# The Importance of the Coastal Area

The coastal area is the interface between the land and the sea. Characterized by high biological productivity and biodiversity, coastal areas are home to at least 13 coastal systems and are governed by physical, chemical, and biological processes. The vast living and nonliving resources of the seas of East Asia provide needed primary resources for industrial development within and outside the region. They contribute to the development of maritime trade and livelihood to millions of coastal inhabitants.

The coastal areas of East Asia provide a continuous supply of goods — fish, oil, gas, minerals, salt, and construction materials — and services — shoreline protection, sustaining biodiversity, water quality maintenance, transportation, recreation, and tourism. If the estimated global value of goods and services sourced from different ecosystems averages $33 trillion a year, then a substantial part of this figure must belong to East Asia, considering that one-third of all the coral reefs and mangroves in the world and a great part of the seagrasses are found in the region. Coral reefs in Southeast Asia alone generate an estimated value of $112.5 billion a year. The value of the global center of marine biodiversity supported by the area is beyond valuation. If it is lost, it can never be replaced.

Coastal areas are also very accessible, making them centers of human activity, where people live, derive their recreation and their means of livelihood. People aggregate in a very narrow strip of land. The already dense population in that area is growing much faster than in inland areas. It is also the preferred site for urbanization.

More than half the world's population lives within 60 km of the shoreline, and this could rise to three quarters by the year 2020. Many of the world's poor are crowded in coastal areas. Coastal resources are vital for many local communities and indigenous people.

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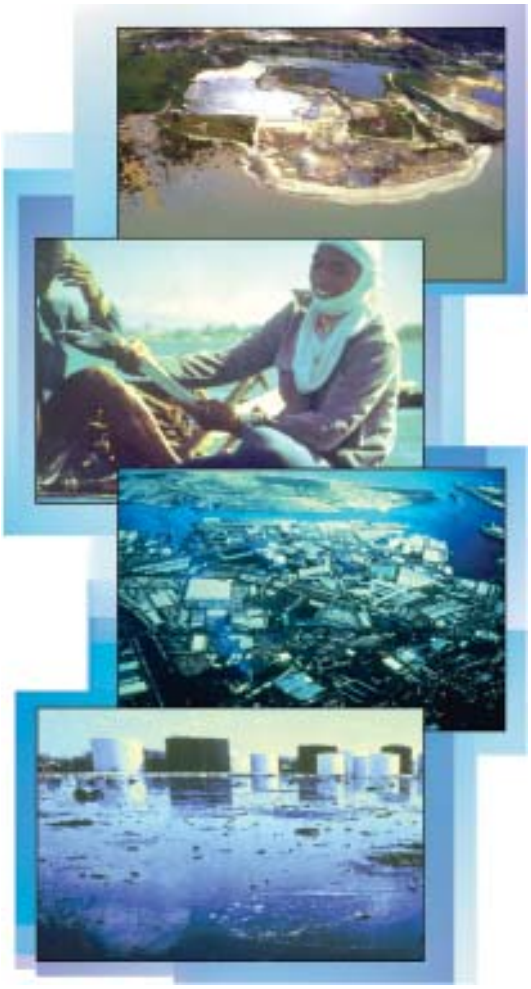
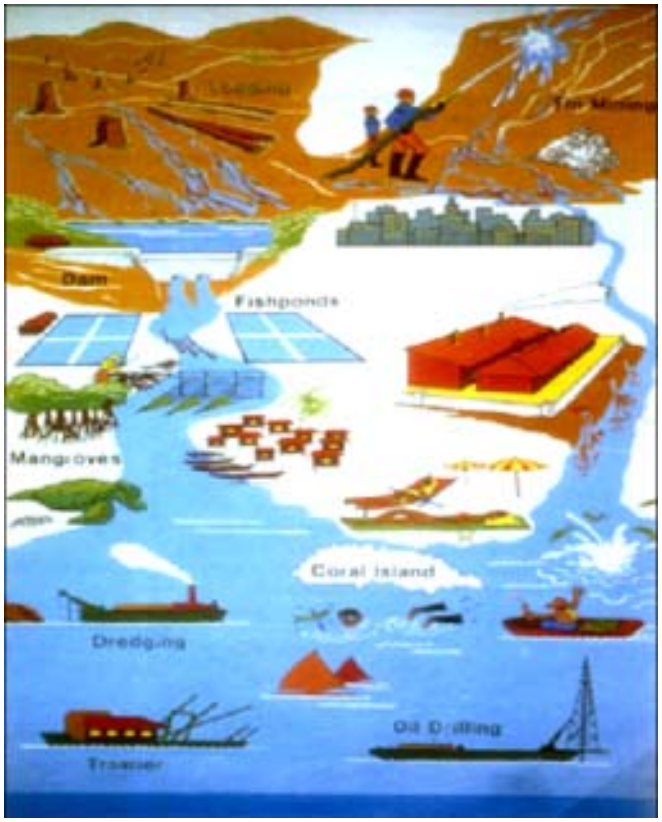
Degradation of the oceans continues on a global scale, despite progress made during the last three decades in some places and on some issues. This impedes development and diminishes human welfare. A fundamental solution to many of the sea's environmental problems lies in scientifically informed management that integrates the range of uses of the marine environment to ensure that their benefits are sustained. Such management regimes, when effectively implemented, have produced concrete benefits for society and the environment, but they have not been widely applied. This is largely due to a lack of informed constituencies, appropriate institutional structures, and political will.

GESAMP 2001, A Sea of Troubles






Providing the natural setting conducive to port, shipping, maritime trade, primary industries, and coastal tourism, the coasts of the region are major social and economic development zones, contributing some 40 to 60% of the GDP of the countries in the region. Much of the industrial developments in the region occur along the coast, especially refineries, petrochemical manufacturing, food processing, shipbuilding and repair, and other marine industries.

Because coastal areas are preferred sites for human settlements and urbanization, severe conflict results from multiple use and competition for the limited land and sea resources by various stakeholders. The existing property rights regimes operating in both sides of the coastal area complicate the conflicts: whereas the ocean side has a public character, a mixed public and private character operates in the land area.

## Adverse Impacts of Current Trends

If current trends in environmental degradation are not changed, the social fabric of many nations could dramatically deteriorate over the next 50 years.

- Food security will be undermined as populations of fish and other edible marine products crash due to unsustainable take, destructive practices, and habitat degradation.
- Economic dislocation will result for those whose jobs are related to the coastal and marine environment when the environment is no longer able to generate sustainable livelihoods.
- Public health will be compromised by toxins and hazardous compounds in edible marine products and by increased dangerous waste levels in coastal waters used by the public.
- Some coastal areas will be made uninhabitable due to rising sea levels and intensified severe weather systems from climate change. This will increase the vulnerability of the people, especially the poor, to climatic events.
- There will be increased loss of life and more pollution incidents as greater shipping congestion and other marine activities lead to more maritime accidents.
- Infrastructure will deteriorate as pressures of urbanization undermine ability to provide adequate infrastructure levels for population.
- Aesthetic and recreational values will be lost.
- Conflicts on the use of the resources and inaccessibility will intensify and lead to social strife.
- Pressure on the state will increase to cope with and compensate for the loss of values of the marine environment, e.g., health and social services, food adequacy, and public works.
- Economic development will not be able to compensate for irreversible damage in the Seas of East Asia.

### Trends in Environmental and Social Problems

- Southeast Asia's coastal ecosystems have been severely damaged. In the last 30 years, 11% of coral reefs collapsed while 48% are in critical condition. Recent findings show over 80% face risks. Mangroves, on the other hand, have lost 70% of their cover in the last 70 years while seagrass beds' loss ranged from 20-60%. Unless managed, the current rate of loss will result in the removal of all mangroves by 2030, while reefs face collapse within 20 years.
- Fish production in the region has fallen. Peak production was reached in 1988 in Northwest Pacific Ocean and in 1991 in West Central and Southwest Pacific Ocean. Data from these fishing regions show that change in catch from peak year to 1992 ranged from -2% to -10%. Problems in open access and overcapacity precipitated the decline. In 1995, East Asia contributed 78% to global capacity with its 980,000 decked fishery vessels.
- In 2000, 6 coastal megacities (with more than 10 million people) were located in East Asia; this is predicted to increase to 8 by 2015. With urbanization and the continued rural-to-urban migration, the populations of smaller coastal cities (3-8 million people) are also increasing.
- There are 35 pollution hotspots and 26 sensitive and high-risk areas identified in countries and subregions bordering South China Sea; a number are also found in the Koreas, Japan, and the rest of China.
- Trade in East Asia as a share of GDP increased from 15% in 1970 to over 50% in 1995, as exports grew 10% per year. Accompanying this increase is the proportionate growth in seaborne trade, especially containerized trade. In East Asia ports, total volume of containers increased by 270% from 1985 to 1995; with the ports estimated to handle around 47% of total world container throughput in 2000, which figure is expected to reach 50% by 2005.
- An "East Asian economic miracle" was sustained over three decades - changing the regions' patterns of production and consumption. Accompanying this economic growth was poverty reduction from 720 million to 350 million people. Recent economic projections, however, see a very volatile and unpredictable growth, posing a grave threat to the regions' millions of people still mired in poverty.

# Poverty and the Environment

## Causes of Environmental Problems

Rapid economic growth has been accompanied by deterioration in air and water quality, depletion of resources that are otherwise renewable, and loss of habitats and endemic species. High incidence of water-related, waterborne, and air-related diseases affect human productive capacity. Habitat and resource degradation and loss of biodiversity affect resource productive capacity and intrinsic resiliency, which in turn affect income, food adequacy and security, shoreline protection, natural defense against calamities, and future potential uses.

People contribute to environmental and resource damages, and consequently suffer from them. This shows that economic growth is short-lived if the environment and resources are not conserved due to the high costs of ecological and socioeconomic impacts. Moreover, certain sectors suffer disproportionately from the loss of the natural and economic values, particularly those relying on traditional resource-based activities, and those living in calamity-prone areas.

**Poverty is the state of inadequate consumption of food and deprivation of the essential assets and opportunities to which every human is entitled.**

- There is a large variation in the incidence of poverty across countries, ranging from a high 34.5% in Cambodia to a virtual elimination of poverty at $1 per day in the case of Hong Kong, Malaysia, Singapore, and South Korea.
- In year 2000, about 236 million persons in East Asia were deemed to live below the poverty line ($1 per day).
- Nearly half the population, about 857 million people, live on less than $2 per day. About 80% of the poor dwell in the countryside and mountains. Therefore, social vulnerability remains high.
- Studies have shown that more than 500,000 infants in the region die each year as a result of waterborne diseases linked to dirty water. About 60% of these deaths are a consequence of the deficit in rural water supplies while another 30% are due to lack of sanitation facilities in urban areas.

### Underlying Cause: Institutional Failures

The degradation of the environmental resource base is attributed mainly to institutional failures:

- failure of the market system (e.g., pollution, overextraction of resources, influential vested interests, inadequate property rights system);
- inappropriate and/or inconsistent application of government policies (e.g., inappropriate economic growth policies, weak regulatory and enforcement systems, concentration of growth in few urban centers);
- information failure, including information for decisionmaking;
- inadequate budgetary commitments and funding; and
- failure to develop skilled human resources through capacity-building.

The Asian Miracle refers to the unprecedented economic growth achieved in the region as a whole these past three decades, accompanied by remarkable increases in per capita incomes, significant decline in the incidence of absolute poverty, and notable improvement in key social indicators. The 1997-1999 financial crisis has shown the unsustainability of such growth due to a number of factors, including the inherent structural and institutional problems, labor and capital productivity problems, and low priority given to environmental and resource management. The interrelationships of the ecosystems and the ongoing production of goods and services that are extracted from the natural environment and of residuals that are being dumped back into the natural system have become obvious these past three decades, but links between improved environmental management and economic development are still not well-understood by policymakers both in the public and private sectors.

**Reverse Causality: Poverty**

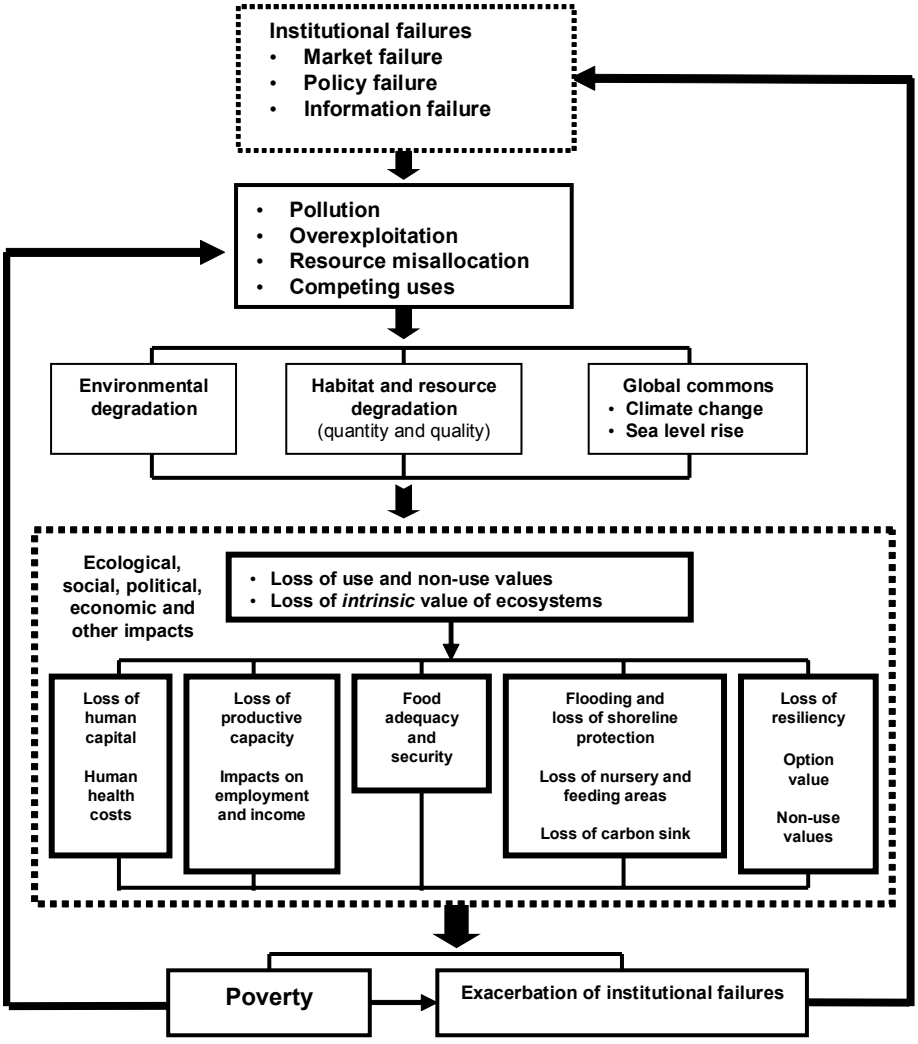
Although much of the damage has been caused by institutional failures, the pressures of poverty compound the threat. The poor turn to natural resources, which supplement income, especially in times of acute economic stress.

The rural poor are constrained in their access to land, credit, insurance and capital markets, and are often forced to live on fragile lands and waters.

Poverty contributes to increasing stresses to the ecological systems, which in turn exacerbate institutional failures and economic productivity. Examples:

- farming of hillsides and marginal areas by the landless, causing soil erosion and lower agricultural productivity; and
- use of illegal fishing methods to catch more fish, but causing damage to habitats, which further aggravates fish productivity.

**Poverty and the environment.**



**Population**

High population levels and growth rates exert pressures on the environment and resource base to provide adequate food supply, clean air and water, and a source of income. Rapid urbanization and unequal development in the rural areas fuel inmigration, add stress to existing physical and social infrastructures, and compound the environmental problems.

**Cumulative Causation**

The three causes of resource and environmental problems – institutional failures, high fertility rates and poverty – pull in different directions, but feed upon one another, and together create conflict between concerns about impacts of environmental and resource problems that sweep across local areas, countries, and regions, and matters that are specific to the needs and concerns of poor people.

There exists cumulative causation, thus poverty reduction strategies need to be accompanied by policies and actions that enhance the quality and productivity of the environment and natural resources and human capital.

# Transboundary Issues

Environmental issues are increasingly transboundary because: (1) resources occur in or move through many countries; (2) activities in the marine environment, such as shipping, fishing, and the movement of migratory and alien species, involve multiple countries, and (3) the ocean is a medium through which pollutants are relatively easily transmitted. The causes and/or impacts involve more than one country or jurisdiction and therefore the response needs to be multilateral or regional. As we move into the 21st century the impact of transboundary issues will become increasingly critical. Transboundary issues include, among others:

**Pollution**

- Projected growth in production will also generate increasing industrial and domestic wastes, the major sources of marine pollution in the region.
- The current level of sewage treatment in the region is low. For example, just over 10% of the organic component is removed by sewage treatment in countries bordering the South China Sea. Unless this is drastically improved, the sewage from increased populations in concentrated areas will accelerate eutrophication and threats to public health at transboundary levels.
- Nonpoint sources of pollution, or runoff from such diverse activities as agriculture, mining, timbering and land-clearing, and residential and commercial development are increasing in volume. Evidence indicates that land-based sources are polluting nearshore areas and bays and inlets and may also be affecting the main areas of LMEs.
- International trade is anticipated to triple in the next 20 years and between 80 and 90% of this is expected to move by shipping. About 300 oil spills with over 200 million gallons of oil were spilled in the region since the mid-1960s. Although these numbers were largely in decline during the decade, the projected increase of shipping traffic increases the likelihood of oil spills.

**Introduction of alien species**

- International shipping also transfers approximately 10 billion t of ballast water around the world annually. Although necessary for ship safety, ballast water can contain marine organisms that threaten ecosystems and public health. For example, in some countries red tide organisms have been introduced by ballast water and have contaminated shellfish. As ships get larger and faster, and as maritime trade increases, the problem will become more acute.

**Overexploitation**

- Most of the small pelagic species comprising the South China Sea capture fisheries, which could be shared or straddling stocks, are already fully exploited. There is also indication that the large pelagic stocks are in a state of full exploitation.
- The discard of by-catch, estimated at over one-fourth of total marine catch, contributes to inefficient and wasteful exploitation.

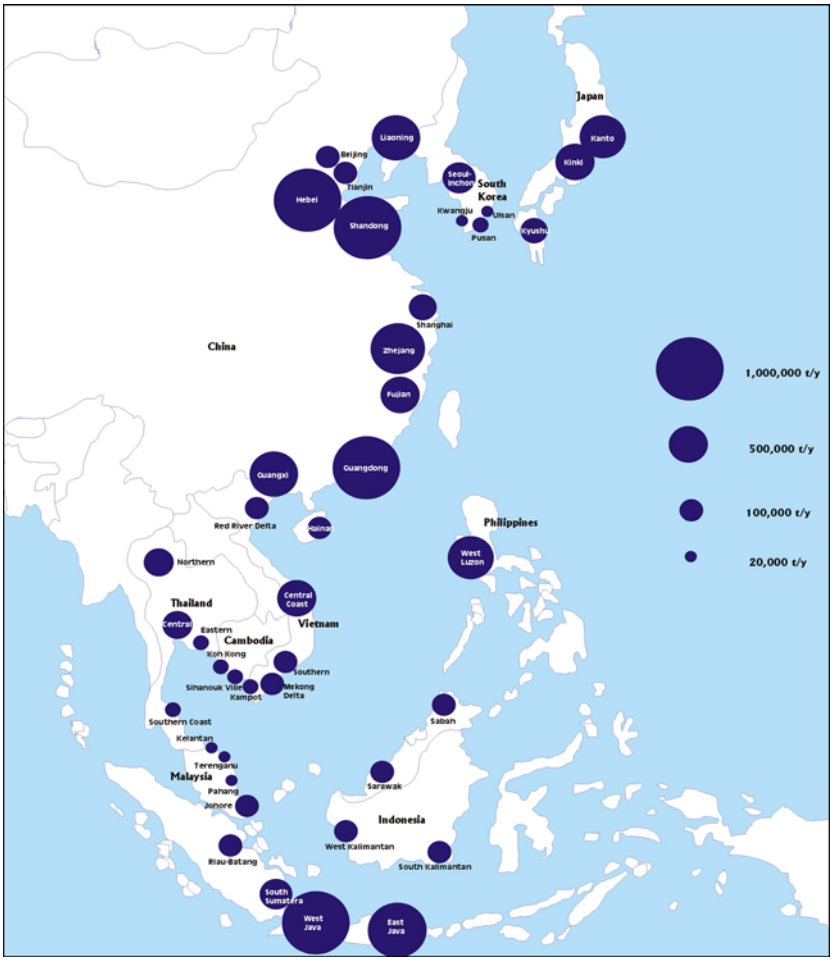
**Destructive fishing practices**

- Destructive fishing practices in one country can impact on the viability of migratory fish in another country. These practices include fishing with explosives, trawling with nets and chains, and using cyanide to stun fish so that they can be caught alive - a trade valued at $1 billion per year - and other practices which degrade fish habitats such as reefs and mangroves.

**Change in consumption and use patterns and international trade**

- The rising global demand for shrimp was largely met by exports from the region despite major adverse environmental impacts through the deforestation of mangroves, the introduction of alien shrimp species (and associated pathogens) and the threat to public health from chemicals associated with shrimp culture.
- Degradation of coastal habitats contributing to loss of biodiversity has transboundary impacts because of the strong interdependence of seagrass beds and coral reef ecosystems on one another. Furthermore, they contribute significantly to fisheries shared by proximate coastal countries.

## Land-based Sources of Marine Pollution



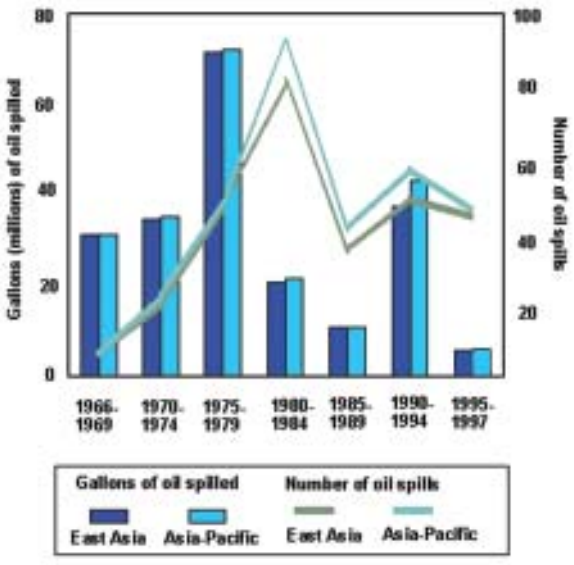

Estimated BOD from domestic sources in East Asia.

Land-based activities contribute to most of the pollution load in the Seas of East Asia including municipal, industrial and agricultural wastes, runoff and atmospheric deposition.

In 1999, Bohai Sea, Yellow Sea and East China Sea received 1.5 billion t of industrial wastewater discharges from 12 major coastal cities in China. About 25% of the Bohai Sea water body is considered seriously polluted. Most important pollutants offshore of China are inorganic nitrogen and phosphates. In 2001, some 77 red tide events covering a total of 15,000 $km^2$ were recorded where nutrient pollution was serious offshore of China.

In the South China Sea, land-based sources play a major role in both inland and coastal pollution. China, Indonesia, Malaysia, Philippines, Thailand, and Vietnam release a minimum of about 430,000 t of BOD per year into aquatic systems interacting with the South China Sea. Only 11% of BOD generated was removed by sewage treatment in 4 of these countries. About 10 million t of fertilizers are used annually in the coastal areas of Cambodia, China, Indonesia, Philippines, and Vietnam, contributing to nutrient loading in the South China Sea. In Indonesia, Thailand, Malaysia, and Philippines, land clearance takes place over a total of about 50,000 $km^2$ of forest for roundwood, contributing to soil erosion and increased suspended solids in the aquatic system. The coastal population of South China Sea in Cambodia, China, Indonesia, Malaysia, Philippines, Thailand, and Vietnam generates a total of over 66 million t of solid wastes per year. A significant portion of the solid wastes is composed of plastics, metals, and glass that are not readily biodegradable. Oil and other hydrocarbons from land-based sources also cause pollution in the South China Sea.

## Pattern of Oil Tanker Routes and Oil Spills in East Asia


Over 220 million gallons of oil were spilled in the Asia-Pacific region since 1965; about 96% of this (212 million gallons) occurred in East Asia.

The East Asian spills came from a number of sources, though 80% involved vessels.

Increased likelihood of oil spill may result from:

- increased tanker traffic and trade routes thus increasing risk of vessel spills; and
- greater oil production and storage and pipeline transport thus increasing risk of pipeline and facility spills.