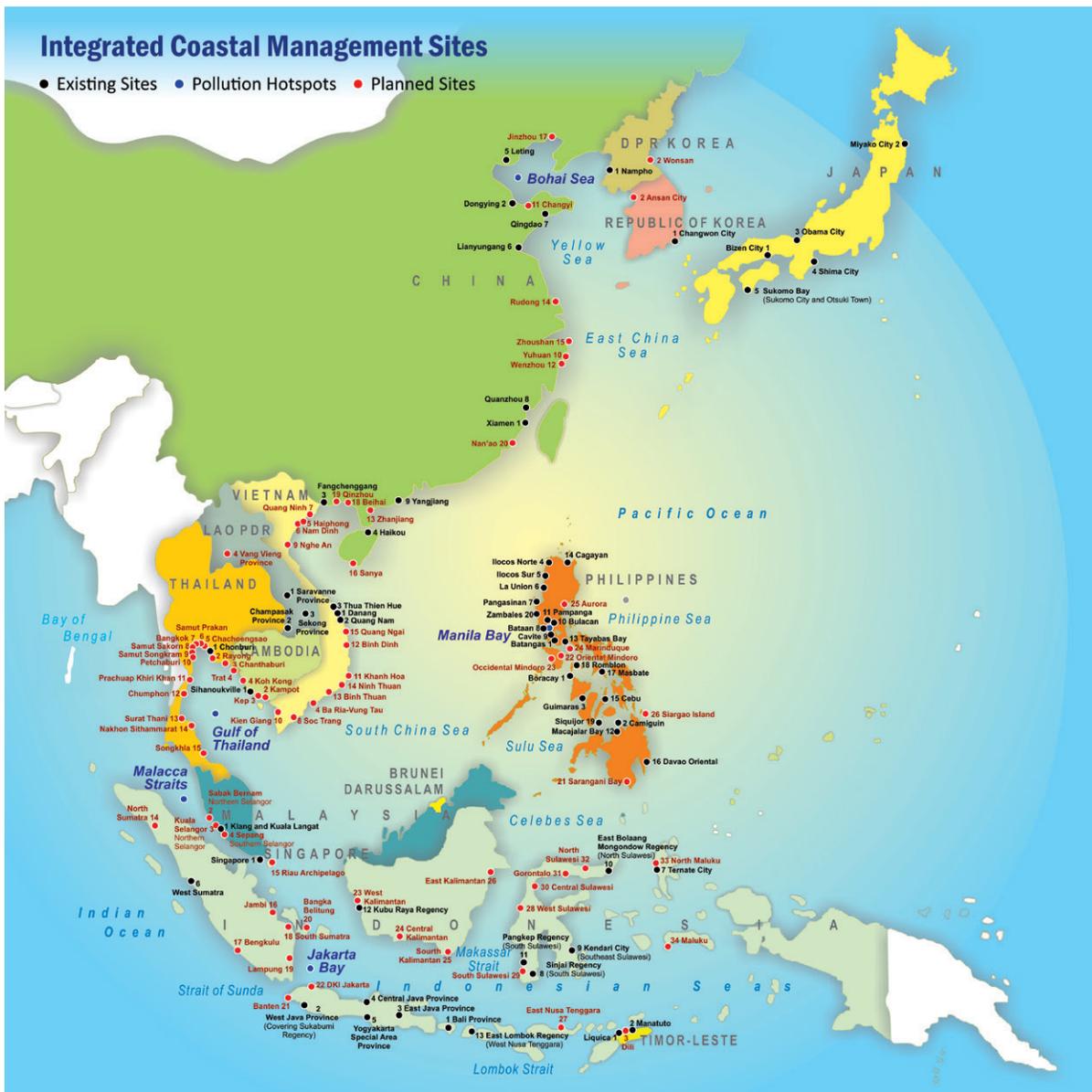
Expanding ICM Program Coverage of the Coasts and Watershed in the EAS region

In line with the national ocean policies, legislation, strategies, action plans and programs, countries have developed and implemented projects through different funding sources to support ICM programs to address different challenges. These programs are manifested in different forms, ranging from coastal strategic planning to the application of ICM tools such as MPAs, marine spatial

planning and total pollution load control in line with the concept of “from ridge to reef” under the overall ICM policy and legal framework of respective countries.

Figure 7 maps the local governments in the EAS region with ICM programs. Case studies across the region are readily available in PEMSEA’s knowledge management portal, SEA Knowledge Bank, to provide a snapshot of the ICM program development, implementation and scaling up in different countries.

Figure 7. Map of local governments with committed ICM programs in East Asian region.*



* All of the 74 coastal local governments of RO Korea have established and implemented Local Coastal Management Plans in accordance with the Coastal Management Act and National Integrated Coastal Management Plans. On this map, only Changwon City and Ansan City are illustrated as both are members of PEMSEA Network of Local Government.

Case Box 7 Sustainably Managing Solid Waste for A Beautiful Living Environment and A Clean Sea

In Japan, there are at least 12 laws related to waste and recycling, ranging from an act for establishing a sound material-cycle society to legislation related vehicles, home appliances, food resource, containers and packaging, and polychlorinated biphenyls (PCB). Implementation of these laws appears to be very effective. According to the municipal waste statistics in 2013, the total amount and daily per capita solid waste were on a downward trend, i.e, total amount (44,874,000 tons per year) and daily per capita (958 grams) solid waste generation were 0.8% and 0.6% less than in 2012. The recycling rate on the other hand is steadily increasing with a 0.1% (20.6%) increase in 2013 from the recycling rate in 2012. The final disposal amount (4.54 million tons) was also 2.4% less than disposal amount from the previous year.

Waste management is also integrated into the Sustainable Singapore Blueprint (SSB 2015). Under the Theme of Work of A Vibrant and Sustainable City, there is a focus on working towards a Zero Waste Nation by reducing consumption, and reusing and recycling all materials to give them a second lease of life. 100% of the population of Singapore has access to waste collection services since 2007, and recycling rate has increased from 40% in 2000 to 60% in 2014.

In Thailand, the Pollution Control Department (PCD) has been continuing to develop and implement government policies and programs on waste minimization by applying the 3Rs – reduction, recycle and reuse through promoting application of integrated technologies, clustering management, public-private partnerships, and waste to energy, and undertaking continuous awareness raising and capacity building initiatives to increase stakeholders' participation in creating a clean environment to the society.

The 3Rs program in particular includes the following:

- Applications in community-based solid waste management including:
 - Community-based recycling and school recycling programs (Garbage Bank); community buy back centres; waste donation; household composting; and zero waste programs

- Hazardous waste management (E-waste Inventory and promotion of system for management of household hazardous wastes from source separation to recycling and disposal)
- Cooperation with manufacturers, distributors and communities to take back end-of-life products (e.g., packaging, mobile phone and batteries, fluorescent lamps, used lead-acid batteries and dry cell batteries)
- Applications in the industrial sector, which include:
 - Eco-Industrial Development Pilot Project at the Rojana Industrial Park in Ayutthaya in 2010 – 2014 to demonstrate Eco-Industrial Estate/Park/Town concept, 3R implementation in Industries and Communities, and among government, enterprises and the public
 - Waste Utilization Demonstration Project (year 2009 – 2013) to promote 3R activities in industrial waste management and reduce waste going to landfills
 - Implementation of Metal Recovery Project (2009 – 2012) to demonstrate simplified metal recovery technology for E-wastes
- Applications in government operations through the program on Government Green Procurement

National 3Rs conferences have also been conducted to introduce the 3Rs principle, policy and strategies as well as transfer knowledge, experience and best practices among government, business, NGOs and civil society in the 4 regions of Thailand (Central, North, Northeast and South).

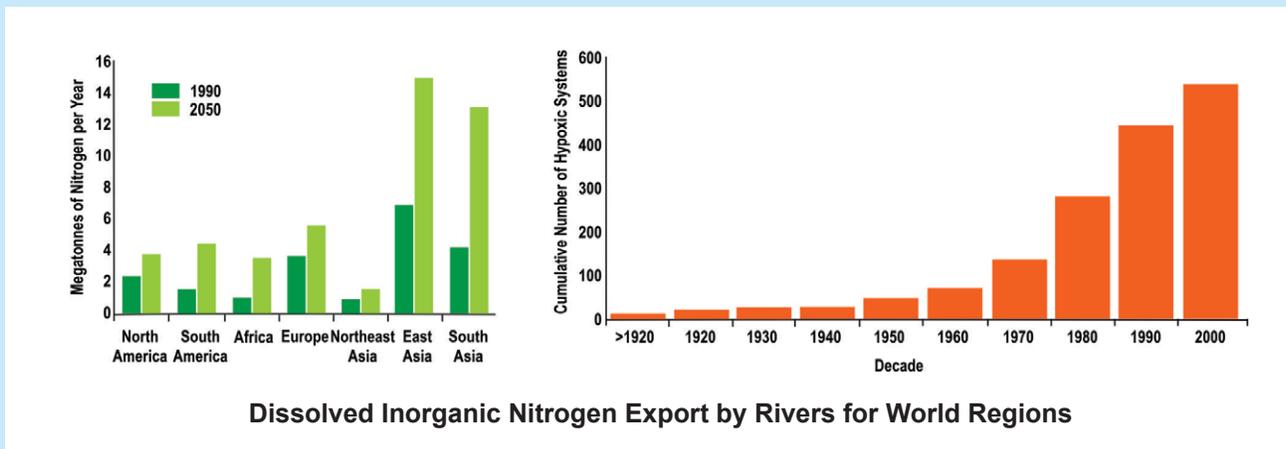
The Thailand Waste Recovery Center was established to develop 3Rs database and information technology and to serve as knowledge hub for dissemination of 3Rs knowledge, technologies, experiences, and best practices through cyber network.

Improvement of regulations and strategic plans to support further application of the 3Rs is in progress, focusing on resource efficiency, sustainable consumption, proper treatment and disposal of waste residues, extended producer responsibility, public private partnership and application of economic instruments.

Annex F provides details on geographic scaling up of ICM programs with the UNDP/GEF Scaling up SDS-SEA Implementation Project and national ICM programs in 12 participating countries. National ICM programs of Indonesia and Vietnam contributed to significantly to increase in coverage (**Case Box 6**).

ICM programs have contributed to improved solid waste management (**Case Box 7**) and the integrated management of river basin and coastal areas in several countries (**Case Study 8**). **Annex G** identifies 9 countries that have scaled up ICM to include at least 785,000 km² of watershed area.

Case Box 8 Reducing Excessive Nutrients through Total Pollution Load Control



In East Asia and South Asia, the increase in hypoxic coastal areas resulting from excessive discharge of untreated sewage, agriculture and aquaculture runoffs, loadings from industries and habitat modification suggests that cost-effective and innovative solutions are needed to arrest the trend.

In RO Korea, total pollution load management system (TPLMS) is used in coastal pollution reduction from land-based activities and rehabilitation of deteriorated environment. The initiative was first incorporated into Masan Bay Special Management Areas among the nine Coastal Environmental Management Areas (CEMAs), and its adoption was expended to Shihwa and Busan Special Management Areas.

In Japan, total pollutant load control system (TPLCS) 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.

Total pollutant loading control was also demonstrated in Hai River, Daling River, Luan River and Guangli River of Bohai Bay in China. The Water Pollution Prevention and Treatment Action Plan promulgated by the State Council on April 16, 2015, will also apply total pollution loading control system to improve water environment.

In the Philippines, Laguna Lake Development Authority (LLDA) conducted a total pollutant loading study in the Laguna de Bay – Pasig River – Manila Bay watershed. The study focused on BOD, TN and TP loadings of 58 sub-basins for 2008, 2010, 2015 and 2020.

The implementation of the TPLCS has turned out tangible results in implementing countries. In RO Korea, sewage treatment coverage in coastal areas increased from 39% in 1998 to 80.1% in 2010 and the proportion of coastal water for swimmable and fishable uses increased from 79 percent in 2007 to 88 percent in 2012. In Japan, environment quality standards 2 (EQS2) for human health have been achieved with a 99.2 percent compliance rate in 2013. EQS for conservation of the living environment have been achieved an 87.3% rate of compliance for BOD or COD.

TARGET 4: A REPORT ON THE PROGRESS OF ICM PROGRAMS EVERY THREE YEARS, INCLUDING MEASURES TAKEN FOR CLIMATE CHANGE ADAPTATION

Status: Achieved

The first country and regional review of SDS-SEA implementation was prepared in 2011 and submitted for review by the 4th Ministerial Forum in 2012, and second country and regional review will be submitted to the 5th Ministerial Forum in November 2015. In addition, state of coast reports are being initiated or completed in 29 local governments in line with the PEMSEA guidebook for preparation of SOC report for local government. These reports serve as useful assessment of the social, economic and environment performance of coastal and ocean development in consolidating and refining ICM program development and implementation as part of the ICM cycle.

The development of a State of the Coasts (SOC) Reporting System was initiated by PEMSEA 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 Declaration 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 drafted/prepared by 30 local governments including: Preah Sihanouk (Cambodia); Dongying, Fangchenggang, Haikou, Laoting, Lianyungang, Qingdao, Quanzhou, and Xiamen (China); Badung, Bali, Buleleng, Denpasar, Gianyar, Jembrana, Karangasem, Klungklung,

Tabanan and Jakarta (Indonesia); Sedone River (Lao PDR); Batangas, Bataan, Cavite and Guimaras Provinces (Philippines); Changwon City (RO Korea); Chonburi (Thailand); Liquica and Manatutu Districts (Timor Leste); and Danang (Vietnam). Four of the SOC reports have been published and the balance are in the process. Ten local governments are expected to initiate the process of SOC development within the year 2015.

IV. 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.

Challenges at Regional level

PEMSEA is in the process of transforming into a self-sustaining and dynamic international organization that is relevant, effective and responsive to regional and national priorities and needs. It is presently initiating the implementation of the Strategy and Action Plan for a Self-Sustaining Organization.

As an international organization, PEMSEA is focusing on its mandate, i.e. the implementation of the SDS-SEA, especially the advancement of 5-year regional and national SDS-SEA implementation plans, capacity development and knowledge management.

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 task in the region.

The challenges for PEMSEA over the next 5 years entail the following:

1. Bringing together different regional planning frameworks, including LME SAPs (e.g. the Yellow Sea, South China Sea and the Arafura-Timor Seas), the West and Central Pacific Fisheries (WCPF) Commission, Coral Triangle Initiative and other mechanisms and initiatives, 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 non-government organizations, which share PEMSEA's vision, mission and goals, as Partners;
 3. Facilitating 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. Achieving sustainable financing mechanism to assist country and non-country partners to accelerate and sustain SDS-SEA implementation at the regional and national level.

Challenges at National level

Notwithstanding the progress and achievements of Country Partners, shortfalls exist among most Country Partners in responding to the challenges in climate change adaptation and disaster risk reduction, coastal and marine ecosystem management, sustainable fisheries and livelihoods, water resource management and pollution reduction. **Table 12** summarizes the key challenges and constraints to sustainable development of coasts and oceans in each of the above five aspects reported by at least two countries.

Table 12. Challenges and constraints to sustainable development of coasts and oceans*

Climate Change Adaptation and Disaster Risk Reduction
Natural disaster impact not fully considered in coastal infrastructure
Poor inter-sectoral coordination in disaster response
Low capacity in ocean observation and forecasting for early responses and assessment of impact from storm surges, tsunami and other marine disasters
Information and education at local level is weak about climate change
Low individual and institutional capacity for oil spill preparedness
Lack of public participation in disaster management
Water Resource Management
Excessive fragmentation of the water management system and weak coordination mechanism and unclear responsibilities
Underdeveloped system of water rights
Limited national information on water use per sector and quality of available water supply to support sound planning
Limited access and coverage of water supply
Fisheries and Livelihoods
Saltwater intrusion in coastal provinces reduces the area available for cultivation
Limited livelihood opportunities and credits available, leading to unsustainable agricultural and fishing practices
illegal fishing and derelict fishing gears
Lack of incentive and market access of eco-aquaculture products

Pollution
Lack of fully operationalized pollution monitoring system to support decision making
Need for sustainable financing mechanisms to leverage private sector investment in mitigation of pollution through public-private partnerships and adoption of market instruments
Lack of control of rural pollution from non-point sources
Absence of waste water collection and treatment infrastructure
Lack of technologies to turn solid waste as a revenue generation scheme
Poor access to knowledge on segregation, recycling, recovery and reuse
Inefficient and ineffective solid waste collection
Absence of integrated waste management strategy
Habitat Management
Large volume of land-based pollutant and sediments
Low coverage of territorial waters by MPAs
Lack of a more scientifically and systematically designated MPA network under a master plan.
Inadequate financing
Lack of technical capacity in assessing and evaluating effectiveness of biodiversity conservation.
Pressures on natural resources nearby PAs due to poverty and lack of alternative opportunities

(* as reported in country reviews [Annex H])

From the country perspective, there are also a number of common challenges and constraints to improved governance of coastal and marine areas 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;
9. Limited knowledge sharing on best practices and case studies within countries and across the region.
10. Outmoded infrastructure in waste water collection and treatment;
11. Limited sources of livelihoods and development opportunities that result in unsustainable production and practices; and
12. Lack of environmental markets for eco-friendly good and services.

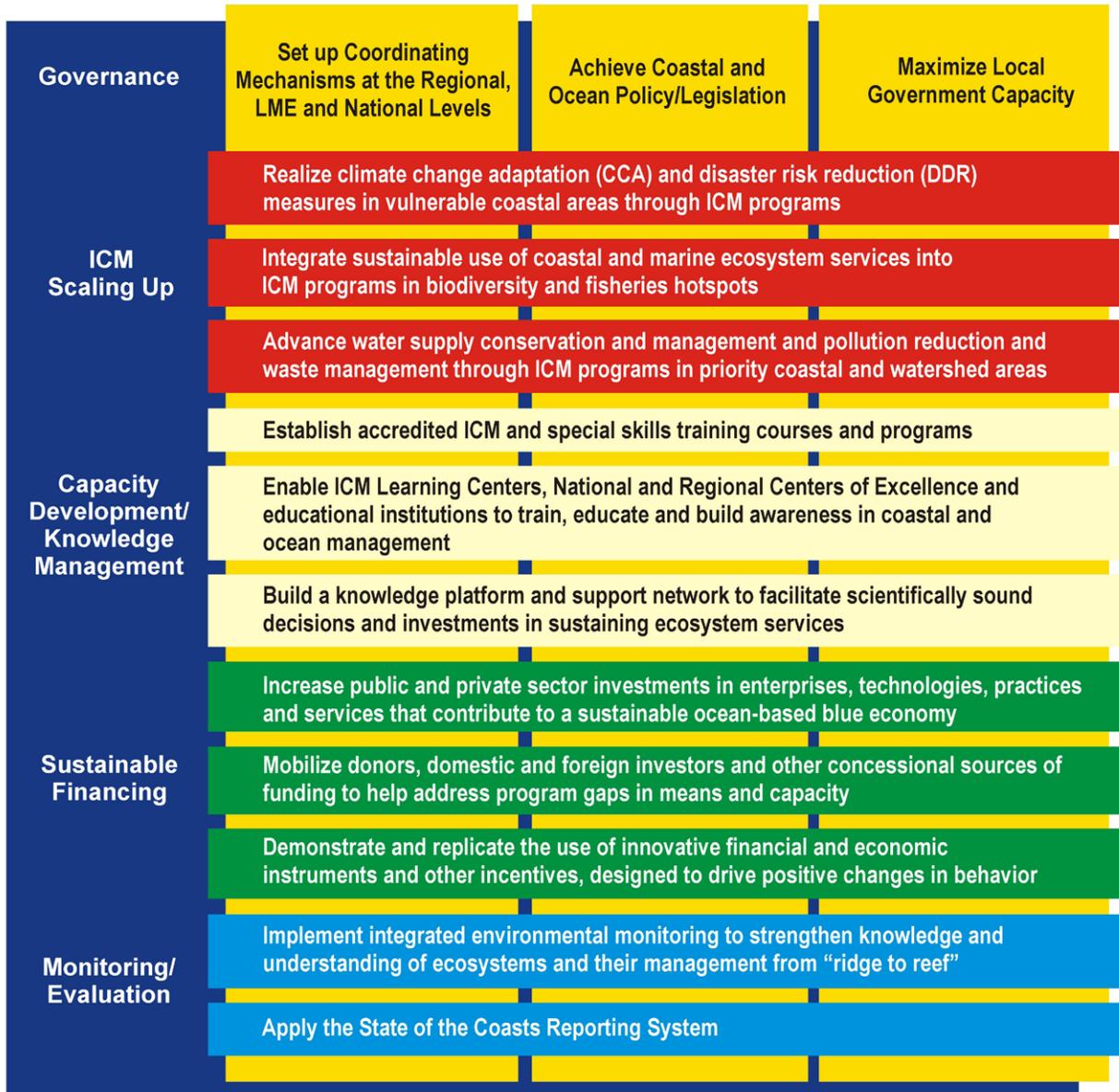
These issues suggest that, while there has been significant progress among countries in developing policies and supporting legislation, the focus now needs to shift to improving competencies, capacities and in implementation and nurturing of environmental markets. It also clearly indicates that coordination 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.

V. Desired Targets and Strategies

PEMSEA Partner Countries adopted the Regional SDS-SEA Implementation Plan for 2012-2016 following a series of consultations and collaborative planning sessions organized by PEMSEA in 2011-2012 with Partner Countries, local governments

and other stakeholders. A review of the gaps and challenges at national and local levels suggests that the Regional SDS-SEA Implementation Plan remains to be the valid framework (**Figure 8**).

Figure 8. Framework of SDS-SEA Implementation Plan (2012-2016).



The SDS-SEA implementation plan consists of five (5) components, 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 coming 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 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. With assistance of the World Bank, a knowledge portal will be set up and operationalized to facilitate sharing and dissemination of good practices of six World Bank

investment projects among communities of practices and private sector investments.

Integral to the implementation of the SDS-SEA is a sustainable financing platform to mobilize resources from countries, donors, financing institutions and private sector. The platform will finance innovative and resource-recovery initiatives that bring long-term, efficient and high quality public services to local people without compromising the natural capital of marine and coastal ecosystems. Design of the financing platform requires developing partnership with financing institutions, donors, development agencies and striking a balance between sustainability and affordability of the innovations.

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 informs 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 outcomes cannot be achieved in all areas before 2016, 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. With the endorsement of the updated SDS-SEA by the 5th Ministerial Forum in November 2015, the regional five year plan will be updated accordingly to reflect the latest development covering the period of 2016-2021.

Annex A

Methodology of the Graphic Presentation of the Country Progress in SDS-SEA Implementation (2003-2015)

1. Radar graphs are prepared to illustrate the status of SDS-SEA implementation of the 12 countries from 2003 to 2015. The graph only displays the robustness of each country in the 9 categories of SDS-SEA implementation aspects as shown in **Figure 2**.
2. A value, or point, is assigned to each Category and Sub-category. Each Category enjoys the same overall weight of “2”
3. The actual weight of each Category is determined by the accumulative weights of all Sub-categories.
4. For Categories with more than one Sub-category, weights of sub-categories under that Category are assigned the same percentage as shown in the below matrix.

Weight assignments to Categories and Sub-categories

Categories	Percentage
1. National Policies/Strategies: A national policy or strategy that provides the vision and strategic direction for:	100%
Coastal and Ocean Development and Management, ICM or EBM	12.5%
River Basin/Water Resource Management	12.5%
Conservation and Management of Biological Diversity	12.5%
Environmental Protection/Pollution Reduction	12.5%
Sustainable Fisheries	12.5%
Climate Change	12.5%
Disaster Risk Reduction and Management	12.5%
Land and Sea-Use Zoning/Marine Spatial Planning	12.5%
2. National Legislation: National legislation/regulations covering the following management aspects:	100%
Coastal and Ocean Development and Management, ICM or EBM	12.5%
River Basin/Water Resource Management	12.5%
Conservation and Management of Biological Diversity	12.5%
Environmental Protection/Pollution Reduction	12.5%
Sustainable Fisheries	12.5%
Climate Change	12.5%
Disaster Risk Reduction and Management	12.5%
Land and Sea-Use Zoning/Marine Spatial Planning	12.5%
3. Institutional Arrangements: A functional national interagency coordinating mechanism that is responsible for:	100%
Coastal and Ocean Development and Management	14.3%
River Basin/Water Resource Development and Management	14.3%
Conservation and Management of Biological Diversity	14.3%
Pollution Reduction	14.3%
Sustainable Fisheries	14.3%
Climate Change	14.3%
Disaster Risk Reduction and Management	14.3%
4. Awareness and Communication - A national communication program that facilitates awareness building/knowledge sharing in coastal and ocean management	100%

Categories	Percentage
5. Capacity Development	100%
A capacity needs assessment conducted to determine ICM training/education requirements at the national and local levels	20%
National training program that strengthens the skills and knowledge of national and local level ICM managers and practitioners.	20%
An accreditation system that certifies training courses, institutions, and individuals for ICM training of managers and practitioners.	20%
Primary and secondary school curricula include topics on coastal and marine ecosystems	20%
Universities offer undergraduate and/or post-graduate courses in ICM or ecosystem-based management of watersheds and coastal areas.	20%
6. Sustainable Financing: Financial/economic incentive programs set up by the central government to encourage investment by subnational/local governments for:	100%
National development plan mainstreams sustainable development of coastal and marine ecosystems into government programs	
a. ICM development and implementation	14.3%
b. Natural and manmade hazard prevention and management, including climate change	14.3%
c. Habitat restoration and management, including biodiversity conservation	14.3%
d. Water supply and use management	14.3%
e. Food security and livelihood management, including sustainable fisheries and aquaculture	14.3%
f. Pollution reduction and waste management	14.3%
Government policies/regulations facilitate investment by the business sector in sustainable development of the coastal and marine economy	14.3%
7. Sustainable Development Aspects (National): A national program or plan of action that covers the following priorities	100%
ICM development and implementation	14.3%
Climate change adaption	14.3%
Disaster risk reduction and management	14.3%
Habitat restoration and management, including biodiversity conservation	14.3%
Water supply and use management, including river basin management	14.3%
Food security and livelihood management, including sustainable fisheries and aquaculture	14.3%
Pollution reduction and waste management	14.3%
8. Sustainable Development Aspects (Local): Subnational/local action plans or management programs support of the national priority objectives and targets covering:	100%
ICM development and implementation	14.3%
Climate change adaption	14.3%
Disaster risk reduction and management	14.3%
Habitat restoration and management, including biodiversity conservation	14.3%
Water supply and use management, including river basin management	14.3%
Food security and livelihood management, including sustainable fisheries and aquaculture	14.3%
Pollution reduction and waste management	14.3%
9. Monitoring and Evaluation	100%
A national monitoring and reporting system that provides regular reports on the state of land, river, coastal and marine ecosystems in the country	50%
A subnational monitoring and reporting system that provides regular reports on the effectiveness of ICM programs in sustaining healthy and resilient ecosystems	50%

5. For each Sub-category, a value of “2” is assigned for the status of implementation indicated as “In Place”, or blue in color reflected in the progress overview matrix (Figure 2); a value of “1” for “Partially”, or green in color; and a value of “0” for “Not Started”, or yellow in color.

- (Value - 0) Not Started (no activity at this point in time)
- (Value - 1) Partially (underdevelopment; being initiated in some parts of the country)
- (Value - 2) In Place (policy or program in place and functioning)
- (Value - None) Not Applicable

Annex B

Ocean and Sectoral Policies (related with the aspects of Sustainable Development) since 2003

Country	Sustainable Development	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Disaster Risk Reduction and Management	Total No.
Cambodia	1	4	3	7	6	3	3	3	30
	National Strategic Development Plan 2009-2013	Royal Decree No. NS/RKT/0212/079							
	Establishment and Function of the National Committee for Management and Development of Coastal Area (2012)	Cambodian Climate Change Strategic Plan 2014-2023	Sub-decree on the Establishment of Protected Forests, Natural Resources Conservation, Wild Life Protection Areas and Protected Forests for Biodiversity Conservation (2002, 2004)	The National Strategy for Rural Water Supply, Sanitation and Hygiene (NSRWSSH) for 2011-2025	Strategic Framework for Food Security and Nutrition in Cambodia 2008-2012	National Strategic Plan for Land-based Pollution Management 2006-2010	Royal Decree No. NS/RKT/0804/263, establishing the National Committee for Disaster Management (NCDM) (2004)		
		Sub-decree on the Ship and Port Security (2006)	The Cambodia REDD+ Roadmap (2010)	Sub-decree on Forest Community (2003)	Rural Water and Sanitation Sector Investment Plan 2010-2-25 (2009)	National Nutrition Strategy 2009-2015 (2009)	Sub-decree on Healthcare Waste Management (2008)	Five-year Strategic National Action Plan for Disaster Risk Reduction - SNAP-DRR 2008-2013	
		Sub-decree on the Establishment of National Committee for Open Sea Security (2009)	Cambodia Shoreline Management Strategy (2006)	Sub-decree on Management of Community Fisheries (2005)	Strategic Plan on WRM and Development 2005-2008 (2005)	Masterplan on Fishing for the Future 2010-2019	Key River Basin Pollution Prevention and Mitigation Plan 2011-2015 (2012)	Sub-Decree No. 61 on the Establishment of the National Committee for Disaster Management (2006)	
		Cabinet Decision No. 45 - Regulations on Creation, Conservation and Supervision of Marine Resources (2013)		National Forestry Program 2010-2029	National Policy for Water Supply and Sanitation (2003)				
				National Action Program for Land Degradation 2010-2020	National Drinking Water Quality Standards (2003)				
				The Strategic Planning Framework for Fisheries 2010-2019	Institutional Development Plan for Water and Sanitation 2003-2012				

Country	Sustainable Development	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Disaster Risk Reduction and Management	Total No.
				The National Environmental Strategic Plan (2009) Control Regulations of the Environment Protection Law adopted by Decision No. 22 of the Cabinet of DPR Korea (2015)					
China	2 Central Committee and State Council on accelerating the Construction of Ecological Civilization (2013) Circular on Promoting Public-Private Partnership (2014)	4 National Ecosystem Protection and Conservation Plan 2013-2020 12th Five-Year Plan for National Ocean Development (2012)	2 National ocean observation and forecast development plan 2008-2015 National Climate Change Program (2007)	11 Key Function Zone Scheme (2010) National Biodiversity Strategy and Action Plan of China 2011-2030 (2010)	1 Circular on Implementation of the Strictest Water Resource Management System (2012)	1 China Poverty Reduction Strategy 2011-2020 (2013)	7 Technical Guidelines for Program Environmental Assessment (2014) Regulation on the Prevention and Control of Pollution from Large-scale Breeding of Livestock and Poultry (2014) Urban Garbage Classification in Cities (2014)	6 Regulations for Natural Disaster Relief (2010) Master State Plan for Rapid Response to Public Emergencies (2006) National 11th Five-Year Plan on Comprehensive Disaster Reduction (2007) Special National Plan on Seepage Prevention and Reinforcement for Unsafe Reservoirs (2008)	34
				National Plan for Establishment of Forest Nature Reserves 2006-2030 (2003)			National Development and Reform Commission (2010)		
				Trial Technical Guidelines for Valuating Marine Ecological Damage (2013)					
				National Science and Technology Program in Support of Ocean Development 2008-2015 (2008)					
				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 (2008)					

Country	Sustainable Development	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Disaster Risk Reduction and Management	Total No.
				National Project Plan for Establishing Coastal Protective Forest System 2006-2015 (2003) Decision of the Central Committee of the Communist Party of China and the State Council on Speeding up Forestry Development (2003)			12th FYP Blue Sea Action Plan (2009) Amendment to the Administrative Regulation on the Prevention and Control of Pollution Damages to the Marine Environment by Coastal Engineering Construction Projects (2004)	Earthquake-proof Classification Standards for Construction Projects revised 2008-2009 Earthquake-proof Construction Design Specifications revised 2008-2009	
				Plan for Conservation and Development of New Agricultural Plant Varieties (2007)			Treasury MEP Opinions on Promoting the Government and Social Capital Cooperation in the field of Water Pollution Prevention and Control (2015)		
				Action Plan for China Aquatic Biological Resources Conservation (2006) National Master Plan for Grassland Conservation, Construction and Utilization 2007-2020 National Program for Conservation and Use of Biological Resources 2007-2020 Updated National Marine Function Zoning Scheme 2011-2020					

Country	Sustainable Development	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Disaster Risk Reduction and Management	Total No.
DPR Korea	1	1	0	0	4	0	1	1	8
	National Capacity Needs Self-Assessment for Global Environmental Management Report and Action Plan (2005)	Integrated Coastal and Marine Development Plan of West Sea of Korea			Cabinet Decision No. 28 "Water Resources Management Regulations in Taedong River Basin" (2003)		National Oil Pollution Contingency Plan (2008)	National Program to prevent/mitigate hazards from flooding (2006)	
					Master Plan for Land Management and Environmental Protection of Taedong Riverbasin (2005)				
					Assessment of current and perspective water resources (2007)				
Indonesia	0	5	6	5	0	6	4	0	26
	National Ocean Policy (2014)	Climate Change Sectoral Roadmap (ICCSR) (2010)	Indonesian Biodiversity Strategy and Action Plan (2003)		Ministerial Decree No 56 on Moratorium of Fishing License for Large Fishing Vessels (2014)	Ministerial Decree No. 51 on Seawater Quality Standard (2004)			
	Regulation No. 16/2008 Planning and Management of Coastal Zone and Small Islands (2008)	National Action Plan for Disaster Preparedness and Risk Reduction (NAP-DPRR) 2006 - 2009	Presidential Instruction No. 16 supporting the development of marine tourism and enhancing management and control of National Marine Park sustainability (2005)		Ministerial Decree No. 1 on Banning Catch of Spawning Lobster, Mangrove Crabs and Blue Swimming Crabs (2015)	Ministerial Decree No. 75 on Organization and Management of National Cleaner Production Center (2004)			
					Masterplan for Land and Environment of Taedong River, adopted by Decree No. 2816 of the Presidium of Supreme People's Assembly, DPR Korea (2008)				

Country	Sustainable Development	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Disaster Risk Reduction and Management	Total No.
		Regulation No. 17/2008 Conservation Area in the Coastal Zone and Small Islands (2008)	National Action Plan Addressing Climate Change (2007)	National Strategy and Action Plan for the Management of Indonesia's Wetlands (2004)		Ministerial Decree No. 2 on Banning Trawls and Similar Fishing Gears (2015)	Regulation No. 16 on the National Policy and Strategy for the Development of Domestic Wastewater Management (2008)		
		Regulation No. 18/2006 Accreditation to Programs on Management of Coastal Zone and Small Islands (2008)	National Plan for Disaster Management 2010-2014	Government Regulation No. 60 on Fish Conservation Management (2008)		GR No. 60 Conservation of Fish Resources Stocks (2007)	Emergency Plan for Preparedness and Action for Oil Spill Incidents (2006)		
	Regulation No. 8/2009 Participation and Empowerment of Society in the Management of Coastal Zone and Small Islands (2009)	National Action Plan for Disaster Risk Reduction 2010-2012	Ministerial Decree No. 57 on Transshipment Banning (2014)		Five-year Strategic Plan (2010-2014) in the areas of Policy, Sustainable Fisheries, and Climate Change				
		GHG Emission Reduction Plan (2011)			Fisheries Management Plan for the Arafura Sea known as WPP 718 (2014)				
Japan	1	5	2	3	1	1	0	2	15
	Basic Environment Plan (2006)	Guidelines for Developing Integrated Coastal Zone Management Plans (2003)	Kyoto Protocol Target Achievement Plan (2005)	3rd and 4th National Biodiversity Strategy (2007, 2010)	Integrated Water Resource Management (2008)	Basic Plan for Fishery Policy (2007)		Basic Disaster Management Plan (2011)	
		Basic Policy concerning the Preservation and Management of Islands and Seas (2008)	Guidelines for Measures to Prevent Global Warming (2010)	5th National Biodiversity Strategy of Japan 2012-2020 (2012)				Emergency Plan for Preparedness and Action for Oil Spill Incidents (2006)	
		Water Plan 2010-2015		Marine Biodiversity Conservation Strategy (2011)					

Country	Sustainable Development	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Disaster Risk Reduction and Management	Total No.
Lao PDR		Basic Plan on Ocean Policy (2003, 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)							
	0	0	1	9	2	3	2	2	19
			Climate Change Strategy (2010)	Forest Vision for 2020 (2005)	National Strategy for Rural Water Supply and Environmental Health Sector (2004)	Ecotourism Strategy and Action Plan 2005-2010 (2004)	Decree on the Management of Solid Waste and the Cleaning of Public and Residential Areas	Strategic Plan on Disaster Risk Management (SPDRM) (2003)	
				National Biodiversity Strategy to 2020 and Action Plan to 2010 (2007)	Prime Minister Decree No. 293 on Establishment and Activities of the River Basin Committee (2010)	National Growth Poverty Eradication Strategy (NGPES) (2004)	Pollution Control Agreement (2015)	Country Strategy Note on Disaster Management No 1139/MLSW (2003)	
				National Environmental Strategy up to the year 2020		Lao Agricultural Development Strategy (2010)			
				Environment Action Plan 2006-2010					
				Decree on the Protection Forests 2010					
				Decree on Forest Seeds Sources					

Country	Sustainable Development	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Disaster Risk Reduction and Management	Total No.								
Philippines	1	2	3	5	1	1	2	2	17								
										Philippines Development Plan 2011-2016	Executive Order No. 533 Adopting Integrated Coastal Management as a National Strategy to ensure the Sustainable Development of the Country's Coastal and Marine Resources and Establishing Support Mechanisms for its Implementation (2006)	National Framework Strategy for Climate Change (2010)	Executive Order 578 established the National Policy for Protecting, Conserving and Sustainably Utilizing Biological Diversity (2006)	National Integrated Water Resources Management Plan Framework (2006)	National Stock Assessment Program (NSAP)	National Oil Spill Contingency Plan (2014)	National Disaster Risk Reduction and Management (NDRRMP) 2011-2028
										National ICM Program 2012-2016	National Climate Change Action Plan 2011-2028	National Wetlands Action Plan (2011-2016)		DAO 2005-10: Clean Water Act Implementing Rules and Regulations (2005)	Administrative Order 1 directing 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 (2010)		

Country	Sustainable Development	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Disaster Risk Reduction and Management	Total No.
			National REDD+ Mechanism for Greenhouse Gas Reduction and Conservation of Biodiversity in the Philippines 2013-2017	Executive Order 797 adopting the CTI National Plan of Action (2009)					
				DENR Administrative Order 2013-12 Guidelines for the Implementation of Sustainable Coral Reef Ecosystem Management Program (SCREMP) (2013)					
				Executive Order No. 154 adopting a national plan of action to prevent, deter, and eliminate illegal, unreported and unregulated fishing, and for other purposes (2013)					
RO Korea	1 National Strategy for Low Carbon, Green Growth (2010)	10 2nd Basic Plan for Ocean and Fisheries Development (2011)	4 National Climate Change Adaptation Plan (2011-2015)	8 National Environment Comprehensive Plan 2006–2015	2 2006-2015 National Master Plan for Water Environment Management (2006)	5 National Master Plans for Management of Fishery Resources (2011)	4 2nd Comprehensive National Waste Management Plan 2002–2011	3 National Oil Spill Contingency Plan (2008)	37
		2nd National Basic Plan on Coastal Environment Management Areas (2012)	2nd National Comprehensive Plan on Climate Change of Marine and Fisheries Sector (2007)	Natural Environment Protection Framework Plan 2006–2015	3rd National Basic Plan for Reclamation of Public Waters (2010)	2nd National Basic Plan for Marine Tourism Development	1st Master Plan for Resource Recirculation 2011–2015	National Master Plan for Maritime Safety (2012)	
		4th Comprehensive Marine Environment Management Plan (2011)	1st National Framework Plan on Safety Management (2005)	3rd National Strategy on Biodiversity Conservation (2014)		3rd National Basic Plan for Development of Fish Farming (2015)	National Master Plan for Waste Management(2012)	3rd National Basic Plan for Management of Disasters and Safety (2014)	

Country	Sustainable Development	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Disaster Risk Reduction and Management	Total No.
		2nd National Integrated Coastal Management Plan 2011-2020	National Plan for Assessment of Impacts of Climate Change and Adaptation (2010)	2nd National Marine Debris Management Plan 2014-2018		3rd National Basic Plan for Improving Quality of Life of Farmers and Fishermen and Development of Agriculture and Fishing Village (2015-2019)	National Master Plan for Nationwide Sewerage System 2007-2015		
		National Basic Plan on Marine Ecosystem Conservation and Management (2009)		1st and 2nd Basic Plan for Coastal Wetlands Conservation (2005, 2012)		2nd National Basic Plans for Fishing Ground Management (2011)			
		2nd Coastal Enhancement Plan 2010-2019		2nd National Basic Plan for Conservation of Natural Environment (2006)					
		National Comprehensive Management Plans for Uninhabited Islands (2009)		National Comprehensive plan for management of Marine Bio-Resources (2014)					
		2020 Marine Technology Road Map (MTRM) (2012)		4th National Comprehensive Marine Environment Management Plan (2011)					
		2nd National Basic Plans for Preservation of Specified Islands (2015)							
		2nd National Basic Plan on Environmental Management Sea Areas							

Country	Sustainable Development	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Disaster Risk Reduction and Management	Total No.
Singapore	5	1	1	2	0	1	0	0	10
	Sustainable Singapore Blueprint - SSB 2015 (2015)	Integrated Urban Coastal Management (IUCM) Framework and Implementation Plan (2009)	National Climate Change Strategy (2012)	National Biodiversity Strategy and Action Plan (2009)		Our Water, Our Future (2013)			
	Singapore Blue Plan (2009)			Parks and Waterbodies Plan (revised in 2014)					
	Clean and Green Singapore (yearly)								
	Urban Redevelopment Authority Master Plan (2008)								
	Strategies for Sustainable Growth 2010-2030								
Thailand	1	0	1	3	1	2	6	0	14
	Thailand's Eleventh Plan 2012-2016 (2012)		National Strategic Plan on Climate Change 2008-2012 (2008)	Biodiversity Policy (2009)	Master Plan for Water Management (2012)	Master Plan of Marine Fisheries Management in Thailand 2009-2018	Action Plan for Solid Waste (2006)	National Master Plan for Disaster Prevention and Mitigation 2010-2014	
				National Policy, Measures and Plans on the Conservation and Sustainable Utilization of Biodiversity 2008-2012		Effluent Standards for Housing Estates (2005), aquaculture (2006), and fish piers (2006)	Rehabilitation plan for domestic wastewater collection and treatment systems (2006)		
				Coastal Habitats and Resources Management (CHARM) 2002-2007			Pollution Management Plan 2012-2016		
							20-Year Policy and Prospective Plan for Enhancement and Conservation of National Environmental Quality 1997-2016		

Country	Sustainable Development	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Disaster Risk Reduction and Management	Total No.
Timor Leste	Timor-Leste Strategic Development Plan 2011-2030	0	1	5	2	9	0	2	20
				Government Resolution No. 8/2007 on protection of marine and terrestrial areas (2007)		Government Decree No 5/2004 on general regulation on fishing, amended through Government Decree No 3/2005 (2005)	Environmental Quality Management Plan (2012-2016)	National Disaster Risk Management Policy (2008)	
				Government Resolution No. 9/2007 on National Policy and Strategy for Forestry (2007)		Government Decree No 2/2005 on tariffs for fisheries licenses, inspection, related activities, and services of fisheries (2005)			
				National Biodiversity Strategy and Action Plan (2011)		Ministerial Diploma No 01/03/GM//2005 on the definition of fishing zones (2005)			
				Ministerial Diploma No 04/115/GM/IV/2005 on the list of protected aquatic species (2005)		Ministerial Diploma No 03/05/GM//2005 on allowed percentages of by-catch (2005)			

Country	Sustainable Development	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Disaster Risk Reduction and Management	Total No.
Viet Nam	6	7	5	7	1	3	5	0	34
	Master plan of Socioeconomic Development of Viet Nam's Sea and Coastal Areas in the Gulf of Thailand No.18/2009/QĐ-TTg (2007)	Resolution No. 09 - NQ / TW of the Fourth Conference of the Party Central Committee on Strategy for Viet Nam Seas toward 2020 (2007)	National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020 - No. 172/2007/QĐ-TTg (2007)	Second National Biodiversity Action Plan to the year 2010 (2007)	National Water Resources Strategy Towards 2020 - No. 81/2006/QĐ-TTg (2006)	National Food Security Program (2009)	National Plan on Coping with Oil Spill Incidents for the period 2001 - No. 129/2001/QĐ-TTg (2010)		
	Vietnam Socio-economic Development Strategy (SEDS) 2011-2020	Resolution No. 2007/2007/NĐ-CP of the Vietnam Government on National Action Plan to Implement the Strategy for Viet Nam Seas toward 2020 (2007)	National Target Program to Respond to Climate Change - No. 158/2008/QĐ-TTg (2008)	National Target Program to Respond to Climate Change - No. 158/2008/QĐ-TTg (2008)		Implementation of Fisheries Sector Program Support Phase II 2006-2010	Decision No.1278/QĐ-TTg of The Prime Minister on approving the Plan on Implementation of the Joint Statement and Framework Program between Viet Nam, Cambodia and Thailand on partnership on oil spill incident preparedness and response in the Gulf of Thailand (2009)		
	Strategic Direction for Sustainable Development in Vietnam - Vietnam Agenda 21 (2004)	Master Plan on Basic Survey and Management of Marine Resources and Environment until 2010 and Vision until 2020 - No. 47/2006/QĐ-TTg (2006)	National Strategy on Climate Change - No. 2139/QĐ-TTg (?)	Fisheries Development Strategy through 2020 - No. 1690/2010/QĐ-TTg (2010)		Decree No.51/2014/ND-CP of the Government on licensing marine spatial area for marine resources use and exploitation (2014)	Decision No.1864/QĐ-TTg of The Prime Minister on approved plan of the implementing the agreement between the Philippines and Vietnam governments about the cooperation in the field of oil spill response on the sea (2011)		

Country	Sustainable Development	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Disaster Risk Reduction and Management	Total No.
	Vietnam Sustainable Development Strategy for 2011-2020 - Decision No. 432/QĐ-TTg (2012)	Decree on Integrated Management of Natural Resources and Environmental Protection of the Sea and Islands - No. 25/2009/ND-CP (2009)	National target program on climate change response for the period 2012-2015 approved (2012)	Planning of Vietnam's Marine Protected Areas System to 2020 (2006)			Action Plan Framework for Adaptation to Climate Change in the Agriculture and Rural Development Sector Period 2008-2020 (No. 2730/QĐ-BNN-KHCN) (2008)		
	National Strategy on Environmental Protection until the Year 2010 and Vision Toward 2020 (2003)	Integrated Coastal Management Program for North Central and Central Coastal Region until 2010 2010 and Orientation until 2020 - Decision No. 158/2007/QĐ-TTg (2007)	National Action Plan on climate change for the period 2010-2020 (2012)	Circular No.22 regulating the development and implementation of plan for integrated management of coastal resources and coastal environment protection at the local level (2012)			Framework Programme for the Joint Oil Spill Preparedness and Response in the Gulf of Thailand (2006)		
	National Strategy on Environment Protection to 2020, with Vision to 2030 (2012)	Decision of the Prime Minister on the approval of Vietnam Strategy for ICM to 2020 and Orientation to 2020 (2014)		Decision No.742/QĐ-TTg of the Prime Minister on approval of national system of marine protected area in Vietnam towards 2020 (2010)					
	Prime Minister Decision No.23 Regulation for Coordination of Integrated Management of Marine and Island Resources and Marine and Island Environmental Protection (2013)		Decision No.1570/QĐ-TTg of the Prime Minister dated on approval of strategy for marine resources sustainable use and marine environmental protection towards 2020, vision to 2030 (2013)						
TOTAL	20	39	29	65	21	35	34	21	264

Annex C1

East Asian Countries Ratification of International Conventions & Adoption of other Instruments Relating to Coastal and Marine Environment

COUNTRY	UNCLOS 82	UN FCCC 92	Kyoto Protocol 97	Biodiversity 92	Ramsar 71*	CITES 73	Migratory Species 79	World Heritage 72	Whaling 46	Basel Convention 89	UNCCD 94
Brunei Darussalam	96 r	07 a	09	08		90 a				02	02
Cambodia	82 s	95 a	02	95	99	97 r		91	06	01	97
China	96 r	93	02	93	92	81 r		85	80	91	97
DPR Korea	82 s	94 AA	05	94				98		08	03
Indonesia	86 r	94	04	94	92	78 a		89		93	98
Japan	96 r	93 A	02	93	80	80 A		92	51	93	98
Lao PDR	98 r	95 a	03	96		04 a		87	07		96
Malaysia	96 r	94	02	94	95	77 a		88		93	97
Philippines	84 r	94	03	93	94	81 r	94	85	W	93	00
Rep. of Korea	96 r	93	02	94	97	93 a		88	78	94	99
Singapore	94 r	97	06	95		86 a				96	99
Thailand	11 r	94	02	04	98	83 r		87		97	01
Timor-Leste	13 a	06 a	08	06							03
Vietnam	94 r	94	02	94	89	94 a		87		95	98

Legend:

- Numbers represent year of ratification/accession
- Y – Participated in the Conference
- W – Withdrawn
- r – ratification
- a – accession
- s – signature
- A – acceptance
- ^ – Signature
- **Only at conference; does not indicate status of current participation
- *Year of entry into force
- AA – approval

Note: Ratification, Acceptance(A), Approval(AA), Accession(a), Succession(d), Signature (s)

Sources:

UNCLOS	http://www.un.org/Depts/los/reference_files/status2010.pdf , as at 10 October 2014
UNFCCC	http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php
Kyoto Protocol	http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php
CBD	http://www.cbd.int/convention/parties/list/
Ramsar	http://www.ramsar.org/cda/en/ramsar-about-parties-contracting-parties-to-23808/main/ramsar/1-36-123^23808_4000_0__
CITES	http://www.cites.org/eng/disc/parties/alphabet.shtml
CMS	http://www.cms.int/about/Partylist_eng.pdf
World Heritage	http://whc.unesco.org/en/statesparties/
Whaling	http://www.iwcoffice.org/_documents/commission/convention_status.pdf
Basel Convention	http://www.basel.int/ratif/convention.htm

Annex C2

East Asian Countries Ratification of International Conventions & Adoption of other Instruments Relating to Coastal and Marine Environment

COUNTRY	Rotterdam Convention	Basel Protocol 99	GPA on LBS 95**	Bio-safety Protocol 2000	Stockholm Convention on POPs 2001	Montreal Protocol 87	Vienna Convention (Ozone Layer)	Treaty on Plant Genetic Resources for Food and Agriculture 2006	Fisheries Convention and Management of Highly Migratory Fish Stocks 04**	Hyogo Framework for Action	Nagoya Protocol	Mercury Convention
Brunei Darussalam					02 ^A	93 a	90 a			05Ad		
Cambodia			Y	03	06	01 a	01 a	04 A		05Ad	12 s, 15 r	13 s
China	05		Y	05	04	91 a	89 a		Y	05Ad	11s; 13r	13 s
DPR Korea	04			03		95 a	95 a	04 a				
Indonesia	98 ^A		Y	04	09	92	92 a	06 a		05Ad		13 s
Japan	04		Y	03	02	88 A	88 a		Y	05Ad	11 s	13 s
Lao PDR				04	06	98 a	98 a	06 a		05Ad	12 a	
Malaysia	02		Y	03	02 ^A	89 a	89 a	04 a		05Ad	14 a	
Philippines	06		Y	06	04	91	91 a	06 a	Y	05Ad		13 s
RO Korea	03		Y	07	07	92 a	92 a	09 a	Y	05Ad	11 s	
Singapore	05				05	89 a	89 a			05Ad		13 s
Thailand	02		Y	05	05	89	89 a			05Ad	12 s	
Timor-Leste						09 a	09 a			05Ad		
Vietnam	07			04	02	94 a	94 a			05Ad	14 a	13 s

Basel Protocol	http://www.basel.int/ratiff/protocol.htm
GPA on LBS	
Biosafety Protocol	http://www.cbd.int/convention/parties/list/
Stockholm	http://chm.pops.int/Countries/StatusofRatification/tabid/252/language/en-US/Default.aspx
UNCCD	http://unccd.int/convention/ratiff/doiif.php
Rotterdam Convention	http://www.pic.int/home.php?type=t&id=63&sid=17
Montreal Protocol	http://treaties.un.org/Pages/ViewDetails.aspx?src=UNTSO&tabid=2&mtdsg_no=XXVII-2-a&chapter=27&lang=en#Participants
Vienna Conv (Ozone)	http://treaties.un.org/Pages/ViewDetails.aspx?src=UNTSO&tabid=2&mtdsg_no=XXVII-2&chapter=27&lang=en
Plant Genetic Resources	http://treaties.un.org/Pages/showDetails.aspx?objid=080000028006554e
ASEAN Transboundary Haze	http://www.disasterdiplomacy.org/aseanhaze.pdf
Nagoya Protocol:	www.cbd.int/abs/nagoya-protocol/signatories/default.shtml
Hyogo	http://www.preventionweb.net/files/32916_implementationofthehyogoframeworkfo.pdf
Mercury	http://www.mercuryconvention.org/Countries/tabid/3428/Default.aspx

Annex D1

East Asian Countries Ratification of International Conventions Relating to Marine Pollution (IMO Conventions)

CONVENTION	MARPOL 73/78					London Convention		COLREG Convention	Intervention		CLC			FUND		
	I/II	III	IV	V	VI	Convention	Protocol		Convention	Protocol	Convention	Protocol	Protocol	Convention	Protocol	Protocol
COUNTRY						72	96	72	69	73	69	76	92	71	92	03
Brunei Darussalam	86							87			D	92	03	D	03	
Cambodia	95	94	94	94				94			95	01	02		02	
China	83	94	06	88	06	85	06	80	90	90	D	D	00	D	00*	
DPR Korea	85	85	85	85				85								
Indonesia	87							79A			78		00	D		
Japan	83	83	83	83	05	80	07	77	75		D	94	96	D	96	05
Lao PDR																
Malaysia	97			97				80			D		05	95	05	
Philippines	01	01	01	01		73							98		98	
RO Korea	84	96	04	96	06	93	09	77A			D	93	98	D	98	10
Singapore	91	94	05	99	00			77			D	82	98		98	
Thailand	08							79								
Timor-Leste																
Vietnam	91							90					04			

Annex D2

East Asian Countries Ratification of International Conventions Relating to Marine Pollution (IMO Conventions)

CONVENTION	SUA		SOLAS			LL	Salvage	OPRC	HNS		OPRC HNS	Bunker Oil	Anti-Fouling	Ballast Water	Nairobi WRC	Hongkong Convention
	Convention	Protocol	Convention	Protocol	Protocol	Protocol			Convention	Protocol						
COUNTRY	88	05	74	78	88	88	89	90			00	01	01	04	07	
Brunei Darussalam	04	04	87	87												
Cambodia	06	06	95	95	01	01										
China	92	92	80	83	00	00	96	98			10	09	11			
DPR Korea			85	85	01	01						09				
Indonesia			81	88												
Japan	98	98	80	81	00	00		96			07		03			
Lao PDR	12	12														
Malaysia			84	84	12	12		97			14	09	10	10	13 a	
Philippines	04	04	82					14								
RO Korea	03	03	81	83	00	00		00			08	09	08	09		
Singapore	04		81	84	00	00		99			07	08	10			
Thailand			85					00								
Timor-Leste																
Vietnam	02	02	91	93	02	02						10				

Legend:

- Numbers represent year of ratification/accession
- D – Denounced
- a – approval
- A – Acceptance

Sources:

<https://imo.amsa.gov.au/public/parties/solas88protocol.html>
<https://imo.amsa.gov.au/public/parties/solas78protocol.html>
<https://imo.amsa.gov.au/public/parties/ll88protocol.html>
<http://www.imo.org/About/Conventions/StatusOfConventions/Documents/Status%20-%202014.pdf>

Ocean and Sectoral Laws (related with the aspects of Sustainable Development) since 2003

Country	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Marine Spatial Planning	Disaster Risk Reduction and Management	Total No.
Cambodia	1	0	1	1	1	0	0	0	4
	Law on Administrative Management of Capital, Provinces, Municipalities, Districts and Khans (2008)		Law on Bio-safety (2008)	Law on Water Resources Management (2007)	Law on Fisheries (2006)				
China	1	4	0	2	2	0	0	2	11
	Law on Protection of Sea-Islands (2007)	Renewable Energy Law (2005, 2009)		Water Pollution Prevention and Control Law (2007)	Law on Fisheries of China (2007)			Regulations for Natural Disaster Relief (2010)	
		Energy Saving Law (2007)		Water and Soil Conservation Law (2010)	Law on the Real Rights of China (2007)			Emergency Response Law (2007)	
		Circular Economy Promotion Law (2008)							
DPR Korea	0	0	5	2	2	1	0	1	11
		Clean Production Promotion Law (2012)	Fluvial Law (2004)	Revised Law on Rivers and Streams (2013)	Revised Law on Fishery (2014)	Law on Sewage System (2009)		Disaster Prevention, Rescue and Restoration Law (2014)	
			DPRK Law on Environment Impact Assessment (2007)	Revised Law on the Prevention of the Taedong River Pollution (2013)	Revised Fish Breeding Law (2014)				
			Revised Environmental Protection Law (2013)						

Country	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Marine Spatial Planning	Disaster Risk Reduction and Management	Total No.
Indonesia			Revised Law on Nature Conservation Areas (2014)						
			Revised Forest Law (2012)						
	National Act No. 27/2007 on Management of Coastal Zones and Small Islands amended by National Act No. 1/2014 (2007,2014)	0	Biodiversity Basic Law (2008)	National Act No. 7/2004 on Integrated Water Resources Management at the Basin Level (2004)	Fishery Law No. 31 (2004)	Law No. 18/2008 Solid Waste Management (2008)	National Act No. 26/2007 Spatial Planning (2007)	Law No. 24/2007 on Disaster Management (2007)	23
	National Act No. 32/2004 on the Decentralization of Authorities and Responsibilities in Coastal and Marine Management (2004)		National Act No. 23/2014 on Local Government Autonomy (2014)	National Act No. 32/2004 Decentralization of Authorities and Responsibilities in Coastal and Marine Management (2004)	NA No. 45/2009 on Fisheries Management (2009)	National Act No. 32/2009 on Environmental Protection and Management (2009)	National Act No. 26/2005 on Spatial Planning, including coastal and marine areas (2005)	Law No. 32/2009 on Environmental Protection and Management (2009)	
	National Act No. 25/2005 on Investment Policy in Coastal and Ocean Development (2005)			National Act No. 32/2009 on Environmental Management and Control (2009)	Act No. 33/2004 Financial Balance among National and Local-level Governments (2004)	Law No. 19/2009 on Ratification of Stockholm Convention On Persistent Organics Pollutants (2009)		National Act No. 24/2005 on Disaster Preparedness and Mitigation (2005)	
Environment Act No. 32/2009 supports the management of coastal and marine resources through risk management and ecosystem-based management principles (2009)			National Act No. 19/2008 on water resources management (2008)		Amendment on Act on Liability for Oil Pollution Damage (2005)				
National Act No 17/2009 concerning Shipping Mandates the Improvement of Management Quality of Port Authority (2009)									

Country	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Marine Spatial Planning	Disaster Risk Reduction and Management	Total No.
Japan	2	2	6	0	1	4	0	0	15
	National Spatial Planning Act (revised in 2005)	Act on Promotion of Global Warming Countermeasures (2008)	Basic Act on Biodiversity (2008)		Fisheries Basic Act (2005)	Law on Special Measures on Removal of Environmental Problems Caused by Specified Industrial Wastes (2003)			
	Basic Act on Ocean Policy (2007)	Law Concerning the Rational Use of Energy (2013)	Invasive Alien Species Act (2004)			Law for the Control of Export, Import and Others of Specified Hazardous Wastes and other Wastes (revised in 2005)			
			Law for Enhancing Motivation on Environmental Conservation and Promoting Environmental Education (2003)			Water Pollution Control Law (2010, 2011)			
			Landscape Act (2004)			Act on Special Measures for the Conservation of Lake Water Quality (revised 2005)			
			Nature Conservation Act (revised in 2009)						
			Natural Parks Act (revised in 2009)						
			Forestry Law (2007)						
			Wildlife and Aquatic Animals Act (2008)						
			Law on Lands (2003)						
		Environment Law (2010)							
Lao PDR	0	0	4	0	0	0	0	0	4

Country	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Marine Spatial Planning	Disaster Risk Reduction and Management	Total No.
Philippines	1	2	1	0	0	2	0	1	7
	Philippine Coast Guard Law (2009)	Climate Change Act (2009)	Marine Ecosystem Conservation and Management Act (2006)			Oil Pollution Compensation Act (2007)		Disaster Risk Reduction and Management Act (2010)	
		Renewable Energy Act (2008)				Philippine Clean Water Act (2004)			
RO Korea	3	3	5	2	4	0	0	3	19
	Law on Public Waters Management and Reclamation (2010)	Framework Act on Low Carbon, Green Growth (2010)	Law on Conservation and Use of Biodiversity (2012)	River Act (2004)	Fisheries Resources Management Act (2009)			Marine Environment Management Act (2007)	
	Law on the Conservation and Management of Uninhabited Islands (2007)	Framework Act on Management of Disaster and Safety (2004)	Marine Ecosystem Conservation and Management Act (2006)	Water Quality and Aquatic Ecosystem Conservation Act (2008)	Special Act on Improving Quality of Life of Farmers and Fishermen and Development of Agriculture and Fishing Village (2014)			Environmental Impact Assessment Act (2008)	
	Maritime Safety Act (2012)	Law on Safety Insurance and Prevention of Disasters for Farmers and Fishermen (2015)	Special Act on the Preservation of the Ecosystem in Island Areas including Dokdo (2009)		Law on Conservation and Uses of Marine Bio-Resources (2012)			Fishing Ground Management Act (2008)	
			Act on the National Trust of Cultural Heritages and National Environment Assets (2006)		Islands Development Promotion Act (2009)				
			Law on Wildlife Protection and Management (2008)						
Singapore	1	0	4	2	0	3	0	0	10
	Merchant Shipping Act (2008)		Parks and Trees Act (2005)	Public Utilities Act (Revised in 2012)		National Environment Agency Act (2003)			
			National Parks Board Act (revised in 2012)	Sewerage and Drainage (Amendment) Act (2012)		Radiation Protection Act (2008)			

Country	Oceans	Climate Change	Habitats	Water Resources	Food Security and Livelihood	Pollution Reduction	Marine Spatial Planning	Disaster Risk Reduction and Management	Total No.
			Sand and Granite Quarries Act (2013)			Transboundary Haze Pollution Act (2014)			
			Endangered Species Act (2008)						
Thailand	1	0	0	0	0	0	0	1	2
	Promotion of Marine and Coastal Resources Management Act (2015)							Disaster Prevention and Mitigation Act, B.E. 2550 (2007)	
Timor Leste	1	0	0	2	2	4	0	0	9
	Government Decree-Law No. 3/2004: APORTIL - Managing the Port Facilities and Services (2004)			Law No. 04/2004 on Water Supply for Public Consumption (2004)	Law 6/2005 provides the General Basis of the Legal Regime for the Management and Regulation of Fisheries and Aquaculture (2005)	Law No. 05/2011 on Environmental Licensing (2011)			
				Law No. 05/2009 on Licensing, Commercialization and Quality of Drinking Water (2009)	Law No. 12/2004 on Criminal Actions related to Fisheries (2004)	Law No. 10/2004 on Health System (2004)			
						Law No. 33/2008 on Hygiene and Public Order (2008)			
						Government Decree Law No. 10/2004 on Health System (2004)			
Vietnam	2	0	2	0	1	1	0	0	6
	Vietnam Law of the Sea (2013)		Law on Forest Protection and Development in 1991 amended in 2004 (No. 29/2004QH11)		Law No. 17/2003/QH11 on Fisheries (2003)	Law on Natural Resources and Environment of Sea and Islands (2015)			
	Revised Environmental Protection Law (2005)		Law on Biodiversity (2008)						
TOTAL	17	11	30	15	16	19	2	11	121

Annex F

Proposed Geographic Scaling up of ICM Programs

Country (Length of total national coastline, excluding some associated islands; Total number of ICM sites)	Existing ICM Programs / Sites	Length of Coastline (km) (percentage of total national coastline)	Proposed New ICM Programs / Sites	Length of Coastline (km) (Percent of country's total coastline)	SUBTOTALS
Cambodia (440 km) 4 provinces	Preah Sihanouk	140.5	Koh Kong	206.5 ¹	
			Kep	26.5	
			Kampot	66.5	
Subtotals		140.5 (32%)		299.5 (68%)	440 (100%)
China (32,000 km) 20 cities and counties	Dongying	350	Yuhan	329	
	Fangchenggang	584	Changyi	53	
	Haikou	136.23	Wenzhou	339	
	Leting	98	Zhanjiang	1,556	
	Lianyungang	204.82	Rudong	104	
	Qingdao	863	Zhoushan	300	
	Quanzhou	541	Sanya	260	
	Xiamen	234	Jinzhou	97.7	
	Yiangjiang	477	Beihai	500	
			Qinzhou	520	
		Nan'ao	65		
Subtotals		3,488.05 (10.9%)		4,123.7 (12.89%)	7,611.75 (23.8%)
DPR Korea² (2,880 km) 1 city	Nampho City	127 (7.06%)			
Subtotals		127 (7.06%)			127 (7.06%)
Indonesia 44 (95,161 km) 34 provinces	Provinces		Provinces		
	Bali	437	North Sumatera	1,300	
	West Java (covering Sukabumi Regency)	1,000	Riau Archipelago	2,367	
	East Java Province	1,600	Jambi	228	
	Central Java Province	729	Bengkulu	525	
	Yogyakarta Special Area Province	110	South Sumatera	525	

- 1 Koh Kong and Sihanoukville have a combined coastline total of 347 km, however provincial coastlines for both provinces have not been officially declared by the government based on adjustments of provincial boundaries done in 2008. Baseline information is as of 2007, prior to the delineation of new boundaries in 2008.
- 2 DPR Korea is a PEMSEA Partner Country. ICM activities undertaken by PEMSEA in partnership with DPR Korea are on a cost-sharing basis, using non-GEF funds.

Country (Length of total national coastline, excluding some associated islands; Total number of ICM sites)	Existing ICM Programs / Sites	Length of Coastline (km) (percentage of total national coastline)	Proposed New ICM Programs / Sites	Length of Coastline (km) (Percent of country's total coastline)	SUBTOTALS
	West Sumatera	2,420	Lampung	1,105	
			Bangka Belitung	1,200	
	Regencies/City		Banten	520	
	Ternate City (North Maluku Province)	124	DKI Jakarta	32	
	Sinjai Regency (South Sulawesi Province)	28	West Kalimantan	1,163	
	Kendari City (Southeast Sulawesi Province)	86	Central Kalimantan	750	
	East Bolaang Mongondow Regency (North Sulawesi Province)	123	South Kalimantan	1,331	
	Pangkep Regency (South Sulawesi Province)	250	East Kalimantan	1,185	
	Kubu Raya (West Kalimantan Province)	194	East Nusa Tenggara	5,700	
	East Lombok (West Nusa Tenggara Province)	220	West Sulawesi	752	
			South Sulawesi	1,973	
			Central Sulawesi	4,013	
			Gorontalo	560	
			North Sulawesi	1,837	
			North Maluku	6,298	
		Maluku	10,630		
Subtotals		7,321 (7.69%)		43,994 (46.23%)	50,596³ (53.2%)
Japan (35,000 km) 5 sites	<ul style="list-style-type: none"> • Bizen City 99 • Miyako City 136 • Obama City 76 • Shima City 29.5 • Sukumo City and Otsuki Town 152 				
Subtotal		492.5 (1.4%)			492.5 (1.4%)

3 To avoid double-counting, the coastline lengths of the Regencies and City with existing ICM programs, which are within provinces that are scaling up new ICM programs, have been subtracted from this subtotal.

Country (Length of total national coastline, excluding some associated islands; Total number of ICM sites)	Existing ICM Programs / Sites	Length of Coastline (km) (percentage of total national coastline)	Proposed New ICM Programs / Sites	Length of Coastline (km) (Percent of country's total coastline)	SUBTOTALS
	Manila Bay • Bataan • Cavite • Bulacan • Pampanga	144 122 31 21	Siargao Island • Burgos • Dapa • Del Carmen • General Luna • Pilar • San Benito • San Isidro • Santa Monica • Socorro	10.08 37 19 22 20 15 7 86 17	
	Macajalar Bay	176			
	Tayabas Bay (Quezon side)	305.7			
	ICRMP ⁶ • Cagayan (12) • Cebu (19) • Davao Oriental (7) • Masbate (17) • Romblon (8) • Siquijor (7) • Zambales (9)	565 874 471 788 387 88 278			
Subtotals		5,927 (16.3%)		1,376.9 (3.79%)	7,303.9 (20.1%)
RO Korea (14,963 km)	74 (coastal local governments)	14,963 (100%)	0	0	14,963 (100%)
Singapore (195 km)		195 (100%)			195 (100%)
Thailand (3,148 km inclusive of islands)⁷ 15 provinces	Chonburi Province	171.78	Inner Gulf of Thailand • Samut Sakorn • Chachoengsao • Samut Prakarn • Bangkok • Samut Songkram • Petchaburi	42.79 16.28 50.20 5.81 25.20 91.73 (232.01)	
			Eastern Thailand • Rayong • Trat • Chanthaburi		
			Middle Gulf of Thailand: • Chumphon • Prachuap Khirikhan • Surat Thani	247.75 246.75 166.38 (660.88)	

6 Number in brackets indicates the number of coastal municipalities that participated in the ICRMP project

7 Based on most recent data from DMCR.

Country (Length of total national coastline, excluding some associated islands; Total number of ICM sites)	Existing ICM Programs / Sites	Length of Coastline (km) (percentage of total national coastline)	Proposed New ICM Programs / Sites	Length of Coastline (km) (Percent of country's total coastline)	SUBTOTALS
			Lower GOT: • Songkhla • Nakhon Sithammarat	157.90 244.99 (402.89)	
Subtotals		171.78 (5.46%)		1,686.83 (53.58%)	1,858.61 (59%)
Timor Leste (735 km)	Manatuto District	62.00			
	Liquica District	80.00			
3 districts			Dili District	102.36	
Subtotals		142.00 (19.3%)		102.36 (13.93%)	244.36 (33.2%)
Vietnam (3,269 km)	Ba Ria –Vung Tau	305	Nghe An	82	
12 provinces	Danang	92	Kien Giang	206	
	Haiphong	125	Khanh Hoa	385	
	Nam Dinh	72	Binh Dinh	134	
	Quang Nam	125	Binh Thuan	192	
	Quang Ninh	270	Ninh Thuan	125	
	Soc Trang	72			
	Thua Thien Hue	128			
	Quang Ngai	130			
Subtotals		1,319 (40.3%)		1,124 (34.4%)	2,443 (74.7%)
GRAND TOTAL 227,713.6 km*		34,577.83		52,685.81	87,263.64

8 Estimated using the total regional coastline based on national coastlines of 12 countries included in the table.

* Sum total of country-coastlines as identified in this table

Annex G
**Watershed Areas covered by ICM Initiatives in
the East Asian Region**

Country	Watershed	Areas (km ²)	Areas (km ²) Subtotal
China	Jiulong River basin, Fujian	14,241	>661,641
	Bohai Bay	647,400	
	Yangtze River Delta area	No data	
DPR Korea	Taedong River basin	No data	
Indonesia	Jakarta Baytotal area	490	>60,650
	Ciliwung River catchment area	347	
	Tomini Bay Program	59,500	
	Tukad Badung	25	
	Tukad Ayung	288	
	West Java	No data	
	Siak	No data	
	Riau	No data	
Japan	Tokyo Bay	No data	
	Ise bay	No data	
	Seto Island Sea	No data	
Lao PDR	Nam Theun-Nam Kading	14,820	24,677
	Sedone River basin	7,229	
	Three (3) sub basins of Sedone	2,628	
Philippines	Calumpang River	367	21,739
	Labac River	3,372	
	Manila Bay	18,000	
RO Korea	Busan Coastal Area	741.5	4,779.94
	Ulsan Coastal Area	200.85	
	Gwangyang Bay	465.93	
	Masan Bay	307.65	
	Shihwa• Incheon Coastal Area	1,181.88	
	Gamak Bay	255.3	
	Deukryang Bay	550.25	
	Wando•Doam Bay	769.98	
	Hampyeong Bay	306.6	
Thailand	Prasae River	2,112	2,112
Vietnam	Vu Gia-Thu Bon River basin	10,350	10,350
TOTAL			>785,949

Regional Review:

Implementation of the Sustainable Development Strategy
for the Seas of East Asia (SDS-SEA) 2003-2015

Annex H

Country SDS-SEA Summary Reports:
Implementation of SDS-SEA 2003-2015



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 (2003-2015)



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 km ² with more than 64 islands
Area of territorial sea	18,480 km ²
Length of coastline	435 km

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)

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



Progress in SDS-SEA Implementation (2003-2015)

National Ocean Policy and Institutional Arrangements

- Royal Degree No. NS/RKT/0212/079 on the Establishment and Function of the National Committee for Management and Development of Coastal Area
- Circular No.1 on the Development of Coastal Areas in Cambodia signed by Samdech Akka Moha Sena Padei Techo HUN SEN on February 3, 2012 providing guidelines on the utilization and sustainable development of beaches, islands and coastal areas
- 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

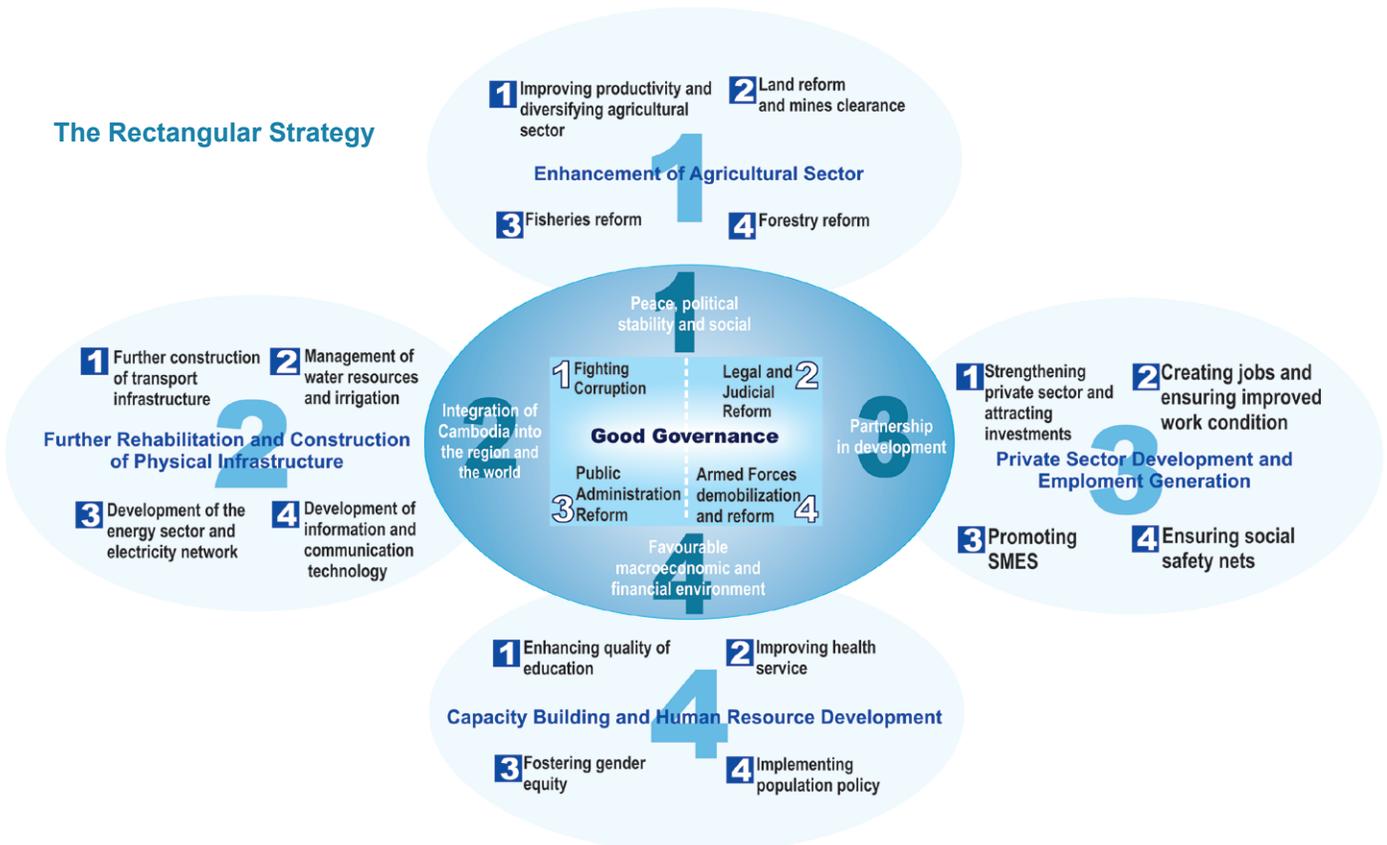
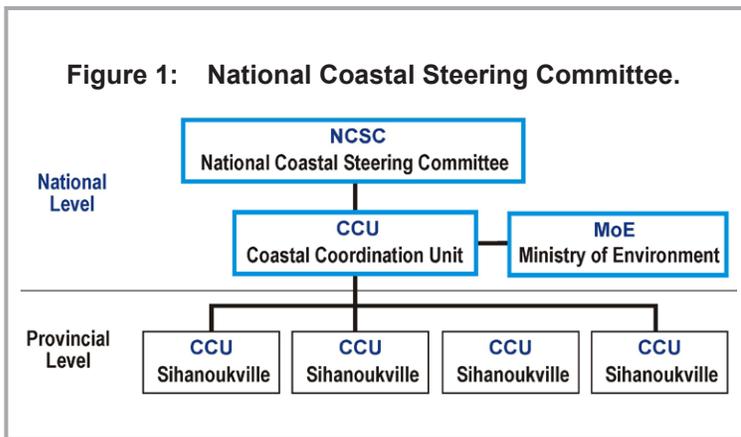


Figure 1: National Coastal Steering Committee.



ICM Implementation

- ICM implementation in Preah Sihanouk currently covers 140.5 km or 32.3% of the country’s coastline (PEMSEA, 2010).
- Expansion and scaling up of ICM initiated in three coastal provinces, covering 100% of the national coastline

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

- Cambodian Climate Change Strategic Plan 2014-2023 (2013) prepared by the National Climate Change Committee emphasizes institutional capacity building, science-based knowledge for project of climate change impacts, adaptation and disaster risk reduction and building resilience capacity and production skills, particularly at the community level to overcome climate change impacts.
- The Cambodia REDD+ Roadmap has been developed and being implemented.

- National Self Capacity Assessment (NSCA) Action Plan for UNCBD, UNFCC and UNCCD.
- 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.
- Sub-decree on Management of Community Fisheries (10 June 2005);
- National Forestry Program 2010-2029;
- National Action Program for Land Degradation 2010-2020;
- 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.

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:
- 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.
- The Ministry of Tourism has formulated a draft Tourism Strategic Plan 2011-2020 (late 2011)
- Draft Ecotourism Policy prepared

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.
- Masterplan on Fishing for the Future 2010-2019 identifies three indicators:
 - Stabilization of wild fish capture production at not more than 500,000 tons per year;
 - Increased on rice field fish production by 15 percent annually, to reach 500,000 tons per year by 2019; and
 - Increased on aquaculture production by 15 percent (50,000 t) annually, to reach 185,000 tons per year by 2019.
- 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.

Water Use and Supply Management

- Adoption of the National Strategy for Rural Water Supply, Sanitation and Hygiene (NSRWSSH) for 2011-2025 (2010).
- Rural Water and Sanitation Sector Investment Plan (2010-2025) provides the basis for water and sanitation reforms in rural areas (2009).
- Law on Water Resources Management (2007) formulated to promote the sustainable use of water resources through an integrated approach.
- Strategic Plan on WRM and Development, 2005-2008 (2005).
- 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);
- National Policy for Water Supply and Sanitation (2003) and divided into three main parts (a) Urban Water Supply; (b) Urban Sanitation; and (c) Rural Water Supply and Sanitation.
- National Drinking Water Quality Standards (2003).
- Institutional Development Plan for Water and Sanitation (2003-2012).

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 No. 26 on Solid Waste Management, 1999 regulating the solid waste management in proper technical manner to ensure the protection of human health and the conservation of biodiversity.
- 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.
- 10-year National Program on Sub-National Democratic Development (NP-SNDD) was launched to be implemented in three phases from 2009-2019.

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 workshops 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

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.

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).
- The government is implementing climate change programmes and projects worth some US\$110 million to strengthen Cambodia’s ability to adapt to climate change in 2010-2015
- 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).
- *Building Resilience to Climate Change Impacts – Coastal Southeast Asia (BCR)* implemented by the IUCN (January 2011-December 2014) in Cambodia to strengthen local capacity to plan for, and adapt to future climate risks including Kampot and Koh Kong, Cambodia. Activities include: (a) Vulnerability assessment; (b) Implementation of pilot actions in key communities; (c) design and implementation of multisector plans and strategies; and (d) cooperation with neighbouring provinces and neighboring countries on climate change adaptation
- 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 Occheauteal 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.



- Sea use zoning for coastal area in Kampot implemented under the IUCN support as part of the initiative under the *Building Coastal Resilience Project*.
- *Sustainable Sihanoukville* project implemented in Preah Sihanouk on Adaptation and Mitigation to Climate Change implementation under collaboration with UN-Habitat and funded under the Cambodian Climate Change Alliance which included the following:
 - Capacity building of climate change and its effect in coastal area conducted among local authorities, provincial departments, tourist establishments, students and fishers;
 - Strengthening of accuracy of weather information;
 - Risk preparedness plan has been developed for Tomnop Rolok area; and
 - Beach assessment conducted to monitor the rate of erosion in Occheauteal Beach.

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. In 2010, forest cover was 57.07 percent of Cambodia's land area.
 - 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).

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

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.

- In late 2010, 430 Community Forests (CFs) had been established in 20 provinces, equaling 380,976 hectares.
- 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).
- Protected areas in 2010 represented about 3.1 million hectares, lower than the 1993 baseline of 3.3 million hectares.
- 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.
- Establishment of a Marine Fisheries Management Area around Koh Rong and Koh Rong Sanloem implemented by the Ministry of Agriculture, Forestry and Fisheries (MAFF) from 2012-2015 to create a multiple use management area, with benefits to business, biodiversity and marine fisheries
- 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.
- Increase in fisheries production
 - Inland fisheries produced 395,000 tonnes in 2007 and increasing to 445,000 tonnes in 2011.
 - Marine fisheries production was 63,500 tonnes in 2007, compared to 91,000 tonnes in 2011.
 - Aquaculture production was 35,260 tonnes in 2007 compared to 72,000 tonnes in 2011.
- Abolition of the large-scale fishing lots covering 953,740 ha, maintaining only the medium and small-scale fishing to reduce overfishing and illegal fishing activities.
- 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 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.



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, reducing 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.
 - Poor organization of small-scale fishers which composes about 87% of the total fishers.
-
- 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 (estimated US\$18,853.55) is being revolved to members from Sangkat Kampenh, Tomnop Rolok and O'tress with 120 families benefitting from this.
 - “Clean City, Clean Resort and Good Services” movement was launched by the Ministry of Tourism in late 2011 to encourage responsible businesses.
 - Through the improved management of the Occheauteal Beach the following were noted by Preah Sihanouk’s Department of Tourism: (a) increased number of tourists in the province from 144,995 in 2004 to 712,023 in 2011; (b) increased length of stay of tourists in the beach; (c) increased number of people employed in the beach area; (d) strengthened government and private sector partnership; and (e) greater political commitment to coastal management.

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

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

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 m³. 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.
- 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



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.

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;
 - 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).
- Wastewater storage facility set up in Kep Town which caters to hotels and restaurants near the coastal area

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, policies 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 (2003-2015)



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 m ²) (CIMA)
Area of territorial sea	380,000 km ²
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\$6,629 (IMF, 2013)
GDP growth (2006-2010)	7.7%
Growth rate of marine economy (2006-2010)	7.6% (SOA, 2014)
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	CNY 5.431 trillion (US\$ 890 billion) (SOA, 2014)
Economic contribution of the marine economy to the national economy in 2010	9.5% of GDP (SOA, 2014)
Employment contribution of the marine economy to national employment	35.1 million job opportunities in 2013 (SOA, 2014)



Progress in SDS-SEA Implementation (2003-2015)

National Ocean Policy and Institutional Arrangements

Status of coastal and ocean policy

- In 2014, the State Council adopted the National Ecosystem Protection and Conservation Plan (2013-2020). Developed by 12 line ministries under the coordination of National Development and Reform Commission, the plan covers terrestrial, coastal areas, Bohai Sea, Yellow Sea, East China Sea and South China Sea and lists 12 sea areas as priority for protection and conservation. Ecological disaster prevention and control, ecosystem restoration, designation of MPAs, monitoring and inventory are highlighted as the major areas for support up to 2020.
- In 2013, SOA published the 12th FYP for National Ocean Development which sets the objectives and targets for ocean development up to 2020. Key tasks and targets focus on marine resource management, sea area use, island protection and development, marine environment protection, marine ecosystem restoration and conservation, disaster risk preparedness and response, education and capacity development, law and regulation and awareness-raising.
- In 2012, SOA initiated development and accreditation of marine ecological civilization demonstration zone in China's 11 coastal provinces following the adoption of ecological civilization as a new development concept by the 18th Congress of the Chinese Communist Party which advocates respect of nature, living with nature and protecting nature. Through the accreditation scheme, SOA hoped coastal cities and counties could integrate the concept of marine ecological civilization into economic, political, cultural and social development programs and projects. Key areas of marine ecological civilization demonstration focus on initiatives, programs and projects in relation to rationalization of industrial structure and transformation of development pattern in coastal areas; strengthening management and control of pollutant discharge into sea; strengthening marine ecosystem conservation

to improve marine ecological safety; and raising the awareness of marine ecological civilization. In 2013, Xiamen and other 11 coastal cities and counties were accredited the title of National Marine Ecological Civilization Demonstration Zone by SOA, China. In 2013, Ministry of Environmental Protection issued Assessment Criteria of Ecological Civilization Pilot and Demonstration. One year later, Ministry of Environmental Protection published Assessment Criteria of Ecological Civilization Demonstration for Villages and Townships.

- National Science and Technology Program in Support of Ocean Development (2008-2015) was adopted in 2008. It aims to achieve the target of contribution to 50% of marine economic growth by advancing science and technologies, transformation of science and technology innovations to support marine high-technology industries, application of ocean-related public services, development of marine information products, capacity development, etc.

Status of ICM policy/legislation

- In 2013, Chinese People's Congress initiated the process of developing Ocean Basic Law.
- Law on Protection of Sea-Islands was adopted in 2009. It 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 was adopted in 2007. It affords protection to user rights of sea areas legally acquired.
- Law on Fisheries of China was amended in 2007.
- Administrative Regulation on the Prevention and Control of Pollution Damages to the Marine Environment by Coastal Engineering Construction Projects was amended in 2004.

National Ocean Policy and Institutional Arrangements, continued.

Status of Institutional Arrangement

- Established in 1964, State Oceanic Administration (SOA) of China is the competent authority in charge of sea use, maritime rights and interests and law enforcement, marine eco-environment protection, ocean survey and scientific research, protection of islands and seas, ocean observation and forecasting, marine hazards warning among

others. It coordinates the formulation of marine development strategy and national plans for ocean development programme, major marine functional zoning scheme, marine eco-environment protection, marine economic development, island protection as well as the supervision of the implementation. SOA is administered by Ministry of Land and Resources of China.

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

In 2010, Chinese People's Congress adopted the Outline of National 12th Five-Year Plan for Social and Economic Development (2011-2015). Selected policies in relation to nature and environment conservation and protection which are also relevant to coastal and marine environment conservation and protection are summarized below.

Product pricing and environmental protection fee reform

- Promote water price reform
- Increase pollution emission payment collection rate;
- Increase garbage treatment fee and subsidies
- Promote Environmental protection tax reform
- Establish and improve pollution right trading system and market development

Establish eco-compensation mechanism

- Increase fiscal transfers
- Design of National Eco-compensation Special Fund
- Implement resource-intensive enterprise sustainable development deposit system
- Explore eco-compensation by users
- Explore market-based eco-compensation mechanisms
- Enact and implement eco-compensation regulation

Integrated rural environment protection

- Develop highly efficient, ecological and safe agriculture;
- pollutant treatment from pesticides, fertilizer and membrane use;
- Prevention & treatment of animal husbandry pollution;
- Implement rural cleaning program;
- Promote centralized treatment of garbage.

Strengthen pollutant emission reduction and treatment

- Implement key pollutant emission total loading control
- Targets: increase urban and township swage treatment rate to 85% and garbage treatment rate to 80%

Develop marine development strategy

- Develop and implement marine key function zoning plan;
- Improve sea use right trading mechanism
- Integrate marine environment protection and land-based pollution prevention and treatment
- Control inshore resource over-exploitation
- Strengthen sea reclamation management
- Improve disaster prevention and reduction system
- Improve marine legislation and policy



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

Climate change adaptation

- Develop national climate adaptation strategy
- Technology development and extension
- Consider climate factors into investment decisions
- Strengthen extreme weather monitoring, early warning, prevention capacity to reduce impact

Develop circular economy

- Clean production in agriculture, industry and commerce

Promote sea water desalinization

Promote civil society organizations

National Coordinating Mechanisms for Coastal and Ocean/ICM Policy

- China National Oceanic Commission was established in 2013. This national high-level inter-agency mechanism seeks to coordinate the development and implementation of national marine strategy and other major ocean-related initiatives.
- China Coast Guard was created in 2013 as a functional unit of SOA. It has unified the law enforcement roles of China Marine Surveillance, the coast guard forces of the Ministry of Public Security, the fisheries law enforcement command of the Ministry of Agriculture, and the maritime anti-smuggling authorities of the General Administration of Customs.
- 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.
- Legislation, plan and standards for disaster preparedness, response and recovery have been put in place. These include Regulations for Natural Disaster Relief (2010), Emergency Response Law (2007), Master State Plan for Rapid Response to Public Emergencies (2006), National 11th Five-year Plan on Comprehensive Disaster Reduction (2007), Special National Plan on Seepage Prevention and Reinforcement for Unsafe Reservoirs (2008); Earthquake-proof Classification Standards for Construction Projects (revised 2008-2009), Earthquake-proof Construction Design Specifications (revised 2008-2009), etc.
- In 2011, State Oceanic Administration (SOA) established SOA Marine Disaster Reduction Center in Beijing. The Center is mandated to safeguard the marine economy development, ocean management, public service delivery and ocean security by creating and managing an operation platform for marine disaster prevention and risk reduction, marine emergency response and associated capacity development. Key roles of the Center include development of national marine disaster reduction programs, plans and mechanisms; development of technical criteria and standards for disaster prevention and reduction; undertaking disaster impact survey, statistics and assessment; production of disaster analysis reports; development of disaster risk reduction public services products; education and awareness raising; conduct of trainings, etc.

Supporting Sectoral Policies and Legislation

Climate Change and Disaster Management

- China has adopted a system of laws and regulations to mitigate emission of GHGs and adapt to impact of climate change. These include Renewable Energy Law (2005 and revised in 2009), Energy Saving Law (2007), Circular Economy Promotion Law (2008) and Clean Production Promotion Law (2012).
- 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 2007, China released its National Climate Change Program, which outlines the strategies including

ICM Implementation

Percentage of national coastline with ICM implementation (2010): 14.6%

- Coastlines covered by ICM programs in China increased from 11.2% in 2011 to 14.6% in 2014.
- In June 2014, the number of PNLG members in China increased from six in 2011 to ten. Application for PNLG membership by Beihai City was approved by Executive Committee in April, 2014.

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)
Changyi	53
Dongying	350
Fangchenggang	584
Haikou	136.23
Haiyang	230
Laoting	98
Lianyungang	204.82
Panjin	118
Qingdao	863
Qinzhou	530
Quanzhou	541
Wenchang	278.5
Xiamen	234
Yangjiang	477
Total:	4,687.55

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.

Habitats and Biodiversity

- In 2010, the State Council published National Key Function Zone Scheme, a strategic, basic and mandatory plan for coordinated national development giving particular regard to ecological security. The plan categorizes land into four different zones with varied focus for development, i.e. priority development, key development, restricted development and forbidden development. Development policies for each type of zones are specified, as well as the incentive policies to implement policies in particular measures pertinent to restricted development and forbidden development zones which harbor the country's 25 key 'Ecological Function Zones' (EFZs) that must be protected and managed sustainably. Marine key function zoning is one of the priority tasks identified in the 12th FYP (2010-2015). Ecological compensation including fiscal transfers is one of the key mechanisms to implement the zoning scheme. In response, local governments have developed financial policies to implement the scheme. For example, Fujian Province has adopted the Provincial Ecological Conservation Fiscal Transfer Rules in 2012 to integrate financing to restricted development and development forbidden zones into the provincial budgetary system. With these enabling rules, Fujian Province transferred CNY520 million to the two types of development zones in 2012.
- Developing a national regulation on payment for ecological services was initiated by the State Council in 2010 with participation of 11 line ministries including the National Development and Reform Commission, Ministry of Finance, Ministry of Land and Resources, Ministry of Water Resources, Ministry of Environmental Protection, State Forestry Administration, State Oceanic Administration, etc. A draft regulation is under consultation with stakeholders in early 2014.



- A revised National Biodiversity Strategy and Action Plan of China (2011-2030) was approved by the State Council in 2010. 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.
- In August 2013, the SOA adopted the Trial Technical Guidelines for Valuating Marine Ecological Damage in accordance with National Marine Environmental Protection Law, National Tort Liability Law. The Guidelines provides with process, valuation methodologies, restoration and investigation requirements and reporting template for assessing the damages to marine ecosystems and marine protected areas from manmade and emergent incidences.
- Since 2003, a number of national plans have been adopted for various ecosystem types and species. These include National Plan for Establishment of Forest Nature Reserves (2006-2030), National Project Plan for Establishing Coastal Protective Forest System (2006-2015), Decision of the Central Committee of the Communist Party of China and the State Council on Speeding up Forestry Development (-2050), Plan for Conservation and Development of New Agricultural Plant Varieties (2007); Action Plan for China Aquatic Biological Resources Conservation (2006); National Master Plan for Grassland Conservation, Construction and Utilization (2007-2020), National Program for Conservation and Use of Biological Resources (2007-2020), etc.
- In 2012, the State Council issued the Circular on Implementation of the Strictest Water Resource Management System. Based on this Circular, total water use quota and water function zone pollution standard compliance rate for 2015, 2020 and 2030 were established for each province. Meanwhile, decrease rate of water use efficiency per unit output value and irrigation water use efficiency rate by 2015 were also established for each province. In order to enforce the compliance of these targets, the State Council established a mechanism to assess the performance in implementation of the “strictest water resource management system” in the same year.

Fishery Management and Livelihood

- In 2013, the State Council published a notice on promoting the sustainable and healthy development of marine fishery.
- In 2011, the State Council issued China Poverty Reduction Strategy (2011-2020) which identifies the poverty areas, key tasks and targets and guarantee mechanisms for its implementation.
- The policy of “zero increase” and “negative increase” in marine capture fishery were introduced in 1999. It concerns 110,000 fishing vessels and 1 million fishers.

Pollution Reduction and Waste Management

- Technical Guidelines for Program Environmental Assessment has taken effect. (2014),
- State Council released Regulation on the Prevention and Control of Pollution from Large-scale Breeding of Livestock and Poultry. (2014)
- Ministry of Housing and Urban-Rural Development in collaboration with three other ministries launched the demonstration of urban garbage classification in cities. (2014)
- The State Council approved the Key River Basin Pollution Prevention and Mitigation Plan (2011-2015). The Plan was proposed by Ministry of Environmental Protection, National Development and Reform Commission, Ministry of Finance and Ministry of Water Resource covering. (2012)
- National Development and Reform Commission and 10 other line ministries jointly published the policy on promoting recycling industry as a measure to implement the Circular Economy Law (2010).

Water Resource and Use Management

- China has established a water legal system consisting of laws (Water Law, 1988, 2002; Water Pollution Prevention and Control Law, 2000, 2007; Flooding Prevention Law, 1997; Water and Soil Conservation Law, 2010), regulations (Regulation to Implement Water Pollution Prevention and Control Law, Water Channel Management Regulation, 1988; Regulation on Combating Drought, 2009; Hydrology Regulation, 2007; Regulation on Water Licensing and Water Resource Fee Collection Management, 2006) and administrative orders.

Financing

- The total investment in environmental protection during the 11th FYP period (2005-2010) amounted to CNY1.53 trillion, a 70% increase than the 10th FYP. This environmental protection investment accounted for about 1.5% of the total GDP for the same period.
- During the 10th FYP (2001-2005), public financing for environmental protection accounted for 13% of the total, while 15% came from bank financing, and 72% came from enterprise and private financing.
- From 2006 to 2008, CNY 23.8 billion (US\$ 3.78 billion) of state revenues and CNY 22.6 billion of local revenue were invested to provide safe drinking water to an accumulated rural population of 109 million (State Council Information Office, 2009).
- From 2007 to 2012, a total of CNY 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.
- Investment for implementation of Master Plan on the Bohai Sea Environmental Protection (2008-2020) was estimated at CNY130 billion (US\$18.6 billion) by the four provinces and municipalities.
- In 2013, CNY10.8 billion (US\$1.77 billion) of sea user fees were collected to support coastal environment management and ecosystem conservation.
- In September 2014, Ministry of Finance of China issued a notification on the promotion of public-private partnership and PPP Operational Guidelines. Enabled by this policy, up to January 9, 2015, seven provinces approved nearly 500 projects in 17 sectors with an investment of 800 billion yuan. By number, nearly one third of these projects invested in environmental protection totalling 40 billion yuan. Waste water and solid waste treatment and waste incineration power plants are the primary PPP projects for environment protection.
- 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 (2009).

Monitoring and Evaluation

State of the Coasts and Seas

Vulnerability to Climate Variations and Disaster Risks

- 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 CNY10 billion (US\$ 1.59 billion) and the death of 59 people. In 2010, 132 oceanic disasters were recorded, leading to direct loss of CNY13.3 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. The rate of erosion and magnitude are increasing in majority of the monitoring sections. In 2013, except monitoring sites in coastal areas of South China Sea, areas affected by sea water erosion in Panjin and Tangshan have enlarged. At the same time, chloride ion contents in monitoring stations of Jinzhou, Yantai and Weifang of Bohai, Yancheng and Lianyungang of Yellow Sea, and Changle of East China Sea have increased (SOA, 2013).
- Frequency of red tide declined from 116 times in 2003 to 69 times in 2010, and further reduced to 46 times in 2013. Affected areas shrank from 25,000 km² in 2004, 10,000 km² in 2010 and 4,070 km² in 2013 (SOA, 2003; 2010; 2013).

Habitat and Biodiversity

- In 2010, status of 18 coastal ecological monitoring and control zones for monitoring of marine ecosystems in estuaries, bays, tidal flats and coastal wetlands, mangroves, coral reefs and seagrass beds was assessed as healthy (14%), sub-healthy (76%) and non-healthy (10%) (SOA, 2010). In 2013, the status was assessed as healthy (23%), sub-healthy (67%) and non-healthy (10%) (SOA, 2010; 2013).

Fishery and Livelihoods

- Marine tropic index from 1997-2006 increased steadily, benefiting from implementation of summer fishing moratorium policies since 1995 (MEP, 2010).



Water Resource Management and Pollution

- China supports 20 percent of the world population with only 7 percent of the global water supply. Over 400 cities, two-thirds of the total, are short of supply. More than 100 cities are faced with severe shortages (Chen Lei, 2012).
- Water consumption per CNY 10,000 of industrial value-added declined from 288 m³ in 2000 to 164 m³ in 2005. A further reduction of 30% to 115 m³ was achieved during the 11th FYP. (ADB, 2007).
- Land-based pollutants contribute to nearly 70% of pollutant loadings in coastal seas.
- It is estimated that in 2012 discharge of COD and ammonia nitrogen from large-scale livestock and poultry farms amounted to 10.99 million metric tons and 630,000 metric tons, accounting for 45% and 25% of national total discharge in the same year and 95% and 78% of agricultural discharge. Though there is a decrease in livestock and poultry farming discharge comparing with the first agricultural pollution survey results, their contribution to agricultural pollution has remarkably increased.
- 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 were classified for levels lower than Class V standard. In 2013, 71% of sections qualify for Class I and III standards, and 19.3% of sections qualify for Class IV-V, and 9.0% of sections are classified as levels lower than Class V standard. (MEP, 2010; 2013).

Sea Water Pollution

- Of the 280,000 km² of sea areas monitored in 2010, 62.7% of sea areas qualify for Class I and II standards; 14.1% of sea areas qualify for Class III; and 23.2% of sea areas qualify for Class IV or lower. In 2013, 66.4% of sea areas qualify for Class I and II standards; 15.0% of sea areas were classified as Class III and IV, and 18.6% was classified as Class IV or lower. (China SOE, 2010; 2013).

Monitoring of Environment, Coasts and Oceans

- China has already established an ocean, coastline, land and satellite-based marine monitoring system

to generate, consolidate and analyze data for public use (SOA, 2012).

- 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, 2012).
- 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 km².
- Capacity of monitoring land-based pollution was enhanced during the 11th FYP (2006-2010) (MEP, 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;
 - 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 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

- In 2011, SOA, Ministry of Education, Ministry of Science and Technology, Ministry of Agriculture and Chinese Academy of Sciences jointly publish Guidelines for National Marine Human Resource Development Medium- and Long-Term Plan in support of implementation of land and sea integration and marine economic development strategy. The program seeks to increase the ocean-related human resource base from 2 million people in 2010 to 4 million by 2020 in the area of scientific research, ocean engineering, marine resource development and use, public services, ocean management, high-tech and international cooperation. Ocean-related sectors and coastal provinces are required to develop appropriate measures to implement the Guidelines.
- 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.
- 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.
- Established in 2011, PEMSEA National Task Force in China provided training for application of ICM tools and instruments to over 100 staff in coastal and fishery management from coastal provinces.

Sustainable Development Aspects

Natural and Manmade Hazards

- China has strengthened its ocean climate observation network during the 11th Five-Year Plan period. Now China is able to observe key climate elements of all inshore areas and parts of its offshore areas and monitor the status of typical marine ecological sensitivity zones. Sea level rise, coastal erosion, sea water intrusion and soil salinization at national level are regularly monitored, surveyed and assessed. All these efforts have enabled China to

Challenges and Opportunities: Natural and Manmade Hazards

- Absence of legislation related with prevention and reduction of loss from ocean-based natural and manmade disasters
- Lack of consideration of disasters in coastal Infrastructure. From 2000 to 2009, nearly 33% of sea dikes were affected
- Poor inter-sectoral coordination in disaster response to oilspill incidence. There is a need to put in place an emergency early-warning and response system for major environmental incidents
- Lack of adequate environmental risk assessment of large thermal power stations, nuclear stations, oil refineries, ocean-based oil and gas pipelines and oil reserves
- 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

understand better the temporal and spatial distribution of marine disasters. Currently, China reports the status of its marine environment, sea level and marine disasters on an annual basis.

- In 2007, the state began to establish disaster-reduction demonstration communities. By 2008, 284 communities had been awarded the title of "National Comprehensive Disaster-reduction Demonstration Community" by the state (State Council Information Office, 2009).
- Response measures to marine disasters focus on: (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 stormsurges, surfs, tsunamis, sea ice, oil spill and red tide; and (4) strengthening of dikes and upgrading construction standards.
- Integrated disaster risk reduction was pioneered in some coastal cities of China with evidenced



effectiveness. 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 (PEMSEA, 2012).

Habitats and Biodiversity

- China's marine jurisdiction includes temperate, subtropical and tropical climatic zones crossing 38 degrees of latitude. There are 20,000 species residing in these zones, including 14% of the world's fish species, 43% of the mangrove species, 14% of the cephalopods, and 33% of the Indo-west Pacific region's coral reef species. For example: there are 1,140 species in the Yellow Sea and Bohai Sea; 4,167 in the East China Sea; and 5,613 in the South China Sea (CCICED, 2010).
- China has instituted national, provincial and municipal (county) marine functional zoning schemes since 2002 when the Sea Use Management Law was passed to resolve conflicts in sea uses, increase sea use efficiency and promote coordinated development in coastal areas. An updated National Marine Function Zoning Scheme (2011-2020) was adopted by the State Council in 2013. It sets the national binding targets as well on sea areas for marine protected areas, fisheries, reclamation, reservation, natural coastlines and consolidated and restored coastlines. Provincial Marine Functional Zoning Schemes in their third round were approved by the State Council in the same year. Municipal (county) level marine functional zoning in all coastal provinces is ongoing in 2014.
- As of June 2014, China has established a network of 240 MPAs including Marine Special Protected Areas (MSPAs) to protect its coastal and marine biodiversity, representing 3.23% of jurisdictional sea areas. China aims to achieve 5% coverage of coasts and seas by 2020 to cover majority of the 98 priority areas for protection identified in the 2010 National Biodiversity Strategy and Action Plan (NBSAP).
- In 2010, the first provincial 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 the 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.

- From 2008 to 2010, PEMSEA parallel site of Quanzhou 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.
- In 2010, Ministry of Environmental Protection in collaboration with other 6 ministries including State Oceanic Administration conducted an assessment of 69 national level protected areas in 6 provinces.
- Protection and conservation efforts have indicated resilience of protected areas and recovery of marine mammals. 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. The population size of the Humpbacked Dolphin (*Sousa chinensis*) in Xiamen shows signs of recovery. About 30-40 individuals were found

Challenges and Opportunities: Habitats and Biodiversity

- Large volume of land-based pollutant;
- Low coverage of territorial waters by MPAs.
- Gaps in coverage of offshore areas and marine vertebrates in the MPA system and expansion of MPAs for sustainable use (i.e. marine special protected areas)
- Development of a more scientifically and systematically designated mpA network under a master plan.
- Inadequate financing.
- Lack of technical capacity in assessing and evaluating effectiveness of biodiversity conservation.

in an MPA in west areas of Xiamen and the newly restored Wuyuan Bay.

Food security, fisheries and livelihood

- 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 seasonal non-fishing policy and closed fishing season policy in the Yangtze River Basin have been in place for many years.
- PEMSEA ICM parallel site 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

- 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).
- Terrestrial and coastal cities of Dongying, Binzhou, Weifang, Dezhou, Zibo and Yantai located within the Yellow River Delta High Efficiency Eco-Economy Zone have established an inter-city coordination mechanism to facilitate joint and simultaneous ecological and environmental restoration, establishment of information sharing, joint prevention and control. The six cities also plan to create mechanisms in environmental and air pollution prevention and mitigation, automatic transboundary water quality data sharing, air quality and water quality monitoring result communication and joint early warning mechanism.
- 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 CNY 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 Resources, 2012).
- 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.
- With PEMSEA support, total pollutant loading reports of Hai River, Daling River, Luan River and Guangli River of Bohai Bay were produced,

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 aquaculture development.

Challenges and Opportunities: Water Supply/River Basin Management

- Excessive fragmentation of the water management system
- Low water use efficiency by agriculture and industry;
- Failure in linking ocean planning with watershed planning
- Underdeveloped system of water rights;
- Excessive reliance on administrative measures rather than market-based and economic instruments.



mitigation strategies and investment plans were developed, and investment projects were identified to meet the offshore water quality criteria of various marine function zones.

Pollution reduction/waste management

- Joint actions in mitigating pollution in rivers are gaining ground in China. Xiamen developed Jiuling River – Xiamen Bay Ecosystem Management Strategic Action Plan in collaboration with environment and agricultural sectors of upstream cities of Longyan and Zhangzhou, and with assistance from SOA, NOAA, PEMSEA, the GEF and UNDP (XOFB et al. 2012). Shenzhen, Dongguan and Huizhou in Guangdong Province are in the process of establishing a joint pollution treatment mechanism to achieve pollution reduction effectiveness by engaging upstream cities of Danshui River, Shima River and Maozhou River. (NDRC, 2014). In the Yangtze River delta area, the coastal and inland provinces and municipality of Jiangsu, Zhejiang, Shanghai and Anhui signed the Yangtze River Delta City Environment Protection Cooperation (Hefei) Declaration in 2012. The Declaration resulted in the development of the Yangtze River Delta Transboundary Environmental Pollution Incidence Emergency Response Joint Action Program. Transboundary environmental pollution disputes settlement and response mechanism, joint law enforcement, joint sampling, coordinated emergency incidence handling, information exchange and sharing, early warning and post-incidence evaluation are the key actions in the Program.
- Liaoning Province has adopted an integrated land and sea use plan – the Liaoning Coastal Conservation and Development Plan in 2014. The plan covers an area of 2,110 km long, 10 km landward and 12 nautical miles seaward, with 14,500 km² of land area and 21,000 km² of sea area and 28 counties in six coastal cities. According to the plan, land and sea will be zoned as priority conservation areas and priority development areas. Focusing on conservation of biodiversity and ecosystem services, priority conservation areas allow agroforestry, fishery and tourism, while priority development areas are zoned for industries, ports, urban development. Minimum areas in square kilometres for coastal priority conservation zones and priority development zones are specified in the Plan (NDRC, 2014).
- 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 CNY 3.2

Challenges and Opportunities: Pollution Reduction/Waste Management

- 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.

trillion (US\$ 508 billion). Over 20,000 enterprises were closed up for failing to meet environmental standards.

- From 2001-2005, CNY 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 CNY 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.
- 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 CNY 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 Ocean and Fishery Bureau, 2012).

- On April 16, the State Council promulgated Water Pollution Prevention and Treatment Action Plan. By 2020, the action plan seeks to clean 70% of seven major rivers in China, achieve grade III water quality level in 93% of rivers for drinking water use. Integrated measures cover pollution reduction in ten priority industries, sewage treatment in urban and rural areas and ports; industrial restructuring and upgrading; water conservation through water efficiency improvement and technical support; use of market mechanisms; law enforcement; water environment improvement through total pollution control, environment risk assessment; safeguard of water security; clarity in roles and responsibilities of all parties; and enhancement of public participation and scrutiny. This action plan is expected to leverage 1 trillion yuan investment.

Major Challenges in Meeting SDS-SEA Objectives and Targets

- **Segmented ocean management mechanism.** China adopts a management system that integrates overall supervision and sectoral and hierarchical management where the functions of resource development and resource management departments overlap. The segmented management system has artificially divided the marine ecosystem as a functional unit into different areas of supervision and management by different agencies, thus,

compartmentalizing the rules and functions of an integrated marine ecosystem. The situation fails to solve marine ecological-environmental problems across administrative borders and agencies due to the limitations of the management mechanism that lacks coordination and a common and coherent enforcement of the laws.

- **Legislative system fails to consider ecosystem approach.** Some existing laws and regulations were developed to address the development, utilization, protection and management of sectoral marine resources. On one hand, the sector laws over-stress the importance and peculiarities of certain species of marine resources and its development and utilization under sector management and pays improper attention to the needs and benefits of other industrial sectors and marine resources. A situation is created where prominence is given to sector features, a lack of coordination among different sectors and conflicting regulations and policies are issued by various departments. The result is an absence of a united national ocean policy. On the other hand, many laws and regulations pay more attention to the contents and structure of common, similar and general environmental protection issues, therefore, failing to adapt to the ecosystem-based integrated ocean management due to lack of solutions to practical environmental issues in different regions, and more specifically, due to the lack of regional environmental management legislation.
- **Disconnection between land and sea environmental protection programs and action plans.** Planning and implementation of pollution mitigation programs at the national, regional and local levels and coastal and

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ocean management programs have not considered watershed and its connection to the sea. This has failed to effectively link ocean planning with watershed-wide planning as well as sea use planning

and land use planning. Integrated decision-making between marine environmental protection and coastal regional development should be further strengthened.

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

- Develop and implement the national ocean and coast sustainable development strategy and programs.
- Conduct strategic environmental assessment of ocean-related programs and plans.
- Develop basic ocean law, coastal management law and Bohai sea environment management law.
- 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.
- Demonstrate of environment accounting in coastal areas to appreciate the value of coastal and marine ecosystem services.
- 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

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The Democratic People's Republic of Korea's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2015)

Basic Facts	
Total Population	24,759,000 (2013)
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 km ²
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 per capita (current US\$)	22,070 (2009)
GDP composition by sector	Agriculture: 13.8% (2007); Industry: 44.9% (2007)

Supporting Sectoral Policies and Legislation

Climate Change/Disaster Risk Reduction

- 1st National Communication on Climate Change DPRK under the UNFCCC (2000)
- National program to prevent/mitigate hazards from flooding (2010)
- DPRK Law on Disaster Prevention, Rescue and Restoration (2014)



Biodiversity/Habitats

- DPRK Law on Environmental Protection Revised (2013)
- DPRK Law on Nature Conservation Areas Revised (2014)
- DPRK Law on Rivers and Streams Revised (2013)
- Cabinet Decision No. 97 "Enforcement Regulations on Useful Animals Conservation Law" (1999)
- DPRK Forest Law revised (2012)
- DPRK Agro-forestry Regulation



Progress in SDS-SEA Implementation (2003-2015)

National Ocean Policy and Institutional Arrangements

Status of coastal and ocean policy/legislation:

- Integrated Coastal and Marine Development Plan of West Sea of Korea
 - National Ocean Science and Technology Development Strategy (2015~2020)
 - Regulation on Protection, Management and Supervision of Coastal Areas and Seas (revised in 2015)
 - National Economic Development Strategy (under development)
 - Integrated Coastal Management Plan of Wonsan City, Kangwon Province (under development)
 - Eco-environmental Protection Plan for Wonsan Area (under development)
- The Maritime Supervision Administration (MSA) is the administrative authority for the marine affairs of DPR Korea and the main mission of MSA 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. The Ministry of Fisheries (MoF) is responsible for the production of fish 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. The State Hydro-meteorological Administration (SHMA) has the responsibility and duty for weather and hydrological forecasting.
 - Thanks to the close cooperation between relevant stakeholders, DPRK has made many achievements in the coastal and marine areas management:
 - Regulation on Protection, Management and Supervision of Coastal and Marine Areas has been revised,
 - Boundary Coastal and Marine Supervision Bureau has been newly established in MoLEP,
 - A system of managing the coastal and marine areas by square meter has been adopted, and
 - Eco-environmental monitoring and supervision capacity has been constantly strengthened.

Institutional Arrangements

- There are various agencies related to the management of the coastal and marine areas of the DPRK.
- The Ministry of Land and Environmental Protection (MoLEP) is the main body responsible for the environmental management and supervision. It is a leading agency for developing policy and strategies related to environmental protection and sustainable development of coastal and marine areas.
- 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 of 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 15 years.

Status of ICM policy/legislation

The country has various laws in accordance with the principles of integrated coastal management (ICM). The government is going to scale-up ICM Programme in line with the already existing legislations in support of ICM activities. The Draft SDS-SEA Implementation Plan of DPR Korea for 2015-2020 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;

National Ocean Policy and Institutional Arrangements, continued.

- 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.

Fisheries

- DPRK Law on Fishery Revised (2014).
- Cabinet Decision No.45 “Regulations on Creation, Conservation and Supervision of Marine Resources” (2013).
- DPRK Fish Breeding Law Revised (2014)

River Basins/Water Quality

- DPRK Law on Water Resources (1997)
- “Masterplan for Land and Environment of the Taedong River”, adopted by Decree No. 2819 of the Presidium of Supreme People’s Assembly, DPR Korea (2008).
- DPRK Law on Prevention of the Taedong River Pollution Revised (2013).
- “On Setting up of Wonsan - Mt.Kumgang Area as International Tourist Resort”, adopted by Decree No. 48 of the Presidium of Supreme People’s Assembly, DPR Korea (2014)
- DPRK Law on City Management Revised (2015)

Pollution Reduction and Waste Management

- DPRK Law on Marine Pollution Prevention Revised (1999)
- DPRK Maritime Law Revised (1998)
- DPRK Law of the Land Revised (1999)

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. National Ocean Science and Technology Development Strategy was completed in 2014 and National Environmental Protection Strategy is in final completion. 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. The country has decided to scale up the ICM to Wonsan City by shifting from West Sea to East Sea and from local level to central level. Some challenges, however, are present in the ICM scaling up process in the country. This includes the limited investment to the environmental sectors as well as the need to build awareness and consensus among the government agencies.

Percentage of national coastline with ICM implementation

Nampho City: ICM coverage 127 km or 7.06% of the country’s coastline

Taedong River basin: ICM coverage about 450 km or 15.6% of the country’s coastline

- 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 Revised (2004)
- DPRK Land Planning Law Revised (2004)
- DPRK Law on Environment Impact Assessment Revised (2007)
- DPRK Law on Sewage System (2009)
- DPRK Law on Air Pollution Control Revised (2014)
- “Control Regulations of the Environment Protection Law”, adopted by Decision No. 22 of the Cabinet, DPR Korea (2015)

Livelihood/Food Security

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

“Sustainable food security and improvement of the quality of life” is a primary concern of the DPRK Government among its priorities of development.

The basic principle of the Government policy for solving food problems is self-sufficiency in food. The

policy aims at producing 6.0 million tons of grain for the present year and 7.0 million tons for the years to come, thus solving food problems in the main and putting the food supply on a sustainable footing.

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.

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

Rivers and Streams	Basin area (km ²)	Ca ²⁺	Mg ³⁺	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.

- 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.
- IIMS Networking Workshop, Nampho on 4-7 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)
- Workshop on 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.

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).
- PEMSEA in collaboration with the GBCIO conducted a National Integrated Coastal Management (ICM) Train-the-Trainers Course 1 on 30 March - 1 April 2011, Pyongyang of DPR Korea.
- The National ICM Training conducted on 29-31 August 2012, ICM Training Centre, Kim Il Sung University, Pyongyang, DPRK (53 participants including trainers)
- Consultation Workshops on the Development of Wonsan Integrated Coastal Management on 1-2 July 2013, Wonsan City, Kangwon Province, DPRK (16 participants)
- Workshop on the National integrated coastal and marine management conducted in March 2013, ICM Training Center, Grand People's Study House, Pyongyang, DPRK (136 participants including trainers)
- The National ICM Training conducted on 15-16 September 2013, Wonsan Fishery University,



Kangwon Province, DPRK (68 participants including trainers)

- The National ICM Training conducted on 17-19 September 2014, ICM Training Centre, Kim Il Sung University, Pyongyang, DPRK (72 participants including trainers)
- The National Consultation Workshop for Continuous Implementation of SDS-SEA in DPRK on 10 June, 2015, Koryo Hotel, Pyongyang city of DPRK and The Wonsan Consultation Meeting on Study of the Eco-environmental State of Wonsan-Mt. Kumgang Area, 11 June 2015, Tongmyong Hotel, Wonsan city of DPRK (Mr. Stephen Adrian Ross, Executive Director, Dr. Chua Thia-Eng, Chair Emeritus of PEMSEA and 27 national stakeholders participated in the National workshop and 11 national stakeholders in Wonsan Meeting)

State of the Coasts

Ministry of Land and Environment Protection has conducted and published, in cooperation with the United Nations Environment Programme, Environment and Climate Change Outlook on the Democratic People's Republic of Korea in 2012. 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).

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.

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 in recent years. Over the period from 1918 to 2000 the average temperature increased by 1.9°C. This represented one of

the fastest rates of warming among Asian countries. Climate change is a significant concern since many human and environmental systems are already vulnerable to climate variability including droughts and floods.

Heavy rainfall events have exacerbated soil erosion in areas where forest cover has been removed and increased sediment loads in waterways and lakes. Assessments of flood vulnerable areas have been already conducted in DPR Korea in response to the challenges posed by climate change and disaster risk. The program for the mitigation of damages from flood has already completed in March, 2010. The government established the National Emergency Disaster Commission in 2014 and set up various departments to address and guide the integrated issues for disaster risk reduction into various agencies including the Ministry of Land and Environment Protection. 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

The DPR Korea is bounded to east and west by ocean. The East Sea of Asia strongly influences the marine environment around the country, although the east and west coasts differ greatly. On the east, the coastline is largely made up of exposed erosion areas, while the western shoreline is largely depositional with wide areas of tidal flats.

Both seas are rich in biodiversity. The eastern water contains over 450 species of 295 genera of 140 families while the western waters have 250 species of 181 genera of 108 families. The primary commercial species in the west are anchovy and mackerel in offshore waters and shrimps and mollusks in coastal waters. The east coast has cold-current fish that include herring, Pollack, cod and sailfin sandfish. The eastern waters also have 546 species of seaweed that are of high economic value, including 329 species of red algae. The DPR Korea has undertaken public awareness activities to protect biodiversity, including publishing a Red Book of Plants in 2005, which reports the status of seed plants, based on a national survey on rare and endangered species. Public education programs promote the conservation of endangered and threatened species.

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 DPR Korea Environment and Climate Change Outlook has identified some challenges to ensuring the management of habitats and biodiversity in the country. The reasons for biodiversity loss are complicated but can mainly be attributed to human activity influencing natural processes. In general, drivers and pressures affecting biodiversity are population growth, habitat conversion, alien species intrusions, environmental pollutants, soil and water loss, and unsustainable extraction of natural resources.

Fisheries

Recognizing the need to sustain resources, at the same time meet the food demand for its population, the government has attached importance to fishing 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

Korea is rich in water resources. By enacting the Law on Water Resources, the Government established a legal framework for developing, using and conserving water resources, and took steps for conserving water resources throughout the country and using them more effectively for human daily life. However, water resources have diminished by more than 20% in recent years due to severe droughts, flood damage and destruction of forests as result of climate change. On the other hand the development of the economy and the increase of the population have led to an increase in the proportion of utilization of water resources from 11.2% in 1990 to 18.6% in 2008. In 2008 the proportion of water used for industry was 30%, for agriculture 62% and for households 8%.

Pollution Reduction/Waste Management

Growing population, coastal development and other activities exert pressure to the rivers and seas 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 and seas 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 in particular. Therefore, the water quality of Taedong River and Wonsan Bay does yet come up to the Standard of the State Environment Protection.

The government has adopted Decree No. 2819 of the Presidium of Supreme People's Assembly, DPR Korea "Master plan for Land and Environment of the Taedong River" to urgently deal with pollution problems in Taedong River and Decree No. 48 of the Presidium of Supreme People's Assembly, DPR Korea "On Setting up of Wonsan - Mt. Kumgang Area as International Sightseeing Resort" in 2014.

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.

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.

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.

- To reduce natural calamity by climatic change;
- To introduce the latest science and technology related to the coastal and sea;



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

The Draft SDS-SEA Implementation Plan of DPR Korea for 2016-2020 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, 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;
- Scale up ICM in Nampho and Taedong River basin areas; and
- Scale up ICM in Wonsan City located in the Korea East Sea (from 2016 to 2020).

• 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.

- To strengthen public awareness on the Integrated Coastal Management;
- To improve environmental infrastructure; and
- Lack of national investment on monitoring and assessment on environmental change of the coastal and maritime area.

DPRK has regarded the environmental protection and sustainable development of economy as principle of state actions, and devote the utmost attention to this work, and will contribute to the environmental protection of the earth by strengthening international exchange and cooperation.

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- UNEP.2012. Environment and Climate Change Outlook∥DPR Korea
- UNSTATS, Millennium Development Goals Progress Report∥Central Bureau of Statistics, DPR Korea



Indonesia's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2015)



Basic Facts	
Total Population (2010)	237.6 million
Forecast population (2015)	247.6 million
Forecast population (2020)	271.07 million
Population growth rate (2005)	1.3%
Average Annual Population growth rate	1.49%
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 (2013): 9,083,972.2 (Billion Rupiahs) (approx. US\$825.8 B)

GDP per capita (2013) (at current market prices)

IDR 36,508,486 (approx. US\$ 3,319 at US\$ - IDR 11,000)

GDP composition by sector (2013, Badan Pusat Statistik)

Agriculture, forestry, hunting and fishery (14.43%); mining and quarrying (11.24%); manufacturing industry (23.70%); electricity, gas and water (0.77%); construction (9.99%); trade, hotel & restaurants (14.33%); transport and communication (7.01%); finance, real estate and business services (7.52%); services (11.02%)

Employment by sector (Labor force: 114,021,189) (February 2013, Badan Pusat Statistik, BPS)

Agriculture, forestry, hunting and fishery (35.04%); mining and quarrying (1.36%); manufacturing industry (12.97%); electricity, gas and water (0.22%); construction (6.04%); wholesale and retail trade, restaurants and hotels (21.75%); transportation, storage and communications (4.59%); financing, insurance real estate and business services (2.64%); community, social and personal services (15.38%)

Major contributing sectors to the marine economy

Table 1

Major contributions to national employment

Table 2

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 (2003-2015)

National Ocean Policy and Institutional Arrangements

- National Act (NA) No 27/2007 on Management of Coastal Areas and Small Islands puts forward the implementation of ICM; amended through National Act No 1/2014 on Management of Coastal Areas and Small Islands.
- Adoption of national ocean policy (National Act No 32/2014 on Marine Affairs adopted on September 2014).

Table 2. Major Contributor to National Employment.

No.	Main Industry	2014	
		February	August
1	Agriculture, Forestry, Hunting and Fishery	40,833,052	38,973,033
2	Mining and Quarrying	1,623,109	1,436,370
3	Manufacturing Industry	15,390,188	15,254,674
4	Electricity, Gas, and Water	308,588	289,193
5	Construction	7,211,967	7,280,086
6	Wholesale Trade, Retail Trade, Restaurants and Hotels	25,809,269	24,829,734
7	Transportation, Storage, and Communications	5,324,105	5,113,188
8	Financing, Insurance, Real Estate and Business Services	3,193,357	3,031,038
9	Community, Social, and Personal Services	18,476,287	18,420,710
10	Others	118,169,922	114,628,026

Indonesia National Development Plans

The current Long-term National Development Plan (2005-2025) and the National Medium-term Development Plan 2009-2014 and 2015-2019 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.

Indonesia National Development Plans, continued.

- **National Medium-term Development Plan (2010-2014)**

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.

- **National Medium-term Development Plan (2015-2019)**

1. Availability of transport infrastructure and electricity
2. Conservation of water resources
3. National defense capabilities, including the territorial sea
4. Increasingly integration of manufacturing industry with agriculture, marine and other natural resources
5. Development of education science and technology

Governance-related Challenges (SDS-SEA consultation)

- Lack of national/local marine and coastal policy
- No comprehensive land (terrestrial), coastal and sea use
- 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



Monitoring and Evaluation

- The State Ministry of Environment and Forestry (MoEF; formerly Ministry of Environment/MOE) conducts monitoring and key data included in State of Environment Report (regular monitoring conducted in 30 rivers on pH, BOD and COD; fecal coliform monitored in 21 rivers; total coliform monitored in 24 rivers). Along with that, some local governments such as Jakarta, Batam and Bontang have been conducting regular water quality monitoring in their coastal waters as part of their monitoring and evaluation programs.
- The Ministry of Environment and Forestry (MOEF) 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); the SOC guide was translated in Bahasa and published by MOEF.
- In 2013, PEMSEA, Sukabumi Regency and the Center for Coastal and Marine Resources Studies of Bogor Agricultural University (CCMRS-IPB), co-organized a workshop for the development of the SOC Reporting System in Sukabumi Regency.
- CCMRS-IPB also organized an ICM Forum for Leaders that was held in Bogor in 2013 to discuss progress and accomplishments and define a strategy for improving ICM implementation in Indonesia.
- Statistical reports on coastal and marine resources are published by the National Bureau of Statistics in cooperation with MoMAF.

SDS-SEA-related Legislation, Policies and Plans

Coastal and Water Resources Management

- National Act No. 7/2004 on integrated water resources management at the basin level
- National Act No. 32/2004 on decentralization of authorities and responsibilities in coastal and marine management; National Act No 23/2014 on Local Government Autonomy provides authority to provincial governments to manage natural resources and environment

- National Act No. 27/2007 concerning management of coastal zones and small islands provides the framework and process for integrated planning, use and management of coastal and marine areas; amended through National Act No. 1/2014
- 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)
- National Act 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.
- National Act No. 19/2008 on water resources management
- MoMAF Ministerial Decree No 12/ 2013 on the Surveillance of Coastal Area and Small Islands Management
- National Act No 23/2014 on Local Government Autonomy provides authority to provincial governments to manage natural resources and environment
- MoMAF Ministerial Decree No 40/2014 on the Active Involvement and Empowerment of Community in Coastal and Small Islands Management
- MoMAF Ministerial Decree No. 4/ 2014 on the Planning of Coastal and Small Islands Area Management

Development and Spatial Planning

- National Act 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.

- National Act 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.
 - National Act (NA) No 27/2007 on Coastal and Small Islands Management
 - MoMAF Ministerial Decree No, 62, 63 and 64/2014 on Management Plan and Waters Natural Sanctuary Zoning on the area of South-Eastern Part of Aru Islands (2014-2034), Raja Ampat (2014-2034) and Tourism Park of Padaido Islands (2014-2034)
 - Local Government Regulations on Zonation Plan of Coastal Area and Small Islands
 - Special Area of Yogyakarta Province (Local Regulation No. 16/2011)
 - East Java Province (Local Regulation No. 6/2012)
 - Central Java Province (Local Regulation No. 4/2014); plan covering 2014-2034)
 - Pekalongan City (Local Regulation No. 4/2010)
 - Ternate City (Local Regulation No. 36/2011)
 - Gresik City (Local Regulation No. 8/2011)
 - Kendari City (Local Regulation No. 5/2013)
 - Banjar Regency (Local Regulation No. 3/2013)
 - East Bolaang Mongondow Regency (Local Regulation No. 5/2013)
 - Pangkep Regency (Local Regulation No. 13/2013)
 - Kubu Raya Regency (Local Regulation No. 23/2011)
 - Local Government Regulation of West Sumatera Province No 13/2012 about Spatial Planning of West Sumatera Province 2012-2034
- Fair and Equitable Sharing of Benefits Arising from Their Utilization to The Convention on Biological Diversity
- 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)
 - National Strategy and Action Plan for the Management of Indonesia's Wetlands (2004)
 - Ministerial Decree (MOE) No 201 (2004) on the Standard Criteria for Mangrove Ecosystem
 - Ministerial Decree (MOE) No 200 (2004) on the Degradation Standard Criteria for Sea Grass Ecosystem
 - Presidential Decree No. 121 (2012) on Rehabilitation of Coastal and Small Islands Area
 - MoMAF Ministerial Decree No 07/ 2013 on the Certification of the Origin of the Seaweed
 - MoMAF Ministerial Decree No 17/ 2013 on the Permits for Coastal Reclamation in Coastal and Small Islands Area
 - MoMAF Ministerial Decree No 18/ 2013 on Declaration for Full Protection of Whale Shark (*Rhincodon typus*)
 - MoMAF Ministerial Decree No 35/ 2013 on Procedures for the Declaration of the Protection Status of Fish Species
 - MoMAF Ministerial Decree No 04/ 2014 on Declaration for Full Protection of Manta Ray Fish
 - MoMAF Ministerial Decree No 13/ 2014 of the Network of Indonesian Aquatic Conservation
 - MoMAF Ministerial Decree No 28/ 2014 on the Change of the Ministerial Decree No 17/ 2013 about the Coastal Reclamation Permits in Coastal and Small Islands
 - MoMAF Ministerial Decree No 41 (2014) on the Banning of Entry of Dangerous Fish from Outside of the Republic of Indonesia Territory

Biodiversity and Habitat Protection

- Indonesian Biodiversity Strategy and Action Plan (IBSAP, 2003) guides the implementation of national biodiversity program until 2020
- Law No 11 (2013) on the Ratification of Nagoya Protocol on Access to Genetic Resources and The



Fisheries

- Fishery Law No. 31/2004
- Government Regulation No. 60/2008 on Fish Conservation Management
- NA No. 45/2009 on Fisheries Management
- Marine Affairs Law No. 32/2014
- MoMAF Ministerial Decree No 04/ 2013 on Guideline on Business Development in Fisheries Sector Based on Community Group
- MoMAF Ministerial Decree No 03/ 2014 on the Strategic Plan of the Ministry of Marine Affairs and Fisheries 2010-2014
- MoMAF Ministerial Decree No 18/2014 on the Area of Management of Fisheries in the Republic of Indonesia
- MoMAF Ministerial Decree No 21/ 2014 on the Banning of Export of Ornamental Fish Arwana and Live Fries of Bofia Fish from the Area of the Republic of Indonesia
- MoMAF Ministerial Decree No 46/ 2014 on the Declaration of Limited Protection Status of Sea Bamboo (Isis spp.)
- MoMAF Ministerial Decree No 56/2014 on Moratorium of Fishing License for Large Fishing Vessels.
- MoMAF Ministerial Decree No. 57/2014 on Transshipment Banning
- MoMAF Ministerial Decree No 59/2014 on the Banning of Export of Cowboy Shark Fish (*Charcharhinus longimanus*) and Hammer Shark (*Sphyrna* spp.) from the Republic of Indonesia
- MoMAF Ministerial Instruction No 630/ 2014 on the Implementation of Temporary Hold (Moratorium) of Legal Permit Issuance on Capture Fisheries, Transshipment in the Sea and Use of Foreign Ship Labour
- Governmental Decree No. 62/ 2014 on the Implementation of Education, Training and Extension on Fisheries
- MoMAF Ministerial Decree No. 1/2015 on Banning Catch of Spawning Lobster, Mangrove Crabs and Blue Swimming Crabs
- MoMAF Ministerial Decree No. 2/2015 on Banning Trawls and Similar Fishing Gears
- MoMAF Ministerial Decree No. 4/2015 on Banning of Fishing in the Fisheries Management Area No. 714 of the Republic of Indonesia
- Ministerial Decree No. 2/2015 on Banning Trawls and Similar Fishing Gears

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)
- Solid Waste Management Law No. 18/2008
- Regulation No. 16/2008 on the National Policy and Strategy for the Development of Domestic Wastewater Management
- National Act No 32/2009 on Environmental Protection and Management.
- Law No. 19/2009 on Ratification of Stockholm Convention On Persistent Organics Pollutants
- Ministerial Decree of MOE No. 17/2009 on Guideline of Carrying Capacity Determination in the frame of Spatial Planning Mechanism
- Ministerial Decree of MOE No. 18/2009 on Permits on Hazardous Substances Management
- Ministerial Decree of MOE No 31/2009 on Extension and Control of the implementation of Systems of Environmental Management, Ecolabeling, Clean Production, and Environmental Based Technology in Local Government
- Ministerial Decree of MOE No. 05/2009 on Waste Management in Port Area
- Ministerial Decree of MOE No. 03/2010 on Waste Water Standard for Industrial Area
- Ministerial Decree of MOE No. 01/2010 on Water Pollution Management

- Ministerial Decree of MOE No. 13/2010 on Environmental Management and Environmental Monitoring and Letter of Statement to Conduct Environmental Management and Monitoring
- Ministerial Decree of MOE No. 02/2010 on The Use of Electronic System of Hazardous Substances Registration in the frame of Indonesia National Single Window within Ministry of Environment

Climate Change and Disaster Risk Reduction

- Law No. 24/2007 on Disaster Management required the government to establish Disaster Management Agencies at the national, provincial and district levels. The National Disaster Management Agency was established in 2008. Disaster Management Agencies have been established in all 33 provinces and in 399 (out of 497) districts and cities in the country.
- 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) 2006-2009
- National Action Plan Addressing Climate Change (2007)
- National Plan for Disaster Management 2010-2014; Regional Disaster Management Plans of all 33 provinces formulated
- National Action Plan for Disaster Risk Reduction 2010-2012
- National Act No 17/2009 concerning shipping mandates the improvement of management quality of port authority

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)
- Payment for ecosystem services (PES) approach has been tested in some areas in relation to eco-tourism.

Information and Public Awareness

- The Ministry of Environment and Forestry (MOEF), Ministry of Marine Affairs and Fisheries (MOMAF) 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)
- The MOEF also implements programs that promote participation of various sectors and stakeholders in environmental protection and management, including the following:
 - Adiwiyata - a program that encourages the creation of knowledge and awareness and participation of community schools on efforts to conserve the environment.
 - Kalpataru - Environmental Awards at the national level are given to individuals or groups who have demonstrated their pioneering work in the function of preserving the environment. Presented by the Head of State of the Republic of Indonesia every year on World Environment Day on June 5.
 - Proper - Environmental Management Awards for company in managing their environment aimed to improve role of company in managing environment and to enhance stimulant effects on companies in managing environment, natural resources, energy conservation and community development.



- National Biodiversity Information Networks collaboration between LIPI, Universities and BIG (Geospatial Information Agency)
- 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
- National ICM Forum conducted in Indonesia every three years (2010, 2013)

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.
- 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
- Orientation of members of high level ICM coordination committee and ICM training and planning workshop for nine subdistricts of Sukabumi Regency conducted by MOE, CCMRS and PEMSEA in May 2012. A workshop on the development of State of the Coast Reporting System was conducted in December 2013.
- 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
- MoMAF entered into a partnership with the Coral Triangle Center in 2012 on human resources development and training to support management of marine conservation area, including the establishment of a Center of Excellence in Bali.
- National Training Course on Marine Spatial Planning (MSP) conducted in 2012 in cooperation between CCMRS-IPB and COBSEA

ICM Implementation

- The multisectoral nature of marine and coastal resources management and the need for integrated management was recognized in Indonesia in the early 1990s, 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)
 - The Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security or CTI-CFF (2007 – 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)
 - USAID-Indonesia Marine Resources Program (ongoing)
 - Capturing Coral Reef and Related Ecosystems Services (CCRES) Project
- 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. As of 2014, under the guidance of MoMAF, ICM implementation has been initiated in at least 151 out of a total of 300 coastal regencies/cities, covering 25,587 km of coastline equivalent to around 27.94% of Indonesia's national coastline. Four provinces (Special Area of Yogyakarta, East Java, Central Java and West Sumatera) and 9 regencies and cities have adopted Coastal and Marine Zonation Plans in the form of Government Regulations, while most of the other sites are in the process of developing ICM plans and governance mechanisms.
- 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. An updated coastal strategy for the province was prepared and approved by the provincial legislative body in 2013.
- Sukabumi Regency, PEMSEA site since 2003, also has an interagency and multisectoral ICM



ICM Implementation, continued.

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 covering the three provinces of Jakarta, West Java and Banten in 2010. Development of an ICM program focusing on pollution reduction has been initiated in North Jakarta.
- The three provinces surrounding Tomini Bay (North Sulawesi, Central Sulawesi and Gorontalo) also adopted the Tomini Bay Integrated and Sustainable Management Strategic Plan in 2009. Capacity building and development of ICM programs are being undertaken through the facilitation of MOE and MOMAF.
- Strategic Action Plans for Coastal and Marine Environment for 3 provinces in Tomini Bay, 3 provinces in Jakarta Bay, 2 provinces in the Bali Strait and 8 provinces in the East Coast of Sumatera have been completed through the support of the MOE, in cooperation with concerned local governments, relevant national agencies, and various stakeholders. The action plans delineate roles of local governments and various stakeholders in addressing problems in the respective areas over the short-, medium- and long-term, and are expected to enhance synergy and coordination in addressing environmental problems effectively and efficiently.
- Under the GEF/UNDP/PEMSEA Project on Scaling Up the Implementation of the SDS-SEA (2014-2019), PEMSEA and MOEF, with the support of CCMRS-IPB and in consultation with national and local stakeholders, selected 3 regencies (Sukabumi, East Lombok, and Tangerang), 1 city (Bontang) and 2 provinces (Bali and Central Sulawesi) as ICM Learning Sites to demonstrate how ICM can enhance the effectiveness of implementing management programs on pollution, water resources, habitat protection and biodiversity conservation, sustainable fisheries and alternative livelihoods, and climate change adaptation and

Location of ICM Program	Length of Coastline (km)
Bali Province	430
Sukabumi Regency	117 ¹
Tomini Bay	2,500.46
Bontang City	24.4
15 provinces and 40 coastal districts (MCRMP); coastal management regulations enacted in 4 provinces and 9 districts/ cities	6,761 ²
Other coastal districts developing coastal strategic plans	No data
COREMAP, CTI/SSME, BOBLME, ATSEA	No data
Total	9,715.86

1 Coastline of regency counted under West Java Province (under MCRMP)
 2 Coastline of provinces/regencies/cities that have enacted coastal management regulations, excluding coastline of one regency covered under Tomini Bay

disaster risk reduction. 21 provinces were also identified as priority sites for scaling up development and implementation of ICM governance mechanisms, with a target of covering around 50% of the country's coastline by 2015.

- 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 1998-2018. Phase I (Initiation/Pilot Phase; 1998-2003) was implemented in Kepulauan Riau (Riau), Sikka (East Nusa Tenggara), Selayar (South Sulawesi) and Biak (Papua). Phase II (Acceleration; 2004-2011) was 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). Phase III (Institutionalization; 2014-2018) will be implemented in 7 Districts (Selayar, Pangkep, Sikka, Wakatobi, Buton, Biak, Raja Ampat) and 7 national marine conservation areas (Padaido, Raja Ampat, Waigeo Barat, Kapoposang, Laut Sawu, Aru Tenggara, and Laut Banda).
- The Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF) is a

ICM Implementation, continued.

multilateral partnership of six countries (Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands and Timor-Leste) formed in 2007 to address the urgent threats facing the coastal and marine resources of one of the most biologically diverse and ecologically rich regions on earth. CTI-CFF is managed through a Secretariat based in Jakarta, Indonesia. Countries have adopted the CTI-CFF Regional Plan of Action and their respective National Plan of Action (NPOA). CTI implementation in Indonesia is led by a multisectoral National Coordinating Committee (NCC) and thematic working groups focusing on seascapes, fisheries, marine protected areas, climate change, threatened species protection, monitoring and evaluation and capacity building. Key achievements in Indonesia include the following: (1) identification of priority seascapes; (2) completion of zoning regulations for fishing gears that support sustainable fisheries; (3) designated a 1.2 million hectare marine park as a protected area; (4) conduct of community information campaigns on climate change; (5) development of a school for marine conservation and the institutionalization of a marine protected area training curriculum.

- 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. The Transboundary Diagnostic Analysis (TDA) has been completed and a Strategic Action Programme (SAP) has been drafted for the BOBLME area.
- 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. The TDA has been completed and the SAP has been adopted for the Arafura and Timor Seas area.

- The USAID-Indonesia Marine Resources Program provides support to projects and activities such as: (1) Indonesia Marine and Climate Support (IMACS); (2) Coral Triangle Support Partnership (CTSP); (3) National Oceanographic and Atmospheric Administration (NOAA) Capacity Building and Training Program; (4) Marine Protected Area Governance (MPAG); (5) Grants to nongovernmental organizations for climate change adaptation and disaster risk reduction activities; and (6) Partnerships with universities for augmenting scientific research and education on biodiversity. IMACS is the major USAID project supporting MoMAF with the implementation of its five-year Strategic Plan (2010-2014) in the areas of policy, sustainable fisheries, and climate change.
- CCRES aims to design and support the uptake of innovative models for valuing mangrove, seagrass and coral reef ecosystem services with the potential to enhance the sustainability of marine-based enterprise and marine spatial planning in select coastal communities in Indonesia and the Philippines.
- 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. The City of Bontang is the first to adopt an integrated land and sea use zoning plan.
- Based on available coastline data, ICM is being implemented, at varying scales, in at least 3.1 % of Indonesia's national coastline, one of the longest in the world.
- Based on available coastline data, ICM program development has been initiated, at varying scales, in around 28% of Indonesia's coastline, one of the longest in the world. Local governments that have adopted coastal management plans cover at least 10 % of national coastline.



Sustainable Development Aspects

Natural and Manmade Hazards

- Indonesia is one of the countries vulnerable to natural and climate-related hazards. The country is affected by floods, landslides, droughts, tsunamis, earthquakes, volcanoes and forest fires. In particular, floods and earthquakes are the most frequent disasters. Between 2003-2005 alone, there were approximately 1,429 disaster incidents in the country. From 2000-2010, the annual average direct damage from disasters ranges from US\$ 100 – 110 billion, equivalent to 5% of national GDP, with an average of around 1,000 casualties annually. Flooding was the topmost disaster in the last five years. In addition to natural hazards, Indonesia also experiences human-induced disasters such as oil spills, urban/structural fires, air/land/sea mishaps, and other incidents.
- 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)
 - Coastal Village Resilience Program (Program Desa Pesisir Tangguh or PDPT) of MOMAF - implemented in 66 villages in 22 Districts (2012 – present)
 - ProKlim (Climate Village Program) of the MOEF encourages community participation in implementing local actions on climate change adaptation and mitigation.
 - Implementation of the GHG Emission Reduction Plan, targeting 26% reduction by 2020
 - Programs on disaster prevention and management implemented by the National Disaster Management Agency in coordination with other ministries, including establishment of early warning systems for key hazards; national disaster information system; inclusion of DRR in school curriculum; establishment of systems for risk and data analysis such as the Indonesian

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

Disaster Data and Information, hazard and vulnerability databases, and various scientific tools; etc.. InaSAFE 2.0, a software that can predict the social and human impacts of natural disasters using scientific hazard information and community knowledge on disaster risk for better planning, preparedness and response, was launched in April 2014.

- 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. The City of Bontang has adopted an integrated land and sea-use zoning plan.
- 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.
- As of 2013, risk maps have been prepared for all 33 provinces.

Habitats and Biodiversity

- Indonesia has the largest area of coral reef in Southeast Asia, which are among the most biologically rich in the world. Estimates of the areal extent of these coral reefs vary, but they likely total about 51,000 km². The Indonesian archipelago is estimated to harbor over 75% of the world's coral species, with more than 590 species of corals identified in Indonesian waters. At

Table 3. Status of Coral Reefs in Indonesia, 2011

Location	Number of stations	Excellent (%)	Good (%)	Fair (%)	Poor (%)
West	479	5.64	28.81	34.03	31.52
Middle	292	5.82	30.14	44.18	20.55
East	305	5.25	20.98	34.43	39.34
Indonesia	1,076	5.58	26.95	36.90	30.76

Notes: Data collected from 1,076 observation stations across Indonesian waters.

Excellent: 70%–100% live coral cover

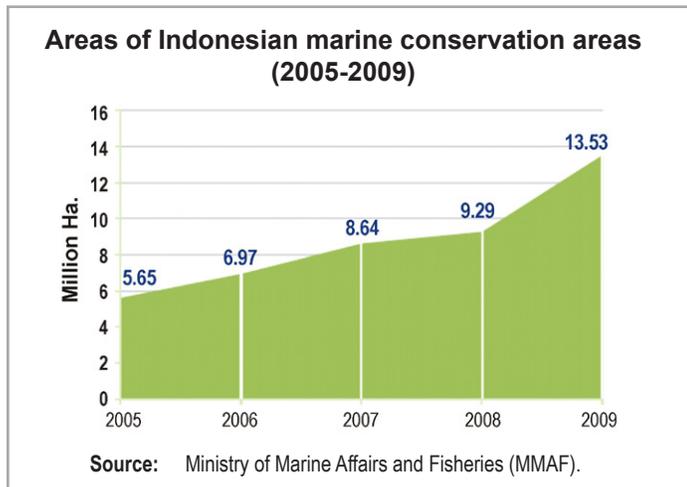
Fair: 25%–49% live coral cover

Poor/Bad: 0%–24% live coral cover

Source: State of the Coral Triangle - Indonesia

least 553 species of Scleractinian corals are found in Raja Ampat, which has one of the world’s richest coral reef fish fauna, consisting of at least 1,320 species, the highest count in the world for an area of that size.

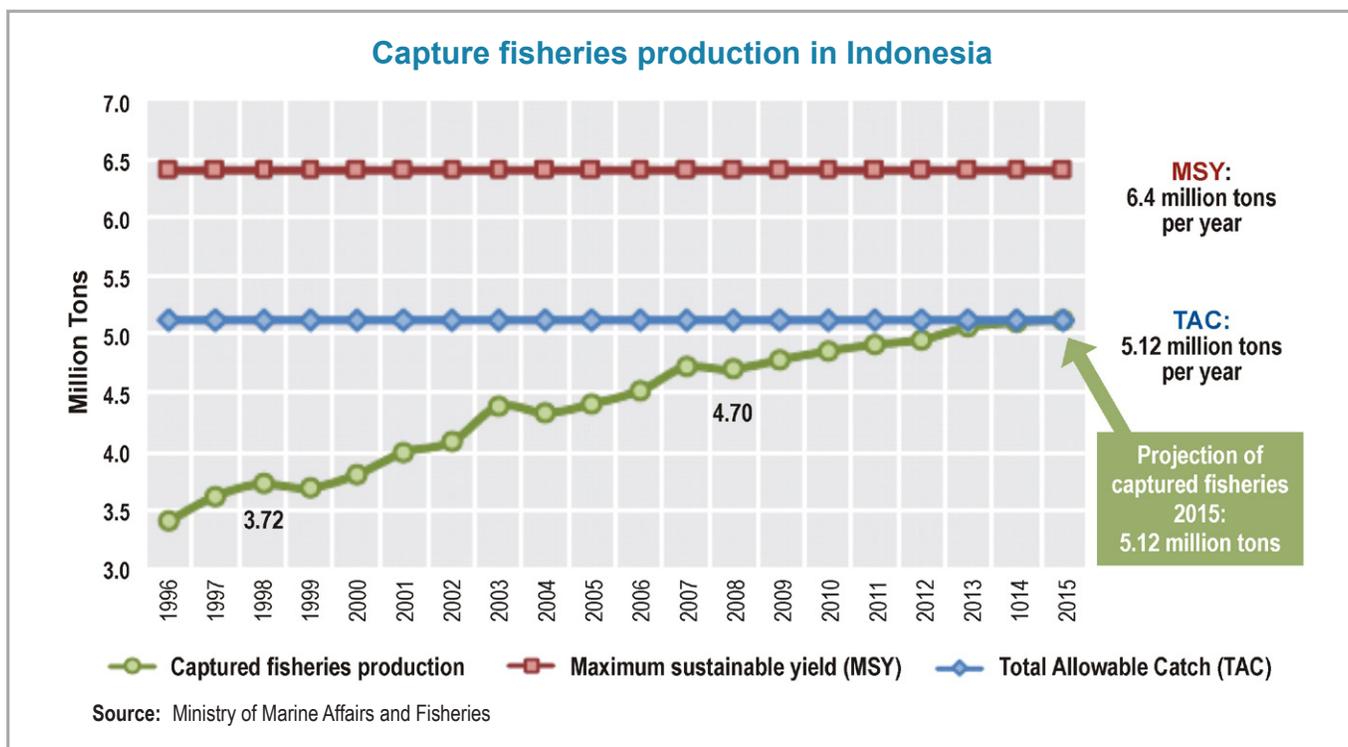
- From 1993 to 2008, evaluations of coral reef indicated a slight improvement in their condition. At the end of 2008, about 5% of the reefs were in excellent condition, 25% in good condition, 37% in moderate condition, and 32% in bad condition.



- The results of monitoring activities in 1,076 stations all over Indonesia indicate that at the end of 2011, about 5.6% of coral reefs were in excellent condition, 27.0% in good condition, 36.9% in fair condition, and 30.8% in poor condition (CRITC COREMAP 2012) (Table 3).
- There are currently 13 species of seagrass recorded in Indonesia, spread over at least 30,000 km² throughout the country; and 41 species of mangroves, occupying some 3.2 million hectares, half of which are in West Papua.
- To protect marine and coastal habitats and biodiversity, the government has set a target to expand the area of marine conservation areas to 15.5 million ha by the end of 2014 or approximately 5% of Indonesian territorial waters, and to 20 million ha by 2020. The total area was 13.53 million ha in 2009 or 4.35% of the national territorial waters (3.1 million km²). From 2010 to end of 2013, around 3.6 million hectares of marine conservation areas have been established, including 76 local MPAs and 2 national MPAs in the Sawu Sea and Anambas Sea.
- In 2014, MoMAF declared regulations on the spatial planning and zonation of Marine Protected Areas (MPAs) in the following areas in Indonesia: Southeast of Aru Islands, Raja Ampat, Padaido Islands, Waigeo, Banda Sea, Gili Matra (West Nusa Tenggara), Anambas Islands (Riau Archipelago), Pieh Island (West Sumatera), Sawu Sea (East Nusa Tenggara).
- MoMAF has also declared to fully legally protect the following marine species: Manta Ray Fish, Whale Shark (*Rhincodon typus*), Napoleon, Bofia (banned export), and Lobster (banned export)
- 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
 - Coral Triangle Initiative National Plan of Action (CTI-NPOA), with specific goals for improving management of marine protected areas and improving the conservation status of threatened species
 - Development of Biodiversity Clearing House (MOEF)

**Challenges and Opportunities:
Habitats and Biodiversity**

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



- o RANTAI EMAS Program implemented by MOEF, including protection and rehabilitation of mangrove as well as coral reef ecosystems, carbon value calculation, carbon stock certification for community groups, and carbon certification for businesses.

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.

Challenges and Opportunities: Food Security

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

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

Table 4. Capture Fisheries Production, 2005-2012 (ton)

Sub-sector	2005	2006	2007	2008	2009	2010	2011	2012
Marine Fisheries	4,408,499	4,512,191	4,734,280	4,701,933	4,812,235	5,039,446	5,345,729	5,435,633
Open water	297,370	293,921	310,457	494,395	295,736	344,972	368,542	393,561
Total	4,705,869	4,806,112	5,044,737	5,196,328	4,914,560	5,384,418	5,714,271	5,829,194

Source: Badan Pusat Statistik. http://www.bps.go.id/eng/tab_sub/view.php?kat=3&tabel=1&daftar=1&id_subyek=56¬ab=5

- **Table 4** shows the steady increase in capture fisheries in Indonesia, from both marine fisheries and inland open water capture, from 2005-2012. The total capture fisheries production in 2010 was valued at Rp 64.5 quintillion (US\$ 6.8 trillion), of which marine fisheries capture was valued at Rp 48.8 quintillion (US\$ 5.1 trillion) and inland open water capture was Rp 4.3 quintillion (US\$ 453.0 million).
- Aquaculture production in Indonesia has increased significantly from 2.2 million tons in 2005 to 9.7 million tons in 2012. In 2009, the aquaculture production, which totalled 4.7 million tons was valued at Rp 40.5 quintillion (US\$ 4.3 trillion).
- 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, livelihood development and capital access.
- To manage the fishery areas, the government has established 11 fishery management areas (*wilayah pengelolaan perikanan* or *WPP*) covering Indonesia's territorial sea and exclusive economic zone.
- On February 2014, a Fisheries Management Plan for the Arafura Sea (known as WPP 718) developed by MoMAF with the support of the USAID-Indonesia Marine and Climate Support Project (IMACS) in collaboration with other agencies, NGOs, universities and other stakeholders, was launched.
- An initiative to develop and implement an Ecosystem approach to Fisheries Management (EAFM) has also been initiated through the following:
 - Establishment of a National Technical Working Group on EAFM, which has produced several documents related to EAFM implementation
 - Setting up and testing of EAFM Indicators in 6 sites (Berau, Wakatobi, Aru Island, East Flores, Alor, Flying Fish in South Sulawesi)
 - Selection of EAFM Implementation Site such as East Lombok, Gili Matra and Wakatobi Sulawesi

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

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 km²
 - Ciliwung River: total catchment area 322 km²
 - Tomini Bay Program (2007-2012): total catchment area 59,500 km²
 - 13 national priority rivers identified
 - River basin management plan for West Java, Siak and Riau

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

Pollution Reduction and Waste Management

- About 40% of domestic sewage in Indonesia is discharged directly or indirectly via rivers and into the sea without proper treatment.



- 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 connections)
 - 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 following:
 - 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;
 - SANIMAS, a national program on community-based sanitation.
 - ADIPURA - one of the priority programs in the control of pollution from domestic activities and provides awards for local governments for demonstrating commitment in keeping their areas clean and green (Clean and Green City)
 - Blue Sky - aims to control emissions of mobile sources of pollution through the implementation of a coordinated and integrated policy, prioritizing control of pollution from motor vehicles.
 - Towards Green Indonesia - one of the programs that are expected to improve the quality of the environment and provide an opportunity for the community to play an active role in the preservation of natural resources and environmental damage control
 - Management of Hazardous and Toxic wastes in all fields particularly the industrial sector
- National budget allocation for sanitation increased from 540 billion Rupiah or about USD57 million (0.1% of the national budget) in 2006 to about 2 trillion Rupiah in 2010 (0.2% of the national budget) and 3.9 trillion Rupiah (about USD422 million) in 2012.
- Local governments also increased budget allocation for sanitation from 0.5% of their budgets in 2008 to about 2 to 4% in 2012.
- 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) - US\$ 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 preparedness 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 2020)
- Promoting the EAFM

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Priority Issues for the Next Five Years for SDS-SEA Implementation, continued.

- 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 (2003-2015)



Basic Facts (Statistics Bureau, 2012):

Total Population (2012)	127,515,000
Forecast population (2015)	126,597,000
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 (2013)

US\$ 38,491.354 (IMF, 2014)

GDP by economic activity (2010, ESRI, 2012):

Agriculture, forestry and fishing (1.2%); Mining, construction and manufacturing (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. The Plan was revised in 2013. It stated making efforts to implement ICM based on independence of individual regions and offering assistance to regions that strive to formulate their own plans.
- The Basic Plan on Ocean Policy (2013) identified following measures:
- Promotion of development and use of marine resources
 - Conservation of marine environment, etc.
 - Promotion of development of the exclusive economic zone (EEZ) and Continental Shelves
 - Securing maritime transport
 - Securing safety and security of the sea
 - Promotion of marine surveys
 - Promotion of research and development of marine science and technology
 - Promotion of marine industries and increase in international competitiveness
 - Comprehensive management of coastal zones
 - Preservation of remote islands
 - Securing international coordination and promoting international cooperation
- Enhancements of citizen's understanding of the sea and fostering of human resources.
 - The Basic Policy concerning Preservation and Management of Islands for Management of the Sea was established 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.
 - As the Bay Renaissance Project, local governments and national governments corroboratively establish and promote Bay Renaissance Action Plan in Tokyo Bay (2nd phase 2013-), Osaka Bay (2nd phase 2014-), Ise bay (2006-), and Hiroshima Bay (2006-).
 - Adopted the definition of marine protected areas and clarified the existing areas that meet this definition in 2011.
 - To promote local implementation of ICM, case studies are corrected nationwide and published in 2011 and revised in 2014. The revised case studies composes 24 selected ICM measures with its outline, back ground, points for integration, and success criteria.
 - Adopted the definition of marine protected areas and clarified the existing areas that meet this definition in 2011.
 - Receiving Recommendation of extended continental shelf adapted by Commission on the Limits of the Continental Shelf (CLCS) in April, 2012.
 - Decision of the Governmental policy for extending the continental shelf in July, 2014 by the Headquarters for Ocean Policy.
 - Enactment of the Cabinet Order to establish the outer limits of extended continental shelf with regard to the Shikoku Basin region and the Southern Oki-Daito Ridge region in October, 2014.
 - Recommendation of an extended continental shelf (ECS) in 2012
 - Adopted Policy on promotion of use of marine renewable energy (2012)

Supporting Sectoral Policies, Legislations and Strategies

Environmental Policy (MOE, 2012, 2014)

- The Basic Environment Plan was subsequently adopted in 1994. It was revised in 2000 and 2006. The Fourth revision of the Plan was adopted in 2012 to provide a plan for advancing environmental policies with the whole government, in a comprehensive manner and from a long-term perspective
- The Environmental Impact Assessment Law was enacted in 1997
- The Law of the promotion of procurement of eco-friendly goods and services by the state and other entities was enacted in 2000.

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
- 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.
- A revised 5th National Biodiversity Strategy of Japan (2012-2020) was formulated in September 2012, in consideration of the Aichi Biodiversity Targets adopted at the 10th Meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 10) and as a consequence of the 2011 Great East Japan



Earthquake. The strategy provides the roadmap for the achievement of the Aichi Biodiversity Targets

- 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.

ICM Implementation

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

Food Security and Fisheries

- Developed the Basic Plan for Fishery Policy based on the Fisheries Basic Act.

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

Financing Mechanisms

- The national government provides subsidy to local governments to ensure the implementation of required programmes, policies and relevant legislations.
 - The new thrust of green economy and society and green markets innovation created over JPY 86 trillion in new environment-related markets and 2.4 million new environment sector jobs in 2012 (MOE, 2014).
- Water, Soil and Ground
 - Water Pollution Control Law
 - 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
 - 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 Disease

Information and Public Awareness (MOE, 2012)

- The Law enacted in 2003 for promoting of Environmental Conservation Activities through Environmental Education
- The Law of Promotion of Business Activities with Environmental Consideration by Specified Corporations, etc., by Facilitating Access to Environmental Information, and Other Measures enacted in 2004

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
 - The Ocean Policy Research Institute, Sasakawa Peace Foundation (OPRI, SPF) has supported promotion of integrated coastal management in five model sites, namely: Bizen City, Miyako City, Obama City, Shima City and Sukumo Bay (Sukumo City and Otsuki Town). The institute organized seminars and facilitate network among model sites and related local governments to enhance their capacity to promote the ICM.



- The OPRI also has promoted and supported implementation of ICM education for undergraduate and post graduate levels in collaboration with universities
- The OPRI has collaborated and as secretariat of the Ocean Policy Institute Network in the East Asian Region (OPINEAR) to share and learn policy formulation on coastal and ocean governance in the region together with member institutes

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 Great East Japan 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.
- The Great East Japan Earthquake in 2011 is game changer. Lessons learned from this earthquake informed the revisions made in the Disaster Countermeasures Basic Act and Basic Disaster Management Plan. Japan's system of emergency response, recovery and rehabilitation, as well as disaster prevention and mitigation, has since been reviewed and enhanced (PreventionWeb, 2013).

Challenges and Opportunities: Natural and Manmade Hazards

- Implementation of the revisions made in the Disaster Countermeasures Basic Act and the Basic Disaster Management Plan

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 km². This is about eight percent (8%) of the total territorial waters and EEZ of the country.
- In 2011 through 2014, two initiatives were taken for Sato-Umi programs. The first was guiding support for the plans to activate sea nutrients recycling, the plans to be set by the local public organizations based upon our survey findings out of its model projects. The second was the continued promotional activities of the programs.

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
- EQS² for human health have been attained with a 99.2% compliance rate in fiscal year 2013. EQS for conservation of the living environment have been achieved with an 87.3% 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 92.0% for rivers,

Challenges and Opportunities: Habitat protection and management

- Implementation of the 5th National Biodiversity Strategy 2012-2020. The following are the main components of the Strategy:
 - The Strategy including basic strategies
 - Roadmap for the achievement of the Aichi Biodiversity Targets
 - Action plan

55.1% for lakes and reservoirs, and 77.3% for coastal waters. Although the compliance rate for rivers is high, the rate for lakes and reservoirs remains low. 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 88.6%, 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 sewerage treatment facility provision objectives and 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 2013, the total amount and daily per capita solid waste were on a downward trend, i.e, total amount (44,874,000 tons per year) and daily per capita (958 grams) solid waste generation were 0.8% and 0.6% less than in 2012. The recycling rate on the other hand is steadily increasing with a 0.1% (20.6%) increase in 2013 from the recycling rate in 2012. The final disposal amount (4.54 million tons) was also 2.4% lesser than disposal amount from the previous year (Government of Japan, 2015).
- 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 CODMn, T-P and T-N became target items of the TPLCS in 2001. The 7th TPLCS basic policy was set forth in 2011.

Challenges and Opportunities: Pollution Reduction and Waste Management

see Water Use and Supply Management

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 stabilization of fisheries management, the Government will work to promote conservation and management of resources for sustainable use.

- Measures to alleviate environmental pollution and reduction in GHG emissions seek to improve efficiency of thermal power plants, improvement in public transportation networks and methane recovery and electricity generation in wastewater treatment

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 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 10 to 20 substances that are potentially hazardous to human health or the ecosystem are selected and assessed annually. By 2014, the results of the initial environmental risk assessment on 325 substances have been published (Government of Japan, 2014).
- 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).



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

- 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.

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.

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Lao PDR's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2015)



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 (2003-2015)

National Water 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.
- 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 Government 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.

Integrated Riverbasin/Watershed 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:
 - National Integrated Water Resources Management (N-IWRM) supported by the Asian Development Bank, 2011-2015 with a total budget of \$4.2
 - Mekong- Integrated Water Resources Management (M-IWRM) supported by the World Bank, 2012-2017 with a total budget of \$18M
 - Sedone Riverbasin covering the three provinces of Saravanne, Champasack and Sekong with a total catchment area of 7,229 km² (PEMSEA).
- Houay Champi Intregated Sub-River Basin Management supported by the Swiss Development Cooperation with a total budget support of 88,000\$
- Nam Ngum Riverbasin with a catchment area of 16,906 km² and additional funding support from the Asian Development Bank of US\$ 300,000 for 2011-2015
- Nam Theun-Nam Kading with a catchment area of 14,820 km²
- Sustainable Management the Watershed in Lower Mekong "Nam Ton Sub-River Basin Management"

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.
- Decree on Social and Environment Impact Assessments (ESIA) with supporting decrees on on Strategic Environment Assessment (SEA) and agreement on Environmental Standards are under development in support of the ESIA to achieve sustainable practice and outcomes on environmental management. The Decree on SEA aims to ensure that policies, programmes and plans include mitigation measures to prevent and minimize negative impacts of socioeconomic development to the environment
- Agreement on National Environmental Standards (2010)

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.

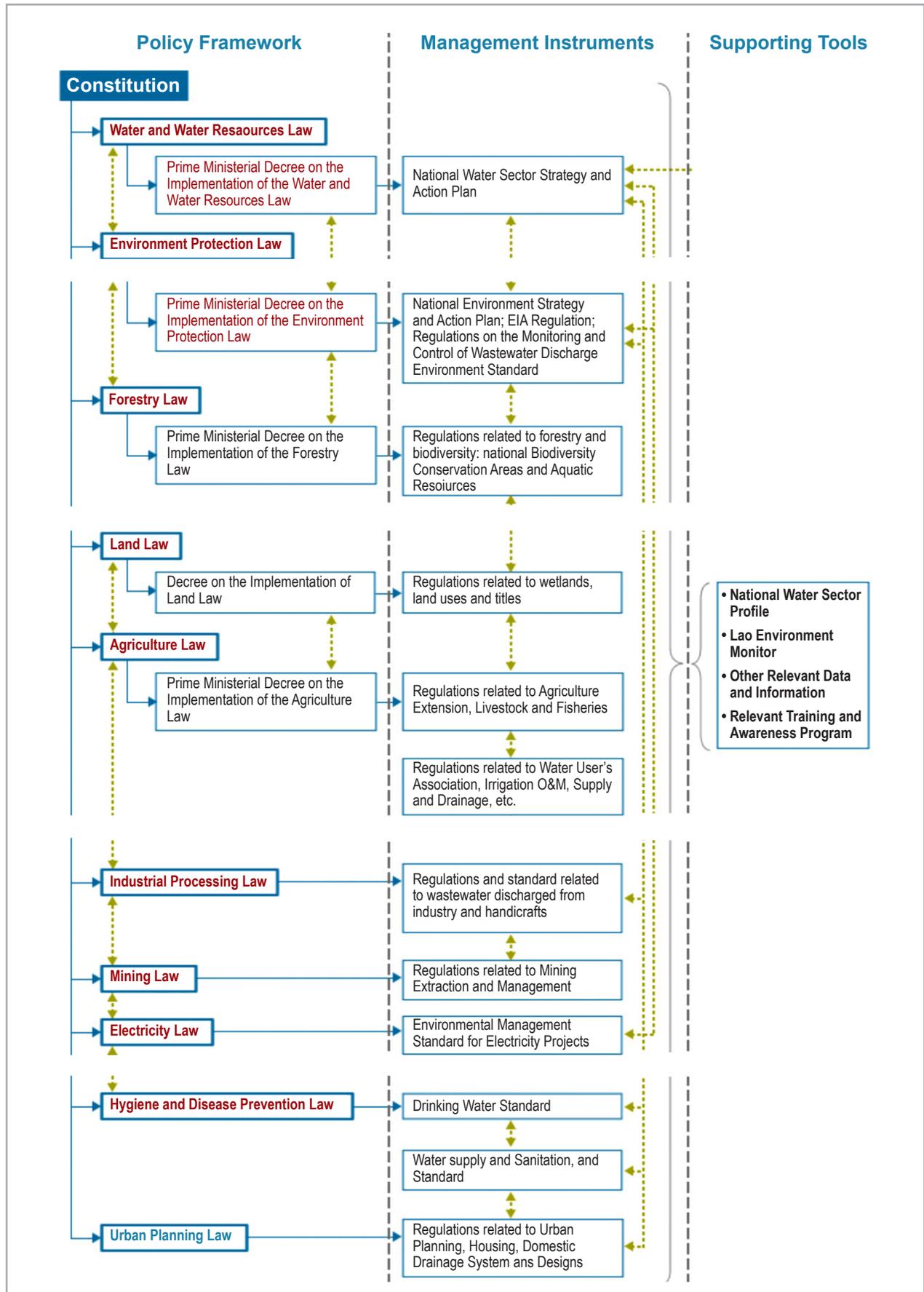
Forestry

- Forestry Strategy 2020 (2005) aims to promote sustainable forest resource management and use. Nine key programmes of action were identified, and if successfully implemented will lead to a stabilization of forest cover in about 70% of the total land in 2020:
 1. land and forest use;
 2. production forest;
 3. non-timber forest products;

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 km² (PEMSEA)
 - Nam Ngum Riverbasin with a catchment area of 16,906 km²
 - Nam Theun-Nam Kading with a catchment area of 14,820 km²
- 4. tree plantation development;
- 5. harvest/logging plans and royalties;
- 6. wood processing industry; 7
- 7. biodiversity conservation;
- 8. protection forest and watershed management; and (9) village land and forest management.
- The Forestry Law (FL) was issued on 11 October 1996 and revised in 2007 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.
- The following laws and decrees support forest conservation, restoration and management:
 - Decree on the Protection Forests (2010)
 - Decree on Forest Seeds Sources (2010);

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





- Decree on the Management and Protection of Forest in Nakai-Nam Thurn Watershed Area (2010);
- Decree on Pharmaceutical Natural Resources (2003); Decree on Commercial Tree Planting and Environment Protection (2003);
- Decree on Sustainable Production Forest Management (2002); and
- Decree on the Management of Wildlife, Hunting and Fishing (1989).

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

- Renewable Energy Strategy to 2025 (2010) calls for for institutional arrangement and capacity strengthening and measures for promotion and development such as tax exemptions and reduction, promotion of investments, implementation of Clean Development Mechanism projects, research in renewable energy, awareness raising, technology transfer and establishment of a renewable energy fund.
- 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

Financing

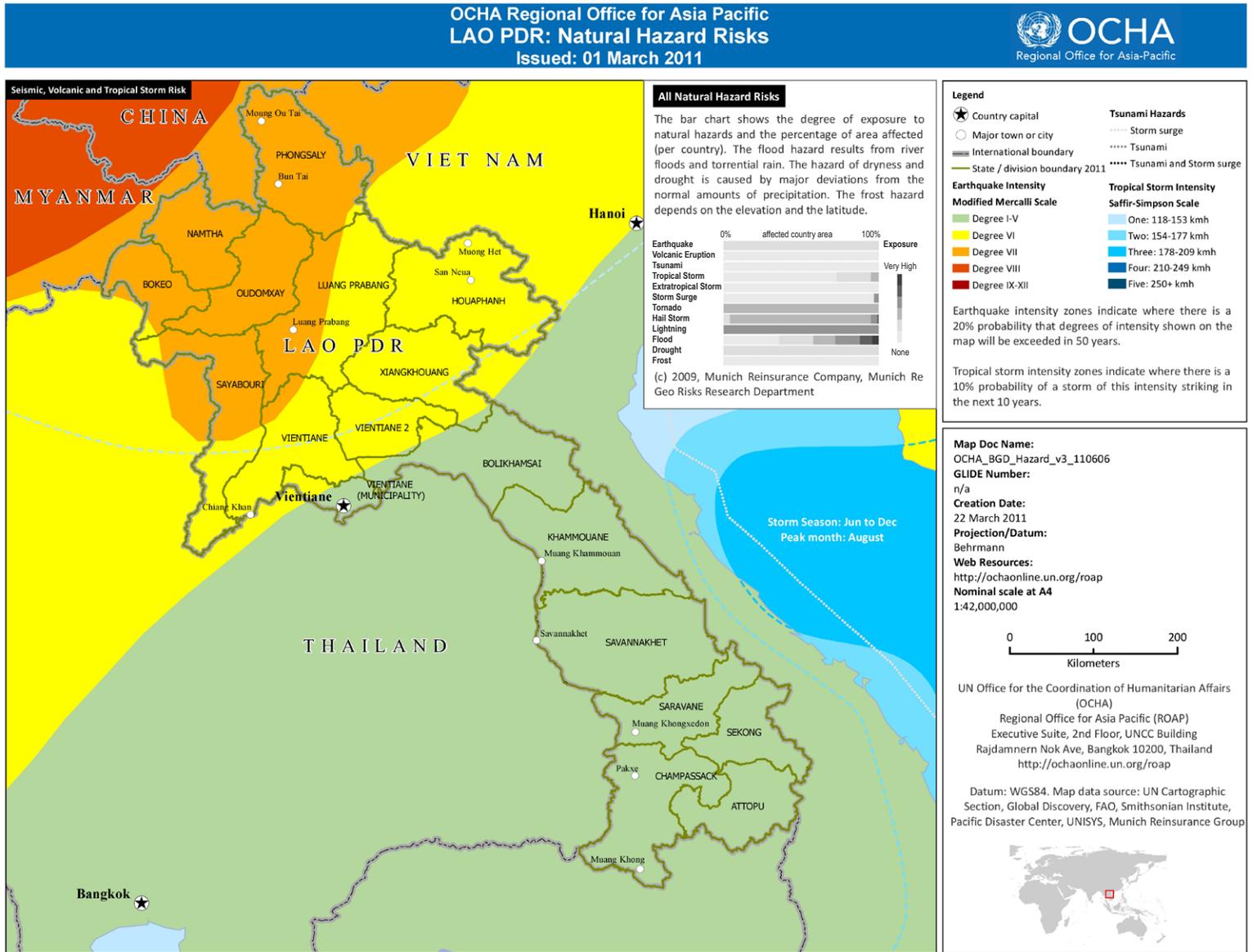
- The Environmental Protection Fund which was set up in 2005.
- The water use fee study is being undertaken by DWR to review and assess possible user fees for water use. The results of the study will pave the way for establishing a Water Fund in the future.
- The Round Table Process and its associated 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.

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.

Climate Change/Disaster Risk Reduction

- National Disaster Management Plan 2012-2015 is currently being finalized with the following key objectives:
 1. safeguarding sustainable development and reducing the impacts and damages caused by natural and manmade disasters;
 2. shifting from relief to mitigation of disaster impacts on communities, society and the economy and to preparedness before a disaster strikes, with emphasis on hazards such as floods, drought, landslides and fires;
 3. ensuring that disaster management is a joint responsibility of both the Government and the people, through building of community capacities; and
 4. promoting sustainable protection of the environment and the country's natural wealth, including forests, land and water resources

Figure 2: Composite Map of Hazards in Lao PDR.



- Climate Change Strategy (2010) focuses on adaptation and mitigation, with seven key priorities:
 1. agriculture and food security;
 2. forestry and land use change;
 3. water resources;
 4. energy and transport;
 5. industry;
 6. urban development; and
 7. public health.

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.

Biodiversity/Habitats

- Forest Vision for 2020 (2005)
- 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) identifies the following key programmes for implementation:
 1. Scientific data and biodiversity knowledge development
 2. Biodiversity management
 3. Human resource development
 4. Public awareness and involvement
 5. Institutional and legal frameworks
 6. NBSAP implementation
 7. International cooperation
- 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)
- 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.
- 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.
 - 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**).

Challenges and Opportunities: Natural and Manmade Hazards

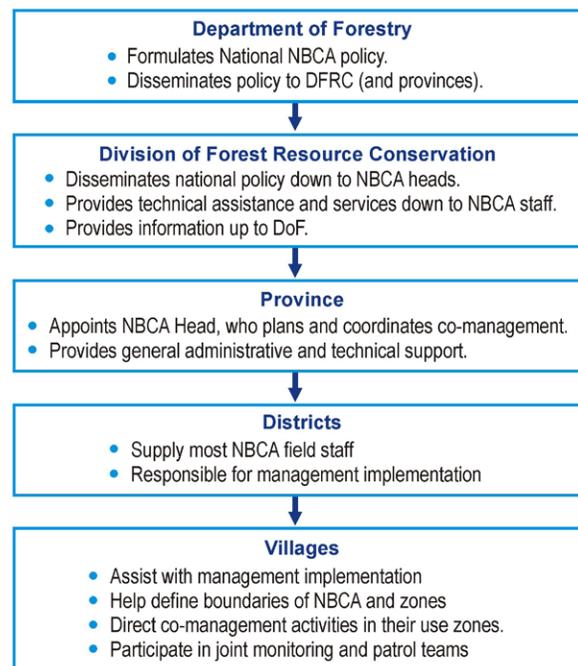
- Strengthen the National Disaster Management Committee (NDMC), which is an inter-ministerial committee responsible for policy formulation and disaster management, and the National Disaster Management Office (NDMO), the secretariat to the NDMC.
- Operationalizing Strategic Plan for Disaster Management 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.**

- Hazard mapping and risk assessment conducted for Lao PDR.
- Development of a National Adaptation Program of Action (NAPA) with 45 priority projects.
- 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.

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.

Figure 4: National protected area management structure.





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.



- 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 Loey 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.

- Ecotourism Strategy and Action Plan 2005-2010 (2004) aims to promote Lao PDR as renowned destination for sustainable tourism that benefit natural and cultural heritage conservation, local socioeconomic development and spread knowledge of the country's unique cultural heritage around the world.

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.

Water Supply/River Basin Management

- The average annual rainfall is 1,935 mm or 462 km³, and from this, average runoff is 1,055 mm or 250 km³;
- The average river inflow to the country is 73 km³ from China (Mekong), 9.5 km³ from Myanmar (Mekong). The total national annual surface water supply (national runoff plus inflow from other countries) is therefore 332.5 km³.
- 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.
- 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.

Pollution Reduction/Waste Management

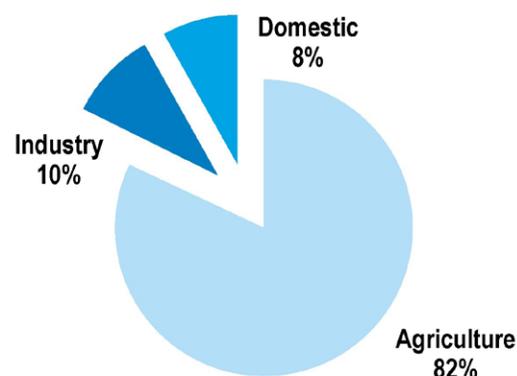
- Annual waste generation in 2004 was 270,000 tons.
- Domestic waste accounts for the bulk of materials generated. The average urban waste production in Lao PDR is 0.75 kg per capita per day.
- The average collection rate for urban households in the five larger urban areas is 45 percent. Only in Luangprabang has a collection system that services more than 50 percent of the households.



Challenges and Opportunities: 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.
 - Assess the downstream impact of catchment deforestation.

Figure 5: Water Withdrawal by Sector.



Source: FAO

- 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.

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 treatment 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



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

- 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.
- Wetland Management
 - Manage NongOun wetland , Yommalath district and Thakheak district
 - Prepare Wetland Management Guideline
 - Plan to inventor the wetland in the country
- Groundwater Management
 - Draft the Groundwater Management Decree and Regulation
 - Prepare National Groundwater Profile
 - Draft the National GW Action Plan
 - Manage the GW used for Irrigation in Akxang village, Vientiane Province
- Sub river basin management
 - Manage Nam Xong sub-river basin, Vangvieng district, Vientiane province
 - Manage Houay Champi sub-river basin, Pakse, Bacheing and Sanasomboin district, Champasack province
 - Manage Nam Ton sub-river basin, Sangthong district, Vientiane capital
 - Manage Nam Kho sub-river basin, Xiengkong province

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The Philippines' Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2015)



Basic Facts

Total Population	95.77 million (2012) ADB
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 km ² with more than 7,100 islands
Territorial sea (up to 12 nautical miles)	679,800 km ²
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 (2003-2015)

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.
- Philippine Congress has approved the ICM Bill during the meeting of the House Committee on Ecology on August 12, 2015. The passage of the ICM Bill is currently being undertaken at the Senate.
- National interagency coordinating mechanism is pending passage of the ICM Bill.

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.
- Scoping of 12 priority coastal provinces on scaling up the implementation of the SDS-SEA in the Philippines conducted in March-June 2014 incorporating the identified priority sites of DENR under the NICMP and SCREMP.

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).
 - SOC reporting initiated in the provinces of Bataan, Bulacan, Cavite and Pampanga
- Regional State of the Coral Triangle – Coral Triangle Marine Resources: Their Status, Economies and Management and State of the Coral Triangle: Philippines published by ADB in 2014.
- Manila Bay Coordinating Office currently spearheading the updating of the Manila Bay Environmental Atlas
- 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).
- Bills filed at the 16th Congress of the Senate of the Philippines
 - Senate Bill No. 2132 – Coastal Climate Change Adaptation Act filed on February 20, 2014
 - Senate Bill No. 1542 – National Hazard Mapping Act filed on September 5, 2013
 - Senate Bill No. 1444 – Tsunami Ready Act filed on August 29, 2013

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.

- House Bill 4019, an Act creating the Manila Bay Development Authority, filed at the 16th Congress of the House of Representative on 27 February 2014.

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.
- Executive Order 797 issued on May 6, 2009, adopting the CTI National Plan of Action
- DENR Administrative Order 2013-12 Guidelines for the implementation of Sustainable Coral Reef Ecosystem Management Program (SCREMP)
- Executive Order No. 154 signed on December 6, 2013 adopting a national plan of action to prevent, deter, and eliminate illegal, unreported and unregulated fishing, and for other purposes.
- Manado Communiqué, titled “The sustainable utilization and conservation of coral reefs, food security, and partnerships and initiatives,” signed by the 29 countries including the Philippines and 13 international organization during the World Coral Reef Conference in Manado, Indonesia in May 2014.
- Bills filed at the 16th Congress of the Senate of the Philippines:
 - Senate Bill No. 138 - Philippine Corals and Other Marine Treasures Protection Act filed on July 1, 2013
 - Senate Bill No. 1308 – Mangrove Forest Protection and Preservation Act filed on August 15, 2013
 - Senate Bill No. 2200 – Sustainable Management

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.
- SCREMP regular budget allocation for 2014 is PhP 74 M with supplementary budget of PhP 70 M for priority provinces

Source: DENR, 2012.



of Forest Resource Act filed on May 5, 2014

- Senate Bill No. 2056 – Marine and Coastal Resources Protection Act filed on January 15, 2014
- Senate Bill No. 1901 - Protected Areas Declaration Act filed on November 4, 2013
- Senate Bill No. 1898 - Verde Island Passage Act filed on November 14, 2013
- Senate Bill No. 1644 – Sustainable Forest Management Act filed on September 11, 2013
- Senate Bill No. 1479 – Greening Act filed on September 3, 2013

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.
- Bills filed at the 16th Congress of the Senate of the Philippines
 - Senate Bill No. 1723 – Environmental Education Course of Instruction for kindergarten to elementary filed on September 18, 2013
 - Senate Bill No. 1128 – National Coastal Clean Up Day Act filed on July 29, 2013

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 as 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.
- Bills filed at the 16th Congress of the Senate of the Philippines
 - Senate Bill No. 1800 – Water Use Efficiency and Conservation Research Act filed on October 3, 2013
 - Senate Bill No. 1236 – Soil and Water Conservation Act filed on August 6, 2013

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,

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.
- Vulnerability assessments for soil erosion, landslides, biodiversity loss and forest fire of 43 priority watersheds nationwide have been completed (DENR-ERDB).

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).
- Integrated land and sea use zoning plans were adopted at the provincial, municipal and city levels in the Province of Bataan, Municipality of Abucay and City of Balanga (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.
- Project NOAH (Nationwide Operational Assessment of Hazards) launched by the Department of Science and Technology on July 6, 2012, which aims to undertake disaster science research and development, advance the use of cutting-edge technologies and recommend innovative information services in government's disaster prevention and mitigation efforts.

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.

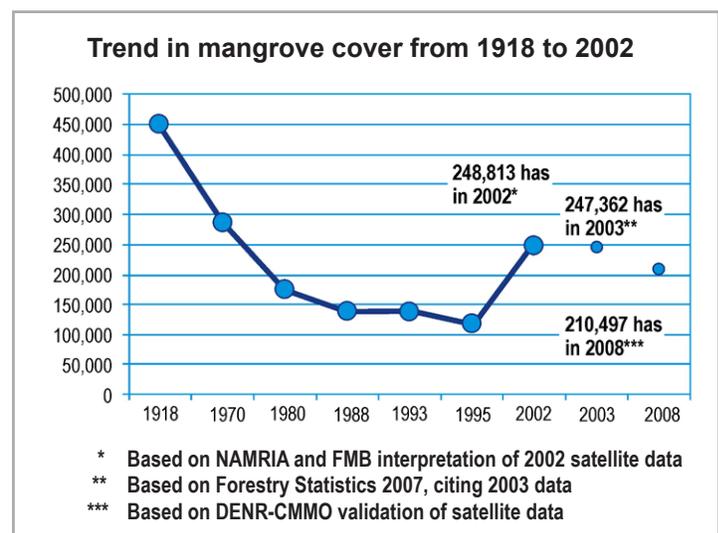


- Low Emission Capacity Building Programme Philippine Project (2012-2014) is assisting the country in the formulation of its roadmap for climate change mitigation strategies with donor funding from European Union/Government of Germany/Government of Australia
- Project ReBUILD: Resilience Capacity Building for Cities and Municipalities to Reduce Disaster Risks from Climate Change and Natural Hazards (Phase 1) (2012-2015) seeks to improve the governance framework in Region 2, CAR and Region 6, by putting in place the necessary enabling policy environment, mechanisms, systems and tools. It also aims to improve the competencies of the concerned personnel to address disaster risks from natural hazards and climate change, which set back development gains and make the vulnerable poor population poorer with donor funding from the Government of New Zealand/New Zealand Aid Programme.
- Enhancing Greater Metro Manila's Institutional Capacities for Effective Disaster/Climate Risk Management towards Sustainable Development (GMMA READY Project) (2011-2014) aims to decrease the vulnerability of the Greater Metro Manila Area (GMMA) to natural hazards and increase their resilience, by strengthening the institutional capacities of the local government units, concerned national government agencies, academic institutions and civil society organizations to manage disaster and climate change risks with donor funding from the Government of Australia/AusAID.
- Enabling Regions 10 and 11 to Cope with Climate Change (2012-2014) aims to assess the disaster vulnerabilities of the affected areas of Regions 10 and 11 in Mindanao to geological, meteorological and meteorologically-induced hazards due to climate change with donor funding from the Government of Australia/AusAID
- National REDD+ Mechanism for Greenhouse Gas Reduction and Conservation of Biodiversity in the Philippines (2013-2017) aims to establish a national implementation framework and coordination system, develop financing/benefit-sharing mechanisms, integration of ecological, social and governance standards (safeguards), forest land use planning in selected sites and information and knowledge management and awareness building on REDD+ system.

- Philippine Chillers Energy Efficiency Project (2011-2017) is a WB-GEF-MLF-assisted project which aims to replace CFC and non-CFC based inefficient chillers with new and more energy efficient new technology chillers through provision of financial subsidy (15% of the chiller ex-works cost) and technical assistance to a significant number of enterprises in the private and public sectors

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.
- 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



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.

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.
- National Greening Program, the national government’s biggest reforestation program based on Executive Order No. 26, is targeting to reforest 1.5 million hectares of denuded and degraded forestland nationwide from 2011 to 2016 using some 1.5 billion seedlings.
- Partnerships for Biodiversity Conservation: Mainstreaming in Local Agricultural Landscapes/ Biodiversity Partnerships Project (BPP) (2010-2016) seeks to increase the capacity of the LGUs to mainstream biodiversity conservation in production landscapes/seascapes geared towards the protection and enhancement of the quality of the environment and the sustainable management of the natural resources with donor funding from UNDP/GEF.
- National Biodiversity Planning to Support the Implementation of the CBD 2011-2020 Strategic Plan in the Philippines (2012-2014) addresses the country’s need to fulfill its obligations under the Convention on Biological Diversity (CBD) and to contribute to the efforts towards implementing the CBD Strategic Plan 2011-2020 at the national level with donor funding from USAID and GEF.
- Philippine Wealth Accounting and Valuation of Ecosystem Services (2013-2017) aims to inform development planning and policy analysis on the sustainable use of key natural resources by: (i) developing macroeconomic indicators that account for natural capital values in order to measure the sustainability of economic development; (ii) developing national accounts for prioritized natural resources — minerals and mangroves — “based on the UN’s 2012 System of Environmental-Economic Accounts (SEEA) and analyzing the impact of different natural resource management and revenue sharing scenarios on income and economic development; (iii) developing and constructing ecosystem accounts for Southern Palawan and the Laguna Lake basin and analyzing the trade-offs



associated with different resource and ecosystem use scenarios; and (iv) building capacity for institutionalization of the prioritized SEEA modules.

- Integrated Natural Resources and Environmental Management Project (2013-2020) aims to manage the upper river basins and component watersheds to support poverty reduction, watershed management, biodiversity conservation and climate change policy objectives with emphasis on developing the capacities of the local governments, institutions and upland communities as development partners.

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.
- 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.
- USAID and DA-BFAR launched the Ecosystems Improved for Sustainable Fisheries (ECOFISH) Project on October 17, 2012, a five-year technical assistance project designed to protect and manage eight marine key biodiversity areas (MKBAs) in the country, namely, the Calamianes Group of Islands in Palawan, Lingayen Gulf in Pangasinan, Ticao Pass-Lagonoy Gulf-San Bernardino Strait in Bicol and Samar region, Danajon Double Barrier Reef in Bohol and Leyte, Southern Negros Occidental, Surigao provinces, the Sulu Archipelago and the Verde Island Passage in Batangas and Mindoro area.
- Sulu-Celebes Sea Sustainable Fisheries Management (2010-2014) aims improve the condition of the fisheries and their habitats in the SCS through an integrated, collaborative, and participatory management at the local, national, and tri-national levels with funding from GEF.

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.

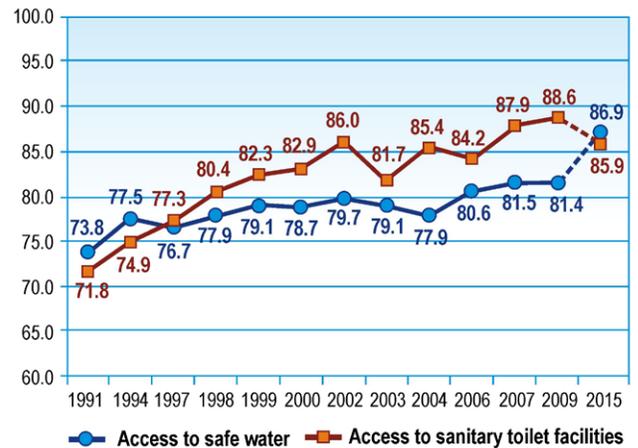
Source: Philippine Development Plan 2011-2016.

Water Supply/River Basin Management

- The country has 421 identified principal river basins with drainage areas ranging from 40km² to 27,753 km².
- Twenty one (21) river basins are considered as priority river basins, with each one having at least 990 km² basin area. These major river basins cover a total area of 111,269 km², equivalent to 37.1 percent of the total land area of the Philippines.
- RBCO initiated the formulation of the Integrated River Basin Management and Development Master Plan for the Eighteen (18) Major River Basins and three (3) principal priority river basins using the Integrated River Basin Management and Development Framework Plan approved by the President in 2007 through the DENR-RBCO.
- Among the 18 Major River Basins, there are seven (7) completed Master Plans, four (4) were initiated by the DENR through various funding support, such as: (1) Cagayan River Basin – under the DENR regular fund; (2) Mindanao River Basin – DENR provided partly Php10 Million; (3) Agusan

River Basin – ADB-fund support; and (4) Buayan-Malungon River Basin – as part of the Mindanao RB Master Plan. The other three (3) river basins, such as: (1) Pampanga River Basin – initiated by NWRB and supported by JICA; (2) Agno River Basin – formulated by former Agno River Basin Development

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



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.



Commission; and (3) Pasig-Laguna de Bay River Basin – under the management of two (2) institutions: the Laguna Lake Development Authority (LLDA) and the Pasig River Basin Rehabilitation Commission (PRRC). Likewise, among the three (3) principal river basins, one is completed (Central Cebu River Basin) and the other two (Marikina and Iloilo-Batiano River Basins) are on the last stages of completion. The remaining 11 Major River Basins are still in the process of finalizing their respective Master Plans.

- The dependable surface water supply from rivers, lakes and reservoirs is estimated at 125.8 billion m³. Groundwater potential is 20.2 billion m³ and the reservoir has an aggregate area of 50,000 km² (DENR 2010).
- The Philippines has privatized water distribution in Metro Manila, which has greatly improved distribution in infrastructure 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.
- The Supreme Court issued a continuing mandamus in 2008 requiring 13 national government agencies to clean and rehabilitate Manila Bay and restore its waters to Class SB to make it fit for swimming, skin-diving and other forms of contact recreation. As of June 2014, there are 279 activities stipulated in the Operational Plan for the Manila Bay Coastal Strategy (OPMBCS). Of this, 236 or 85% are being carried out by the mandamus agencies.
- In 2013, the average DO Levels of 5 out of 16 major rivers monitored in the Manila Bay Region (Regions 3, 4A and NCR) excluding the Pasig River are within the standards. These rivers are found in Region 3 (Talisay River) and Region 4A (Cañas River, Imus River, Ylang-ylang River and Rio Grande River). Also, 5 out of these major rivers have improved DO levels (Imus River, Ylang-Ylang River, Talisay River, Sta. Maria River and Obando River) from the 2012 data. Eight (8) out of the 16 major rivers in the Manila Bay Region failed in both the DO and BOD standards. As noted, majority of the waterways in

these regions are unfit for human activity despite recent cleanup efforts done by various boundary partners;

- 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.
- HCFC Phase Out Management Plan – Stage 1 (2013-2015) comprises of policy, investment and non-investment activities (training, capacity building and public awareness) to completely phase out HCFC-141b in the foam sector as well as control growth in consumption of HCFC-22 in the refrigeration, air conditioning, and servicing sectors and consumption of HCFC-141b in solvent/servicing usages.
- Improve the Health and Environment of Artisanal Gold Mining Communities in the Philippines by Reducing Mercury Emissions (2012-2014) aims at reducing the impacts of mercury on the health and environment of artisanal gold mining communities in the Philippines by promoting sound chemical management and strengthening local and national capacity to effectively reduce mercury use, emissions and exposure.

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. Committee on Environment and Natural Resources of the Senate of the Philippines and Committee on Ecology of the House of Representatives created Technical Working Groups to review and refine the ICM Bill through a series of consultations and workshops with relevant national agencies, academe, international organizations and civil society groups.
- 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 effectiveness 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



The Republic of Korea's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2015)

Basic Facts

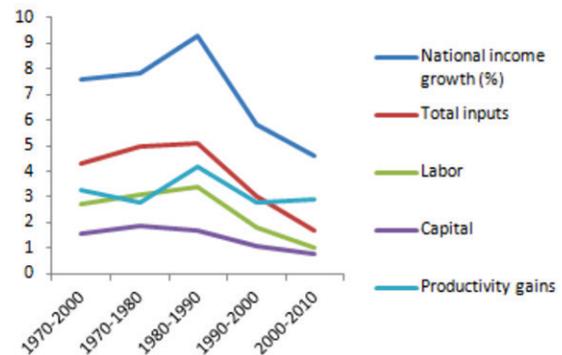
Total Population (2014)	51.3 million (Statistics Korea, 2015)
Forecast Population (2030)	52.2 million (Statistics Korea, 2015)
Percentage of Coastal Population	27.1 (MOF, 2014)
Administrative districts and major cities (Coastal)	9 provinces, 1 special city and 6 metropolises (8 provinces and 3 metropolises)
Land Area	100,148 km ² (MOF, 2014)
No. of islands	3,358 (MOF, 2014)
Area of territorial sea	Approximately 87,000 km ² (MOF, 2014)
Length of coastline	14,962 km (MOF, 2014)

National Economy

GDP per capita (2010)	GDP growth (2011)
US\$27,963.6 (Bank of Korea, 2015)	3.3% (Bank of Korea, 2015)
GDP composition by sector (2014)	
Agriculture, forestry and fishing (2.7%); mining and quarrying (29.5%); manufacturing (29.4%); electricity, gas (2.9%); construction (5.7%); services (29.9%) (Statistics Korea, 2015)	
Employment by sector (2015)	
Agriculture, Forestry and Fisheries (4.9%); Mining & Manufacturing (17.3%); Construction & Services (77.8%) (Statistics Korea, 2015)	



Sources of ROK's Growth (Contribution in %)



Sources: Kim et al. (2012)

Ocean Economy in the Republic of Korea

Total gross domestic output (GDO) of ocean-based economy was KRW 134 trillion in 2008, which is expected to be increased by 66% (KRW 223 trillion) in 2020.

	2008			2009 (est.)		
	Gross Output (A)	B/A (%)	Value-added (B)	Gross Output (A)	B/A (%)	Value-added (B)
Fisheries	64,522	35.5	22,880	84,290	47.4	39,972
Marine Mining	4,247	67.0	2,846	182,538	67.0	122,300
Ship Building and Marine Plant	513,336	28.6	146,873	703,477	35.0	246,217
Harbor	31,441	53.3	16,755	49,956	53.3	26,623
Marine Transportation	417,237	14.2	59,087	673,425	25.0	168,356
Other Marine Sectors	312,758	376.9	130,156	444,390	488.8	223,398
Total	1,343,541	28.2	378,597	2,138,076	38.2	852,653

Note: Unit: KRW 100 Million

Source: Hwang and Park (2011)



Progress towards SDS-SEA Targets

National Ocean Policy and Institutional Arrangements

- The Republic of Korea (herein after referred to as ROK) is surrounded by ocean and has sea waters of 433,000□ under its jurisdiction, which is about five times the size of its land. The ocean has been important to the industrialization and advancement of the Korean economy. ROK produces 3 million tons of fish per annum, 99.7% of its trade cargo is transported by the ocean.
- Under the circumstances, the Ministry of Maritime Affairs and Fisheries (MOMAF) was established in 1996 to realize the integrated ocean governance, which was involved in 13 different ministries and administrations. The Framework Act on Ocean and Fisheries Development was, in accordance with changing conditions, also wholly amended in 2002 by MOMAF to promote the development of the ocean industry, and protect the ocean environment, ocean resources, and ocean jurisdiction. This law became a basis of integrated ocean policies in South Korea. But MOMAF was disassembled by the previous administration in 2008. The functions of maritime transportation, marine environment policy, and so on, were transferred to the Ministry of Land, Transportation and Maritime Affairs (MLTM), and that of fishery to the Ministry for Food, Agriculture, Forestry, and Fishery (MIFAFF). After then, the present administration reestablished the Ministry of Oceans and Fisheries (MOF) in 2013 aiming for integrated ocean and fisheries management.
- The mission of ROK's ocean policy is to find new values from the sea and to make the sea an arena for people's happiness. Main strategies to complete the mission are: (1) job creation; (2) dynamic and Innovative maritime and fisheries industries; (3) expansion of scope of activities related to ocean by actively accepting new ocean regime; (4) Transformation of seas, coasts and islands into a nest of happiness for all; (5) safer and cleaner seas that people can trust; (6) ensuring that marine tourism and culture will flourish; and (7) gaining support and trust from the public on ocean policies. The Ministry of Oceans and Fisheries as a very unique ocean governance covers a full range of marine and fishery affairs, i.e., port development, shipping, logistics, fisheries, coastal management, marine environment and ecosystem protection, and other marine and coastal issues.
- National regime on sustainable development of ocean and coastal areas has been operating through comprehensive and sectoral (local) arrangements. The Framework Act on Ocean and Fisheries Development provides a national framework on policy directions for each sector and local governments, which are guided by the Basic Plan for Oceans and Fisheries Development (Ocean Korea 21). The Basic Plan as a 10-year national strategic plan ensures sustainability on social, economic and environmental perspectives by harmonizing conflicting activities on ocean and coastal areas.

Organization of Ministry of Oceans and Fisheries of RO Korea



National Ocean Policy and Institutional Arrangements, continued.

- Sustainability of ocean and coastal areas in ROK has been ensured through establishment of legal and institutional mechanism dealing with marine environment and ecosystem, and coastal management in the late 1990s. Revision and enactment of major laws has been conducted since then, Marine Environment Management Act, Coastal Management Act, Wetlands Conservation Act, Marine Ecosystem Conservation and Management Act, the Law on Conservation and Management of Uninhabited Islands, Fishing Grounds Management Act, the Law on Management and Reclamation of Public Owned Waters, Submarine Mineral Resources Development Act, Maritime Safety Act, etc.
- Each act has its own plans to meet their objectives. The plans are established at national, local, site-specific levels in the field of marine pollution management, coastal and marine ecosystem protection, public waters management, uninhabited islands conservation, coastal spatial planning and management, response on natural and man-made disasters, marine science and technology, marine and coastal survey and monitoring etc.
- Major policy directions and plans are consulted and accepted through planning and decision making process with a participation of related ministries, stakeholders, interest groups, experts, NGOs/NPOs, and local governments. Consultation processes on formulating policies and plans are synthesized through the Marine and Fisheries Development Committee under the Framework Act on Ocean and Fisheries Development, chaired by the Prime Minister and the National Committee on Coastal Management under the Coastal Management Act, chaired by the Vice Minister of MOF.

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 marine management and blue ocean strategy in ROK, the Framework Act on Ocean and Fisheries Development was wholly amended in 2002. Prior to the enactment of the revised Framework Act, 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.
- The 2nd Basic Plan for Ocean and Fisheries Development (2011-2020) was formulated and started to implement 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 through global/regional cooperation. The 2nd Basic Plan envisions the ROK as a global leading country in ocean in 2020.

- 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.

Marine Environment Management Plan

- The Marine Environment Management Act was promulgated in 2007 which is an entirely revised version of the Marine Pollution Prevention Act of 1978. The Act functions as an overarching legal framework for protection and management of marine and coastal environments including principles, national policy direction, action plan establishment, environmental standards and criteria, pollution control from land- and sea-based activities, designation and management of coastal environmental management areas, comprehensive environmental impact assessment (EIA), environment monitoring and survey, international cooperation, and establishment of government-affiliated agency (KOEM or the Korea Marine Environment Management Corporation).
- Comprehensive Marine Environment Management Plan is a comprehensive framework plan to address all



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

environmental and ecological issues in marine and coastal areas, which is based on the Marine Environment Management Act. The 1st Plan was prepared in 1996, and renewed every five years. To tackle the issues in strategic manners, the revised act in 2008 stipulates 10 years-renewal of the plan.

- The 4th Comprehensive Marine Environment Management Plan was formulated in 2011 on the basis of principles of ecosystem-based management, integrated approach, local participation, and respecting global environmental standards.
- The 4th Plan envisions ROK's seas and coasts as clean and productive in 2020. The Plan encompasses five strategies: (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) consolidating national capacity for marine environment management.

Integrated Coastal Management Plan

- The Coastal Management Act was enacted in 1999. Based on the Act, the 1st National Integrated Coastal Management Plan (2000-2010) has been formulated and implemented since 2000 as an overarching spatial plan for sustainable development of coastal areas. The 1st Plan focused on balancing between coastal development and environmental protection for securing sustainability in RO Korea.
- The 2nd National Integrated Coastal Management Plan (2011-2020) has been strengthened from the 1st Plan in consideration of changing environmental, social, economic and institutional circumstances such as marine spatial planning, climate change, and newly introduced management instruments on natural hazards. 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 of the coastal policy.
- The vision of the 2nd Plan is set to create ECHO (Ecosystem, Co-ordination, Human and Ocean) in coastal areas. The 2nd Plan contains 5 strategies and

259 actions: (1) applying sophisticated 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) advancing institutional arrangements 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 protection and management. It stipulates various activities including regular marine ecosystem survey ecosystem information system, habitat and species protection, marine protected areas (MPAs) establishment, marine biodiversity conservation, etc.
- The 1st National Basic Plan on Marine Ecosystem Conservation and Management (2009-2018) is a 10-year operational strategy of the Act. It envisions that ROK will create "values and wealth for future" by maintaining healthy marine ecosystems in jurisdictional waters. The objective of the Plan is to maintain a balance between the conservation and wise use of marine ecosystems.
- The 1st Plan comprises five strategies: (1) maintaining a balance between the wise use and conservation of marine ecosystems; (2) enhancing marine biodiversity through protection of major species and habitats; (3) applying a gradual approach to restoration of marine ecosystem; (4) encouraging public participation in the implementation of the ecosystem management policies; and (5) developing more adaptive policy for effective marine ecosystem management.

Basic Plan for Coastal Wetlands Conservation

- Coastal wetlands have been one of most controversial issues in ROK in terms of sustainable development in marine and coastal areas. Establishment of integrated coastal management regime was supported, to large extent, by enhanced social discourse on conservation and rational use of coastal wetlands in the mid-1990s. The Korean government enacted Wetlands Conservation Act in 1999, which is jointly governed by two ministries, MOF for coastal wetlands and Ministry of Environment (MOE) for inland wetlands.

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

- In applying the Act for coastal wetlands conservation, the Basic Plan provides strategies and actions for the conservation and sustainable uses of the wetlands, and designation of Coastal Wetlands Conservation Areas plays an important role in protecting ecological integrity from destructive exploitation with very rigid legal instruments. Formulation and implementation of management plans at each area is followed by the rules and procedures of designating Coastal Wetlands Conservation Areas.
- The 1st Basic Plan for Coastal Wetlands Conservation was prepared in 2005, and implemented from 2006 by MOF. The 2nd Plan was formulated in 2012 with a goal of sustainable use of coastal wetlands ecosystem services. The Plan has five strategies; (1) Improving institutional arrangements; (2) strengthening science-based management system; (3) more focusing on natural resource management; (4) promoting education and raising public awareness; (5) enhancing cooperation at local, national and global levels. 19 major agenda were prepared to achieve the goal of the Basic Plan.

Legal and Institutional Mechanism Supporting Sectoral Policies, Legislation, and Plans

Marine Ecosystem Protection and Biodiversity Conservation

- Five ministries (Ministry of Oceans and Fisheries; Ministry of Environment; Ministry of Land and Transportation; Ministry of Agriculture, Food and Rural Affairs; and Ministry of Culture, Sports and Tourism) are involved in the protection of coastal and marine ecosystems in ROK. MOF as a leading ministry, in cooperation with other ministries, enacted Wetlands Conservation Act in 1999, and Marine Ecosystem Conservation and Management Act in 2006.
- To meet the goals of the acts, the Korean government has established and implemented the National Basic Plan on Coastal Wetlands Conservation, and the Marine Ecosystem Conservation and Management Plan. The latest Plans were prepared in 2012 for coastal wetlands and in 2008 for marine ecosystem respectively.
- Coastal Wetlands Protected Areas by Wetlands Conservation Act and Marine Protected Areas by Marine Ecosystem Conservation and Management Act have their own implementation plans for each protected area. The Korean government has designated 22 Marine Protected Areas (MPAs) for ensuring sustainable use and protection of marine biological diversity and its ecosystems.

- National Strategy on Biodiversity Conservation was prepared in 2014, based on the Law on Conservation and Uses of Biodiversity in 2012, which was to accommodate the Convention on Biological Diversity (CBD). Moreover, ROK successfully hosted the Twelfth Meeting of the Conference of Parties (COP 12) to the CBD at Pyeongchang in 2014. In particular, MOF hosted the Sustainable Ocean Initiative (SOI) High-level Meeting at CBD COP 12, aiming for laying a global platform to build partnership and enhance capacity to achieve the Aichi Biodiversity Targets related to marine and coastal biodiversity.

Marine Environmental Management

- Marine Environment Management Act acts as an overarching legal framework on protection and management of coastal and marine environment. The Comprehensive Marine Environment Management Plan since 1996 has evolved to reflect dynamically changing conditions related to marine environment management (1st: 1996–2000; 2nd: 2001–2005; 3rd: 2006–2010; 4th: 2011–2020).
- The Korean government designates Coastal Environmental Management Areas (CEMAs) to more proactively manage qualified areas (4 Conservation Areas), and highly polluted areas (5 Special Management Areas) based on the Marine Environment Management Act. The 2nd National Basic Plan on Environment Management Areas (EMSAs) has been implemented in 2012, and local management plans for each EMSA also prepared and



implemented in cooperation with relevant ministries and local governments. The national and local plans are revised every five years.

- TPLMS (Total Pollution Loads Management System) is highlighted among achievements in terms of the coastal pollution reduction from land-based activities and the rehabilitation of deteriorated environment. TPLMS initiative was firstly incorporated into Masan Bay Special Management Areas among nine EMSAs, its adoption was expanded to Shihwa and Busan Special Management Areas.
- National Marine Debris Management Plan firstly prepared in 1998 has been revised periodically on the basis of the Marine Environment Management Act.
- National Oil Spill Contingency Plan was developed in 2001, and entirely revised in 2008 by incorporating preparedness and response of HNS accidents as OPRC-HNS Protocol was ratified. In line with the revision, local Oil Spill Contingency Plans were revised in 2009 and national oil spill response system has been strengthened after the Hebei Spirit oil spill accident in 2007, where an estimated 12,547,000 liters (10,900 M/T) of crude oil were released.

Integrated Coastal Management (ICM) and Spatial Planning

- The Coastal Management Act of 1999 has functioned as a legal framework to manage coastal areas. The 2nd National ICM plan was adopted in 2011 with a vision of “Coastal ECHO (Ecosystem, Co-ordination, Humans and Ocean)” representing ecosystem-based and integrated socioecological system to ensure sustainable development of coastal areas.
- Each local government has established local ICM plans through adoption of MOF and implemented under the guidance of National ICM plan. According to newly introduced institutional mechanism, coastal zoning mechanism (statutory mechanism) and natural coastline protection system (called cap-based natural coastline protection) were incorporated into local

ICM plans since 2009. Entire coastal waters are divided into four use zones (use, conservation, special and management coastal waters) and 19 functional districts.

- Ecological and economic importance on islands has driven enactment of the Law on Conservation and Management of Uninhabited Islands in 2007. Based on the law, all uninhabited islands are classified into four categories (strict conservation, conservation, use and development). The Comprehensive Plan for Uninhabited Islands Management has been revised by reflecting change of the islands classification regularly.

Coastal Disasters, Erosion and Climate Change

- The Natural Disaster Countermeasures Act was enacted in 1967, and constantly revised. The Framework Act on the Management of Disaster and Safety enacted in 2004, which stipulates all affairs on prevention, preparedness, response and recovery on disastrous accidents, man-made (social) and natural disasters. In addition, the 1st National Framework Plan on Safety Management was formulated in 2005, and revised every five years.
- The 2nd National Comprehensive Plan on Climate Change of Marine and Fisheries Sector was formulated by Ministry of Maritime Affairs and Fisheries (now MOF) in 2007, and the 3rd National Comprehensive Plan is under re-arrangement, expecting to be adopted in the end of 2015.
- The 2nd Coastal Enhancement Plan (2010-2019) to protect coastlines from coastal erosion and hazards has been prepared and implemented by MOF, which is based on the Coastal Management Act.
- Coastal Erosion Management Areas are designated to manage heavily eroded areas based on results from coastal erosion monitoring. By the end of this year, three Coastal Erosion Management Areas are expected to be designated as pilot areas, and management plans be established by MOF.
- National Plan for Assessment of Climate Change Impacts and 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.

Sustainable Development Aspects

Marine Ecosystem Protection and Biodiversity Conservation

- As of 2010, 525 coastal and marine protected areas (total area: 10,006.9 km²) have been designated, which accounted for 11.5% of ROK's territorial sea area including marine parks, natural and cultural heritages, wildlife protected areas and specially managed uninhabited islands. Among them, MPAs consist of 12 Coastal Wetland Protected Areas and 10 Marine Ecosystem Protected Areas, which makes up about 471.5 km² in total area, including Ulleung Island Areas designated in 2014. In addition, the number of total MPAs will be expanded by 31 in 2018.
- Several coastal and marine protected areas have their own facilities for managing MPAs and educating people, and operated in corporation with local NGOs and NPOs. Community-based approach has been applied to harmonize marine ecological aspect and local economic aspects, such as cooperatives, social entrepreneurs, and community entrepreneurs.
- The Korean government has striven to restore degraded marine habitats since 2008. The strategic action plan for marine ecosystem restoration was prepared in 2008, and four areas were successfully restored. Based on the achievements, public investment for the restoration would be expanded by putting a "restoration" into key area of national marine policy regime.
- Endangered or ecologically important species are designated as "Marine Protected Species", currently a total number of 52 species has been specified "Marine Protected Species" as of April, 2014 (MOF); 15 marine mammals, 2 fishes, 24 invertebrates, 7 sea weeds/sea grass and 4 reptiles.

Marine Environmental Management

- Sewage treatment coverage in coastal areas increased from 39% in 1998 to 80.1% in 2010, and the coverage for Environmental Management Sea Areas (EMSAs) accounts for 87.3%. Tertiary treatment coverage in coastal areas as of 2010 is 54.1%. Especially, tertiary treatment coverage for EMSAs accounts for 64.2%, which implies intensive investment has been made to rehabilitate degraded coastal environment.
- An effective instrument to reduce land-based pollutants, TPLMS, expanded to other Special Management Areas from Masan Bay to Shihwa and Busan areas. Target pollutants are also expanded from COD (chemical oxygen demands) to phosphate.
- Institutional mechanism and increased public investment for marine environment are conducive to maintaining and improving coastal water quality. Proportion of coastal waters for "Swimmable and Fishable Uses" increased from 79% in 2007 to 88% in 2012.

Integrated Coastal Management and Spatial Planning

- Most of 74 local governments established local ICM plans to manage their territorial coastal area by 2009, and currently been revising their plans to apply the advanced zoning mechanism and coastline management system. MOF is supporting efforts of local governments to prepare the plans by providing technical assistance. And, MOF started to revise the 2nd National ICM plan according to periodical revision of the plan under Coastal Management Act, and will be prepared at the end of 2015.
- MOF is directly responsible for implementation of 82 actions among total 259 actions on the 2nd National ICM plan (2011-2020) while other actions are in charge of relevant ministries and local governments. Among them, 9 actions were completed and 45 actions under being well proceeded (MOF, 2014).
- Classification of uninhabited islands will be



completed in 2015 and its related management plan is constantly revised by accepting classification decision of National Committee on Coastal Management.

Coastal Disasters, Erosion and Climate Change

- MOF established the 2nd National Coastal Enhancement Plan in 2009, and revised the plan in 2014 to pay more attention on coastal erosion prevention and damaged area rehabilitation. A number of projects on the plan increased 324 to 370 in 2014, a total budget of US\$ 1.8 billion would be invested until 2019 including amount of investment in 2009-2013.
- The Korean government will prepare the 3rd National Comprehensive Plan on Climate Change in marine and fishery sectors by the end of 2015. More focus will be placed on adaptation as extreme events are expected to be increased and vulnerable areas to be enlarged.
- Central and Local Disaster Committees had been established under the Framework Law on the Management of Disasters and Safety of 2004. A Headquarters for Disaster and Safety Management has also been established under the Ministry of Public Safety and Security.
- Vulnerability mapping has been conducted by KHOA (Korea Hydrographic and Oceanographic Agency) and NEMA (National Emergency Management Agency) for the entire country's coastline. The vulnerability map is utilized to make a decision on national disaster countermeasures.

Monitoring and Evaluation

- The Korean government has conducted various marine environmental, ecological, and socioeconomic surveys and monitoring, which covers following aspects:
 - Marine environmental quality
 - Coastal wetlands
 - Marine and coastal habitats and target species
 - Uninhabited islands
 - Fishing grounds environment
 - Physical and geological characteristics of marine and coasts
 - Coastal erosion
 - Coastal vulnerability
 - Full array of socioeconomic features
- All survey and monitoring are statutory activities and conducted by MOF and its related agencies (KHOA, NFRDI, KOEM, KMI, KIOST etc.) in cooperation with universities and research entities. All data and information collected by the survey and monitoring are open to the public through internet portal systems (Marine Environment Information System or MEIS, Coastal GIS, etc.) for their uses. The data and information are put into a decision-making process and contribute to enhancement of knowledge-based management system. In addition, MOF has been assessing the state of Korea coasts and seas at the national level and publish the assessment report periodically since 2009 to provide basic data for ocean policies in connection with the 'Regular Process for Global Reporting and assessment of the State of the Marine Environment, including Socioeconomic Aspects' implementing under United Nations (UN). This assessment report identifies the socioeconomic and environmental impacts of human activities on Korea's coast and seas and proposes approaches to minimize these impacts.

Challenges and Priority Issues in the Next Five Years

Challenges are remaining in ensuring sustainable development of coastal and marine areas in ROK. Followings are challenges to be tackled for the next five years.

- **Enhancing Integrated management regime on coastal and marine environment.** MOF was re-established in 2013. However, within the ministry, each sector has not yet been arranged in integrated manners to achieve sustainable development. Current situation is articulating that cooperation among different ministries and agencies on coastal and marine environment should be strengthened. More integrated and coordinated policy making processes are key elements for sustainable development.
- **Protection of marine ecological integrity by managing pollution sources and restoring impaired environments and habitats.** Land-based and growth-oriented national policies during last four decades have degraded natural resources for sustaining the Korean society and economy. Despite of rearrangement and improvement of legal and institutional mechanisms since the mid-1990s, more innovative policy needs to be prepared and implemented for genuine progress.
- **Strengthening institutional and physical infrastructure toward safe and economically sustainable society.** We are living under risk-omnipresent circumstances, uncertainty and unpredictability driven by climate change and natural disasters, which are also threatening coastal communities and economy.
- **Elaborating instruments for coastal and marine spatial planning.** The Korean society has applied zoning scheme and target-based natural coastline management system to marine and coastal management. Assessment and evaluation tools were developed and applied. More sophisticated and advanced management tools needs to be developed and facilitated, though.
- **Consolidating capacity building and enforcement.** Much progress in sustainable development during last two decades has been made. The National Marine and Fisheries Training Institute aiming for providing capacity building program to marine-related workers and fishers was established in 1998 and the Marine Environment Education Center was established in 2010. However, management capacity and compliance with established legal/institutional arrangements remain challengeable issues. Especially capacity building at a local level is very crucial to effectively implement national polices.



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Singapore's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2015)



Basic Facts

Total Population 2011	5,469,700 (Dept of Statistics, 2015)
Percentage of population within 100 km of the coast	100% (WRI, 2001)
Land Area	718.3 km ² (Dept of Statistics, 2015)
Area of territorial sea (up to 12NM)	744 km ² (WRI, 2001)
Length of coastline	195 km (Department of Statistics, 2015)

National Economy

GDP per capita (Department of Statistics, 2015)	S\$ 71,318
GDP growth rate (Department of Statistics, 2015)	2.9% (2014)
GDP composition by sector (2010) (ADB, 2011)	Manufacturing (18.4%); Services (70.4%); Others (11.2%)
Employment distribution by sector (Ministry of Manpower, 2014)	Manufacturing (14.8%); Construction (13.6%); Services (70.9%); Others (0.7%)

Sustainable Singapore Blueprint

The Sustainable Singapore Blueprint (SSB) was first released in 2009 and outlined plans for a lively and liveable Singapore, one that Singaporeans love and are proud to call home. After a review in 2014, the SSB was refreshed as the SSB 2015 in November 2014, with a vision for a Liveable and Endearing Home, a Vibrant and Sustainable City, and an Active and Gracious Community. The SSB 2015 covers the following themes of work:

- A Liveable and Endearing Home** – We aim to have ‘Eco-Smart’ Endearing Towns, where smart technology and eco-friendly features will be embedded into our towns and homes. Parks, ABC (Active, Beautiful, Clean) Waters projects, sports facilities and other community amenities will also be available near residents’ homes. A ‘Car-Lite’ Singapore, with a denser rail network and extensive bus services as well as where cycling and walking are popular, will allow Singaporeans to travel easily around our neighbourhoods and our city. These measures will allow a green lifestyle to be second nature for many, with more ways for people to conserve energy and water and keep their environment clean and healthy.
- A Vibrant and Sustainable City** – Our businesses will adopt greener practices to reduce their environmental footprint and conserve energy, water and waste. We envision a Leading Green Economy where Singapore will be a hub for the cutting-edge business of sustainable development and Singaporeans can enjoy jobs in this exciting and meaningful sector. We will create living labs to test-bed ideas that improve lives and are good for the environment. There is also a focus on working towards a Zero Waste Nation by reducing our consumption, and reusing and recycling all materials to give them a second lease of life. The Government, the community, and businesses will come together to put in place infrastructure and programmes to make this our way of life.
- An Active and Gracious Community** – Community efforts are crucial for a sustainable Singapore. Efforts and commitment today are central for securing the blueprint’s vision for current and future generations. We will encourage Singaporeans to become exemplary stewards of our environment by participating in shaping our neighbourhoods and building a more gracious society together as a community. People, businesses and the Government will come together to care for our common spaces and environment and take a long-term perspective in conserving precious resources.



Progress in SDS-SEA Implementation (2003-2015)

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.
- 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.
- Under the IUCM framework, the Coastal and Marine Environment Policy Committee (CMEPC) and the Technical Committee on Coastal and Marine Environment (TCCME), comprised of 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.

Sustainable Singapore Blueprint Targets for 2030

S/N	Indicator	SSB Targets for 2030
Green and Blue Spaces		
1.	Amount of skyrise greenery	200 ha
2.	Amount of park space and waterbodies open to recreational activity	
	(i) Parks	Park Provision Ratio of 0.8 ha / 1,000 population
	(ii) Waterbodies	1039 ha
3.	Length of park connectors and waterways open to recreational activity	
	(i) Park connectors*	400 km
	(ii) Waterways	100 km
4.	Length of nature ways	180 km
5.	Proportion of households within 10-minute walk from a park	90%
Mobility		
6.	Length of cycling paths	700 km
7.	Modal share of journeys during peak hours made via public transport	75%
8.	Length of rail network	360 km
9.	Proportion of households within 10-minute walk from train station	80%

* Including Round-Island Route.

National Ocean Policy and Institutional Arrangements, continued.

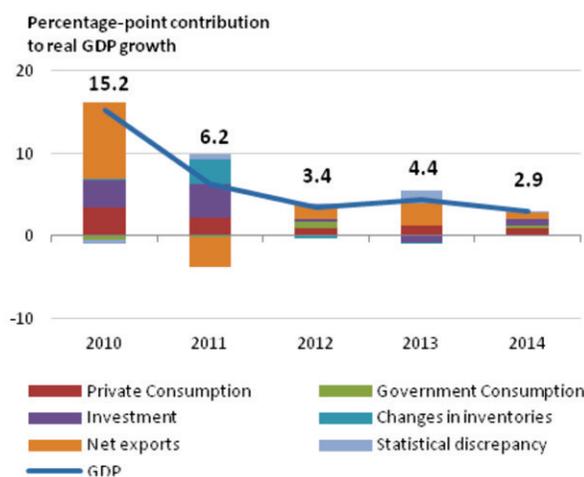
Sustainable Singapore Blueprint Goals by 2030		
S/N	Indicator	SSB Targets for 2030
Resource Sustainability		
10.	Proportion of buildings to achieve BCA Green Mark Certified rating	80%
11.	Energy intensity improvement (from 2005 levels)	35%
12.	Domestic water consumption per capita per day	140 L
13.	National recycling rate	
	(i) Domestic recycling rate	30%
	(ii) Non-domestic recycling rate	81%
Air Quality (Targets for 2020)		
14.a	PM2.5	
	(i) Annual mean	12 µg/m ³ (Long term: 10 µg/m ³)
	(ii) 24-hour mean (99th percentile)	37.5 µg/m ³ (Long term: 25 µg/m ³)
14.b	PM10	
	(i) Annual mean	20 µg/m ³
	(ii) 24-hour mean (99th percentile)	50 µg/m ³
14.c	Sulphur Dioxide (SO ₂), 24-hour mean (Max)	50 µg/m ³ (Long term: 20 µg/m ³)
14.d	Ozone, 8-hour mean (Max)	100 µg/m ³
14.e	Nitrogen Dioxide (NO ₂)	
	(i) Annual mean	40 µg/m ³
	(ii) 1-hour mean (Max)	200 µg/m ³
14.f	Carbon Monoxide (CO)	
	(i) 8-hour mean (Max)	10 mg/m ³
	(ii) 1-hour mean (Max)	30 mg/m ³
Drainage		
15.	Flood-prone areas	23 ha
Community Stewardship		
16.	Number of active green volunteers	5,000
17.	Number of Community in Bloom Gardens	2,000
18.	Number of litter-free Bright Spots	500 (by 2015)



Coastal and Marine Economy

The marine and offshore engineering industry has contributed strongly to manufacturing output in Singapore, increasing its share of manufacturing output from three percent (3%) in 2004 to seven percent (7%) in 2013. In 2013, the marine and offshore engineering industry produced the fifth-largest manufacturing output within the manufacturing sector after petroleum (17%), semiconductors (16%), petrochemicals (12%), and machinery and systems (8%).

Contribution to Growth (Demand) (2010-2014)



Supporting Sectoral Policies and Legislation

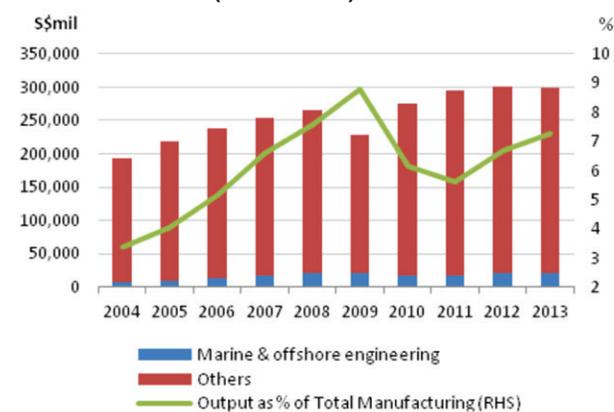
Natural and Manmade Hazards Management

- Maritime and Port Authority of Singapore Act
- Planning Act
- Civil Defence Act
- Civil Defence Shelter Act
- Merchant Shipping Act

Biodiversity and Habitat Protection

- National Parks Board Act
- Parks and Trees Act
- Foreshore Act
- Sand and Granite Quarries Act
- National Parks Act
- Control of Vectors and Pesticides Act
- Wild Animals and Birds Act
- Destruction of Disease-Bearing Insects Act
- Control of Plants Act
- Endangered Species Act

The marine and offshore engineering industry contributes 3%-9% of total manufacturing output within the manufacturing sector in Singapore in the last decade (2004-2013)



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
- Transboundary Haze Pollution Act

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 2014 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 (2012)
- E2 (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 37 projects related to coastal management issues since 2009.
- Ongoing capacity building within government via talks, workshops and through IUCM implementation activities.
- An MOU was signed with PEMSEA in 2013 to establish Singapore as a PEMSEA Regional Demonstration Site and Learning Centre for IUCM.
- The Sisters' Island Marine Park was established in 2014 for recreation, education, and conservation purposes.

Natural and manmade hazards prevention and climate change (NEA, 2015; PUB, 2015)

- 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. Singapore has since embarked on a 2nd National Climate Change Study where the National Environment Agency (NEA), in collaboration with the Met Office Hadley Centre in the United Kingdom commissioned Phase 1 of the study, which aimed to provide projections of changes in the main climate variables of interest to Singapore. The key highlight of this report was the use of high resolution climate models to project regional climate and sea level changes with finer spatial detail for the 21st century over the region, centered on Singapore. The

Challenges and Priorities:

Natural and Manmade Hazards Prevention and Climate Changes

- Adaptation to climate change

study was completed early this year. Phase 2 of the study, which started in end 2014, is making use of the projections from Phase 1 to examine the climate change impacts on areas such as water resources and drainage, biodiversity and greenery, network infrastructure and building infrastructure. This in turn will guide Government agencies in their planning and will serve to shape Singapore's climate change resilience plans. Key findings from Phase 2 can be expected by end 2015.

- To enable Singapore to cope with more intense rainfall, PUB has adopted a holistic "source-pathway-receptor" approach to enhance flood protection for the island. This includes strengthening the drainage infrastructure (i.e. "Pathway" solutions) and introducing measures to better control stormwater at where it falls onto the ground (i.e. "Source" solutions) and at the areas where floods may occur (i.e. "Receptor" solutions).

Habitat Protection and Biodiversity

- About 10% of Singapore's land area is dedicated to parks and nature reserves. Approximately 3,380 ha are legally protected as National Reserves (NParks, 2014). A network of green space, roadside greenery, parks and park connectors, comprising an additional 6,327 ha, supports and buffers these nature reserves (NParks, 2014).
- The country was able to increase its green cover from 35.7% in 1986 (National Parks Board, 2009) to 40% in 2011 (NParks, 2014).
- 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).
- Singapore recognized the need to track our rich urban biodiversity in a manner which can integrate



conservation and adaptation actions. As such, working with the Secretariat of the Convention on Biological Diversity (CBD) and the Global Partnership on Local and Subnational Action for Biodiversity in 2009, we developed the Singapore Index on Cities' Biodiversity to give international focus to biodiversity tracking in urban environments. The index was endorsed in October 2010 at the 10th Meeting of the Conference of Parties to the CBD.

Water Use and Supply Management

- Singapore does not have sufficient land to collect and store water, and has no natural sources of water.
- Integration of all water management functions (water supply, drainage and used water) is under a single agency, national water agency PUB, since 2001.
- Singapore has overcome water shortages in the early years despite the lack of natural water resources by diversifying its sources of water supply through its Four National Taps. The Four National Taps are: water collected from local catchments, imported water, NEWater, and desalinated water (PUB, 2012).
 - Imported water – The country imports 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 total water catchment area is 2/3 of Singapore's land area. With the use of Variable Salinity Plants, we can tap on the smaller streams and canals to help expand the water catchment to up to 90% in the long term.

- NEWater – is high-grade, ultra-clean reclaimed water produced from purifying treated used water. NEWater can meet up to 30% of the nation's current water needs, and this will be increased to meet up to 55% of water demand by 2060.
- Desalination – Desalinated water can currently meet up to 25% of the country's water demand, and desalination capacity will be ramped up to meet up to 25% of future water demand by 2060.
- In particular, NEWater and desalinated water are not dependent on rainfall and are thus more weather resilient. As Singapore builds up its capacity for these weather-resilient water sources, the country will be better prepared for possible prolonged periods of dry spells in future.
- The Deep Tunnel Sewerage System (DTSS) was conceived in the 1990s as a long-term solution for used water management in Singapore. It is an important component of Singapore's water management strategy as it allows every drop of used water to be collected, treated and further purified, ensuring the sustainability of NEWater.
- Phase 1 of the DTSS was completed in 2008, and consists of a 48 km long deep tunnel sewer running from Kranji to Changi, a centralized water reclamation plant at Changi, a deep sea outfall, and the associated link sewers. Used water from homes and industries in the northern and eastern part of Singapore is conveyed through the deep tunnel sewer to the centralized water reclamation plant for treatment to international standards. It is then discharged through the deep sea outfall, or sent to the NEWater Factory for further purification into NEWater.
- Phase 2 of the DTSS will consist of the same four components, and extend the system to cover the western part of Singapore. It is targeted to be completed by 2024.
- To manage water demand, Singapore adopts a three-pronged approach which includes pricing water to reflect its scarcity value, mandating water-saving measures and facilitating programmes to promote water conservation among the community.

Challenges and Priorities: Habitat Protection and Biodiversity (NParks, 2015)

Implementation of the National Biodiversity Strategy and Action Plan (NBSAP), the main components are as follows:

- Safeguard biodiversity
- Consider biodiversity issues in policy and decision making
- Improve knowledge on biodiversity and natural environment
- Enhance public education and awareness
- Strengthen partnerships with all stakeholders and promote international cooperation

The NBSAP is being reviewed and updated for the next five year cycle from 2015 to 2020.

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

- Capturing every drop of rain
 - Collecting every drop of used water
 - Recycling every drop of water more than once
-
- Water consumption declined from 156 L/person/day in 2008 to the current rate of 150.4 L through water conservation programs, including outreach and public awareness and education programs.
 - To encourage the community to make water conservation a way of life, PUB Singapore actively engages the People, Public, Private sectors through initiatives such as:
 - 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.

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.
- As of Dec 2014, there are 262 farms occupying around 679 ha. There are another 117 fish farms occupying 103 ha of sea space.

Pollution Reduction and Solid Waste Management (MEWR, 2012)

- Air quality has improved with reductions in fine particulate matter (PM2.5) — which is linked to

respiratory and cardiovascular illnesses — from an annual mean of 21 µg/m³ in 2005 to 18 µg/m³ in 2014.

- 100% of the population has had access to waste collection services since 2007.
- Recycling rate has increased from 40% in 2000 to 60% in 2014.
- 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 2004 and 2014, electricity produced by natural gas increased from 71.7% to 95.38% of total electricity produced, and overall generation efficiency rose from 44.75% to 46.23%.
- Singapore launched a national energy efficiency plan, E2 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.
- Singapore is investing in capabilities and technologies to increase its capacity to improve

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

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.

- The Singapore Index on Cities' Biodiversity serves 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 ambient air quality, sources of pollution including industrial operations, power generation plants, motor vehicles and off-road diesel engines. Emission standards are specified in the Environmental Protection and Management Act and Regulations, Environmental Protection and Management (Vehicular Emissions) Regulations and Environmental Protection and Management (Off-Road Diesel Engine Emissions) Regulations 2012.
 - 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 and assesses climatic change and weather conditions in Singapore. In addition, it provides early warnings for tsunamis that might impact Singapore.

Monitoring and Evaluation

- Monitoring of the biodiversity in Singapore's nature reserves and marine environment is ongoing. The five-year Comprehensive Marine Biodiversity Survey (CMBS), which was launched in 2010, has been valuable in inventorying our rich coastal and marine resources. Over 200 new records for Singapore were made, about 10 species were rediscovered, and over 100 species were identified as possibly new to science (NParks, 2014).

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Thailand's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2015)



National Economy

GDP
US\$ 317.7 billion (2010); \$385 billion (2013); \$388 (April 2014)

GDP per capita (year)
US\$ 4,720.70 (2010)

GDP growth (past five year average)
7.8% (2010); 2.9% (2013); 3.0-4.0% (April 2014)

GDP 2011 growth forecast
3.5% – 4.5% (2011); 2.2% - 5.2% (2014)

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%)

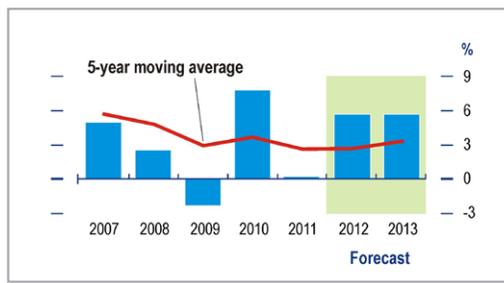
Employment by Sector (May 2014): Labor Force - 37.76 million

1. Agriculture, forestry and fishing – 33.6 %
2. Non-agricultural – 67.4%
 - Manufacturing – 17.2%
 - Construction – 6.0%
 - Wholesale and retail; repair of motor vehicles and motorcycles – 16.6%
 - Transportation and storage - 2.9%
 - Accommodation and food service facilities – 6.9%
 - Financial and insurance activities – 1.4%
 - Real estate activities – 0.4%
 - Public administration defence and compulsory social security – 4.3%
 - Education – 2.9%
 - Human health and social work activities - 2.0%
 - Other service activities – 1.8%

Basic Facts

Total Population 2010	65,926,261 (2010); 67.01 million (2013)
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	3,148 km inclusive of islands

GDP Growth



Source: Asian Development Outlook Database.



Progress in SDS-SEA Implementation (2003-2014)

National Ocean Policy and Institutional Arrangements

Status of coastal and ocean policy/legislation

- Draft bill on management of coastal resources (Promotion of Marine and Coastal Resources Management Act) prepared in 2007 but still under consideration for endorsement to Parliament
- Draft National Coastal and Marine Policy prepared
- National Marine and Coastal Resource Strategy prepared
- A draft National Maritime Interests and National Maritime Security Strategy is currently being prepared by the National Security Council, which will include considerations for sustainable development.
- Management of coastal and marine areas in Thailand is presently governed by various issue- and area-specific policies and plans
- Thailand ratified the UN Convention on the Law of the Sea (UNCLOS) on 15 May 2011

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.
- Under the National Security Council, there is another institutional coordination mechanism in place across sectors called the National Marine Enforcement Coordination Centre.
- At the regional/subregional 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.

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

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). Employment in the agricultural sector has been slowly decreasing, and was about 33.6% in May 2014.
- 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.

- 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.

Medium-term Development Plan

- Thailand's Eleventh Plan (2012-2016) adheres 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

- The Environmental Quality Management Plan for Thailand (2012-2016) specified a target on development and implementation of ICM programs in 50% of coastal provinces.
- Natural resources and environmental management plans are prepared in all provinces.

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).

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

- Master Plan on Water Resources Management Law (2012)
- Draft Integrated Water Resources Management Law (2013)

Pollution Reduction and Waste Management

- Action Plan for Solid Waste (2006)
- Rehabilitation plan for domestic wastewater collection and treatment systems (2006)
- Environmental Management Action Plan for Coastal Aquaculture (2001)
- The Ministerial Regulation on Oil Spill Pollution Prevention, B.E.2545 (2002)
- Pollution Management Plan 2012-2016

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, e.g., intensification of knowledge on marine resources and environment at the high school level in downstream as well as upstream areas
- 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.
 - 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

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). The Management Plan is currently being updated. The DMCR allocates 3.4 million Baht/year (around US\$117,000/year) to support conduct of studies and natural resource management in Songkhla Lake.
 - Establishment and operationalization of PEMSEA’s Port Safety, Health and Environmental Management System (PSHEMS) in Bangkok Port and Laem Chabang 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 Transboundary Diagnostic Analysis (TDA) has been completed and a Strategic Action Programme (SAP) has been drafted for the Bay of Bengal. A regional training on ICM and applications for sustainable fisheries management will be co-organized by BOBLME and PEMSEA in Chonburi, Thailand, on October 2014.
 - A number of community-based coastal resource management (CRM) and fisheries projects have also been implemented.
 - Under the GEF/UNDP/PEMSEA Project on Scaling up the Implementation of the SDS-SEA (2014-2019), 12 provinces have been identified as priority sites for ICM scaling up. Selected sites have been identified as ‘ICM Learning Sites’, to demonstrate how ICM can help facilitate disaster risk reduction management and climate change adaptation (Chonburi); biodiversity conservation and habitat rehabilitation (Koh Tao); MPA management (Koh Samui); sustainable fisheries and livelihood development (Koh Pang Ngan); and water resources and pollution management (Songkhla Lake).
- SDS-SEA Scaling Up**
Target – 50% in national EQM Plan 2012-2016



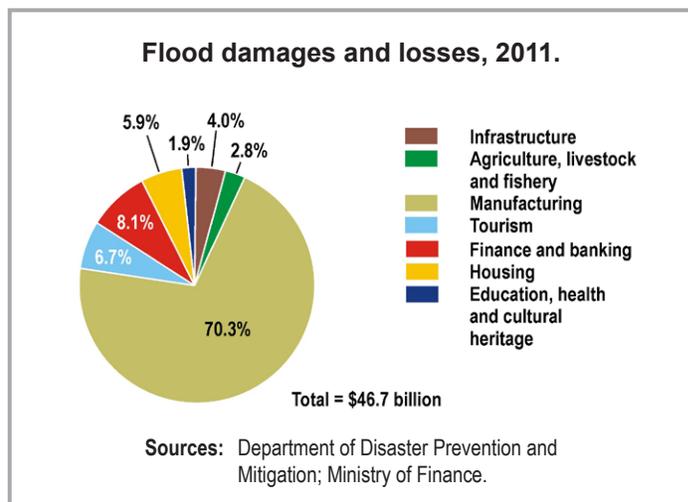
- Routine monitoring of the status of marine and coastal resources, particularly the 3 significant ecosystems, namely, mangroves, coral reefs and seagrass beds
- State of Environmental Governance Report in 2005
- The Office of Natural Resources and Environment Policy and Planning of the MNRE is responsible 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, coastal erosion, 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.
- 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



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

floods and droughts which have become more increasingly common.

- Severe coral bleaching caused by rise in sea surface temperature also occurred widely in 2010, resulting to 50-90% coral mortality in the Andaman Sea and 30-50% in the Gulf of Thailand.
- 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).
- Coastal erosion is also a priority problem in Thailand that is increasing in severity. At present, 830 km of coastline all over the country is affected by coastal erosion, 730 km of which is in the Gulf of Thailand, and 100 km in the Andaman Sea.

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 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
- The Institute of Research and Development of Marine and Coastal Resources (under the

Department of Marine and Coastal Resources) is currently studying coral reef resilience throughout the country to serve as inputs for marine spatial planning.

- In Chonburi Province:
 - Studies made by the Department of Marine and Coastal Resources showed that the length of coastline affected by erosion in four districts of the province (Muang Chonburi, Banglamung, Sriracha, and Sattaheep) has increased from 17.6 km in 2009 to 24.35 in 2011. Protection of coastal areas from erosion is important to the tourism industry of Chonburi, which generates up to 65 billion baht a year (approx. \$2 billion).
 - The Department of Marine and Coastal Resources (DMCR) under MNRE is also currently providing technical and financial support amounting to 9.5 million Baht (more than \$300,000) to undertake EIA and feasibility studies for coastal erosion measures in Saensuk Municipality
 - The Ministry of Natural Resources and Environment (MNRE) will provide a 124.4 million Baht budget (approx. \$4 million) to support actions to address coastal erosion in Chonburi Province
 - Mangrove reforestation activities are contributing to the improvement in coastal protection.
 - In Koh Tao, green development of the island has been emphasized.
- The UNEP/COBSEA/MFF Project on Strengthening the Resilience of Coastal Communities, Ecosystems, and Economies to Sea Level Rise and Coastal Erosion (2013-2014) is aiming to develop practical knowledge in climate change adaptation by prioritizing interventions that strengthen resilience of ecosystems and communities to coastal erosion.

Oil and Chemical Spills

- The Marine Department of the Ministry of Transport is the focal agency and serves as

the National Oil Spill Response Center for Thailand. It conducts oil spill preparedness and response training for local governments regularly.

- 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 occurring 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. A sensitivity index map for the Gulf of Thailand was prepared and published in 2013. An oil spill dispersant guideline for the sub-regional area has been drafted.

Habitats and Biodiversity

- Every coastal province in Thailand has mangrove forests, covering approximately 36% of the coastline with an area of 1,525,061 Rais (2,440 km²).
- Coral reefs cover an area of around 62,480 Rais (100 km²) in the Gulf of Thailand and around 65,776 Rais (105 km²) in the Andaman Sea.
- After the 2004 tsunami, the results from the survey on 174 sites showed that 13% of the total sites were seriously impacted while 40% of the total sites were not impacted at all.
- Seagrass beds in Thailand cover around 118,665 Rais (190 km²)
- 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.

- 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 4,317km² or 3.9% of territorial waters (2008), while the protected land area is 104,452 km² 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. The Department of Marine and Coastal Resources (DMCR) allocates 9.9 million Baht/year (approximately US\$340,000/year) to implement programs on coral reef and seagrass conservation and restoration of endangered species. DMCR also allocated 10 million Baht (around \$1.667 million) to support conservation programs in Pha Ngan Island and Tao Island group.
- 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.

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



- Mangrove rehabilitation in various areas were supported by Mangroves for the Future (MFF), while UNEP supported the Department of Marine and Coastal Resources (DMCR) in coral reef protection by establishing and implementing environment- friendly practices in the diving industry and local communities, applying responsible diving tourism principles under the Green Fins project during 2004 – 2009. At present this project is being continued using the regular budget of DMCR.
- As of July 2014, among the major achievements toward the 2020 Aichi Biodiversity Targets is the increase of protected areas. At least 20% of the marine and coastal areas in Thai waters have been designated as protected areas and at least 5 sites of wetlands of international importance have been designated as Ramsar sites. The Ramsar sites include Ra-Phrathong Islands located in the Andaman Sea with a total area of 12,149.92 ha, and Kra Islands located in the Gulf of Thailand with a total area of 2,827 ha, which were both designated in August 2013. The Samui Group of Islands was declared as protected area in 2014.
- The Aichi Biodiversity Targets have been integrated into Thailand's 11th National Economic and Social Development Plan (2012-2016)
- Thailand's Research Fund (TRF) provides funds for research activities and facilitates the exchange of experiences for biodiversity conservation at local levels.

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.

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.

- 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 spawning crabs (Crab Condominium) in Sriracha, Bangphra and Laem Chabang;
 - 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.
- Development of joint approaches for sustainable fisheries management in the Andaman Sea between Thailand and Myanmar is in process with the support of SEAFDEC, which organized a sub-regional consultative workshop on May 2014 to provide a platform for both countries to identify joint approaches that could be adapted for the management of fisheries habitat, trans-boundary stocks, and fishing capacity, as well as for combating illegal and destructive fishing. A similar sub-regional workshop was also conducted in May 2014 between Thailand and neighboring countries bordering the Gulf of Thailand (Cambodia, Vietnam and Malaysia).

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 m³/year. Of the 800 billion m³/year of rainfall, only about 200 billion m³ is surface water that is available for utilization.
- Total water storage capacity, by different types of dams and reservoirs is about 74 billion m³. However, water in the reservoirs for the summer season is only about 45 billion m³. 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 m³.



- 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)
- Thailand's Department of Water Resources is exploring various approaches and technologies for addressing key water management issues in Thailand, including flooding, drought and water quality, in an integrated manner.
- Following the flooding event in 2011, the government set up the Strategic Committee for Water Resource Management (SCWRM), which formulated the Master Plan on Sustainable Water Resource Management. The Master Plan includes measures for the short- and long-term to reduce the impact of floods and droughts, including work plans on:
 - Restoration and conservation of forest and ecosystem;
 - Management of Major Water Reservoirs and Formulation of the National Annual Water Management Plan
 - Restoration and Efficiency Improvement of Current and Planned Physical Structures
 - Establishing an Information Warehouse as well as Forecasting and Disaster Warning System
 - Preparedness to Emergency Situation in Specific Areas
 - Assigning Water Retention Areas and Recovery Measures
 - Improving Water Management Institutions
 - Creating Understanding, Acceptance, and Participation in Large Scale Flood Management from all Stakeholders

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

The Master Plan also includes an Action Plan for the Integrated and Sustainable Flood Mitigation in Chao Phraya River

- As of December 2013, local public consultation workshops were being held for the preparation of Thailand's Integrated Water Resources Management Law.
- On July 2014, a National Workshop on Strengthening Integrated Water and Flood Management

Implementation (IWRM) in Thailand was held to promote awareness and consensus on the issues, tools and processes for improving water resource management in Thailand's river basins, in particular flood and drought prevention and mitigation and water pollution control.

Pollution Reduction/Waste Management

Wastewater Management

- Main sources of wastewater in Thailand include:
 - Municipal: approximately 14.5 million m³/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 m³/day from >120,000 factories
 - Agriculture: Approximately 0.1 million m³/day from pig farms and aquaculture (point

sources) and 150 million m³/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 m³/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).

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

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
- In 2010 and 2011, municipal waste generation increased to 15.2 million tons and 15.98 million tons, respectively, of which 3.2 million tons and 4.10 million tons were recycled. In 2011, 35% of collected wastes were disposed in sanitary manner while 65% were disposed in unsanitary manner.
- 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%).
- In 2010, industrial hazardous waste generated was 2.441 million tons while household hazardous waste was 0.718 million tons, which was disposed as follows: 15.5% processed to be used as raw materials; 37.4% processed to be used as alternative energy; 23.9% processed for reuse; 2.6% underwent treatment; 17.8% was disposed; and 2.8% was recycled/disposed overseas.
- In 2011, industrial waste generated was 26.4 million tons, of which 2.3 million tons (8.7%) were hazardous and 24.5 million tons (91.3%) were non-hazardous. 43% of the hazardous waste was reused and recycled; 19% was used as alternative fuel; 19% was incinerated; 16% was buried in landfills; and 7% was disposed through other means. For the non-hazardous wastes, 47% was reused and recycled; 40% was used as raw material for other products; 9% was treated and disposed; and 3% was exported.
- Existing municipal waste disposal facilities in Thailand include:
 - 96 sanitary landfills
 - Three (3) incineration facilities, in Phuket Province, Samui Island and Lamphoon Province
 - Three (3) Integrated Waste Management Systems in Wieng Fang Municipality, Rayong Municipality, and Chonburi Provincial Administrative Organization
- Facilities for infectious waste management are being operated in 11 local areas including: Bangkok, Pattaya City, Nonthaburi Provincial Administrative Organization, SamutSakorn Province, municipalities of Suphanburi, Chiang 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.
- The Pollution Control Department (PCD) has been continuing to develop and implement government policies and programs on waste minimization by applying the 3Rs; integrated technologies; clustering management; public-private partnerships; and waste to energy, and undertakes continuous awareness raising and capacity building to increase stakeholders' participation.
- The 3Rs program in particular includes the following:
 - Applications in community - based solid waste management including:
 - Community-based recycling/school recycling programs (Garbage Bank); community buy-back centres; waste donation; household composting; and zero waste programs

- Hazardous waste management (E-waste Inventory and promotion of system for management of household hazardous wastes from source separation to recycling and disposal)
- Cooperation with manufacturers, distributors and communities to take back end-of-life products (e.g., packaging, mobile phone and batteries, fluorescent lamps, used lead-acid batteries and dry cell batteries)
- o Applications in the industrial sector, which include:
 - Eco-Industrial Development Pilot Project at the Rojana Industrial Park in Ayutthaya in 2010 – 2014 to demonstrate Eco-Industrial Estate/Park/ Town concept, 3R implementation in industries and communities, and among government, enterprises and the public
 - Waste Utilization Demonstration Project (year 2009 – 2013) to promote 3R activities in industrial waste management and reduce waste going to landfills
 - Metal Recovery Project (2009 – 2012) to demonstrate simplified metal recovery technology for E-wastes
- o Applications in government operations through the program on Government Green Procurement
- National 3Rs Conferences have also been conducted to introduce the 3Rs principle, policy and strategies as well as transfer knowledge, experience and best practices among government, business, NGOs and civil society in the 4 regions of Thailand (Central, North, Northeast and South).
- The Thailand Waste Recovery Center was also established to develop 3Rs database and information technology and to serve as knowledge hub for dissemination of 3Rs knowledge, technologies, experiences, and best practices through cyber network.
- Improvement of regulations and strategic plans to support further application of the 3Rs are in process, considering resource efficiency, sustainable consumption, proper treatment and disposal of waste residues, extended producer responsibility, public private partnership and application of economic instruments.

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 jurisdiction 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.

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.

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Timor-Leste's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2015)

Basic Facts	
Total Population (in millions)	1.09 million in 2011; 1.12 million in 2012 (ADB); 1.178 million in 2013 (WB)
Annual population growth rate	2.4% (2010-2012)
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 km ² , 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 km ² EEZ
Length of coastline	735 km

National Economy	
GDP per capita (year)	US\$1.615 Billion (2013, WB)
GDP growth (past five year average)	7.8% (2010) 10% for 2014 Asian Development Outlook (2013) 8.1% (2013, WB)
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 (2003-2014)

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.
- A draft framework for a marine and coastal policy has been prepared 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.
- Decree Law No. 4/2014, the Organic Statute of Administrative Pre-Deconcentration Structure, promulgated in 2014, mandates the establishment of a local governance system, enabling the development of mechanisms for administrative decentralization.

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

- Various projects and programs have been contributing to strengthening institutional capabilities for integrated planning and management of marine and coastal resources in Timor-Leste, including the:
 - Partnerships in Environmental Management for the Seas of East Asia or PEMSEA (2000 – ongoing)
 - Arafura and Timor Seas Ecosystem Action Programme Project or ATSEA (2010 – ongoing)
 - Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF or CTI) (2007 – ongoing)
 - Coral Triangle Support Partnership (CTSP) (2008-2013)
 - Strengthening Coastal and Marine Resources Management in the Coral Triangle of the Pacific (ADB-CTP)
 - Regional Fisheries Livelihoods Programme for south and Southeast Asia (RFLP)
- In keeping with the integrated implementation of these projects by the Ministry of Agriculture and Fisheries, the Training on Ecosystem Approach for Managing Coastal and Marine Resources in Timor-Leste was participated by implementers of the above projects in Dili in June 2011.
- 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 were prepared and trainings on ICM and livelihood development related to seaweed culture and fish processing were conducted. Around 2 hectares of mangrove areas and other coastal vegetation were also rehabilitated. The two districts have a total coastline of around 140 km, covering almost 20% of the country's coastline. Further development of the ICM programs will include focus on sustainable fisheries and disaster risk reduction and climate change adaptation in Liquica, and sustainable fisheries and habitat conservation and rehabilitation in Manatuto. Development of ICM program has also been initiated in the district of Dili, focusing on enhancing the effectiveness of MPA management in Atauro Island, complementing the efforts of the ADB-CTP Project on establishment of MPA in the island.
- ATSEA is 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. The TDA has been completed and the SAP has been adopted for the Arafura and Timor Sea area. ATSEA is assisting communities in Bobonaro in developing sustainable livelihood programs based on mudcrab fattening.
- The FAO-sponsored RFLP aims to improve livelihood opportunities and sustainable fisheries management in Timor-Leste by improving co-management mechanisms, data gathering and information-sharing on fisheries, post-harvest and handling practices and marketing of fisheries products, and micro-financing support for expanding livelihood opportunities.
- The CTI is a multilateral partnership of six countries comprising the Coral Triangle (Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands and Timor-Leste) formed in 2007 to address the urgent threats facing the coastal and marine resources of one of the most biologically diverse and ecologically rich regions on earth. Countries have adopted the CTI Regional Plan of Action and their respective National Plans of Action (NPOA). CTI implementation in Timor-Leste is led by a multisectoral National Coordinating Committee (NCC) and thematic working groups focusing on seascapes, fisheries, marine protected areas, climate change, threatened species protection, monitoring and evaluation and capacity building.
- The Coral Triangle Support Partnership (CTSP), a 5-year project supported by the USAID and implemented by a consortium of international conservation-based NGOs including the WWF, Conservation International, and The Nature Conservancy, supports the regional commitment of the six countries to ensure that the marine areas of the Coral Triangle are managed in a sustainable manner by strengthening the capacity of institutions and local communities in marine resource management, and building overall institutional capacity in the agencies that manage marine resources.



ICM Implementation, continued.

- The five-year ADB-funded Coral Triangle of the Pacific (ADB-CTP) aims to assist marine resource management by Pacific Island Coral Triangle countries including Papua New Guinea, Solomon Islands, and Timor-Leste, as well as Vanuatu and Fiji as additional focal countries. It supports the goals of the CTI in the areas of EAFM, MPAs, and climate change adaptation by strengthening the capacity of national and local government institutions responsible for protecting and conserving coastal and marine resources, and assisting local communities in formulating and implementing sustainable resource management and climate change adaptation programs.
- Key CTI initiatives undertaken in Timor-Leste with the support of various partners (CTSP, NOAA, ADB-CTP, the WorldFish Center, etc.) include trainings on and conduct of marine surveys; trainings on EAFM and various tools; demonstration of a process for integrated terrestrial and marine spatial planning in the NKS National Park and establishment of community-based fisheries management schemes including strategies for diversifying household incomes (CTSP); establishment of MPAs in Atauro Island and Batugade (ADB-CTP Project); trainings and applications of tool kits prepared for incorporating climate change considerations into community zoning and regulations; and policy development for addressing threatened species and possible ratification of the Ramsar Convention and CITES.

Monitoring and Evaluation

- A national water quality sampling program is being developed although there is still limited capacity for environmental monitoring.
- 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 Commerce, Industry and Environment, through the National Directorate for Environment and the National Directorate for International Environment Affairs and Climate Change, and with the support of UNDP, prepared the Initial National Communication to the UNFCCC, which was submitted for review of the Council of Ministers on June 2014.
- 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.
- A marine rapid assessment survey was undertaken in 2012 by the Conservation International, NOAA and CTSP to collect information on marine biodiversity of corals and fishes and overall health of the reefs, which can help identify areas for conservation and marine tourism. Twenty-two reef locations were surveyed in the Nino Konis Santana National Park and Atauro Island. Autonomous Reef Monitoring Structures (ARMS) were also installed on the reefs in Atauro Island in 2012 by NOAA, for retrieval in 2015, with data that can show changes in reef health and ocean conditions.
- The ALGIS unit in the Ministry of Agriculture and Fisheries provides mapping and spatial needs for irrigation, forestry, agriculture and aquaculture. Various mapping projects, supported by external funding, have helped establish GIS systems in a number of government agencies and produced an array of geospatial products.

SDS-SEA-related Legislation, Policies and Plans

Disaster Management and Climate Change

- National Disaster Risk Management Plan (2005) endorsed a multisectoral, 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.

- Timor-Leste ratified the UNFCCC in 2006 and the Kyoto Protocol to the UNFCCC in October 2008. Under the Kyoto Protocol, the GoTL has established a Designated National Authority (DNA). The main role of the DNA is to coordinate with key agencies and private sectors to promote and develop alternative affordable and environment-friendly sources of energy through the Clean Development Mechanism (CDM).
- Timor-Leste also ratified the Montreal Protocol on substances that Deplete the Ozone Layer and the Vienna convention for the Protection of the Ozone Layer in 2009
- The broad responsibility for various aspects of disaster management is spread across the Ministry of Social Solidarity and the Ministry of Commerce, Industry and Environment and their associated departments.
 - Within the Ministry of Social Solidarity, the National Disaster Management Directorate (NDMD) is responsible for coordinating and overseeing Timor-Leste's policies and initiatives on disaster risk management.
 - The National Directorate of Environment and the associated National Directorate for International Environmental Affairs and Climate Change (DNAAIAC), within the Ministry of Commerce, Industry and Environment, 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. The NAPA proposed promotion of NDMD-led coordination and information sharing for DRM and climate change risk reduction with key ministries and at the district level, including early warning and response.

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 on protection of marine and terrestrial areas
- Government Resolution No. 9/2007 defines the National Policy and Strategy for Forestry.
- UN Convention on Biological Diversity was ratified in 2007
- 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.
- A National Biodiversity Law and a Wildlife Conservation Law have been drafted; the Program of Work on Protected Areas (PoWPA) is currently underway; and the Draft Forestry Management Law was reviewed by the Council of Ministers on March 2014
- A traditional law on conflict resolution and natural resource use called Tarabandu is practiced by communities, and is being promoted for consideration in developing national policies and legislations.



- Responsibilities for various aspects of habitat protection, restoration and management are spread across the following agencies:
 - National Directorate of Environment, Ministry of Commerce, Industry and Environment
 - National Directorate of Fisheries and Aquaculture, Ministry of Agriculture and Fisheries
 - National Directorate of Forestry, Ministry of Agriculture and Fisheries
- Law No. 12/2004 defines criminal actions related to fisheries.
- Government Decree No 2/2005 establishes tariffs for fisheries licenses, inspection, related activities, and services of fisheries
- Ministerial Diploma No 01/03/GM/II/2005 provides the definition of fishing zones
- Ministerial Diploma No 03/05/GM/II/2005 specifies allowed percentages of by-catch

Fisheries, Food Security and Livelihood Development

- Decree-Law 6/2004 provides the general basis of the legal regime for the management and regulation of fisheries and aquaculture.
- Government Decree No 5/2004 provides the general regulation on fishing, and was amended through Government Decree No 3/2005
- Ministerial Diploma No 04/115/GM/IV/2005 provides the list of protected aquatic species
- Ministerial Diploma No 05/116/GM/IV/2005 specifies minimum sizes of fish species that can be caught
- Ministerial Diploma No 06/42/GM/II/2005 specifies penalties for fisheries infringements

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.
- The GEF Small Grants Programme (SGP) provides small grants for community based organizations in the area of biodiversity, climate change, persistent pollutants, international waters and land degradation.
- Decree-Law No. 42/2012 established a legal framework for public-private partnership agreements to support public infrastructure projects and related service provision.

- 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 country's first National Aquaculture Development Strategy (2012-2030), adopted on March 2013, provides a vision of how the aquaculture sector can contribute toward achieving food security and improving nutrition of communities in Timor-Leste.
- 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.
- A national Basic Sanitation Policy was approved in 2012.
- Drafts of a National Water Resources Policy, National Water Resources Law, and National Water Supply Policy have been prepared, for completion in 2014, and submission to the Council of Ministers in 2015.
- Responsibilities for different aspects of water resources and supply management are spread across the following agencies:
 - National Directorate for Water Supply (DNSA), Ministry of Public Works
 - National Directorate of Basic Sanitation (DNSB), Ministry of Public Works
 - National Directorate of Water Control and Quality (DNCQA), Ministry of Public Works

- National Directorate of Environment, Ministry of Commerce, Industry and Environment
- 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
- A law on industrial emissions has been drafted; the Environmental Basic Law is in the legislative process; while the Policy and Strategic Plan for Environment is waiting to be presented to the Council of Ministers for approval
- Responsibilities for pollution reduction and waste management are spread across the following agencies:
 - National Directorate of Environment, Ministry of Commerce, Industry and Environment
 - Ministry of Health
 - National Directorate of Basic Sanitation, Ministry of Public Works
 - District Administrations
 - Port Administration of Timor-Leste (PATL)
 - 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



although there are ongoing efforts to develop a Department of Fisheries in the National University of Timor-Leste.

- 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 Assessment 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).
 - Marine rapid assessment survey by CI/NOAA/ CTSP at the Nino Konis Santana National Park and Atauro Island (2012)
 - Habitat surveys by MAF and the Coral Triangle Center in Atauro Island in 2013
- Stakeholder education, awareness raising and mobilization are usually undertaken in relation to specific programs and projects.
- A National Fisheries Statistics System (www.peskador.org) was initiated online and provides public access to a wide range of statistical and environmental information relating to fisheries in Timor-Leste. Publicly available information includes boat census data, daily information on the price of fish by species and location, live maps showing fishing grounds, dangerous areas and fishers' movements, and data on accidents at sea or in coastal areas. A restricted area of the site includes live maps and data recording incidents of reported illegal fishing, and complete

data sets of information gathered. The site also includes information on other fisheries-related projects and fisheries legislation, data on weather, tide, wind predictions, cyclone warnings and sea surface temperatures. The site is operated by the National Directorate of Fisheries and Aquaculture (NDFSA) and was established with the support of the Spanish-funded Regional Fisheries Livelihoods Programme for South and Southeast Asia (RFLP) which is implemented by the Food and Agriculture Organization of the United Nations (FAO).

- A National Information Portal for Disaster Risk Management (www.drm.tl) was launched in 2013, which provides a platform for real-time knowledge-networking mechanism for the collection, dissemination and exchange of information, as well as coordination and monitoring of disaster-related initiatives.

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 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.
- 24 officers and personnel from key government agencies, districts of Manatuto and Liquica, and UNTL explored and learned good practices in ICM, fisheries management, livelihood development, habitat protection and restoration, pollution reduction and waste management, and climate change adaptation through a visit to ICM sites in Batangas, Philippines in December 2013.
- 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.

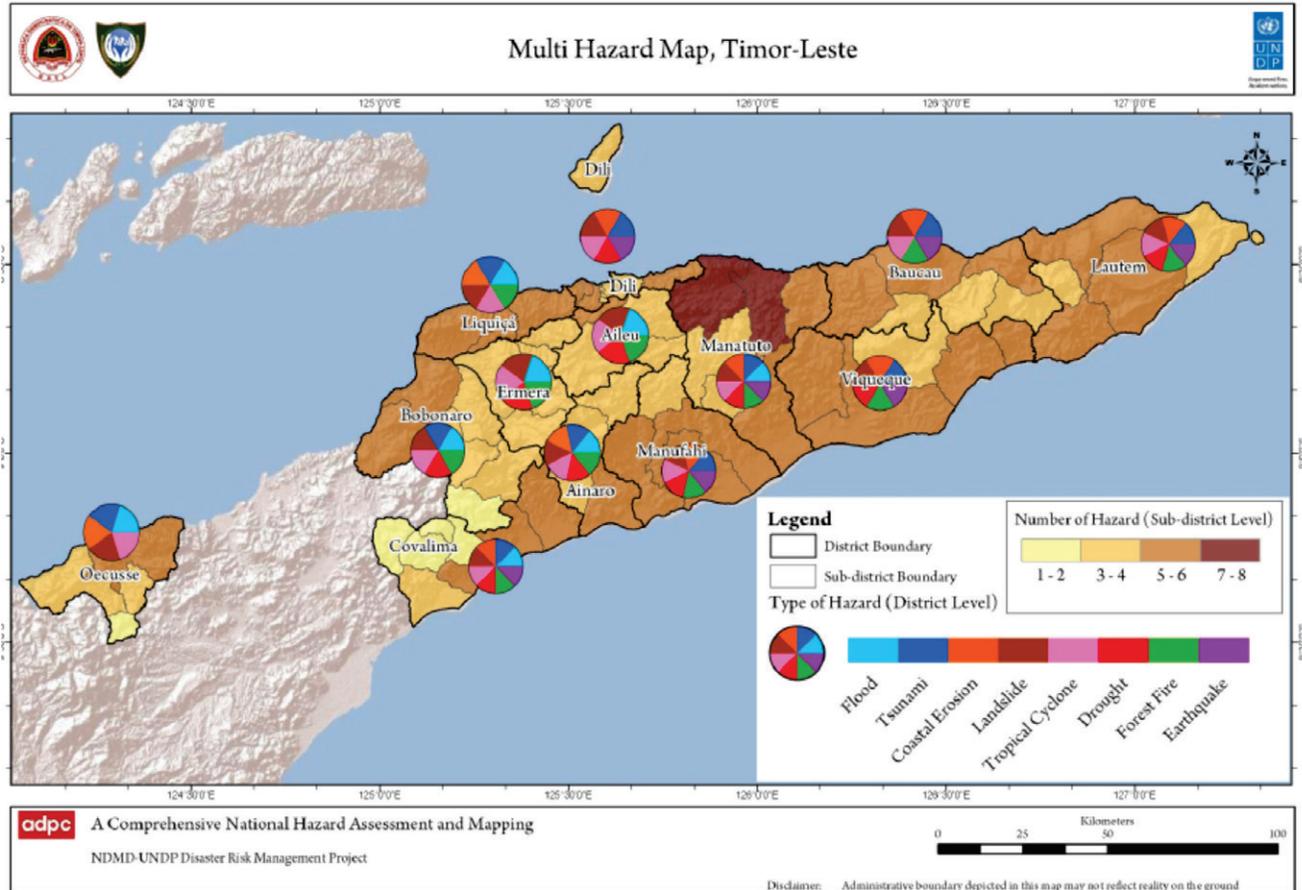
Progress towards SDS-SEA Targets

Sustainable Development Aspects

Natural and Manmade Hazards

- The country is very vulnerable to hazards — floods, landslides, droughts, tropical cyclones, forest fires, earthquakes, coastal erosion, and tsunami waves.

A Comprehensive National Hazard Assessment and Mapping in Timor-Leste. September 2012. National Disaster Management Directorate, Ministry of Social Solidarity.

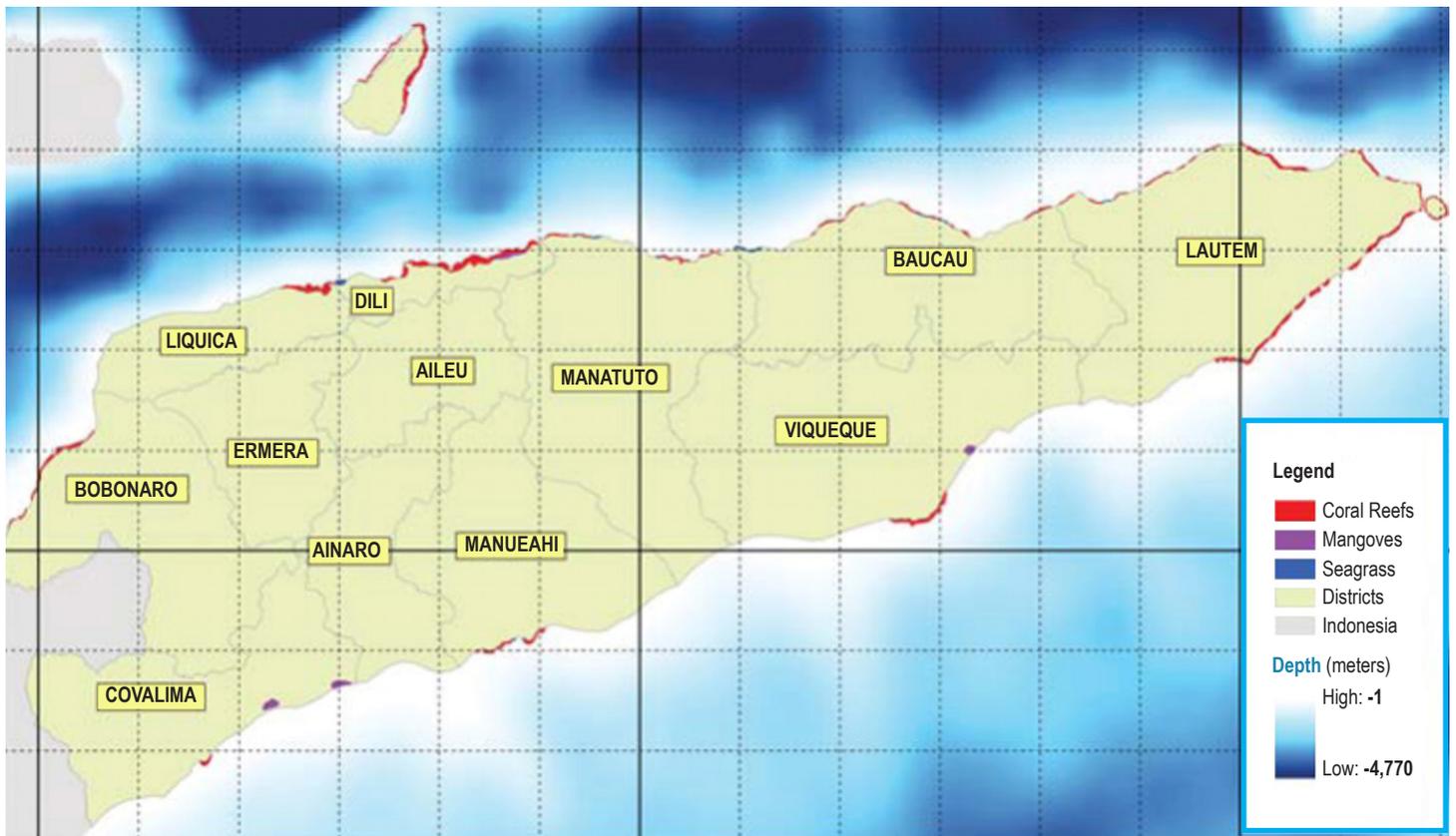




Challenges and Priorities: Natural and Manmade Hazards

- Countrywide response is still centrally managed through the National Disaster Management Directorate. District-level structures for disaster management have been established but still need to be 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.
- Climate change is also impacting on the country in terms of erratic rainfall, floods and drought. Climate change models show heavy, concentrated rainfall and longer dry periods with the implication of more droughts and floods. The southern coast of the country is also affected by cyclonic storms and climate change may impact this process in terms of increasing their frequency and intensity. Sea level rise is also considered to be a major threat in both northern and southern coastal regions.
- Basic systems for Disaster Risk Reduction and Management were established in Dili, Bobonaro and Lautem in 2009-2010 under the Project on Disaster Risk Management Institutional and Operational Systems Development in Timor-Leste. As of 2013, DRR management and coordination mechanisms have been established and DRM plans have been prepared for all districts.
- 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 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.
- The Comprehensive National Hazard Assessment and Mapping in Timor-Leste (October 2012) identifies hazard-prone and disaster-prone areas at the national and district levels based on historic disaster events. A Comprehensive National Risk Assessment and Mapping in Timor-Leste was also completed in 2013.
- The Country Report on Climate Risk management in Timor-Leste (September 2013) highlights the need to integrate development planning, disaster risk management and climate change adaptation, presents a framework for climate risk management, and identifies priority risk management actions.
- A Center for Climate Change and Biodiversity was launched in May 2014, which aims to provide policymakers, natural resource managers, and development practitioners with the tools and information needed to develop and implement decisions and management strategies needed to combat climate change through adaptation and mitigation.

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



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.



- Climate change adaptation planning was also conducted by the NDFA and Worldfish Center in 2012-2013 in consultation with stakeholders in Atauro Island and Batugade in 2013

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 undertaken a series of assessments for the establishment of protected areas and identified 30 protected areas and national parks in a network covering 2,000 km², which is about 15% of the country's land area. The largest one is the Nino Konis Santana National Park, established in 2007, 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.
- 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.

- In 2012, the rapid marine assessment undertaken by CI/NOAA/CTSP recorded around 400 species of reef-building coral species, comparable to Australia's Great Barrier Reef, and highly diverse fish fauna with 741 species recorded, increasing the nation's total to 967 species. A new fish species called the Evoita santanai was also found within the Nino Konis Santana National Park.
- Based on the results of scientific assessments, the Government of Timor-Leste officially declared seven community-established no-take zones within the Nino Konis Santana National Park in February 2013 to enable the replenishment of fish stocks and the protection of coral reefs.
- The Government of Timor-Leste also established two marine protected areas (MPAs) in 2013 as part of ongoing efforts to protect the country's marine resources. Letters of agreement for two MPAs in Atauro and Batugade, respectively, have been finalized and the Atauro MPA has been formally established.

Food Security, Fisheries and Livelihood

- Almost all fishing in Timor-Leste is subsistence or semi-subsistence. Based on the National Directorate

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

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.

- In 2009, the commercial fishery was estimated at about 2,000 tons while subsistence catches were estimated at about 3,500 tons.
- 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.
- To support the strengthening of policy and strategy frameworks for the development of the marine fisheries sector, the report on Prioritization of Fisheries Management Zones in Timor-Leste (2014) identified priority sites for management in order to achieve maximum fisheries replenishment benefits in the short-medium term, including Atauro (~98 km²), Batugade, Behau (~33 km²), Metinaro (~10.9 km²), Buruma (~5.6 km²) and Mehara. These are small and more manageable areas, which would still afford protection to the key ecological features and functions required for fisheries replenishment. Future expansions of the protected areas can be done as the National Directorate for Fisheries and Aquaculture becomes better equipped to do so.

Water Supply/River Basin Management

- The total length of the river system in Timor-Leste is about 4,286 km², covering a total river surface area of around 1,834.2 km². 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

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.

many of the irrigation and reservoir structures are not functional.

- 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. A study on Community-based Integrated Watershed Management in Lacle and Comoro River conducted with the support of JICA developed community-based watershed management plans/guidelines in Lacle and Comoro River Basins.
- More than 25 water resources management and supply and sanitation programs and projects are being implemented by various national agencies.
- 236,186 or 63% of urban population and 510,618 or 71% of rural population had access to clean water in 2012.

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 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, recycle, 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 are 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 Dili Sanitation and Drainage Master Plan (which will be completed within 2011, for implementation (construction, operation and maintenance) until 2025.

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
- Limited capacity for environmental monitoring
- 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.

Priority Issues for the Next Five Years for SDS-SEA Implementation, continued.

- 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.

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Viet Nam's Contribution to the Implementation of the Sustainable Development Strategy for the Seas of East Asia (2003-2015)

Basic Facts	
Total Population	90,000,000 (1 Nov. 2013)
Forecast Population (2015)	4,742,000 (projection by UN Statistics)
Percentage of Population within 100 km of the coast	Over half of major cities are located in the coastal areas and more than 50 percent of the population lives.
No. of coastal provinces	28 28 of the 63 provinces are coastal provinces consisting of more than 125 coastal and 12 island districts
Land Area	310,070 km ²
Length of coastline	3,269 km (excluding islands) and over 3,000 islands

National Economy	
GDP	GDP Growth
US\$ 1,224 (2010)	5.2 percent (2012)
GDP composition by sector	
Agriculture, forestry and fisheries (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\$ 6.5 billion to gross domestic product exports in 2013. 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.

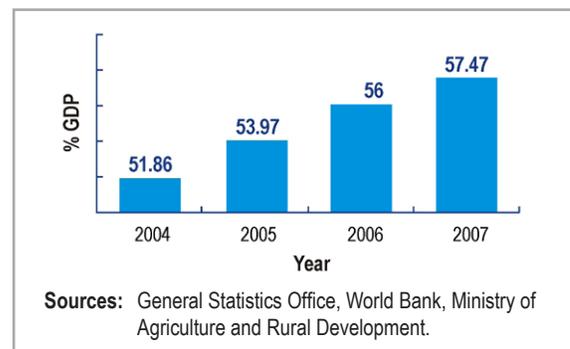
In 2005, some 19 million tons of oil and more than 6.5 billion metric tons of gas were produced resulting in US\$ 7.5 billion export.

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)





Progress in SDS-SEA Implementation (2003-2015)

National Ocean Policy and Institutional Arrangements

- Resolution No. 09 - NQ / TW of the Fourth Conference of the Party Central Committee dated February 9, 2007 on Strategy for Vietnam Seas toward 2020 and Resolution No. 2007/2007/ND-CP of the Vietnam Government on National Action Plan to Implement the 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/QĐ-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, marine areas and islands of Vietnam, as well as 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 (ICM) Program for North Central and Central Coastal Region until 2010 and Orientation until 2020 (Decision No. 158/2007/QĐ-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 Vietnam's sea and coastal areas in the Gulf of Thailand up to (No.18/2009/QĐ-TTg) to develop Vietnam'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 in promoting and pushing the development of inland regions.
- National plan on island system development towards 2020, vision 2030 approved in 2010.
- Law on Natural Resources and Environment of Sea and Islands (Law No. 82/2015/QH13) was ratified on June 25, 2015 during the 9th session of the 13th National Assembly. The law focuses on institutionalizing mechanisms for integrated management, including the rational use and protection of natural resources, the environment, as well as coastal and marine ecosystems and islands.
- Vietnam 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 Law of the Sea adopted by the 13th National Assembly at its 3rd Session on 21 June 2012 and took effect on 01 January 2013. The Law provides for the baseline, the internal waters, the territorial sea, the contiguous zone, the exclusive economic zone, the continental shelf, islands and archipelagos under the sovereignty, sovereign rights and jurisdiction of Vietnam; operations in Vietnam's maritime zones; maritime economic development; the management and protection of the sea and islands.
- Decision No.2295/QĐ-TTg of the Prime Minister dated 17 December 2014 on the approval of Vietnam Strategy for ICM to 2020 and Orientation to 2030.
- Prime Minister Decision No.23 issued on 26 April 2013 provides regulation for coordination of integrated management of marine and island resources and marine and island environmental protection.
- Circular No.22 issued on 26 December 2012 regulating the development and implementation of plan for integrated management of coastal resources and coastal environment protection at the local level providing guidelines and procedure for developing an ICM plan, establishment of steering committee at the local level, data collection, reporting of status of environment and natural resources in coastal areas; identification of objectives of the plan in response to the priority issues and local context; consultation process, plan approval and implementation;

National Ocean Policy and Institutional Arrangements, continued.

monitoring of plan implementation; financing from state budget and other sources; responsibility of VASI and DONRE and provinces including relevant departments

- Decision No.742/QD-TTg of the Prime Minister dated 26 May 2010 on approval of national system of marine protected area in Vietnam towards 2020
- Decision No.1570/QD-TTg of the Prime Minister

dated 06 September 2013 on approval of strategy for marine resources sustainable use and marine environmental protection towards 2020, vision to 2030

- Decree No.51/2014/ND-CP of the Government dated 21 May 2014 on licensing marine spatial area for marine resources use and exploitation.

Vietnam Socioeconomic Development Strategy (SEDS) 2011-2020

- **SEDS 2011-2020 gives attention to structural reforms, environmental sustainability, social equity, and emerging issues of macro-economic 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 SEDS's overall goal is for Vietnam to become basically a modern and industrialized society by 2020.

- **General 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 economic growth; socio-economic development must go hand-in-hand with protection and improvement of the environment.**

- **Create a peaceful environment and favorable conditions for the development of the country**
- **Maintain food 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, Technology and Environment (MOSTE) and now VEA of MONRE covers 21 stations, which carry out monitoring at 250 locations in 45 provinces, and SoE reporting yearly to submit to the National Assembly.

- 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 subordinate units organizes basic and comprehensive surveys of marine and island environment



ICM Implementation

- ICM currently being implemented in about 36% of Vietnam's total coastline with different levels of implementation.
- ICM is currently being developed at varying scales at the 14 coastal provinces in north central and central coastal region (from Thanh Hoa coastal province to Binh Thuan province) and 2 coastal provinces and 1 city in the north (Quang Ninh province, Nam Dinh province, Haiphong city) and 4 coastal provinces in the south (Binh Thuan province, 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,

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

Hai Phong and Quang Ninh. A coordinating mechanism for ICM implementation is also currently being established in Thua Thien-Hue and Quang Nam.

- 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, but currently only 21/28 Divisions of Seas or Seas and Islands established in the coastal provinces.
- 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.

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 in whole of Vietnam.
- Agency of Geology and Minerals, MONRE, maintains a National Groundwater Monitoring Network with 310 regional monitoring stations

and more than 600 observation wells across Vietnam, some of them in coastal areas and on islands.

- Department of Water Resources Management, MONRE, is responsible for water resources state management.
- Ministry of Agriculture and Rural Development (MARD) monitors water quality in aquacultural areas, most of them in coastal brackish-water zone.
- Ministry 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, including environmental monitoring.
- PEMSEA's State of the Coasts (SOC) Reporting System has been initiatively integrated into the National ICM Program; SOC reports are being developed in Da Nang City, Thua Thien-Hue and Quang Nam provinces.
- National Strategy on Environment Protection to 2020, with Vision to 2030 (Decision 1216/QĐ-TTg on September 05, 2012) aims to reduce sources of pollution; improve the environmental condition of polluted areas for better living condition of the people; mitigate the deterioration and exploitation of natural resources, including biodiversity and improve the capability to respond to climate change and reduce greenhouse gas emissions.
- Comprehensive Poverty Reduction and Growth Strategy (No. 2685/2002/VPCP-QH11) is a long-term 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%.

SDS-SEA-related Legislation, Policies and Plans

Sustainable Development

- Strategic Direction for Sustainable Development in Vietnam (Vietnam Agenda 21) (Decision No. 153/2004/QĐ-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.
- Vietnam Sustainable Development Strategy for 2011-2020 (Decision No. 432/QĐ-TTg) aims to strike a balance between sustainable and effective growth with social progress and equality, national resources and environmental protection, socio-political stability, firm protection of independence-sovereignty-unification and territorial integrity of the country.
- 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.
- National Strategy on Environmental Protection until the Year 2010 and Vision Toward 2020 (No. 256/2003/QĐ-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.

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



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.
- Vietnam Environment Protection Fund receives capital sources from the state budget, sponsors, contributions, commission from domestic and international organizations and individuals to support financing for environment protection activities throughout the county

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.

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.
- Planning of Vietnam's Marine Protected Areas System to 2020 (the above mentioned No. 742 QD-TTg) issued on May 10, 2010 establishing a national system of 16 MPAs to ensure that marine ecosystems and species with high economic and scientific value are protected, and

that MPAs contribute to improving the livelihoods of coastal fishing communities. The first phase (2010-2015) focuses on operationalizing the 16 MPAs, the second phase (2016-2020) on creating new MPAs. Currently, some 50% of total 16 MPAs have established the MPA Management Board.

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).

- National Strategy on Climate Change (No. 2139/QĐ-TTg) issued on December 05, 2011 bringing into play the whole country's capacity in simultaneously taking measures of adapting to impacts of climate change and cutting down greenhouse gas emission in order to secure people's safety and property as well as for the sake of sustainable development.
- National target program on climate change response for the period 2012-2015 approved (No. 1183 issued on 30 August, 2012) with the objective to implement the National Strategy on Climate Change.
- National Action Plan on climate change for the period 2010-2020 promulgated (No. 1474 issued on 5 October 2012) focusing on programs related to the establishment of monitoring system for climate change and sea level rise (2013-2015); modernization of monitoring system and forecasting on meteorology and hydrology (2012-2015); development of atlas on climate and climate change for Vietnam (2013-2020); survey, investigation and assessment and development of zoning map of vulnerable areas (flashfloods, landslides in northern mountainous areas) (2012-2015) and all areas (until 2020); establishment of early warning system for tsunami initially focusing on Da Nang to Ninh Thuan Province) (2013-2014); development of system for controlling and preventing diseases of plants and animals under the climate change condition (2016-2018); mechanism and policy for insurance and risk sharing in agriculture sector (2013-2015).
- Policy matrix under the Support Program to Respond to Climate Change approved (No. 44/QĐ-TTg on 2014) with eight overall goals. According to the Decision, the Ministry of Natural Resources and Environment is assigned to draft the Law on Hydrometeorology, the Action Plan for implementing the National Strategy on Integrated Coastal Management integrating climate change. The Ministry of Agriculture and Rural Development is in charge of drafting the Law on Irrigation, decision on supporting plan restructure adaptation to climate change; Strategy on Agriculture Development to 2030 in order to enhance capacity in agriculture and food security, policies on management, protection and development of coastal forests. The Ministry of Industry and Trade is responsible for developing a roadmap for implementing measures for efficient energy use. The Ministry of Health will approve

documents on capacity building for action plans to respond to climate change in the health sector at the provincial level. The Ministry of Planning and Investment will develop a national action plan to implement the national strategy for green growth.

Integrated Water Resources Management

- National Water Resources Strategy Towards 2020 (No. 81/2006/QĐ-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/QĐ-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, 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/QĐ-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.
- Decision No.1278/QĐ-TTg dated 14 August 2009 of The Prime Minister on approval of the implementation plan on the joint declaration and framework program between Vietnam, Cambodia and Thailand about readiness cooperation to respond to the oil spills in Thailand gulf.
- Decision No.1864/QĐ-TTg dated 21 October 2011 of The Prime Minister on approved plan of the implementing the agreement between the Philippines and Vietnam governments about the cooperation in the field of oil spill response on the sea.



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.
- Prime Minister has issued Decision No. 373 on 23 March, 2010, approving the Master Program on Communication and Public Awareness in the field of marine and island protection, management and sustainable development. Total budget estimate allocated for the period 2011-2015 is 175 billion VND, of which 118 billion VND is from the national budget and 57 billion is from the local government budget.

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. Especially, two national multiple disciplines MSc courses on climate change and sustainability science have opened in VNU as pilot courses.
- 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.
- Climate Change and Sea Level Rise Scenarios for Viet Nam were developed in 2009 and updated in 2012
- 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 allocation 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.

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

Habitats and Biodiversity

- A system of 128 protected areas has been established and developed in all ecoregions nationwide covering

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.



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.

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. Five MPAs have been officially designated (Nha Trang Bay, Cu Lao Cham, Phu Quoc, Bach Long Vi and Con Co) with tree national parks with marine components (Cat Ba, Con Dao and Nui Chua).

- Mapping and assessment of almost 70% of important coastal habitats completed.
- 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 km² and 36 coastal and marine protected areas with a total area of 3,929.27 km².

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.

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.

Water Supply/River Basin Management

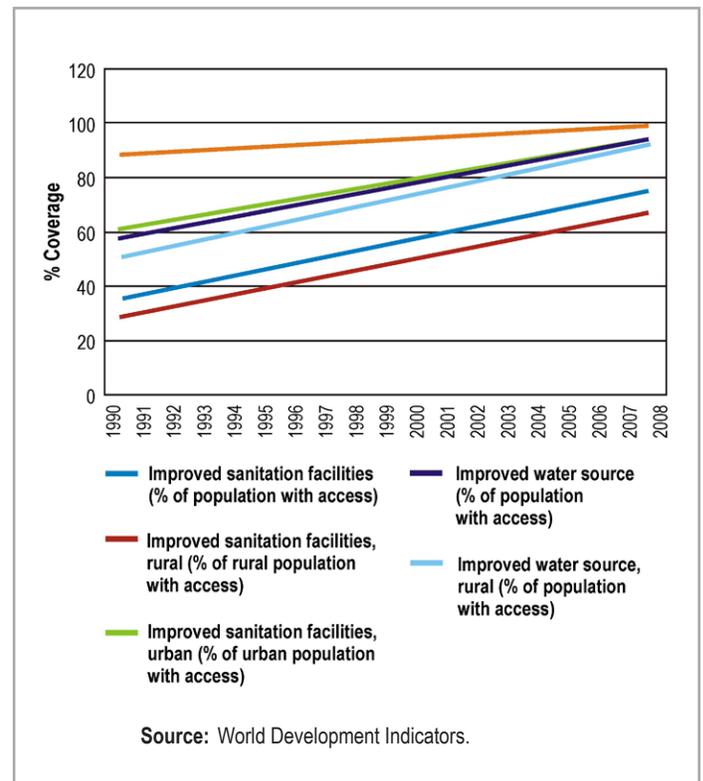
- Total land area covered by the river basins is 1,167,000 km² with out-of-border river basin area covering 835,422 km², accounting for 72 percent of the total watershed area.
- There are 13 rivers with basin areas of over 10,000 km², of which 9 are major rivers (Red, Thai Binh, Bang Giang-Ky Cung, Ma, 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.
- 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.

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

Water Supply and Sanitation in Vietnam (1990–2008).





- 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.

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.

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 m³/day.
- There are 29 centralized industrial wastewater treatment plants in the main industrial parks with a total capacity of about 87,000 m³/ day.
- In provincial towns, 75% of households are not connected to any form of local or central sewerage

- 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.

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.

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

- Development of implementation plan for the Vietnam Strategy for ICM to 2020 and Orientation to 2020.
- Adoption of Law of Marine Resources and Environment
- 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.



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