



# Overview on Land-based Sources and Activities Affecting the Marine Environment in the East Asian Seas

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## Preface

The Global Programme of Action (GPA) for the Protection of the Marine Environment from Land-Based Activities was adopted by 108 governments and the European Commission on 3 November 1995 in Washington, USA. These governments also designated the United Nations Environment Programme (UNEP) as Secretariat of the GPA, with the task of promoting and facilitating its implementation at the national, regional and global level.

The GPA aims at preventing the degradation of the marine environment from land-based activities by facilitating the realisation of the duty of States to preserve and protect the marine environment. It is designed to assist States to take actions individually or jointly within their respective policies, priorities and resources, which lead to the prevention, reduction and control and/or elimination of the degradation of the marine environment, as well as to its recovery from the impacts of land-based activities. Achievement of the GPA will contribute to maintaining and, where appropriate, restoring the productive capacity and biodiversity of the marine environment, ensuring the protection of human health, as well as promoting the conservation and sustainable use of aquatic living resources.

In the Washington Declaration, governments expressed their commitment to protect and preserve the marine environment from the impacts of land-based activities by, among others, "cooperating on a regional basis to coordinate efforts for maximum efficiency and to facilitate action at the national level, including, where necessary, becoming parties to and strengthening regional cooperative arrangements and creating new arrangements when necessary".

To facilitate implementation of the GPA, UNEP, as Secretariat, organised in cooperation with relevant regional organisations, a series of regional technical workshops as a means of strengthening national capabilities for protection of the aquatic environment from land-based activities, and to promote regional and sub-regional cooperation.

For the East Asian Seas Region, UNEP convened a Workshop on Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities in Cairns, Australia (30 April-3 May 1996). This workshop, hosted by Australia, was the third of a series of similarly planned regional workshops that UNEP organised between 1996 - 1997 in the framework of the Regional Seas Programme.

This report comprises recommendations of the Cairns workshop, country reports with respect to the implementation of the GPA at national level prepared by member states of the Coordinating Body on the Seas of East Asia (COBSEA). Existing relevant information, published articles, reports, books, and consultations with regional and national authorities/ experts were used by Hugh Kirkman of the EAS/RCU in Bangkok, as a first draft for the consideration of the governments of member states of COBSEA. This report incorporates and addresses comments provided by member states.

This report contains gaps, in which additional information is required for a complete analysis of land-based sources of pollution in the region, in particular the linkages between land-based activities and their impacts on marine and coastal areas. Nevertheless, the report is a significant contribution that will facilitate the GPA and the achievement of all its goals at the regional and national levels.



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# 1. Introduction

The East Asian Sea is bordered by some of the most populous nations in the world and has been undergoing, over the last four decades, rapid industrialisation and economic and social development. The eight Southeast Asian countries around the South China Sea are the People's Republic of China to the north, the Republic of the Philippines to the east; Malaysia, the Republic of Singapore, the Republic of Indonesia; the Kingdom of Thailand, the Kingdom of Cambodia and the Socialist Republic of Viet Nam to the west. In addition, the study covers South Korea to the north and northern coastal Australia in the south. At the core of the area under study are the Southeast Asian regional waters. Within these waters, the South China Sea is strategically positioned and has always been central to issues of economic and political stability in Southeast Asia and adjacent regions. The heavy reliance on marine resources for these countries demand continued vigilance on ensuring environmental sustainability for the littoral States and for the welfare of future generations.

The Action Plan for the Protection and Sustainable Development of the Coastal and Marine Areas of the East Asian Seas Region, covers the coastal and marine areas of Australia, Cambodia, China, Indonesia, Malaysia, Philippines, Republic of Korea, Singapore, Thailand and Viet Nam. The region has shown an unprecedented rapid industrial development and population growth over the last decade, with little regard for the environment. Over-exploitation of resources in major areas of the region has rendered the marine and coastal ecosystems to be heavily impacted that they have lost a large part of their productive capacity.

It is generally stated that our scientific knowledge of pollution of the marine environment is poorly understood. In fact, the magnitude and main causes of degradation are well known, although specific areas of pollution activity and effects may not be well researched nor documented. Managerial, technological and technical solutions to reduce or eliminate

pollution are also well known. Problems relate more to poor management, inadequate monitoring and lack of information and resources, poor communication between scientists and managers, a sectoral approach to terrestrial and marine management, lack of co-operation between the public and private sectors, ignorance of the costs and economic and social practicalities of implementing solutions, and the lack of will on the part of policy makers in the most countries within the region.

Land-based sources account for 77 per cent of marine pollution with marine transport and dumping at sea constituting the remainder (Chamber of Shipping, n.d).<sup>1</sup> Most land-based sources are small point sources that pass without attracting public attention or area simply accepted as the normal state of affairs. Land-based sources of marine pollution, as an issue, rarely captures the public imagination. It is the classic example of a 'wicked problem'; one that is interconnected between problem and issue; complicated with social, organisational, administrative, economic and legal dimensions; exists in a dynamic and uncertain environment; is the result of several competing claims and interests, and contains social constraints that require social, political and organisational solutions, not just technological ones.

Exploitation of the watersheds and forest cover and unsustainable agriculture and use of pesticides and fertilisers caused most of the rivers to be heavily silted and polluted. A combination of factors including population growth, saturation of cultivable land for agriculture, migration of population into marginal and vulnerable upland areas, and the high demand for timber for both domestic and foreign markets has resulted in massive loss of forest cover in many part of the Southeast Asian region. There have also been many State-supported programmes to settle people in sparsely populated areas leading to an acceleration of resource use and degradation in many cases. Examples of these are the resettlement of people from the densely populated Red River Delta area to the

<sup>1</sup> See Chia (1995) for a study on ship-source pollution in the Southeast Asian sub-region.



upland provinces in Viet Nam.<sup>2</sup> Such encroachment into forested upland areas invariably involves land clearance and deforestation often in an uncontrolled manner that leads to soil erosion and silting of river channels. Coastal development, including land reclamation, dredging and conversion of coastal land for industrial and housing estates, aquaculture and agriculture activities, tourist resorts and sand mining, are major problems. These activities result in severe coastal erosion and loss of clean beaches, clear water, and increased nutrient and pollution loads that pollute coastal and marine habitats such as mangroves, coral reefs, seagrass beds and other benthic communities.

Within the East Asian Sea countries under review, there are marine ecosystems that range from Arctic to sub-tropical to Equatorial types. These marine waters are some of the most productive in the world and are heavily exploited for fishing and other resources. A significant percentage of the world's fisheries production comes from the waters of this region and provides protein for a large percentage of the population. The East Asian region supports an unparalleled diversity of marine fauna and flora. It contains one-fourth of the world's most productive mangrove forests (World Resources Index, 1996) and nearly one-third of the world's coral reefs (Smith, 1978).

More than 70 per cent of the population in the countries in the region lives in coastal areas, and depend in some way on marine and coastal resources for its main source of food, employment and income. Activities within the coastal and marine areas include manufacturing industries, coastal and marine tourism and recreation, fisheries, aquaculture, harvesting of medicinal and industrial products, and marine and riverine transportation. These activities may be large-scale commercial operations or small-scale land and traditional actions involving local communities. For a region that depends so heavily on marine and

coastal resources, it is of the utmost urgency for the countries in the region to undertake sustainable development of these resources through the prevention of pollution and degradation of the coastal and marine ecosystems.

## 2. Aim of the Study

This overview report as well as the country case studies have the following objectives:

- Present a broad view of the region's marine environment and the major resources contained in it,
- present a comprehensive overview on land-based sources and activities that pollute the seas,
- present the status of activities dealing with the protection of the marine, coastal and associated freshwater environments,
- review relevant information provided by the individual countries of the region,
- identify and assess the problems and establish priorities,
- set management objectives for these priority problems,
- identify, evaluate and select strategies and measures for management,
- establish criteria for evaluating the effectiveness of these strategies, and
- determine the elements required to support the management strategies.

## 3. Scope of the Study

The terms of reference specified ten countries to be covered and they are: Australia, Cambodia, China, Indonesia, Malaysia, Philippines, Singapore, South Korea, Thailand and Viet Nam (Figure 1). For the purposes of this report, the East Asian Seas is divided into three sub-regions: Southeast Asia, northern East Asia, and Australia. While the report covers these countries in their entirety, some areas are

<sup>2</sup> Bernard and De Koninck (1996) reported intensive deforestation in the Central Highlands of Viet Nam resulting from massive commercial logging and agricultural expansion. In 1970, forest cover in Southeast Asia was two-thirds of total area. By 1990, the proportion had fallen to below 50 per cent.



treated in more detail because of the available details in the TDA report which covers the South China Sea. Due to the large size of the country, in the case of China, only the southern provinces of Guangdong, Guangxi, and Hainan with the addition of the Special Administrative regions of Hong Kong and Macau are included. Also, only the Tropical areas of northern Australia is considered.

Figure 2 shows only Southeast Asia plus the southern provinces of China. The areas shaded indicate the portion of the countries that come under the TDA study. Together with Korea, these two regions represent the only Northern East Asian seas sub-region in this overview. In the case of Australia, the area of consideration is the tropical portion from Exmouth Gulf in Western Australia (Lat. 22° S Long. 114° E) to Cairns (Lat. 16° S Long. 146° E) in north Queensland.

Much attention has been directed at ship-source pollution because of the dramatic nature of oil spills arising from shipping incidents and the severity of the aftermath of the spills in relatively small affected areas. The present excludes marine pollution of oil derived from activities that occur in the sea and only deals with oil and a wide range of other pollutants that enter the marine environment derived from land-based sources. These are derived from various land-based sources from a wide variety of anthropogenic activities including those derived from inland locations that result in inputs that are carried by water courses to the sea. Often the level of pollution is exacerbated by natural causes such as flooding and forest fires. This report covers the pollution of the sea and coastal areas but also related freshwater

pation of seven national bodies, namely, Cambodia, China, Indonesia, Malaysia, Philippines, Thailand and Viet Nam. Each national committee prepared a country report intended to provide a country-based analysis of water-related problems and concerns. The reports were completed in the second half of 1998. The present terms of reference (TOR) include three other East Asian Seas countries/regions, namely Australia, Singapore, and South Korea. The study here is based only on secondary sources of information and does not involve any field visits.

The task of the present overview is to draw out only land-based sources of pollution. Inevitably, the coverage and degree of detail of the national TDA reports vary considerably in terms of their quality and completeness. In any case, for the three additional sub-regions — northern Australia, Singapore and South Korea — where national reports were not undertaken, it was necessary to develop the components covering these three sub-regions, based on the preliminary work done by the UNEP Regional Office for Asia Pacific in Bangkok, and the rest from whatever information that could be gathered quickly from other sources.

The present report draws information from a number of earlier reports undertaken by the EAS/RCU and on reports prepared by the member countries. These include an early draft of the state of the marine environment undertaken by Kirkman (unpublished and a set of reports from a project on *Transboundary Diagnostic Analysis of the South China Sea* (Talaue-McManus, 1999), referred to as the TDA report in this study. The TDA report was extensively revised by Kirkman and this study draws from the

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