

---

# *The Seas of East Asia*

---



## The Seas of East Asia

---

The Seas of East Asia are those bordered by China, Democratic People's Republic of Korea (DPRK), Republic of Korea (ROK), Japan, Philippines, Indonesia, Brunei Darussalam, Malaysia, Singapore, Thailand, Cambodia, and Vietnam.

The region encompasses a series of large marine ecosystems (LMEs), subregional seas, coastal areas, and their associated river basins that are linked by large-scale atmospheric, oceanic and biological processes/phenomena, e.g., typhoons, Kuroshio Current and highly migratory species.

The East China Sea, the Yellow Sea, the South China Sea, the Sulu-Celebes Sea, and the Indonesian Seas are five LMEs of great ecological and economic importance to the region.

These five LMEs are semi-enclosed and interconnected. They are strategic, globally significant, and geologically unique international water systems.

- The East China Sea has shallow coastal waters that provide spawning and nursery grounds for many pelagic fish.
- The Yellow Sea, a resource shared by DPRK, China, and ROK, has a geographically unique floor and complex biotic communities due to the complicated oceanographic conditions of the area. It includes Bohai Sea to the north and is connected to the East China Sea in the south, forming a continuous circulation system.
- The South China Sea, which lies within the Indo-West Pacific marine biogeographic province has long been recognized as the global center of marine shallow-water, tropical biodiversity. It is bordered by China to the north, the Philippines to the east, Malaysia, Singapore, Indonesia, and Brunei Darussalam to the south, and Thailand, Cambodia, and Vietnam to the west.
- The Sulu-Celebes Sea area is one of the world's most biologically diverse marine environments. It is surrounded by Malaysia, the Philippines, and Indonesia.
- In between the islands of Indonesia (and therefore entirely within its jurisdiction) is a tropical LME, the Indonesian Seas. Their importance stems partially from the fact that they support an extremely high biological diversity, including both demersal and pelagic fisheries, sharing highly migratory fish resources (e.g., tuna, mackerel, round scad) with adjacent countries (Australia, Philippines and Malaysia).

Major ocean currents which originate from the North and South Pacific travel to the eastern side of the Asian continent. They help generate upwelling zones which contribute to high productivity. These currents also bring about long-distance dispersal of larval recruits of coastal and marine organisms. These major currents may have also effected the luxuriant growth of corals in the Seas of East Asia owing to the warm water coming from the equator.

The state of the world's seas and oceans is deteriorating. Most of the problems identified decades ago have not been resolved, and many more are worsening. The traditional uses of the seas and coasts – and the benefits that humanity gets from them – have been widely undermined.

GESAMP 2001, A Sea of Troubles

The Seas of East Asia.



A simplified map that gives a general idea of the geographic and oceanographic features of the region.

Riverine systems within the region of the Seas of East Asia that are of considerable ecological significance are:

- The Mekong River, which has a globally unique lake-river system (the Mekong-Tonle Sap River-Great Lake System) and globally significant wetlands and flooded forests, supporting one of the most productive and diverse freshwater ecosystems in the world.
- The Yangtze River in China, Asia's longest river, which serves as a major trade and transportation route. It traverses densely populated and economically productive regions of China before emptying into the East China Sea.
- The Yellow River, China's second longest river, passes through the densely populated North China Plain before reaching the Bohai Sea. The plain, one of China's most important agricultural regions, suffers periodically from devastating flooding of the Yellow River.
- The Red River Basin, one of the largest watersheds in Southeast Asia, originates in Yunnan province, China, and flows through Vietnam to the South China Sea where it forms an extensive delta. The problems of frequent and severe flooding in both upper and lower areas of the river, and salinity intrusion during the dry season have an impact in the national economy since the Lower Red River Delta is the most densely populated area in Vietnam.

**East Asian Seas' major river basins.**

Major seas of East Asia	Related river basins	
	Area (km <sup>2</sup> )	Population
Bohai Sea	1,400,000	445,000,000
Yellow Sea	502,000	230,000,000
East China Sea	1,820,000	510,000,000
South China Sea	2,524,960	268,182,000
<b>Total</b>	<b>6,246,960</b>	<b>1,453,182,000</b>

The river basins that are associated with the Seas of East Asia cover a total area of about 6.25 million km<sup>2</sup> and accommodate about 1.5 billion people. The Seas of East Asia are the catchment area of the associated upstream river basins. Therefore the health of the Seas of East Asia is significantly impacted by these river basins and related human activities.

## The People of East Asia



The East Asian region has a total population of 1.9 billion, expected to reach 3 billion by 2015. About 77% (ranging from 24% in Cambodia and China to 100% in South Korea, Philippines, and Singapore) live within 100 km from the coast.

The region is highly urbanized, with rapid population growth. The populations of East Asia as a whole are fast transforming from rural to urban. In 1994, 34% of the populace was in urban areas; it is estimated that by 2025, this will have grown to 1.4 billion people or 54%, for an average growth per year of 2.5%. This will comprise a 29.43% share of the world increase in urban population.

Coastal settlements have developed into major cities now counted among the most populated in the world. It is

estimated that within the next 50 years more cities in the region will join the 6 coastal megacities now found in East Asia.

Because of the region's geography, a large proportion of the East Asian people are dependent on marine food production. One-fourth of the world's marine fish production is contributed by East Asia.

There are 10 million fisherfolk, and 50 million people are dependent on fisheries for a major portion of their livelihood. Twenty-eight percent of the animal protein intake of the East Asian people comes from fish.

Being the region worst affected by natural disasters, combined with high population densities and the large number of people living on floodplains and low-lying coastal areas, the vulnerability of the people of East Asia is high.



**Population and the coastal area.**

Country	Coastline (km)	Population (millions)	Coastal population (% within 100 km of the coast)	Average annual population growth (%)
Brunei Darussalam	161	0.30	99.9	2.4
Cambodia	435	12.49	23.8	2.2
China	32,000	1,287.75	24.0	0.9
DPR Korea	4,009	23.15	92.9	0.9
Indonesia	81,290	206.26	95.9	1.4
Japan	29,020	127.00	96.3	0.2
Malaysia	9,323	24.31	98.0	2.0
Philippines	18,000	79.94	100.0	2.1
RO Korea	11,542	46.14	100.0	0.8
Singapore	268	4.16	100.0	1.4
Thailand	2,600	62.31	38.7	0.9
Vietnam	3,260	80.53	82.8	1.6

## Economic Development in East Asia

---

The region as a whole has achieved unprecedented sustained growth and development in the past three decades despite the economic crisis of 1997-1999. Growth was accompanied by a dramatic decline in the incidence of absolute poverty, significant increases in per capita incomes, and notable improvements in key social indicators. GDP per capita has nearly tripled in several countries. However, aggregate success hides a great diversity of development experiences: the region includes economies at very different stages of development; among and within countries, not all have shared equally in the benefits of the region's growth.

All stages of national economic development are represented in East Asia. According to 1997 data of the 12 countries in the region, the World Bank has classified two countries as low-income economies, five countries as lower-middle-income economies, one country as an upper-middle income economy and four countries as high-income economies. Hong Kong and Taiwan are also classified as high-income areas.

The low and middle-income economies in the region are generally resource-dependent. The coastal and marine resources of this region account for not less than 40% of GDP, although the economies have begun to diversify.

A large portion of economic activities, with the exception of agriculture, are concentrated in the region's coastal cities.

The cities will be drivers of economic growth, with 80% of the incremental economic activity in the region taking place in large and small cities.

Thus, traditional resource-based activities such as coastal fisheries, aquaculture, forestry, and agriculture are found side-by-side with activities such as industry, shipping, and tourism. The potential for economic opportunities in coastal cities is a strong attractive force, fuelling immigration from often economically depressed rural areas. These future coastal residents will demand employment, housing, energy, food, water, and other goods and services, presenting a substantial development challenge for these areas.

A large majority of the people in the region suffer from poverty. In 1998, 65 million people in the countries of East Asia, excluding China, were earning less than US\$1 per day.



### Socioeconomic indicators of East Asian countries.

Country	GDP per capita PPP (current inter- national \$ <sup>a</sup> ) 2000	Average annual GDP growth rate (%), 1991-2000 (1995 US\$)	GDP by sector, 2000 (%)		Employment by sector, 1996-1998 (% of male/female labor force)		Unemployment, 1996-1998 (% of total labor force)	Population below international poverty line, 2000 (%)	Infant mortality rate, 1995-2000 (per 1,000 births)	Child malnutrition (% of children under 5)
			Agriculture	Industry	Services	Agriculture				
Brunei Darussalam	7,252	1.4	1.6	53.3	45.1	n.a.	n.a.	n.a.	7	n.a.
Cambodia	1,326	4.6	37	20	42	n.a.	n.a.	n.a.	103	47
China	3,936	10.1	16	51	33	n.a.	n.a.	18.8	41	9
DPR Korea <sup>c</sup>	478 <sup>d</sup>	n.a.	21.2	42.5	36.3	30.9 <sup>e</sup>	38.3 <sup>e</sup>	n.a.	21.4	n.a.
Indonesia	3,019	3.5	17	47	36	41/42	21/16	39/42	48	70
Japan	26,707	1.3	1	32	66	5/6	39/23	56/71	4	n.a.
Malaysia	9,497	6.6	11	45	44	21/15	34/28	46/57	11	20
Philippines	3,957	3.6	16	31	53	47/27	18/12	35/61	36	n.a.
RO Korea	17,579	5.5	5	43	53	11/14	34/19	55/67	10	n.a.
Singapore	23,356	7.7	0	34	66	0/0	34/23	66/77	5	n.a.
Thailand	6,190	3.5	10	40	49	52/50	19/16	29/34	38	n.a.
Vietnam	2,006	7.9	24	37	39	70/71	12/9	18/20	43	37

<sup>a</sup> According to Earth Trends, "An international dollar has the same purchasing power in a given country as a United States dollar in the United States. In other words, it buys an equivalent amount of goods or services in that country."

<sup>b</sup> 1997 data.

<sup>c</sup> All data for DPR Korea is dated 2001 except for employment by sector, which is dated 1999.

<sup>d</sup> GDP per capita in US dollars.

<sup>e</sup> Not gender-disaggregated.

n.a. - not available

# The Environment of the Seas of East Asia

The following characteristics define the environment of the Seas of East Asia:

- The seas have a total area of 7 million km<sup>2</sup>, with expanded watersheds.
- With a total coastline length of 234,000 km, majority of the countries have long coastlines and large coastal areas.
- The extensive coastal areas of the region are conducive to settlement and livelihood. There are hundreds of natural harbors that have become among the most important ports of the world.
- Two of the largest archipelagic states in the world, and thousands of other islands, are located in the region, making the special needs of island ecosystems important to the region.
- Severe weather systems (monsoons, typhoons) from the ocean affect most parts of the region.
- Most of the region is geologically active - it is part of the Pacific "ring of fire" - and suffers earthquakes and volcanic eruptions.



The region encompasses many ecosystems which are globally significant for their biodiversity. The Seas of East Asia support 30% of the world's coral reefs and one-third of the world's mangroves. These contribute to 40 million t of fish/year and produce close to 80% of the world's aquaculture products. At least 20 of the 50 species of the world's seagrasses are found in the region. Aside from these ecosystems, the region has a wide range of environmentally and economically significant wetlands, estuaries, lagoons, bays, and gulfs.

## Natural roles of ecosystems.

These ecosystems provide the following goods and services:

### Coral reefs

- nursery ground and shelter for fish and other associated organisms;
- natural products (pharmaceuticals);
- physical barrier, i.e., provide shoreline defense by absorbing wave energy; and
- livelihood through attracting ecotourism and fishery-related activities.

### Mangroves

- nursery and feeding grounds for commercially important species of fish, prawns, etc.;
- shelter and breeding grounds for inshore and migratory species;
- livelihood;
- shoreline defense against floods and beach erosion;
- pollutant "sink" by filtering certain types of waste that reach the sea; and
- carbon sink.

### Seagrass beds

- nursery ground, shelter and food for fish, invertebrates and dugong, turtles and seahorses;
- coast stabilization;
- fertilizer and fodder; and
- pollutant sink.

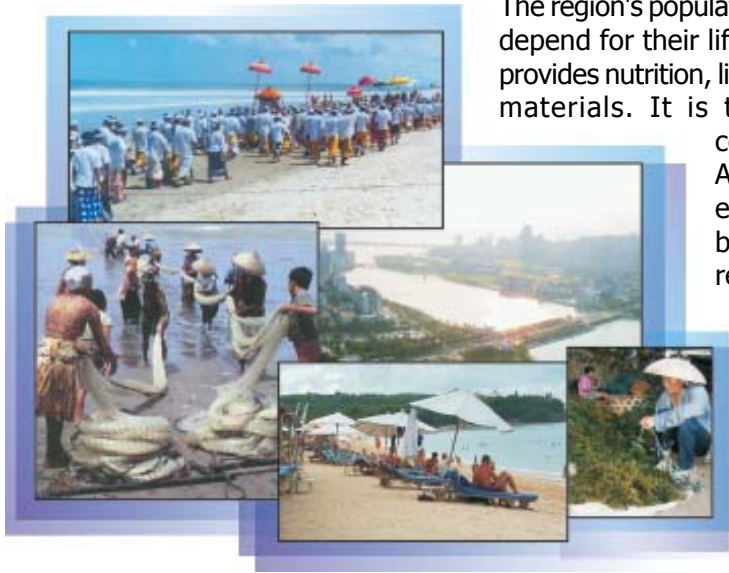
### Other wetlands

- crucial shelter, food, and nutrition for a wide range of sedentary and migratory species, including a great number of rare, vulnerable, threatened, and endangered species.

### Estuaries

- transition from land to sea, from salt to fresh water;
- dwelling and nursery grounds for birds, mammals, fish and other wildlife, and vegetation;
- natural buffer between land and ocean; and
- natural harbors and areas for ports and other infrastructure supporting transportation, industry, commerce, livelihood, and recreation.

# The Value of the Seas of East Asia



The region's populations, or at least a significant part of them, depend for their life on the seas. The marine environment provides nutrition, livelihood, minerals, medicine, and building materials. It is the medium for transportation and communication. Thus, the Seas of East Asia facilitate trade and commerce, and economic growth. Development areas are built around the seas. They provide recreation through sports, tourism, and aquarium products. They also bind the region's peoples together through beliefs, practices, and traditions relating in common to the seas, and through historical and modern trade and migration routes through the seas. Finally, they have special natural features, biological and physical, some found only in the region.

**The East Asian Seas are a common natural heritage because the values are shared by and important to all the littoral countries.**

## **Ecological**

- biodiversity
- habitats

## **Resources**

- living resources
- minerals
- water
- other resources

## **Aesthetic values**

## **Recreation**

## **Historical, political, educational, and cultural values**

- national unity and integration
- equity

## **Development and economic values**

- trade
- shipping and ports
- tourism
- energy
- fisheries and aquaculture
- coastal construction
- oil and gas
- pharmaceuticals