

# Partnership Opportunities for Enhancing GPA Implementation in the East Asian Region (2007-2011)



Coordinating Body on the Seas of East Asia (COBSEA)  
UNEP East Asian Seas Regional Coordinating Unit (EAS/RCU)



GEF/UNDP/IMO Regional Programme on Partnerships in  
Environmental Management for the Seas of East Asia (PEMSEA)

October 2006

This Policy Brief is based on the outcome of the East Asian Seas IGR-2 Preparatory Workshop entitled, Partnership Opportunities for Enhancing GPA Implementation, held in Bangkok, Thailand, on 4-5 September 2006. The workshop was co-organized and co-sponsored by the UNEP East Asian Seas Regional Coordinating Unit (EAS/RCU) and the GEF/UNDP/IMO Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) for the Second Intergovernmental Review Meeting (IGR-2) of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA).

The objectives of the workshop were:

- To review the status of national GPA implementation 2002 through 2006;
- To identify the roles and contributions of regional programs and projects to GPA implementation;

- To outline major activities and targets of countries and regional programs and projects with respect to GPA objectives over the next five years;
- To delineate unmet demands regarding sewage and sanitation in the region, and to examine what is needed to strengthen investments in this sector; and
- To prepare an information document on implementation of GPA in the East Asian region for submission to the IGR-2 meeting.

The workshop was attended by representatives from six countries, namely: Cambodia, China, Malaysia, Philippines, Thailand and Vietnam. Representatives from the following regional organizations were also in attendance: COBSEA; APEC Marine Resource Conservation Group; ASEAN Working Group on Coastal and Marine Environment; UNEP/GPA, UNEP EAS/RCU and PEMSEA.

## Introduction

The East Asian region has been achieving impressive rates of poverty reduction, at around 35 million people annually for the past 15 years or more. While there are still significant problems with entrenched poverty in the region, millions of people now have a chance to experience life beyond basic survival.<sup>1</sup> For example, the sustained growth rates of 10 percent or more in China have helped reduce the number of people existing on less than one dollar per day from 473 million in 1990 to 284 million in 2001. The Chinese Academy of Social Affairs estimates that 19 percent of China's 1.3 billion, or about 250 million people, are now considered middle class — living in households with annual assets of between \$18,000 and \$36,000. It further estimates that if this middle class keeps growing by 1 percent each year, then 40 percent of China's population — almost 500 million people — will reach this status by 2020. Other sources indicate that there are now more middle-to-high income earners, whom UNEP defines as those earning in excess of \$7,000 per annum, in Asia and the Pacific than in America and Europe, combined.<sup>2</sup>

But this remarkable growth is not without its challenges, especially when considering changes that are occurring in the region's ecosystems. The region's environment is under significant stress. As illustrated in Figures 1 and 2, the ecological footprint in the Asia-Pacific region has risen by more than 130 percent since 1961, now requiring 1.3 global hectares of biologically productive area per person. With a supply of only 0.7 global hectares per person, the region is now seeing growing imports of ecological capacity, damaged ecosystems, and an increasing portion of the population living in degraded environments.<sup>3</sup>

Growing populations and their migration to coastal areas, dynamic economic growth, and rising global demands for fishery and aquaculture products, largely met by export products from the East Asian Seas, and rapidly increasing shipping traffic, have combined to exert tremendous pressure on East Asia's marine environment and coastal resources, through depletion of fisheries and destruction of mangroves, coral reefs, seagrass beds and other habitats. Studies warn that at the current rates of degradation, the region's coral reefs face total collapse within 20 years, while mangroves could be gone within 30 years.

Figure 1: Humanity's Ecological Footprint, 1961-2001.

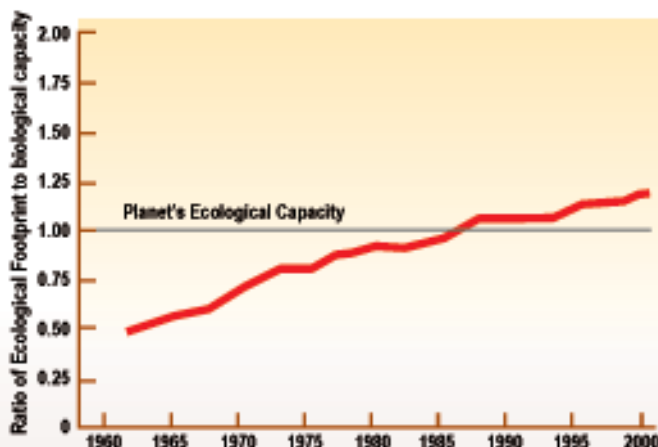


Figure 2: Asia-Pacific's Ecological Footprint, 1961-2001.



Extracted in whole from: *Asia-Pacific 2005: The Ecological Footprint and Natural Wealth*<sup>2</sup>

## Box 1: Montreal Declaration on the Protection of the Marine Environment from Land-based Activities.

### Key Commitments of Governments and Regional Organizations/Programmes:

- Mainstreaming of the GPA into new and existing activities, action programs, strategies and plans at the local, national, regional and global levels and into sectoral policies
- Strengthening the capacity of regional seas organizations for multi-stakeholder cooperation and action
- Supporting the ratification of existing regional seas agreements and development of additional ones
- Taking appropriate action at the national and regional levels to strengthen institutional cooperation between river basin authorities, port authorities and coastal zone managers
- Incorporate coastal management considerations into relevant legislation and regulations
- Strengthening the capacity of local and national authorities to obtain and utilize sound scientific information in integrated decisionmaking
- Applying effective institutional and legal frameworks for sustainable coastal management
- Enhancing the state-of-oceans reporting to better measure progress towards sustainable development
- Improving and accelerating the implementation of solutions to land-based pollution in partnership with the private sector
- Providing an enabling environment for investment

The East Asian Seas serve as the receiving bodies for a substantial volume of freshwater from large river basins, such as the Mekong, Yangtze, Yellow and Red Rivers, as well as numerous small and medium-sized watersheds. These watersheds cover a total land area of about 6.25 million km<sup>2</sup>. The health of the East Asian Seas is significantly affected by human activities in these vast watershed areas, including deforestation, mismanagement of sewage, industrial and hazardous wastes, agricultural and urban runoff, and uncontrolled development/land use, etc.

Decades of advocacy, political commitments and conservation efforts at the national and regional levels have not prevented the East Asian Seas from degrading at an ever-increasing pace. To the estimated 1.3 billion people living within a hundred kilometers of the region's coasts this is easy enough to see, in terms of deterioration of water quality, coastal erosion and sedimentation, overexploitation of fisheries resources, degradation and destruction of habitats, and loss of biodiversity. Compounding problems are caused by growing populations and the pressure to meet the demands of the increasing number of people understandably wishing to enjoy the trappings of middle-class life. However, if such a pattern was to hold, the environmental quality prognosis in the region, and the rest of the world, would be dire.

### Five Years after the IGR-1

Representatives from 98 countries, including ministers and other high-level officials from numerous United Nations bodies, intergovernmental organizations (IGOs) and nongovernmental organizations (NGOs), convened in Montreal,

Canada, from 26 to 30 November 2001, to review the implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) since its adoption in November 1995, and to chart the way forward.

The Intergovernmental Review Meeting (IGR-1) of the GPA focused substantively on the issues of municipal wastewater, integrated coastal and oceans governance, building partnerships and financing the implementation of the GPA. The meeting noted steady, albeit slow, progress in the implementation of the GPA at global, regional and national levels.

Among the important outcomes of the IGR-1 meeting was the Montreal Declaration (Box 1), which highlighted the concerns of the represented countries and organizations with regard to the continuing degradation of the marine environment and the alteration of timing, volume and quality of freshwater inflows, with resulting changes in nutrient and sediment budgets and salinity regimes.

Five years after the IGR-1 meeting, the question on the minds of governments and stakeholder groups when preparing for IGR-2 is "How far have we come with GPA implementation in the East Asian Seas region, and more specifically, with respect to the commitments of the Montreal Declaration?" At first glance, most of the identified commitments under the Montreal Declaration would appear to have not been fully implemented or, even more critically, that no appreciable changes have occurred. However, while there are grounds to argue that the region could have done better, the process of sustainable development is a long and arduous one and requires substantial effort before positive impacts can become visible.

### Indications of Change

Despite first appearances, there has been measurable progress in the region with regard to the Montreal Declaration (Box 1), based on five indicators: 1) development and implementation of national legislation, policies and strategies; 2) strengthening of institutional arrangements; 3) development of capacity in integrated watershed and coastal management and scientific input to policymaking and decision-taking programs; 4) increased access to safe water and improved sanitation and sewage services; and 5) forging of partnership arrangements for sustainable development of coasts and oceans. (See Fact Sheets, Annex 1, regarding country-specific information.)

### Development and Implementation of National Legislation, Policies and Strategies

As illustrated in Box 2, countries have been busy with the development and adoption of national legislation, policy and strategies, which have direct relevance to GPA and the Montreal Declaration of 2001. Of particular note are Malaysia and Vietnam, where framework environmental laws have been revised and updated. In the Philippines, the Clean Water Act of 2004 was promulgated, providing a legal basis for a comprehensive national water management program, including abatement and control of pollution from land-based sources. All countries have adopted national laws, policies or strategies for dealing with pollution prevention

and control, and sewage and industrial waste in particular. China and Vietnam also developed and adopted five-year action plans for addressing pollution concerns to 2010. While there are obvious needs regarding legislative improvements and enforcement capabilities, all countries have the basic national legislation to regulate human activities regarding use of freshwater and marine natural resources, prevention of pollution, and protection of natural habitats.

### Strengthening of Institutional Arrangements

Various institutional arrangements have been adopted in the region in order to better address coastal and marine environmental issues. Most countries

already have a Ministry of Environment, while some aspects of maritime issues are addressed by the Ministry of Transport or similar ministries. Other countries have recently set up new departments or ministries in an attempt to integrate the environment and natural resource-related functions of other ministries. In 2001, Indonesia established a Ministry of Marine Affairs and Fisheries (a similar ministry was established in RO Korea in 1997), while Thailand and Vietnam each established Ministries of Natural Resources and Environment in 2002 and formed new departments and divisions for the management of the coastal and marine environment. The Integrated Coastal Zone Management (ICZM) Division, created under the newly formed Vietnam Environmental Protection Agency in 2002, was tasked with the formulation and implementation of a national ICZM program. The proposed program is expected to be announced this year, with an initial focus on 14 coastal provinces in central Vietnam.

#### Box 2: Key GPA-related Legislation, Policies and Strategies 2002–2006.

##### Cambodia

- National Environmental Action Plan (2003–2008)
- National Policy on Water Supply and Sanitation (2003)
- National Water Resource Policy (2004)

##### China

- Law of Promoting Cleaner Production (2003)
- Regulations on the Administration for Application and Registration of Pollution Discharge (2003)
- Regulations on the Administration for Area and Functional Zone Adjustment (2003)
- Eleventh Five-Year Programme on the Prevention and Control of Water Pollution for Priority Basins (2006–2010)

##### Indonesia

- Ministerial Decree No. 51: Seawater Quality Standard (2004)
- Ministerial Decree No. 75: Organization and Management of National Cleaner Production Center (2004)
- Implementation Plan for Indonesia's Strategy for Sustainable Development (2005)

##### Malaysia

- National Policy on Environment, including sustainable development and environmental conservation (2002)
- Updated Environmental Quality Act, covering scheduled wastes (2005)

##### Philippines

- Clean Water Act (2004)
- Executive Order 533 (2006) Adopting Integrated Coastal Management as a National Strategy to Ensure the Sustainable Development of the Country's Coastal and Marine Resources

##### Thailand

- Policy and Prospective Plan for Enhancement and Conservation of National Environmental Quality (1997-2016)

##### Vietnam

- Decree No. 67: Introduction of Fees for Wastewater (2003)
- Action Programme for Dealing with Most Polluted Hotspots (2003)
- National Action Plan on Pollution Control Towards 2010 (2005)
- Law on Environmental Protection Revised (2006)

#### Box 3: Examples of Integrated Watershed and Coastal Management Initiatives, Strategies and Action Plans (2002–2006).

##### China

- Blue Seas Action Plan (2001–2015)
- Bohai Sea Action Plan (2006–2010)
- Changjiao River Action Plan.
  - Development (2005–2007)
  - Implementation (2007–2012)
- Pearl River Action Plan
  - Development (2006–2007)
  - Implementation (2008–2013)
- GEF/WB Hai River Integrated Water and Environment Management Project (2004–2008)
- GEF/WB Guangdong Pearl River Delta Urban Environment project (2004–2009)

##### Indonesia

- Marine and Coastal Management Project (2001–2006)

##### Malaysia

- River Rehabilitation Programs (26 rivers)

##### Philippines

- GEF/WB Laguna-de-Bay/Pasig River/Manila Bay Integrated Watershed and Coastal Area project (2006–2010)

##### Subregional

- UNDP/MRC/IUCN/GEF Mekong Wetlands Biodiversity Conservation and Sustainable Use Program (2004–2009)
- UNEP/GEF Project "Reversing Environmental Degradation Trends for the South China Sea and Gulf of Thailand" (2002–2007)
- UNDP/GEF Yellow Sea Large Marine Ecosystem Project
- WWF Sulu-Sulawesi Marine Ecoregion Program (1999–2003)

##### Regional

- The ASEAN Marine Water Quality Criteria (2002)
- Sustainable Development Strategy for the Seas of East Asia (2003)
- Vientiane Action Programme (2004–2010)
- Bali Plan of Action: Towards Healthy Oceans and Coasts for the Sustainable Growth and Prosperity of the Asia-Pacific Community (2005)

## Box 4: Key Linkages between GPA and MDG/WSSD.

### MDG Target 10

Halve by 2015 the proportion of people without sustainable access to safe drinking water and basic sanitation

### WSSD JPOI Section IV

Advance the implementation of the GPA, with particular emphasis during 2002–2006 on municipal wastewater, physical alteration and destruction of habitats and nutrients to:

- Facilitate partnerships, scientific research and diffusion of technical knowledge
- Strengthen capacities of developing countries
- Elaborate regional programs of action

Promote the use of integrated coastal zone management, integrated water resources management and the ecosystem approach to achieve sustainable coastal and marine development

On the other hand, the Philippines took a different route to strengthen institutional arrangements within the country. In June 2006, Executive Order 533 was issued, adopting integrated coastal management (ICM) as the national strategy to ensure sustainable development of the country's marine and coastal resources. Under the Executive Order, the Department of Environment and Natural Resources is authorized to establish a national interagency and multisectoral mechanism to provide direction, support and guidance in the development and implementation of a national ICM program.

### Development of Capacity in Integrated Watershed and Coastal Management and Scientific Input to Policymaking and Decision-Taking Programs

Countries of the region, frequently in collaboration with donors, UN agencies and international organizations, institutions and NGOs, have been engaged in numerous projects and programs over the past five years designed to strengthen awareness, capacities, strategies and decisions regarding sustainable development programs for watersheds, coastal areas and Large Marine Ecosystems (LMEs) of

the region (Box 3). Of particular note are the ASEAN Marine Water Quality Criteria, which were developed for 17 parameters by the ASEAN Working Group on Coastal and Marine Environment (AWGCME) in collaboration with UNEP EAS/RCU. The criteria were endorsed during the Seventh Informal ASEAN Ministerial Meeting in November 2002. Since then, ASEAN has received financial and technical support from the Australian Government for implementation of the criteria.

Several of the projects involved the development and adoption of long-term strategies and action programs, which have been based on scientific assessment and multisectoral consultation using such tools as environmental risk assessment (ERA), resource valuation/natural resource damage appraisal (RV/NRDA) and public awareness and consensus building. Included among the outputs of the initiatives during the period were: Manila Bay Coastal Strategy (2002); Conservation Plan for the Sulu-Sulawesi Marine Ecoregion (2003); Sustainable Development Strategy for the Seas of East Asia (2003); Bohai Sea Sustainable Development Strategy (2005), the Vientiane Action Programme (2004–2010), and the Bali Plan of Action: Towards Healthy Oceans and Coasts for the Sustainable Growth and Prosperity of the Asia-Pacific Community (2005). These strategies are now providing a collaborative framework for action programs at the regional, national and sub-national levels.

### Increased Access to Safe Water and Improved Sanitation and Sewage Services

The targets identified under the UN Millennium Development Goals (MDGs) and the World Summit on Sustainable Development (WSSD) Johannesburg Plan of Implementation (JPOI) provide a means of measuring progress in the region regarding access to safe water and improved sanitation and sewage services (Box 4). At the halfway point (i.e., from the baseline year (1990)) to the target year 2015, indications are that countries of the region have been making significant contributions to the global objectives, both in urban and rural areas. By 2002, China increased its total access to basic sanitation facilities by 67 percent over 1990 figures (baseline year). In the urban areas, total coverage grew from 23 percent to 44 percent, while in the rural areas, coverage increased from 7 percent in 1990 to 29 percent in 2002. Overall, about 300 million people gained access to improved sanitation during this period, with Vietnam making the highest coverage increase among Southeast Asian countries — overcoming a

Table 1: Improved Sanitation Coverage for Countries in the East Asian Region.<sup>4</sup>

Country	Population 2002			Total Sanitation Coverage 2002 (%)		Urban Sanitation Coverage 2002 (%)		Rural Sanitation Coverage 2002 (%)		WSSD/MDG Target 2015 (%)
	Total (in Thousands)	Urban (%)	Rural (%)	Total Access	Sewer Connections	Total Access	Sewer Connections	Total Access	Sewer Connections	
Cambodia	13,810	18	82	16	4	53	23	8	0	58.5
China	1,294,867	38	62	44	17	69	42	29	2	70
Indonesia	217,131	44	56	52	1	71	2	38	0	77.5
Malaysia	23,965	63	37					98	0	99
Philippines	78,580	60	40	73	7	81	10	61	2	91.5
Thailand	62,193	32	68	99	>20	97	>20	100	0	98
Vietnam	80,278	25	75	41	2	84	8	26	0	73.5

Table 2: Improved Water Supply Coverage for Countries in the East Asian Region.<sup>4</sup>

Country	Population 2002			Drinking Water Coverage 2002 (%)		Urban Drinking Coverage 2002 (%)		Rural Drinking Coverage 2002 (%)		WSSD/MDG Target 2015 (%)
	Total (in Thousands)	Urban (%)	Rural (%)	Total Access	Household Connections	Total Access	Household Connections	Total Access	Household Connections	Total Access
Cambodia	13,810	18	82	34	6	58	31	29	1	65
China	1,294,867	38	62	77	58	92	91	68	40	87.5
Indonesia	217,131	44	56	78	17	89	31	69	5	89
Malaysia	23,965	63	37	95		96		94	64	97.5
Philippines	78,580	60	40	85	44	90	60	77	22	93
Thailand	62,193	32	68	85	34	95	80	80	12	92
Vietnam	80,278	25	75	73	14	93	51	67	1	88.5

total coverage of less than 22 percent in 1990 to 41 percent in 2002. In addition, Malaysia, Philippines and Thailand appear to be on track in meeting the 2015 targets for access to sanitation, assuming they maintain their average rates of annual increases from the past 12 years (Table 1).

For water supply, China extended access to improved water supplies to an additional 141 million people in urban areas from 1990 to 2002. Although overall urban coverage declined during this period as a consequence of population increases, it is forecast that urban coverage will reach approximately 98 percent by 2015, assuming the past coverage growth rate is maintained. In rural China, about 48 million people received improved water supply services between 1990 and 2002. Projections put China's rural coverage at 85 percent by 2015. For Southeast Asian countries, it appears that they are far more likely to achieve their water supply indicators in urban areas than in rural areas. Based on past coverage growth rates, it appears that Malaysia and Thailand will be able to reach 100 percent coverage in urban areas. However, Indonesia and the Philippines both had relatively high urban coverage in 1990 (i.e., 92 percent and 93 percent, respectively), and they have lost ground in total access, primarily because of population shifts to urban areas (Table 2).

These statistics, while encouraging, provide only a partial picture. From the perspective of sustainable development, there are inherent linkages between safe drinking water and improved sanitation. For example, the target of access to "safe" water is more likely to be achieved if the water source is clean, and the water source is more likely to be clean if it is not polluted by untreated or partially treated wastewater. In this respect, it is evident that countries of the region have been moving towards a target of "improved" sanitation<sup>5</sup> and sewerage systems, rather than basic sanitation. Improved sanitation and sewerage systems take into account health and other implications related to safe water sources, as well as the ambition to advance towards greater levels of social, economic and environmental development than indicated in the WSSD and MDG basic targets.

There are a number of indications of country commitment to the goal of improved sewerage and sanitation services since 2002. For example, in Malaysia, domestic sewage has been cited by the Government as the largest single contributor of organic pollution loading to rivers and coastal areas in the period 2002 to 2004. Confirming that a modern and efficient sewerage system is vital for the country, in order to preserve its natural resources, protect public health and provide a

cleaner and safer environment, Malaysia has embarked on a privatization program of all sewerage services, and is committed to providing treatment facilities for 100 percent of its urban population by 2015. The country is well on its way to achieving this target, with the private concessionaire now operating over 8,400 sewage treatment plants throughout Malaysia.<sup>6</sup>

Thailand has taken an innovative approach to managing domestic sewage over the past five years. While recognizing the need for centralized facilities in its urban centers, the government has also embarked on a pilot program to test the application of wastewater management systems for homes and small communities. The approach was adopted in recognition of the high costs associated with the construction and operation of centralized treatment facilities, and the capacity of small and medium-sized communities to effectively operate and sustain such facilities. At present, Thailand has 15 sewage treatment plants under construction, and another 18 plants are being upgraded. Twenty-one percent (21%) of the 14 million m<sup>3</sup>/day of domestic sewage is being treated in existing facilities, while three pilot projects are underway to test the effectiveness and cost-benefits of low-technology systems.<sup>7</sup>

China's Five-Year Programme on the Prevention and Control of Water Pollution for Priority Basins (2006-2010) has targeted sewage treatment facilities for 70 percent of the urban population by 2010. As of 2005, about 30 percent of the daily wastewater volume of 61.45 million m<sup>3</sup> was being treated in 197 sewage treatment plants. An additional capacity of 4.76 million m<sup>3</sup>/day is available in the existing plants, and another 8.02 million m<sup>3</sup>/day will be added when the 145 facilities currently under construction become operational. All of this adds up to a sewage treatment capacity of about 48–49 percent of the current wastewater volume generated in China's cities. Although China has not set national targets for reductions in marine pollution from land-based activities, the 2010 objective is to reduce pollutant levels by 10 percent (baseline year 2005).<sup>8</sup>

In other countries, the unmet demand for sewage treatment facilities and services remains high. In Cambodia, there are no sewage treatment facilities operating outside of Phnom Penh, although a new facility is being constructed in Sihanoukville.<sup>9</sup> In Indonesia, communal septic tanks are the most common method of treating domestic wastes in urban areas, serving approximately 23 percent of the urban population in 2003. Less than 3 percent of the urban population is connected to sewage treatment facilities, leaving the untreated

discharge at about 232 million m<sup>3</sup>/day.<sup>10</sup> In the Philippines, about 0.5 million (4%) of the population of Metro Manila (the National Capital Region) are connected to sewers, while 600,000 households have septic tanks that discharge into sewers or drainage networks. The capacity of existing sewage treatment plants in the National Capital Region is 0.08 million m<sup>3</sup>/day. About 1 percent of the population of the Philippines is connected to sewers.<sup>11</sup> Urban centers in Vietnam generate about one million m<sup>3</sup>/day of municipal wastewater. Currently, there are 14 centralized treatment facilities operating in 8 main cities, with a total capacity of about 0.46 million m<sup>3</sup>/day. A number of major infrastructure projects have been initiated, with required investments estimated at \$1 billion per year for the next 10 years.<sup>12</sup>

### **Forging of Partnership Arrangements for Sustainable Development of Coasts and Oceans**

The cross-sectoral nature and number of stakeholders involved in the management of land-based pollution underlines the need for effective partnerships.

Prior to 2002, the Regional Programme of Action (RPA) for the Protection of the Marine Environment of the East Asian Seas from the Effects of Land-based Activities was developed under the framework of the Coordinating Body on the Seas of East Asia (COBSEA), identifying the main sources of land-based pollution in the region as (in priority order) sewage, agriculture, industry, urban runoff and habitat modification.<sup>13</sup> The Regional Programme of Action, which was endorsed in 2000, includes recommended actions to be undertaken and outlined responsibilities among the different stakeholders in the region in order to reduce the negative environmental impacts from these priority sources. Since its endorsement, activities have focused on the identification of hotspots of land-based pollution and capacity building on the use of modeling to predict pollution impacts from these hotspots.

Three new initiatives were forged at the regional level during the period 2002–2006.

The East Asian Seas (EAS) Congress 2003, held in Putrajaya, Malaysia, in December 2003 was a premier event in the region aimed at strengthening partnerships among national governments, UN and international agencies and organizations, local governments, NGOs, scientific and technical institutions, the media and the private sector in support of sustainable development of coasts and oceans.<sup>14</sup> Hosted by the Government of Malaysia, and coordinated by the PEMSEA Regional Programme, the five-day Congress focused on the theme Regional Implementation of the WSSD Commitments for the Seas of East Asia. The culmination of the event was the signing of the Putrajaya Declaration of Regional Cooperation for the Sustainable Development of the Seas of East Asia by Ministers and Senior Government Officials from the 12 participating countries of the PEMSEA Regional Programme.<sup>15</sup> The signing signified the adoption of the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA) by the participating countries as a platform for cooperation, and a framework for policy and program development and implementation at the national and local levels. Since signing the Declaration,

follow-on actions have included the drafting of a Partnership Agreement among 14 participating countries<sup>15</sup>, to establish an intergovernmental, multisectoral regional partnership mechanism for the implementation of the SDS-SEA. The Partnership Agreement is scheduled to be signed by Ministers of the participating countries at a Ministerial Forum in December, a highlight of the EAS Congress 2006<sup>16</sup>, to be held in Haikou City, Hainan Province, China.

The Vientiane Action Programme (VAP) 2004–2010 was adopted and endorsed by the ASEAN Leaders during the 10th ASEAN Summit in 2004.<sup>17</sup> The VAP describes the goals and strategies towards realizing the ASEAN Community, which comprises of three pillars: the ASEAN Security Community (ASC); the ASEAN Economic Community; and the ASEAN Sociocultural Community. Environmental cooperation generally falls under the ASC, and one of the key strategic thrusts of the ASC is to promote environmental sustainability through environmental and natural resource management.

The Bali Plan of Action: Towards Healthy Oceans and Coasts for the Sustainable Growth and Prosperity of the Asia-Pacific Community was adopted in September 2005 by Ministers responsible for the marine environment at the Second Ocean-related Ministerial Meeting of the Asia-Pacific Economic Co-operation.<sup>18</sup> The Action Plan recognizes the importance of the ecosystem-based approach to the management of the marine environment to address the serious and continuing threats from land-based and sea-based pollution. It further seeks to ensure sustainable management of the marine environment and its resources.

### **Implementation of GPA from 2007 to 2011**

While progress has been made with implementation of the GPA in the region, it is apparent that many challenges remain. Even with the eventual achievement of the MDG/WSSD targets for water supply and sanitation, which may be considered an important milestone in the process of sustainable development, countries recognize that they are not an endpoint, but that they are moving in the right direction.

Box 6 lists some of the common challenges that countries are facing with regard to implementation of the GPA and, in particular, the discharge of untreated or partially treated sewage and agricultural runoff into rivers and coastal areas. Familiar questions still arise, although they have been around the region for a number of years. For example: How can we increase awareness among government officials and the public of the value and vulnerability of coastal and marine resources? How can water supply, solid waste, sanitation and sewerage facilities be financed? Where are the human resources to develop and plan the projects? Should we be training local government staff to maintain and operate facilities, or should we engage the private sector in the management and operation of facilities? How can a policy and regulatory climate be created that will provide both incentives and legal framework for investments in improved facilities? The fact that these questions are still unanswered in many parts of the region indicates that the challenges need to be tackled in a more substantive way (Box 5). Environmental agencies cannot solve these problems in isolation, but within a new paradigm of multisectoral cooperation and collaboration at the national and regional levels.

**Box 5: Water, Sanitation and Sewerage Services: Are They Affordable?\***

The table below shows the gross domestic product (GDP) per capita in current dollars, adjusted by corresponding Purchasing Power Parity (PPP) based on World Bank estimates. PPP-GDP is a measure of the total value of goods produced by the economy adjusted for the differences in the relative prices of goods and services, particularly non-tradable goods and services. As it takes into account the price differences of non-tradable goods and services (e.g., water services), it provides a better measure for the standard of living of residents of an economy.

An analysis of the PPP-GDP figures offers insights on the relative affordability of additional investment in water and sewerage/sanitation services. For instance, based on current per capita water consumption rates of around 219 liters per day in urban China, an average person would spend \$1.54 per month (or \$18.44 per year) on an average water utility rate of \$0.23 per cubic meter (ranging from \$0.13 to \$0.35). This figure would correspond to only 0.33 percent of per capita GDP. Even if investing in wastewater treatment facilities would result in a 50 percent increase in utility rates, water bills would still represent 0.49 percent of per capita income, PPP-adjusted.

In East Asian countries with half or less than half of the per capita income of China (e.g., Cambodia and Vietnam), the cost of water

services as a percentage of income will be higher. Nevertheless, the price of more water supply coverage and sanitation will still represent only 1 percent of each country's income. In Metro Manila, Philippines, as a result of the privatization efforts, the cost of water has escalated to around \$0.47–\$0.54 per cubic meter, corresponding to around 0.7 percent of its \$5,000 per capita GDP. (However, the ratio is actually only half, as the per capita income of households in Metro Manila is double the national average.) Given that water costs still amount to a minimal share in household expenses, raising water fees to finance additional water and sewerage facilities is a compelling argument not just from an environmental standpoint but from an affordability and financial sustainability aspect as well.

The table below also shows that in the five countries, the consumption share of the lowest income group (or lowest 10 percent of households) ranges from 2.3 percent to 4 percent while the consumption share of the highest income group (or highest 10 percent of households) ranges from 26.7 percent to 33.8 percent. This skew in income distribution and consumption pattern suggests the need to target improved access of the lower income groups, which usually do not have access to safe water and sanitation among other goods and services, and at the same time, a restructuring of the water tariff rates to make it more 'socialized,' i.e., the higher income groups will have to pay more.

**COUNTRY INDICATORS**

Country	GDP	GDP per capita	Household Income or Consumption by Percentage Share
Cambodia	PPP* - \$26.99 billion	PPP* - \$2,000	lowest 10%: 2.9%
			highest 10%: 33.8% (1997)
Indonesia	PPP* - \$827.4 billion	PPP* - \$3,500	lowest 10%: 4%
			highest 10%: 26.7% (1999)
Vietnam	PPP* - \$227.2 billion	PPP* - \$2,700	lowest 10%: 3.6%
			highest 10%: 29.9% (1998)
China	PPP* - \$7.262 trillion	PPP* - \$5,600	lowest 10%: 2.4%
			highest 10%: 30.4% (1998)
Philippines	PPP* - \$430.6 billion	PPP* - \$5,000	lowest 10%: 2.3%
			highest 10%: 31.9% (2003)

\* PPP (Purchasing Power Parity)

\*\* Extracted from PEMSEA, 2005. An Overview of Public and Private Sector Capacities for Environmental Infrastructure in Five East Asian Countries. PEMSEA Manuscript Series No. 2. [www.pemsea.org](http://www.pemsea.org).

## Box 6: Common Challenges among Countries regarding GPA Implementation.

In defining GPA implementation in the region for the next five years, four core areas and related actions aimed at reducing and overcoming constraints identified in Box 6, may be considered, as follows:

### Institutional Component

Actions include:

1. Setting in place national strategies and policies that mainstream GPA objectives into a sustainable development program for coastal and marine areas;
2. Organizing/strengthening national interagency, multisectoral coordinating and enforcement mechanisms; and
3. Integrating time-bound targets for the development and financing of sewerage and sanitation facilities into national development programs, as well as the country assistance programs of donors, international financial institutions, UN agencies, international agencies and organizations, and regional programs and projects.

### Socioeconomic Component

Actions include:

1. Building awareness among senior policymakers, government leaders and the general public on the value of marine and coastal resources and their importance to economic growth, as well as the interlinkages between poverty alleviation and healthy ecosystems;
2. Implementing ecosystem-based management (E-BM)/integrated coastal management (ICM) programs in selected priority watersheds/coastal areas, to build a core of necessary tools, skills and expertise among national and local stakeholders through hands-on experience;
3. Preparing and adopting long-term development strategies for priority watersheds/coastal areas, in consultation with local stakeholder groups, including women and the poor; and
4. Developing and implementing short-term action programs and investment plans for water and sewerage services in priority watersheds/coastal areas, in consultation with local stakeholder groups, including women and the poor.

### Scientific and Technical Component.

Actions include:

1. Conducting capacity development programs aimed at local governments and local stakeholders, providing management tools and skills to plan, develop and implement ecosystem-based management/ICM programs;
2. Engaging scientific and technical institutions, universities and the industry/private sector in partnerships with local governments for the development and implementation of E-BM/ICM programs; and
3. Implementing information- and knowledge-sharing systems and events at the country, regional and global levels, designed to share experiences and to transfer skills, information and technologies among projects and programs being undertaken within and among countries, sectors and stakeholders in the region, and outside of the region.

#### Institutional:

- Policy/regulatory gaps and conflicts
- Institutional overlaps, conflicts and gaps
- Monitoring and enforcement capacity

#### Socioeconomic:

- Rapid population increase and urbanization
- Rapid economic development (e.g., tourism) and industrialization
- Awareness of the value of coastal and marine resources and the services they provide
- Competing and conflicting uses of coastal and marine resources
- Improving access for all, including the poor

#### Scientific and Technical:

- Adequate scientific, technical and management skills/expertise, especially at the local level
- Innovative and appropriate technologies for sewage treatment, solid waste management and agricultural runoff
- Project planning and development

#### Financial:

- Access to adequate and affordable financing
- Adequate revenue sources/user fees to cover operating costs

### Financial Component

Actions include:

1. Establishing and/or strengthening financing policies, programs and mechanisms aimed at leveraging public and private sector investments in water, sanitation and sewerage systems;
2. Assisting local governments/stakeholder groups to plan and develop project proposals for improved water, solid waste, sanitation and sewerage facilities and services, with due consideration of the social, economic and environmental conditions and capacities in the project areas;
3. Setting up a network of financing facilities for water, solid waste, sanitation and sewerage projects, including national programs, national development banks, private sector institutions and donors, to fund fully developed project proposals submitted by local governments/stakeholder groups; and
4. Developing and applying innovative, socially sensitive, economic instruments, which provide local governments, local stakeholders and their partners with sufficient revenue to develop, sustain and improve water, solid waste, sanitation and sewerage facilities and services over the long term, and at the same time strengthen community awareness and ownership of such facilities.

### The Way Forward: Partnership Opportunities

The WSSD JPOI recognized that achieving targets for water supply, sanitation and sewerage systems would necessitate collaborative and partnership arrangements involving a wide range of stakeholders, not just governments. The recognition of the different perspectives, different objectives and different capacities of each



Table 3: Roles and Partnership Opportunities among National and Regional Stakeholders for GPA Implementation (2007 to 2011).

	Government		International Development Partners	Communities and Civil Society	Industry/ Private Sector
	National	Local			
<b>INSTITUTIONAL</b>					
1. Policies/strategies mainstreaming GPA with sustainable development	RC		<i>p</i>		
2. National coordinating mechanisms – interagency, multisectoral	RC	P	<i>p</i>	P	P
3. Time-bound targets for sewerage and sanitation – development and financing	RC	<i>p</i>	<i>p</i>	<i>p</i>	<i>p</i>
<b>SOCIOECONOMIC</b>					
1. Awareness among senior policymakers and the public – poverty and ecosystems	RC	P	<i>p</i>	P	P
2. E-BM/ICM programs – core capacities among national/local stakeholders	RC	RC	<i>p</i>	P	P
3. Development strategies in priority watersheds/coastal areas	<i>p</i>	RC	<i>p</i>	P	P
4. Action programs and investment plans in priority watersheds/coastal areas	<i>p</i>	RC	<i>p</i>	P	P
<b>SCIENTIFIC/TECHNICAL</b>					
1. Capacity development programs – local government/local stakeholders	RC	P	<i>p</i>	P	P
2. Scientific/technical support to local governments – E-BM/ICM	P	RC	<i>p</i>	P	P
3. Information sharing and knowledge transfer – in-country, regional, global	RC	P	P	P	P
<b>FINANCIAL</b>					
1. Financing policies/programs – leverage public and private sector investments	RC	<i>p</i>	<i>p</i>	<i>p</i>	<i>p</i>
2. Preparation of fully developed projects – water, sanitation, sewerage	<i>p</i>	RC	<i>p</i>	P	P
3. Network of financing facilities – sustainable financing for fully developed projects	RC	P	P	<i>p</i>	P
4. Revenue generation for local governments – socially sensitive	<i>p</i>	RC	<i>p</i>	<i>p</i>	<i>p</i>

RC - Responsibility Center

P - long-term partnership arrangement

*p* - Project-specific partnerships/collaborative activities

organization and stakeholder group is the basis for building such partnerships. This perspective was reflected in the Rio principle of "common but differentiated responsibilities."

The challenges associated with the four core areas identified above, involving institutional change, capacity development, and creating new financial mechanisms, will take time to plan and implement. Time is of the essence, and the need for joint and collaborative effort among different organizations and stakeholder groups at the country and regional levels has never been so apparent. An essential element of effective collaboration is a clear definition of who can do what to make full use and benefit of available skills, resources and program commitments of each sector.

In the East Asian region, there are four main groupings of stakeholders: 1) governments, which include national agencies, organizations, institutions and corporations, as well as local government units; 2) international development partners, including donors, regional organizations and programs, UN and international agencies, international financial institutions, and international NGOs; 3) communities and civil society, including universities and colleges, media, local NGOs, people's organizations, religious groups, and individual sectors of the community, including the poor; and 4) industry/private sector,

including multinational corporations, small and medium-sized enterprises (SMEs), commercial banks and private investment groups. Indicative roles and potential partnership opportunities for each group have been identified in Table 3, relative to the four core categories of action identified above.

It is evident that roles and responsibilities of the key players identified in Table 3 will vary from country to country, and even site to site, depending on policies, priorities, and constraints. Furthermore, some of the identified actions are already ongoing in several countries or subregions of the East Asian Seas, while others are in the planning process. In addition, existing platforms of coordination and/or technical cooperation and assistance within the region, such as ASEAN, APEC, COBSEA and PEMSEA may be tapped to further enhance capacity building, technology transfer and knowledge sharing between developed and developing countries. So, in effect, Table 3 serves as a checklist for countries and their regional and global partners, to plan, coordinate, collaborate, share information, monitor progress, evaluate impacts and replicate good practices over the next five years. The desired results, as stated previously, will be measurable indications of improvement in policy, capacity, financing and infrastructure. The desired impact will be measurable improvements in the quality and sustainable management of coastal and marine resources, and the health and well-being of communities at priority sites throughout the region.

## Endnotes:

<sup>1</sup> Environment Matters 2005 – The World Bank Group. World Bank-East Asia and Pacific website: [www.worldbank.org/eapenvironment](http://www.worldbank.org/eapenvironment).

<sup>2</sup> Asian Development Bank. 2005. Asian Environment Outlook 2005—Making Profits, Protecting Our Planet: Corporate Responsibility for Environmental Performance in Asia and the Pacific. Manila: ADB.

<sup>3</sup> WWF. 2005. Asia-Pacific 2005: The Ecological Footprint and Natural Wealth. Published by the World Wide Fund for Nature (WWF). December 2005.

<sup>4</sup> WHO and UNICEF. 2004. "Meeting the MDG Drinking Water and Sanitation Target: A Mid-term Assessment of Progress." United Nations, New York. Presented in Asia Water Watch 2015. Published jointly by ADB, UNDP, UNESCAP and WHO. 2006.

<sup>5</sup> The WHO defines improved sanitation as generally involving better access and safer disposal of excreta through septic tank, pour-flush, simple pit latrine, small bore sewer or ventilated improved pit latrine, whereas basic sanitation can include bucket latrines, public latrines or latrines with an open pit.

<sup>6</sup> Malaysia National Assessment of GPA Implementation: Achievements 2002–2006. Paper presented at the EAS IGR-2 Preparatory Workshop, Bangkok, Thailand, 4-5 September 2006.

<sup>7</sup> Thailand National Assessment of GPA Implementation: Achievements 2002–2006. Paper presented at the EAS IGR-2 Preparatory Workshop, Bangkok, Thailand, 4-5 September 2006.

<sup>8</sup> PR China National Assessment of GPA Implementation: Achievement 2002–2006. Paper presented at the EAS IGR-2 Preparatory Workshop, Bangkok, Thailand, 4-5 September 2006.

<sup>9</sup> Cambodia National Assessment of GPA Implementation: Achievements 2002–2006. Paper presented at the EAS IGR-2 Preparatory Workshop, Bangkok, Thailand, 4–5 September 2006.

<sup>10</sup> Indonesia National Assessment of GPA Implementation: Achievements 2002–2006. Paper submitted to the EAS IGR-2 Preparatory Workshop, Bangkok, Thailand, 4–5 September 2006.

<sup>11</sup> Philippines National Assessment of GPA Implementation: Achievements 2002–2006. Paper presented at the EAS IGR-2 Preparatory Workshop, Bangkok, Thailand, 4–5 September 2006.

<sup>12</sup> Vietnam National Assessment of GPA Implementation: Achievements 2002–2006. Paper presented at the EAS IGR-2 Preparatory Workshop, Bangkok, Thailand, 4–5 September 2006.

<sup>13</sup> UNEP. 2000. Regional Programme of Action for the Protection of the East Asian Seas from the Effects of Land-based Activities. Published jointly by UNEP/GPA Coordination Office and UNEP EAS/RCU.

<sup>14</sup> Chua Thia-Eng, et al., eds. 2004. The East Asian Seas Congress 2003: Regional Implementation of the WSSD Commitments for the Seas of East Asia. 8–12 December 2003. PEMSEA Workshop Proceedings No. 13, 425 p. GEF/UNDP/IMO Regional Programme on Building Partnerships in Environmental Management for the Seas of East Asia (PEMSEA), Quezon City, Philippines.

<sup>15</sup> The 12 countries that signed the Putrajaya Declaration in 2003 included: Brunei Darussalam; Cambodia; China; DPR Korea; Indonesia; Japan; Malaysia; Philippines; RO Korea; Singapore; Thailand; and Vietnam. In 2006, Lao PDR and Timor-Leste indicated their intention to join the 12 countries in the implementation of the Sustainable Development Strategy for the Seas of East Asia.

<sup>16</sup> [www.pemsea.org/eascongress](http://www.pemsea.org/eascongress).

<sup>17</sup> ASEAN. 2005. Vientiane Action Programme (VAP) 2004-2010. Published by the Association for Southeast Asian Nations (ASEAN).

<sup>18</sup> 2nd APEC Ocean-Related Ministerial Meeting (AOMM2). Bali, Indonesia. 16–17 September 2005. Joint Ministerial Statement, Bali Plan of Action.



A N N E X 1 :

# fact sheets

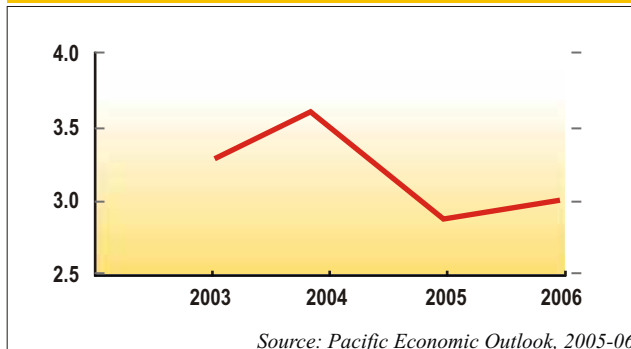


## Australia and GPA Implementation (2002-2006)

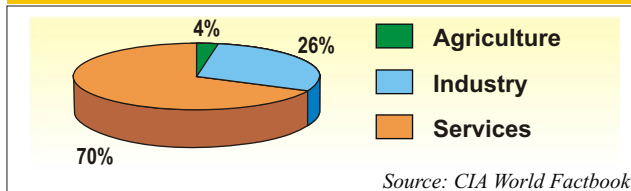
### Basic Facts

<b>Total population (2006):</b>	<b>20.3 million</b>
<b>Forecast population (2015):</b>	<b>21.9 million</b>
<b>Percentage of population (within 100 km of the coast):</b>	<b>90%</b>
<b>GDP per capita (2005):</b>	<b>US\$31,900</b>
<b>Area:</b>	<b>7,686,850 km<sup>2</sup></b>
<b>Area of territorial sea:</b>	<b>773,112 km<sup>2</sup></b>
<b>Length of coastline:</b>	<b>59,736 km</b>
<b>Percentage of population below poverty line:</b>	<b>N/A</b>

### GDP Growth (2003-2006)



### GDP Composition, by sector (2005)



### State of Marine Environment

#### Water Quality

Australia's coastal waters are generally in good condition and support the environmental values of aquatic ecosystem maintenance, primary industry and recreation and aesthetics, but where agricultural, urban and industrial development has occurred, coastal waters have been degraded to some extent.

Pollution of coastal waters is derived from both land and marine sources. While the relative contributions from these sources are poorly defined, it is widely considered that land-based sources such as wastewater treatment plants, landfills, industries and urban and agricultural runoff represent the greatest threat to the environmental values of Australia's coastal waters.

#### Coastal Resources

Australia is highly dependent on its marine resources in a range of ways including the recreational use of beaches and nearshore areas, preferred living and development in the coastal margins and the economic benefits of marine industries, including shipping, tourism, fisheries and offshore oil and gas.

After Indonesia, Australia has the largest area of coral reef of any nation, nearly 50,000 km<sup>2</sup>, or almost 17% of the world's



total. Considerable research has been put into coral reef research in Australia, and there is a good deal of information describing their distribution and biodiversity. Equally importantly, the great majority of Australia's reefs fall within protected areas.

## Progress in Implementing the GPA (2002-2006)

### New (2002-2006) GPA-related legislation, policies and action plans

- National Water Initiative (2004), Australia's blueprint for national water reform in recognition of the national imperative to increase productivity and efficiency of Australia's water use; the need to service rural and urban communities; and ensuring health of river and groundwater systems.
- Australian Government Water Fund of AU\$2 billion to support the National Water Initiative through providing funding to projects within the programs:
  - Water Smart Australia;
  - Raising National Water Standards; and
  - Community Water Grants.
- The Framework for a National Cooperative Approach to Integrated Coastal Zone Management (2003)
- Extension of the National Heritage Trust (1997) until 2007–2008 including the:
  - Landcare Program to reverse land degradation and promote sustainable agriculture;
  - Rivercare Program to improve water quality and environmental condition in river systems and wetlands;
  - Coastcare Program to protect coastal catchments, ecosystems and the marine environment; and
  - Bushcare Program to reverse the long-term decline in the quality and extent of Australia's native vegetation cover.

### Provision of sewage and sanitation

- 95% of the Australian population is connected to reticulated sewerage networks.
- Most unsewered areas use septic tanks or, in rural areas, single household sewage treatment plants.
- In 1997, 17.8% of all wastewater was treated to a tertiary standard, 54.6% to a secondary standard, 27.2% to primary standard, and 0.5% received no treatment.

### Management measures for nutrient reduction

- The 'Coastal Catchments Initiative' to reduce the discharge in pollutants to agreed hotspots

### Awareness-raising initiatives

- Clean Up Australia Day' to inspire and work with communities to clean up, fix up and conserve the environment (annual).

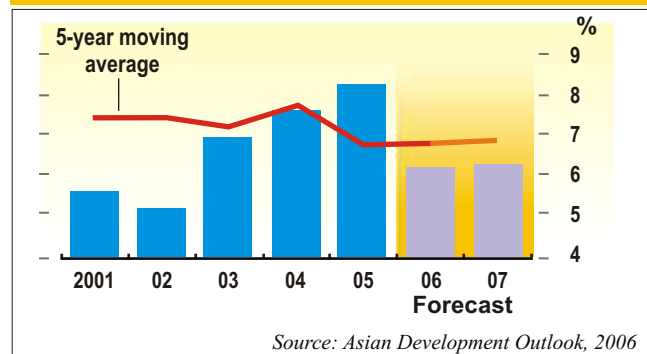


## Cambodia and GPA Implementation (2002-2006)

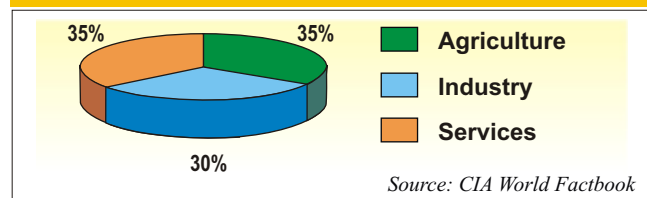
### Basic Facts

<b>Total population (2006):</b>	<b>13.9 million</b>
<b>Forecast population (2015):</b>	<b>16.3 million</b>
<b>Percentage of population (within 100 km of the coast):</b>	<b>24%</b>
<b>GDP per capita (2005):</b>	<b>US\$2,200</b>
<b>Area:</b>	<b>181,040 km<sup>2</sup></b>
<b>Area of territorial sea:</b>	<b>19,918 km<sup>2</sup></b>
<b>Length of coastline:</b>	<b>1,127 km</b>
<b>Percentage of population below poverty line (2004):</b>	<b>40%</b>

### GDP Growth (2002-2007)



### GDP Composition, by sector (2005)



### State of Marine Environment

#### Water Quality

Increasing levels of domestic wastewater, agricultural fertilizers and increasing sedimentation from logging and land clearing for agricultural purposes is contributing to the overall decrease in water quality in Cambodia. There is limited data or information available regarding the level of pollution, but according to water samples taken in 2001, 2002 and 2003 from sampling points in the Mekong, Tonle Sap and Bassac Rivers, these rivers are generally still in good condition. According to marine water sampling during 2003, the marine water quality is also still in good condition. However, considering the high urbanization, economic and industrial growth combined with factors such as the lack of transparent land-use planning and the difficulties in enforcing existing laws and regulation, the water quality is likely to deteriorate in the future unless proper wastewater management concepts are implemented and regularly followed-up.



#### Coastal Resources

Coastal resources in Cambodia are divided into six categories: coral reef, seagrass, sand beach, mangrove, rock beach and mud sanctuary at sea bed. Cambodia has a relatively short coastline, and very little data is available regarding the status of its coastal resources. The data available is primarily covering the status of the

first three categories: coral reefs and seagrass and mangrove areas. In 2002, the coral reefs located around most islands along Cambodia's coastline covered about 33 km<sup>2</sup> and included about 70 species. Seagrass areas can be found along the inland coastline covering an area of about 325 km<sup>2</sup> while the mangrove areas in Cambodia cover more than 560 km<sup>2</sup> and include about 74 species.

## GPA-related targets (2007-2010)

- 1) Increase the urban population with access to improved sanitation from 53% in 2004 to 74% in 2015; and increase the proportion of rural population with access to improved sanitation from 8% in 2004 to 30% in 2015;
- 2) Promote environmental sustainability of the forest cover at 60% of the total area of Cambodia in 2015; and
- 3) Re-plant forest at 140 km<sup>2</sup> in 2004 and 300 km<sup>2</sup> in 2010.

## Progress in Implementing the GPA (2002–2006)

### Some new GPA-related legislation, policies and action plans

- Draft Protected Area Law (2005);
- 'The Commission on Monitoring and Assessing for Suppressing Encroachment into Mangrove Land and Coastal Reclamation' established by the Royal Government of Cambodia in 2005 (Decision # 28 S.SR.);
- National Water Resource Policy for the Kingdom of Cambodia (2004);
- Drinking Water Standard (2004);
- Draft Law on Water Supply and Sanitation of the Kingdom of Cambodia (2004);
- Anukrets on Establishment of Protected Forests, Natural Resources Conservation, Wild Life Protection Areas and Protected Forests for Biodiversity Conservation (2002 and 2004);
- National Policy on Water Supply and Sanitation (2003);
- National Environment Plan (NEAP) (2003–2008);
- Sub-decree on Ozone Depleting Substances Management (2003);
- Forestry Law (2002)

### Provision of sewage and sanitation

- In 2002, 16% of the population had access to sanitation and 4% of the population had a sewer connection.
- One wastewater treatment plant constructed in Sihanoukville.
- Provincial Town Improvement Project (ADB) under implementation to rehabilitate water supply systems, develop sewage collection and treatment system and improve community sanitation conditions at selected locations.

### Management measures for nutrient reduction

- Integrated Coastal Management Project with Sihanoukville as demonstration site (2000–2006)
- Capacity Building for Sustainable Development in the Tonle Sap Region (2003–2005)

### Awareness-raising initiatives

- National Capacity Development Project (2001–2004) to integrate environmental concerns into policy and operational systems and awareness raising;
- Cambodia National Capacity Assessment (2004–2006) for sustainable management and use of natural resources and environment;
- Support to the establishment of Cambodia Community-based Natural Resources Management Network (CBNRM) Learning Institute (2004–2007);
- Participatory Management of Coastal Resources (2004–2007) to strengthen capacities among local institutions on CBNRM as stilted in village/commune; and
- Environmental and Natural Resource Management, ongoing program for awareness raising and training on natural resource management.

### Other

- Beach water quality monitoring conducted by Sihanoukville Environmental Laboratory;
- National Adaptation Programme of Action to Climate Change (2003–2005). Currently (August 2006) under consideration of the Council of Ministers;
- Capacity Development for the Clean Development Mechanism (2003–2005);
- Biodiversity and Protected Area Management Project (2000–2006); and
- Development of the National Biosafety Framework (2003–2005).

## Main challenges in meeting GPA Objectives

- Lack of human resources for development of national marine environmental policy and for monitoring and control;
- Weak enforcement of existing laws and regulations;
- Lack of technical assistance and financial support to maintain institutional capacities;
- Lack of technical capacities for the operation of chemical analysis equipment;
- Lack of capacities to manage emerging environmental issues; and
- Need for international community to assist in:
  - Resources mobilization;
  - Capacity building and awareness raising for government officers and local population for enhanced implementation of environmental conventions;
  - Research on identification and utilization of locally available energy resources;
  - Development of national disaster management plans, community-based preparedness and response activities
  - Development of shoreline management plans;
  - Strengthened public and private partnership; and
  - Strengthened integrated coastal zone management.

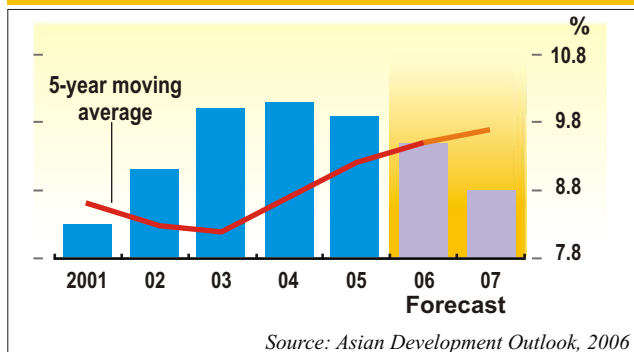


## People's Republic of China and GPA Implementation (2002-2006)

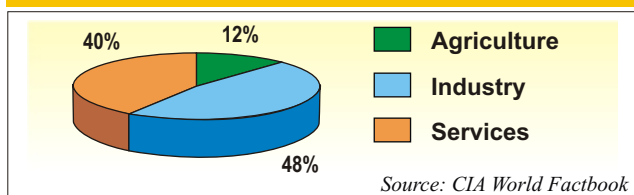
### Basic Facts

<b>Total population (2006):</b>	<b>1,314 million</b>
<b>Forecast population (2015):</b>	<b>1,385 million</b>
<b>Percentage of population (within 100 km of the coast):</b>	<b>24%</b>
<b>GDP per capita (2005):</b>	<b>US\$6,800</b>
<b>Area:</b>	<b>9.6 million km<sup>2</sup></b>
<b>Area of territorial sea:</b>	<b>348,090 km<sup>2</sup></b>
<b>Length of coastline:</b>	<b>30,017 km</b>
<b>Percentage of population below poverty line (2001):</b>	<b>10%</b>

### GDP Growth (2002-2007)



### GDP Composition, by sector (2005)



### State of Marine Environment

#### Water Quality

The main pollution elements in nearshore waters of China are nutrients. Results from the country's 200 coastal monitoring stations indicate that more than 317 billion tons of wastewater was discharged into the ocean from the mainland in 2005, almost twice as much as in 2000.

Generally, the water in the East China Sea suffers from higher loads of land-based pollution than that of the South China Sea and has a lower water quality. Nine national focus waters of environmental concern have been identified in China. Among these the Changjiang River estuary, Hangzhou Bay, Bohai Bay, Pearl River estuary and Minjiang River estuary are the most polluted, classified as class IV and over class IV (polluted).



#### Coastal Resources

At the end of 2002, there were 1,757 nature reserves in China with the total area of 1.33 million km<sup>2</sup>, accounting for 13.2% of the country's total land area. China also has extensive areas of wetlands, 0.66 million km<sup>2</sup>, accounting for 10% of the world's total.

Although China has a substantive coastline facing the South China Sea, there is little or no true reef development along any of it. In

2001, the reef area was covering a total of 1,270 km<sup>2</sup>, primarily in the areas of Hainan, among which 91% were at risk.

In 2001, China had 230 km<sup>2</sup> of mangrove areas mainly bordering the South China Sea. By 2006, thanks to a strict management policy and replanting projects, the area of mangrove has increased with several square kilometers. The total area of seagrass beds found in China amount to only 2.5 km<sup>2</sup>, all of which are bordering the South China Sea and most of which are protected.



## GPA related targets (2007–2010)

- 1) Urban wastewater treatment available for more than 70 percent of the production.
- 2) 10% decrease in pollutants compared to 2005.

## Progress in Implementing the GPA (2002–2006)

### Some new GPA-related legislation, policies and action plans

- The Law of Promoting Cleaner Production (2003);
- Regulations on the Administration for Application and Registration of Pollution Discharge (2003);
- Regulations on the Administration for Area and Functional Zone Adjustment (2003);
- Guidance on Pollution Discharge (2003);
- Provincial Rules on Hearing on Environment Protection Permission (2004);
- List of Poisonous Chemicals for Strictly Limited Import and Export by China (2005);
- Permit for Trans-provincial Movements of Solid Wastes (2005);
- The Eleventh Five-year Programme on the Prevention and Control of Water Pollution for Priority Basins (2006-2010);
- Information Report for Emerging Environmental Accident by the Environment Protection Agencies (2006); and
- National Program of Action for the Protection of the Marine Environment from Land-based Activities (under development).

### Provision of sewage and sanitation

- In 2002, 44% of the population had access to sanitation and 17% had a sewer connection.
- Total amount of urban sewage discharged into the sea from coastal areas: 31.78 million m<sup>3</sup>/day (2005).
- Actual amount of treated urban sewage: 17.1 million m<sup>3</sup>/day (2005)
- Untreated amount of urban sewage in the coastal areas: 14.68 million m<sup>3</sup>/day.
- The total number of wastewater treatment plants operating in 2005 was 197, with a total treatment capacity of 21.86 million m<sup>3</sup>/day.
- The number of wastewater treatment plants currently under construction is 145 with a total capacity of 8.02 million m<sup>3</sup>/day.

### Management measures for nutrient reduction

- A non-phosphorus detergents program was implemented in the Bohai Blue Sea-related watersheds in 2005.

### Awareness-raising initiatives

- During the World Environment Day (June 2005) in 2003, a press brief was organized by the State Council to introduce the Bohai Blue Sea Program.

## Main challenges in meeting GPA Objectives

- Lack of sustainable financing mechanism for investment in wastewater treatment;
- Inadequate user fees to cover treatment costs;
- More rapid economical development and population increase in coastal areas than forecast leading to increasing pollution loads; and
- Lack of waste collection system in coastal urban areas.

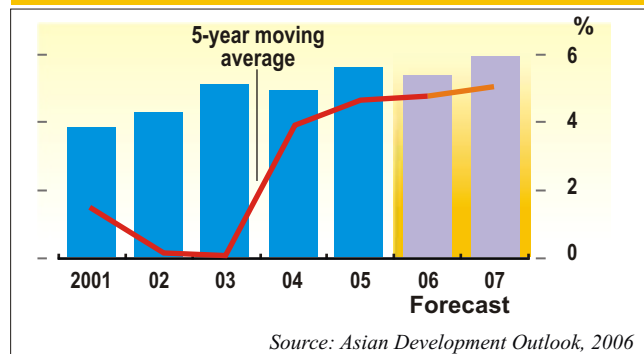


## Indonesia and GPA Implementation (2002-2006)

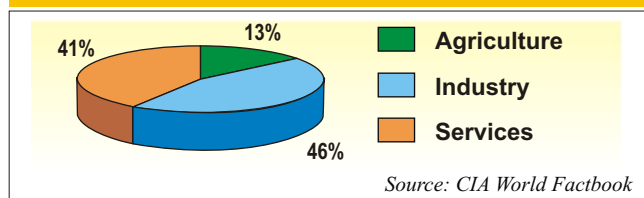
### Basic Facts

Total population (2006):	245.5 million
Forecast population (2015):	278.5 million
Percentage of population (within 100 km of the coast):	96%
GDP per capita (2005):	US\$3,600
Area :	1,919,440 km <sup>2</sup>
Area of territorial sea:	3,205,695 km <sup>2</sup>
Length of coastline :	95,181 km
Percentage of population below poverty line (2004):	16.7%

### GDP Growth (2002-2007)



### GDP Composition, by sector (2005)



### State of Marine Environment



### Water Quality

Land-based sources of pollution such as domestic and industrial wastes; agricultural runoff and waste from animal husbandry are causing a deterioration of the water quality in rivers throughout Indonesia.

Indonesia has one of the lowest rates sewerage and sanitation coverage in Asia, which is causing widespread contamination of surface and groundwater. Currently, the majority of rivers are slightly polluted and special attention must be provided to the heavily

polluted Ciliwung and Cisadane Rivers, in particular regarding fecal coli and total coliform parameters. Other important pollutants from land-based sources in Indonesia include DDT and its derivatives, originating from the high use of agricultural pesticides. Another serious problem in most Indonesian urban areas are the increasing volumes of solid waste and garbage. In 2001, 384 cities in Indonesia generated over 80,000 tons/day of garbage out of which over 15% was thrown into rivers and streets. Open dumping is the most common fate of municipal waste. Solid waste disposal in Indonesia is still facing a number of problems in terms of regulations, funding, technical capacity and lack of adequate facilities.

## Coastal Resources

Indonesia is the world's largest coral reef nation with over 50,000 km<sup>2</sup> of coral reefs (17% of the world's total coverage), among which 82% are at risk. Indonesia also has substantive mangrove areas, covering over 45,000 km<sup>2</sup>, but large areas have been removed for coastal development such as shrimp ponds. Despite the vast area

of the Indonesian archipelago, the majority of its coastal area is already heavily utilized, particularly in the west, and considerable areas are under increasing stress from human activities. In Indonesia, coastal resources and activities generate 25% of the country's gross domestic product.

### GPA-related targets (2007-2010)

Basic sanitation services provided for 77.5% of the population

### Progress in Implementing the GPA (2002–2006)

#### Some new GPA-related legislation, policies and action plans

- Development of Indonesia's National Ocean Policy (target 2006 for approval);
- Implementation of Indonesia's Strategy for Sustainable Development (2005);
- Ministerial Decree 4, Integrated Coastal Management (2002); and
- Ministerial Decrees of Environment:
  - No. 51: Seawater Quality Standard (2004);
  - No. 75: Organization and Management of National Clean Production Center (2004);
  - No. 133: Emission Quality Standard for Fertilizer Industry (2004);
  - No. 200: Standard Criteria of Damage and Guidelines on Determining Status of Seagrass (2004);
  - No. 201: Standard Criteria of Damage and Guidelines on Determining Status of Mangrove (2004); and
  - No. 202: Waste Quality Standard for Businesses and/or Activities of Gold and/or Copper Mining (2004).

#### Provision of sewage and sanitation

- In 2002, 52% of the population had access to sanitation.
- Wastewater treatment systems are operating in 11 cities in Indonesia covering 14% of the population in the service areas (2003).

- Only 2.29% of the total urban population is connected to a sewerage system (2003).
- About 232 million m<sup>3</sup> domestic waste/day is directly disposed into water bodies and on land (2002).
- Pilot activities in provision of Sewerage Waste Processing Installation (IPLT) currently under implementation.

#### Management measures for nutrient reduction

- Prokasih (Clean River Program) implemented in order to reduce pollution discharge from households and industries into riverbeds. By 2004, 30 provinces were included in the program.

#### Awareness-raising initiatives

- Pilot project in integrated waste management by Ministry of Environment implemented 2003–2004 in a selected sub-district of Bidaracina, East Jakarta.
- The Superkasih Program under implementation to encourage industries to comply with environmental laws and regulations through 'Clean River Statement Letters'.

### Main challenges in meeting GPA Objectives

- Slow economic growth;
- Lack of financial allocation for environment protection, both at national and local government level;
- Disintegration of environmental protection activities and exploitation of natural resources;
- Disparity of regional development, such as between Java and outside Java, between Western Indonesia and Eastern Indonesia, and between urban and rural areas;
- Low quality and lack of maintenance of infrastructure and postponed development of new infrastructure;
- High operation and management costs for wastewater treatment systems;
- Lack of qualified human resources; and
- Lack of public awareness.

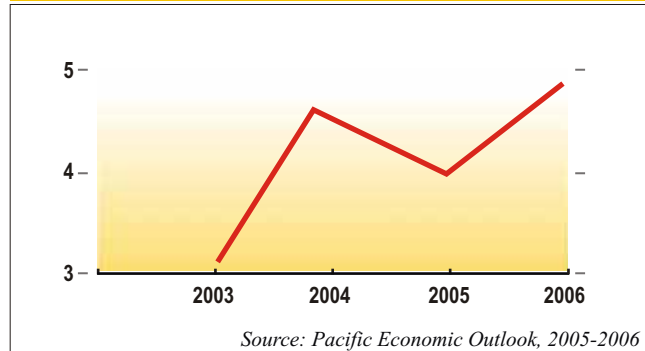


## Republic of Korea and GPA Implementation (2002-2006)

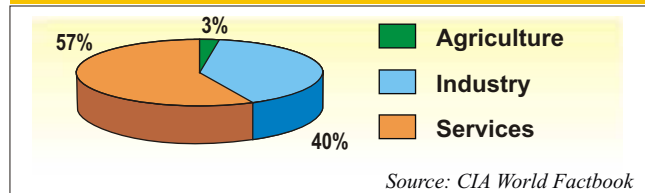
### Basic Facts

<b>Total population (2006):</b>	<b>48.9 million</b>
<b>Forecast population (2015):</b>	<b>50.8 million</b>
<b>Percentage of population (within 100 km of the coast):</b>	<b>100%</b>
<b>GDP per capita (2005):</b>	<b>US\$20,400</b>
<b>Area:</b>	<b>98,480 km<sup>2</sup></b>
<b>Area of territorial sea:</b>	<b>81,125 km<sup>2</sup></b>
<b>Length of coastline:</b>	<b>12,478 km</b>
<b>Percentage of population below poverty line (2003):</b>	<b>15%</b>

### GDP Growth (2003-2006)



### GDP Composition, by sector (2005)



### State of Marine Environment

#### Water Quality

Korea extended the coverage of its wastewater treatment infrastructure from 45% of the population in 1995 to an impressive 81% in 2004. Good progress was also made in reducing industrial discharges and discharges from livestock operations during the same period. Korea has begun moving away from the supply-dominated approach of the past towards a more integrated quality and quantity management of its water resources, adopting a river basin management approach for its four major rivers. As part of this, in 2007, it will begin implementing a "total pollution load management" system to manage point-source pollution discharges. Effluent limits for sewage discharges were tightened. The use of nitrogenous chemical fertilizers was reduced by 29% during 1997–2003. Water legislation was further amended and updated, and much progress was made in implementing the user pays principle for domestic and industrial water use. Korea has made a start at trying to reverse the mounting damages caused by flooding by moving away from a sole reliance on engineering works towards a comprehensive approach that includes ecosystem management.



## Coastal Resources

Coastal management has been regulated since 1999 by the Coastal Management Act (1999). The Guideline for the Establishment of a Coastal Management Plan (2000) specifies five types of coastal areas to promote their rational protection and use: absolute protection areas, protection areas, utilization areas, development adjustment areas, and development-inducing areas. Absolute protection areas (e.g., areas with excellent landscape, wildlife habitats, clean seas with abundant maritime resources) and protection areas (under protection yet allowing minimum, environment-friendly development) are sheltered from construction projects. Much of Korea's tidal wetlands have disappeared due to development, and pressures to develop coastal areas continue unabated.

The Marine Pollution Prevention Act (1991) set out long-term goals for managing the marine environment including reviewing the existing situation, predicting the future course of pollution, and defining necessary preventive actions. A 2001 amendment mandated the setting of a seawater quality target and the launching of the National Plan for Preservation of the Marine Environment to maintain that target. Implementation of the Coastal Management Plan has progressed. Korea's policies to deal with land-based sources of marine pollution include a tightening of regulations on industrial waste disposal, land reclamation, and industrial and residential development in the coastal zone.

## Progress in Implementing the GPA (2002–2006)

### New GPA-related legislation, policies and action plans

- National Plan for Preservation of Marine Environment (2006)
- Comprehensive National Plan of Abating Marine Dumping Wastes (2006)

### Provision of sewage and sanitation

- The proportion of the population that is connected to treatment plants has increased from 45% in 1995 to 81.4% in 2004.
- The number of sewage treatment plants grew from 93 to 268 between 1997 and 2004.
- Overall treatment capacity amounted to 21.7 million cubic m<sup>3</sup>/per day at the end of 2004, 44% more than in 1997.
- All new facilities are equipped for nutrient removal, while existing facilities are gradually being retrofitted to meet tightened effluent limits, which vary among regions depending on the pressure on water resources.
- Limits for sewage discharges were tightened for several high priority areas in 2002 and 2004.

- Operational data from sewage treatment stations in 38 cities and countries in Jeonnam Province generally show a high treatment efficiency (e.g., for BOD an average removal rate of 93% for all stations over 2001–2004) and an effluent quality that is often below 18mg/l of BOD.
- As of mid-2005, ten treatment plants were ISO 9000 or 14000 certified, and efforts were underway to implement quality management schemes in "Special Measurement Areas" upstream from water supply reservoirs and other sensitive areas.

### Management measures for nutrient reduction

- The steady growth of Korean agricultural production continues, despite a decrease of about 5% in the area of agricultural land.
- Intensive livestock farming is projected to shrink or remain steady. After treatment, livestock waste effluent still represents 28% of total point-source pollution in Korea.
- By 2003, Korea had achieved an actual reduction of 19% in its use of chemical nitrogenous fertilizer, thereby making progress towards its goal of reducing use by 30% between 1999 and 2005.

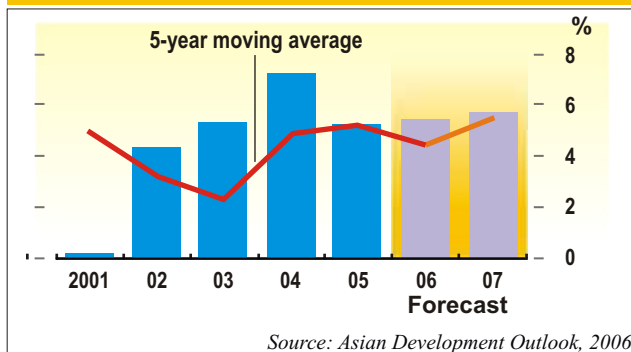


## Malaysia and GPA Implementation (2002-2006)

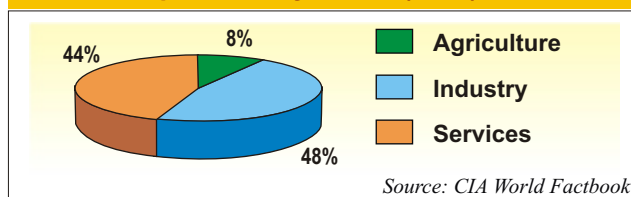
### Basic Facts

Total population (2006):	24.4 million
Forecast population (2015):	28.6 million
Percentage of population (within 100 km of the coast):	98%
GDP per capita (2005):	US\$12,100
Area:	329,750 km <sup>2</sup>
Area of territorial sea:	152,367 km <sup>2</sup>
Length of coastline:	9,323 km
Percentage of population below poverty line (1998):	8%

### GDP Growth (2002-2007)



### GDP Composition, by sector (2005)



### State of Marine Environment



### Water Quality

Monitoring of marine water quality in Malaysia began as early as 1978. In 2004, a total of 1,089 samples from 222 monitoring stations were analyzed. As previous years, the main pollutants of the coastal environment were total suspended solids, E. Coli and oil and grease.

Suspended solid levels are highest in the coastal waters of Pahang, Kedah, Perlis, Perak, Negeri Sembilan and Selangor. Activities such as coastal reclamation, road construction and

clearing of land for agriculture and tourism development without adequate control and protection measures have resulted in erosion and sedimentation of coastal waters.

River quality monitoring was privatized in 1995 including a total of 926 river water quality monitoring stations located within 120 river basins. In 2004, 58 river basins (48.3%) were clean compared to 59 rivers in 2003; 53 (44.1%) slightly polluted compared to 52; and 9 (7.5%) remained polluted.

## Coastal Resources

Peninsular Malaysia is dominated by low-lying land and mangrove areas, while East Malaysia is generally a wide coastal strip with extensive wetlands, mangrove development and where the majority of coral can be found in Malaysia. In 2001, the total area of coral reefs extended to 3,600 km<sup>2</sup>, 91% of which were at risk. The main threats facing Peninsular Malaysian reefs are connected to development such as oil pollution from the high-

traffic shiplanes and high rates of sedimentation and nutrient runoff, while destructive fishing methods are the main cause of concern in East Malaysia.

The mangrove coverage was estimated at 6,424 km<sup>2</sup> in 2001, and the area of coastal wetlands at 553.55 km<sup>2</sup>.

### GPA-related targets (2007-2010)

Sewerage treatment available for 100% of the population in 2015.

### Progress in Implementing the GPA (2002-2006)

#### New GPA-related legislation, policies and action plans

- Updated Environmental Quality Act, open burning (2003) and scheduled wastes (2005);
- The National Policy on Environment (2002) including sustainable development and environmental conservation; and
- The Action Plan for Cleaner Production Practices in Malaysian Industry.

#### Provision of sewage and sanitation

- 82.8% of the population in Peninsular Malaysia has access to sewage treatment;
- The sewerage services were privatized nationwide in 1994. In 2004, 8,414 private sewage treatment plants were operating with a total capacity of over 3 million m<sup>3</sup>/day providing services to over 15 million users (about 60% of total population);
- Individual or small clusters of households use simple wastewater treatment systems;
- The government budget allocation for pollution prevention and control (to Department of Environment) amounts to \$27.4 million (2004); and The operation and maintenance costs for private sewage treatment plans amount to \$55.1 million (2005).

#### Management measures for nutrient reduction

- River rehabilitation programs for 26 rivers identified based on pollution threat and importance for the use of drinking water, fisheries and tourism. In 2006, studies had been carried out on six rivers.

#### Awareness-raising initiatives

- National Environmental Awareness Campaigns for both public and rural areas;
- Awareness campaigns for specified groups (industrial, local community, NGOs and journalists);
- Environmental Awareness Camp for primary and secondary school teachers;
- Environmental Competitions between Institutions of Higher Learning; and
- Sustainable Schools Programme Environment Award.

### Main challenges in meeting GPA Objectives

- High rate of urbanization and industrialization creating increasing pollution loads;
- High operation and maintenance costs of wastewater treatment plants; and
- Difficulties in collecting user fees for wastewater treatment plants.

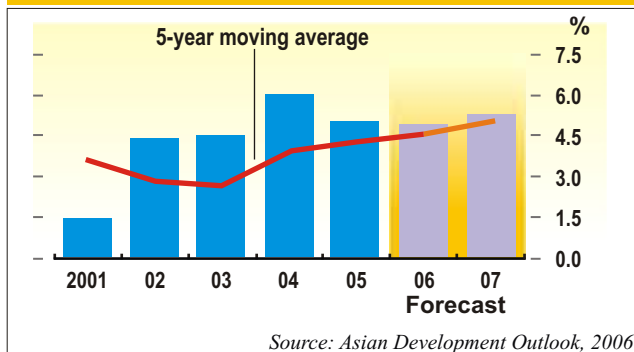


## Philippines and GPA Implementation (2002-2006)

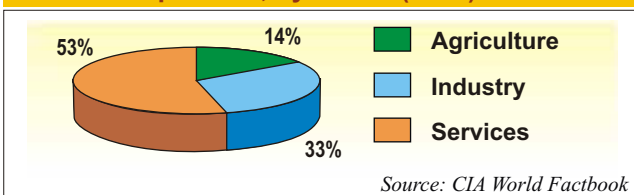
### Basic Facts

<b>Total population (2006):</b>	<b>89.5 million</b>
<b>Forecast population (2015):</b>	<b>105.1 million</b>
<b>Percentage of population (within 100 km of the coast):</b>	<b>100%</b>
<b>GDP per capita (2005):</b>	<b>US\$5,100</b>
<b>Area:</b>	<b>300,000 km<sup>2</sup></b>
<b>Area of territorial sea:</b>	<b>679,774 km<sup>2</sup></b>
<b>Length of coastline:</b>	<b>33,900 km</b>
<b>Percentage of population below poverty line (2001):</b>	<b>40%</b>

### GDP Growth (2002-2007)



### GDP Composition, by sector (2005)



### State of Marine Environment

#### Water Quality

Data from a total of 40 monitored bays and coasts in the Philippines since 1996 indicates that less than 40% of the bays and coasts are living up to the criteria set for waters suitable for tourist zones, fishery spawning areas, and swimming areas. In the coasts of Mandaue to Minglanilla in Central Visayas, the dissolved oxygen levels indicate that the ecosystem is undergoing stress during certain periods.

Among a total of 141 rivers monitored between 1996–2001, 29% had dissolved oxygen harmful for fish, while 64% had maximum values of biochemical oxygen demand indicating organic pollution. Seasonal high organic loadings from rivers draining into the bays result in harmful algal blooms that pose a continuing threat to marine resources and public health.

Domestic wastewater is the main contributor of bacterial contamination to the groundwater supplies and 31% of the illnesses in the Philippines are water-related diseases. Limited data from 129 wells has indicated a high level of positive coliform bacteria in 58% of the wells.

#### Coastal Resources

The Philippines is a large and complex mass of over 7,000 islands. Together with Indonesia in the south, the Philippines lies in the center of global coral reef biodiversity and has a vast area of coral reefs (over 25,000 km<sup>2</sup> in 2001). Many of the reefs in the area are severely impacted by human activities such as overfishing, destructive fishing and sedimentation as a result of deforestation and poor agricultural practices. Up to 75% of the original mangrove cover has been removed, leaving a remaining 1,607 km<sup>2</sup> in 2001. The number of endangered species in the Philippines increased from 212 to 284 between 1990 and 1998, and results of a recent biodiversity assessment show that existing infrastructures (roads, power and energy, ports and harbors, and growth areas) seriously threaten an estimated total area of 1.6 million hectares of biodiversity-rich ecosystems.





## Progress in Implementing the GPA

### New GPA-related legislation, policies and action plans

- Executive Order No. 533 (2006) adopts Integrated Coastal Management as a national strategy;
- Republic Act No. 9275 or Clean Water Act (2004) provides for comprehensive water quality management specifically for abatement and control of pollution from land-based sources; and
- Ecological Solid Waste Management Act (2000) addresses open dumping which is currently the main form of solid waste disposal

### Provision of sewage and sanitation

- In 2002, 73% of the population had access to sanitation.
- The total generated wastewater in the Philippines is estimated at 7.2 million m<sup>3</sup> (72% from urban areas and 28% from rural areas) (2003);
- Only 1% of the total population is connected to a sewer system;
- In Metro Manila with a population of 13.3 million people, 4% is connected to sewer system and 41% has septic tanks while 55% has no access to sanitation services. Untreated sewage flows directly to Manila Bay through an outfall;
- The required capacity for wastewater treatment in Metro Manila is more than 2.4 million m<sup>3</sup>/day;
- The Manila Water Company Inc. (MWC) and the Maynilad Water Services Inc. (MWSI) operating in Metro Manila have existing sewage treatment facilities with a capacity of about 0.08 million m<sup>3</sup>/day;
- Since 2002, the Makati Sewerage Treatment Plant in Metro Manila has been upgraded with 0.012 million m<sup>3</sup>/day to 0.48 million m<sup>3</sup>/day;
- Since 2002, two sewerage treatment plants have been constructed outside Metro Manila (Cabanatuan City, Nueva Ecija and Puerto Princesa City, Palawan);

### Projects:

- WB/GEF Manila Third Sewerage Project (September 2005 - March 2006)
- WB. Local Government Unit Urban Water Supply and Sanitation Project - Phase I & II (1997-2010); and
- JICA Capacity Development Project on Water Quality Management (2005-2006).

### Solid Waste

- In implementing the Ecological Solid Waste Management Act, some local government units have now established material recovery facilities for recyclable waste and are shifting from open dumps to controlled dumps.
- There is an existing sanitary landfill in Clark, and two sanitary landfills are under construction in San Fernando City, La Union and in Puerto Princesa City in Palawan.

### Management measure for nutrients reduction

- "The Community-based Forest Management Program" adopted and implemented by the Department of Environment and Natural Resources to address the degradation of forest areas in the Philippines. To date the program includes 5,503 sites covering an area about 4.9 million ha;
- "The Laguna de Bay Institutional Strengthening and Community Participation" by the Laguna Lake Development Authority addresses watershed degradation through streambank stabilization, solid waste composting facility and reforestation of watershed areas.

### Awareness-raising initiatives

- Beach EcoWatch is an environmental improvement and monitoring program to improve public awareness of water quality at Philippine beaches, and improve compliance by hotel and resort owners.

## Main challenges in meeting GPA Objectives

- Lack of formal structure for GPA implementation;
- Lack of capacity at government level to effectively implement and enforce regulations related to waste management;
- Lack of supporting facilities to cover the collection, treatment and disposal of POPs and other toxic and hazardous wastes and lack of shore reception facilities in major ports; toxic and hazardous waste management system (facilities for collection, treatment and disposal);
- Low priority of wastewater management projects among local government units combined with difficulty in meeting the documentary requirement of banks; general aversion of local governments to borrowing; high interest rates and limited capacity of local government units to put up counterpart funds;
- Lack of awareness and technical knowledge on wastewater management among small and medium-sized enterprises combined with lack of funds and skilled personnel to implement wastewater management projects; high investment and operating costs for the facilities; weak capacity to prepare feasibility studies; low creditworthiness;
- Difficulties in estimating nutrient loading and identifying pollution sources to serve as basis to address nutrient loading through determining targets, action programs and investment needs in sewage treatment and agricultural waste management facilities and services; and
- Further need for implementation of integrated river basin management to address nutrient loads.



## Singapore and GPA Implementation (2002–2006)

### Basic Facts

<b>Total population (2005):</b>	<b>3.6 million</b>
<b>Forecast population (2015):</b>	<b>4 million</b>
<b>Percentage of population (within 100 km of the coast):</b>	<b>100%</b>
<b>GDP per capita (2005):</b>	<b>US\$26,833</b>
<b>Area:</b>	<b>699.4 km<sup>2</sup></b>
<b>Area of territorial sea:</b>	<b>1,100 km<sup>2</sup>*</b>
<b>Length of coastline:</b>	<b>245.65 km</b>
<b>Percentage of population below poverty line:</b>	<b>N/A</b>

\*Approximate figure as not all of Singapore's maritime boundaries have been delimited.

### State of Marine Environment

#### Water Quality

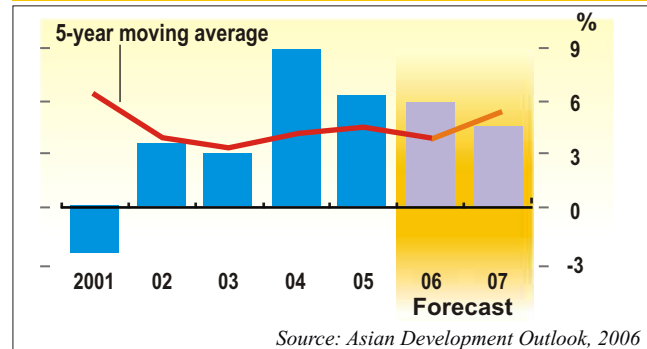
The National Environment Agency (NEA) carries out regular monitoring of the water quality in and around Singapore. The inland water bodies comprise rivers and canals in both water catchment and non-water catchment areas. The coastal areas include waters along the Straits of Johor, Straits of Singapore and around the main offshore islands.

In 2005, the water quality in the water catchments remained good and raw water collected in the reservoirs was suitable for treatment to produce drinking water. The inland waters in non-water catchments are clean and sustain aquatic life. The coastal waters in the Straits of Johor and Straits of Singapore, and around offshore islands was generally good and able to meet recreational water guidelines.

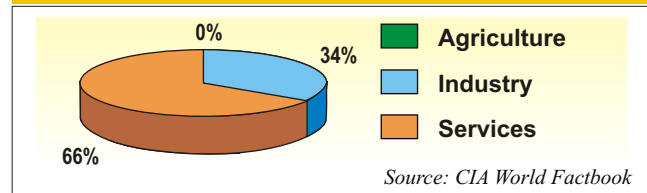
#### Coastal Resources

Even though Singapore is a relatively small and highly developed country, fringing coral reef communities are found around many of the southern islands. However, the coral cover has been affected by developments in the past, leaving existing reefs at some risk due to their small absolute area. In spite of its limited marine waters, Singapore still harbors over 200 species of hard corals, covering over 55 genera, and over 800 species of marine fishes. However, the coral cover has been affected by developments in the past, leaving existing reefs at some risk due to their small absolute area.

### GDP Growth (2002-2007)



### GDP Composition, by sector (2005)



To address this, the National Parks Board (NParks) collaborates with nongovernmental organizations and academic institutions to monitor the biodiversity and health of various ecosystems, and maintains a repository of information on Singapore's natural habitats and biodiversity, both marine and terrestrial. The Singapore Government also puts in place mechanisms to ensure that due consideration is given to the environmental impact of development projects.

The Sisters, a pair of islands with good coral life, has been designated a Marine Nature Area under the Singapore Green Plan 2012. The Sungei Buloh Wetland reserve, located along the northwestern coast of the mainland, protects 130 ha of coastal and estuarine mangroves as well as intertidal mudflats.

## Progress in Implementing the GPA (2002–2006)

### Provision of sewage and sanitation

- Almost all areas in Singapore are served by sewers and all wastewater generated are discharged into sewers.
- Comprehensive sewerage infrastructure comprising 3,140 km of sewers, 260 km of pumping mains, 130 pumping installations and 6 water reclamation plants (wastewater treatment works) to collect and treat the wastewater to comply with the watercourse discharge limits prior to discharge into seas.
- Industries are required to pre-treat their trade effluent generated from their industrial activities to comply with the sewer discharge limits prior to discharge into sewers.

### Management measures for nutrient reduction

- Pollution from poultry farms controlled by requiring poultry to be reared in covered sheds and the dung removed in solid form. The dung removed is processed and used as fertilizer/soil conditioner.
- Highly toxic and persistent pesticides, such as chlorinated hydrocarbon compounds, are prohibited for use in Singapore.

### Awareness-raising initiatives

- The NEA licenses the use of pesticides and requires pest control operators to undergo a customized training course on the safe handling and application of pesticides to ensure that the use of pesticides will not cause water pollution to the watercourses and the coastal areas.

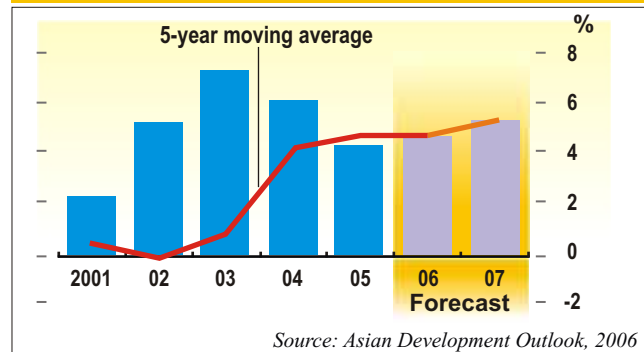


## Thailand and GPA Implementation (2002-2006)

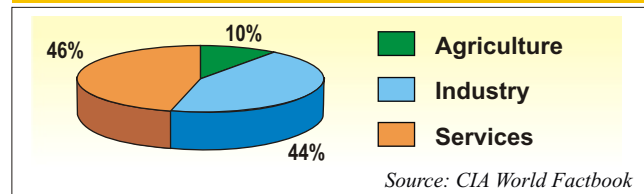
### Basic Facts

<b>Total population (2006):</b>	<b>64.6 million</b>
<b>Forecast population (2015):</b>	<b>68.7 million</b>
<b>Percentage of population (within 100 km of the coast):</b>	<b>39%</b>
<b>GDP per capita (2005):</b>	<b>US\$8,300</b>
<b>Area:</b>	<b>514,000 km<sup>2</sup></b>
<b>Area of territorial sea:</b>	<b>75,876 km<sup>2</sup></b>
<b>Length of coastline:</b>	<b>7,066 km</b>
<b>Percentage of population below poverty line (2004):</b>	<b>10%</b>

### GDP Growth (2001-2007)



### GDP Composition, by sector (2005)



### State of Marine Environment

#### Water Quality

Thailand has an extensive coastline facing the Andaman Sea in the West and the Gulf of Thailand in the east. The coastal waters in the Gulf of Thailand are generally more polluted than those of the Andaman Sea because of higher pollution loadings from industrial and domestic wastewater and high rates of sedimentation as a result of extensive coastal construction.

The accelerating pressures from economic development, tourism, population increase and aquacultural and agricultural activities are causing a deterioration of Thailand's marine environmental quality. Nutrients (nitrogen and phosphorus) are the main pollutants in Thailand's coastal waters. Other important pollutants include coliform bacteria, suspended solids, oil and heavy metals.

Some of the more polluted water resources that require special attention include Lamtakong River in Northeastern Thailand and Thachin River and Songkhla Lake draining into the Gulf of Thailand.

#### Coastal Resources

Thailand's rich coastal resources are heavily utilized for activities such as fisheries, tourism and aquaculture, causing increasing pressures on delicate coastal ecosystems. Thailand's coast is covered by over 150 km<sup>2</sup> of coral reefs, almost 2,000 km<sup>2</sup> of mangrove forests and about 100 km<sup>2</sup> of seagrass beds, but the extent of healthy reefs, seagrass beds and mangrove forest is rapidly decreasing.

In 2002, only 23% of all coral reefs were in good condition; 24% were in moderate condition; 52% were in deterioration and 1% was severely damaged. At present, the healthy reefs of the Andaman Sea are only half of those found in 1992.



## GPA-related targets (2007-2010)

1) 95% of surface water living up to fair water quality standards; and

2) Treatment of 50% of all wastewater from municipalities

## Progress in Implementing the GPA (2002-2006)

### Some new GPA-related legislation, policies and action plans

- Draft Action Plan for Solid Waste (2006)
- Rehabilitation plan for domestic wastewater collection and treatment systems (2006)
- Action Plan for Fish Pier Waste Management (2006)
- Effluent standards for aquaculture (2006), fish piers (2006), housing estates (2005), pig farms (2002), gas stations and oil terminals (2002)
- Environmental Management Action Plan for Coastal Aquaculture (2001)
- Policy and Plan for Enhancement and Conservation of National Environmental Quality (1997-2016)

### Provision of sewage and sanitation

- In 2002, 99% of the population had access to sanitation and over 20% of the population had a sewer connection.
- At present Thailand has 55 operating wastewater treatment plants, 15 plants under construction and 18 plants under restoration
- The total capacity of all wastewater treatment plants is 3 million m<sup>3</sup>/day or 21% of estimated total generated wastewater (14 million m<sup>3</sup>/day)
- Pilot projects:
  - Pilot wastewater management system for small communities in Songkhla Province

- Construction of small-scale wastewater treatment system for Chang Island (2005)
- Study on carrying capacity and development of an action plan for pollution prevention and remedy on Lanta Island (2005)
- Total investment in pollution control 2006: \$1.67 billion among which the main sources of funding was: Government budget, and Grants and loans from the Environment Fund.

### Management measures for nutrient reduction

- Integrated water resources management for 25 major river basins;
- Watershed classification through zoning system of watershed areas to prevent sedimentation and other pollutant discharge; and
- Best Management Practices to Minimize Agriculture-based Non-point Source Pollutions

### Awareness-raising initiatives

- Environmental Warriors (since 2005): a project where volunteers monitor wastewater discharged from factories which currently involves 25 educational institutes in the Bangkok area.
- Quality Index of the Beach (since 2002): Active participation of local governments in protecting tourist beaches regarding coastal water quality, beach litter, encroachment and eutrophication.

## Main challenges in meeting GPA Objectives

- Lack of direction at national level for the management of land-based pollution;
- Lack of unified institutional structure for wastewater and water supply services;
- Lack of ownership and capacity of local government for operation and maintenance of wastewater treatment facilities;

- High operation and maintenance costs for centralized wastewater treatment systems;
- Lack of willingness among the population to pay user fees for wastewater treatment;
- Limited funds to support all the needs in sewage and sanitation pollution control.

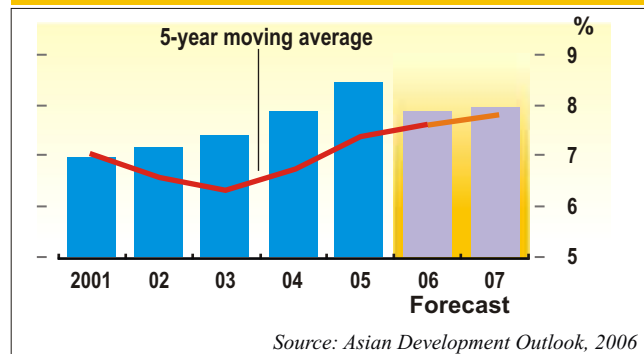


## Vietnam and GPA Implementation (2002-2006)

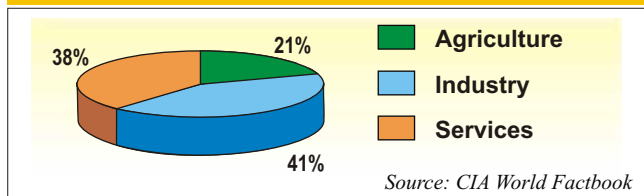
### Basic Facts

<b>Total population (2006):</b>	<b>84.4 million</b>
<b>Forecast population (2015):</b>	<b>92.5 million</b>
<b>Percentage of population (within 100 km of the coast):</b>	<b>83%</b>
<b>GDP per capita (2005):</b>	<b>US\$2,800</b>
<b>Area:</b>	<b>329,560 km<sup>2</sup></b>
<b>Area of territorial sea:</b>	<b>158,569 km<sup>2</sup></b>
<b>Length of coastline:</b>	<b>11,409 km</b>
<b>Percentage of population below poverty line (2004):</b>	<b>19.5%</b>

### GDP Growth (2002-2007)



### GDP Composition, by sector (2005)



### State of Marine Environment

#### Water Quality

In 2004, the water quality in most of Vietnam's estuaries still fell within permitted standards for the majority of parameters with the exception of total coliform and Zink concentrations, which exceeded permitted standards in almost all monitoring stations.

However, with increasing pressures on the marine environment, the water quality in Vietnam is degrading. In almost all coastal provinces, high rates of urbanization and industrial development leads to increasing marine pollution from inland sources. In addition, marine transport, fishing, oil and mining and tourism industries put additional pressure on the marine environment. Along Vietnam's coastline there is, on average, one estuary every 20 km. From these catchments, 880 billion m<sup>3</sup> of water, 300 million tons of sediments, 1,000 tons of nitrate, 22,000 tons of zinc, 20,000 tons of copper and 1,000 tons of cadmium are discharged into the sea every year.

#### Coastal Resources

Coastal development activities are significant to Vietnam's economy, with estimated profits from marine and coastal biodiversity to \$39 million/year and the income from oil, gas and fishery industries occupying 23% of the GDP.

Among the diverse ecosystems along Vietnam's coastline, the most important are wetlands, coral reefs and seagrass. Over the last 50 years, Vietnam has lost more than 80% of its mangrove forest, primarily in the Mekong Delta, Quang Ninh at Hai Phong provinces. The main reasons for the losses are expanding shrimp farming and conversion to agricultural and construction lands. At the same time 85% of the 1,122 km<sup>2</sup> of coral reefs in Vietnam are threatened because of destructive fishing practices, overfishing and sedimentation caused by upland deforestation.

There are vast wetland areas in Vietnam, mainly distributed in the Red River and the Mekong River Deltas and along the coastline. The Ministry of Natural Resources and Environment has identified 68 wetland sites of national importance while only one area, Xuan Thuy National Park, a mangrove area covering 120 km<sup>2</sup>, has been designated a wetland of international importance in the Ramsar Convention.



### Progress in Implementing the GPA

#### Some new GPA-related legislation, policies and action plans

- Master Plan on Basic Survey and Management of Marine Resources and Environment until 2010 and Vision until 2020 (2006)
- Law on Environmental Protection (Revised) (2006)
- The National Action Plan on Pollution Control towards 2010 (2005)
- Decree No 67: Introduction of Fees for Wastewater (2003)
- Action Programme for Dealing with Most Polluted Hotspots (2003)

#### Provision of sewage and sanitation

- In 2002, 41% of the population had access to sanitation and 2% of population had a sewer connection;
- The estimated municipal wastewater discharge from the three main economic zones in Vietnam is about 1,055,606 m<sup>3</sup>/day (North: 397,400 m<sup>3</sup>/day, Central: 97,216 m<sup>3</sup>/day, South: 560,990 m<sup>3</sup>/day);
- Currently, there are 14 municipal centralized wastewater treatment plants operating in the 8 main cities with a total capacity of about 462,320 m<sup>3</sup>/day;

- The estimated industrial wastewater discharge from the three main economic zones is about 324,880 m<sup>3</sup>/day (North: 140,000 m<sup>3</sup>/day, Central: 24,342 m<sup>3</sup>/day, South: 160,538 m<sup>3</sup>/day);
- Currently there are 29 centralized industrial wastewater treatment plants in the main industrial parks with a total capacity of about 87,000 m<sup>3</sup>/day.
- Vietnam uses its Environment Fund to provide low interest loans to the private sector in order to encourage establishment of wastewater treatment systems

#### Management measure for nutrients reduction

- Establishment of Integrated Coastal Zone Management Division (ICZM) at Vietnam Environment Protection Agency (2002)
- Formulation the ICZM program for 14 coastal provinces in the center of Vietnam (2005–2006)

### Main challenges in meeting GPA Objectives

- High urban and industrial development, exploitation of natural resources and growing tourism in coastal provinces leading to increasing land-based pollution loading;
- There is no separate law on marine pollution, only environmental pollution as a whole;
- Low effectiveness of legal framework and weak enforcement of regulations such as 'Polluter Pays Principle';
- No national strategy on control of land-based sources of marine pollution;
- Lack of Vietnamese environmental standards leading to use of international standards, which may not be applicable;
- Lack of standards for control and prevention of pollution, technical equipment and monitoring; and
- Lack of public awareness and priority for environmental protection.

## References for Fact Sheets:

---

- Asean Regional Center for Biodiversity Conservation. 2006. [www.arcbc.org](http://www.arcbc.org) (Accessed September 2006).
- Asia Pacific Foundation of Canada. 2005. Pacific Economic Outlook. Published on behalf of Pacific Economic Cooperation Council.
- Asian Development Bank. 2006. Asian Development Outlook.
- Clean Up Australia. 2006. [www.cleanup.com.au](http://www.cleanup.com.au) (Accessed September 2006).
- Earthtrends, World Resources Institute. 2006. <http://earthtrends.wri.org> (Accessed September 2006).
- Indah Water Consortium. 2006. [www.iwk.com.my](http://www.iwk.com.my) (Accessed September 2006).
- OECD. 2006. Environmental Performance Review: Korea. <http://www.oecd.org>
- Office of Natural Resources and Environmental Policy and Planning. 2006. Thailand: National Report on the Implementation of the Convention of Biological Diversity. Ministry of Natural Resources and Environment, Bangkok, Thailand. 64 p.
- Pollution Control Department 2004. Thailand State of Pollution Report. Ministry of Natural Resources and Environment, Bangkok, Thailand. 128 p.
- Royal Government of Cambodia. 2005. National Strategic Development Plan 2006-2010.
- Royal Government of Cambodia. 2000. National Environmental Concept 2000.
- Singapore Department of Statistics. 2006. [www.singstat.gov.sg](http://www.singstat.gov.sg)
- Spalding M.D., Ravilious C. and Green E.P. 2001. World Atlas of Coral Reefs. Prepared at UNEP World Conservation Monitoring Centre. University of California Press, Berkeley, USA.
- The CIA World Factbook. 2006. [www.cia.gov/cia/publications/factbook/index.html](http://www.cia.gov/cia/publications/factbook/index.html) (Accessed September 2006).
- The Department of Environment and Heritage, Australian Government. 2006. [www.deh.gov.au](http://www.deh.gov.au) (Accessed September 2006).
- The Ministry of Natural Resources and Environment, Vietnam. 2004. Vietnam Report on State of Marine Environment.
- UNEP. 2006. Report of the East Asian Seas IGR-2 Regional Preparatory Workshop, 4-5 September.
- UNEP. 2003. Report of the Regional Workshop on Identification of Pollution Hot Spots in the East Asian Seas Region. 284 p.
- UNEP. 2001. State of the Environment Vietnam 2001.
- WHO and UNICEF. 2004. "Meeting the Drinking Water and Sanitation Target: A Mid-term Assessment of Progress." Presented in Asia Water Watch 2015. Published jointly by ADB, UNDP, UNESCAP and WHO. 2006.
- World Bank. 2005. Philippines Environment Monitor 2005 – Coastal and Marine Resource Management.
- World Bank. 2005. Vietnam Environment Monitor 2005 – Biodiversity.
- World Bank. 2004. Philippines Environment Monitor 2004 – Assessing Progress.
- World Bank. 2003. Indonesia Environment Monitor 2003. [www.worldbank.or.id](http://www.worldbank.or.id)
- World Bank. 2003. Philippines Environment Monitor 2003 – Water Quality.
- World Bank. 2003. Vietnam Environment Monitor 2003 – Water.