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**Environmental pollution around the South China Sea:
developing a regional response to a regional problem**

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Environmental pollution around the South China Sea: Developing a regional response to a regional problem

Introduction

What are the countries around the South China Sea doing about their growing problems of regional environmental pollution? This paper provides one case study of how the member-nations of ASEAN – the Association of Southeast Asian Nations – are attempting to deal with a major cause of transboundary air pollution, smoke haze from forest fires. Air pollution primarily consists of carbon dioxide, sulphur dioxide, other greenhouse gas emissions, and combustion particulates from proliferating smokestacks, forest fires, and motor vehicles in the newly-industrializing countries around the South China Sea.

Smoke haze from Indonesian forest fires is not the only form of regional air pollution; in the long run, industrial emissions from southern China may be more of a problem. However, the relatively sudden, unexpected, and costly smoke pollution of 1997 precipitated a response from ASEAN which may set a precedent for dealing with other regional resource management issues.

This study focuses on the South China Sea because it is an integral ecosystem and a vital international shipping lane. It is also an arena for competing security interests. Countries bordering the South China Sea have been more concerned with maximizing economic growth and ensuring adequate energy supplies than in preserving their common natural resources. They have staked territorial claims to areas with potential oil and natural gas reserves; however, these claims are overlapping and conflicting. While a territorial settlement is unlikely in the short term, other avenues of regional cooperation have emerged, in particular, the ASEAN effort to curb smoke haze. This study will examine the phenomenon of smoke haze, its short-term and long-term causes and consequences, and the institutional responses to it.

The South China Sea is defined by the International Hydrographic Bureau as the semi-enclosed body of water stretching in a Southwest to Northeast direction, whose southern border is 3 degrees South latitude between South Sumatra and Kalimantan (Karimata Straits), and whose northern border is the Strait of Taiwan from the northern tip of Taiwan to the Fukien coast of China. It lies in the heart of the monsoon Asia and is subject to the phenomenon of seasonally reversing winds carrying a lot of moisture, blowing southwest in winter and northeast in summer. The littoral countries have similar coastal ecosystems and access to common deep sea resources; for example, coastal cultivation of oysters and shrimp, and deep sea fishing for tuna and other migratory species in the South China Sea.

The South China Sea is one of the world's busiest international sea lanes. More than half of the world's supertanker traffic passes through the region's waters. Over half of the world's merchant fleet (by tonnage) sails through the South China Sea every year. Tanker traffic through the Strait of Malacca at the southwestern end of the South China Sea is more than three times greater than Suez Canal traffic, and well over five times more than the Panama Canal. The large volume of shipping in the South China Sea/Strait of Malacca littoral has created opportunities for attacks on merchant shipping. In 1995, almost half of the world's reported cases of piracy occurred in this area (USEIA, 1998).

The staking of territorial claims in disputed areas of the South China Sea - thought to be rich in oil and natural gas - has also made this region an arena for competing security interests. Over the next 20 years, oil consumption among developing Asian countries is expected to rise by 4% annually on average, with about half of this increase coming from China. If this growth rate is maintained, oil demand for these nations will reach 25 million barrels per day - more than double current consumption levels -- by 2020 (Noer, 1996). Almost all of this additional Asian oil demand, as well as Japan's oil needs, will need to be imported from the Middle East and Africa. Most all of it will pass through the strategic Strait of Malacca into the South China Sea. Supertankers going to Japan will pass through the wider Lombok Strait east of Bali. This adds to the importance of the South China Sea region which contains oil and gas resources strategically located near large energy-consuming countries.

The problem of environmental pollution around the South China Sea is generally due to population growth and urbanization in coastal cities, economic growth and increased material consumption, and highly polluting technologies for energy production and primary resource extraction. Over most of the past two decades, industrial output and energy consumption has grown faster in the countries around the South China Sea than anywhere else in the world, driven by the region's rapid economic growth and increasing population. Given the region's growing dependence on imported oil and the increasing trade and transport of raw materials, fossil fuels, and commodities across the region's shipping lanes, the South China Sea has become an inter-state highway in the world economy. For the same reasons, it may also become a sink for regional environmental pollution from the industrial effluents of the littoral countries as well as the spills and dumpings of transit vessels.

Until the 1997 currency crisis, rapid economic growth in many Southeast Asian nations had led to rising incomes and increased consumption by an expanding urban middle class. Average annual growth in real GDP in ASEAN countries over the past two decades averaged between 5% and 10%, substantially higher than in major industrial nations (see *Table 1. Growth in Real Gross Domestic Product in Selected Countries*). Energy consumption in most Southeast Asian nations increased even faster (See *Table 2. Energy Production and Use in Selected Countries*). This rapid economic growth, along with increasing industrial production, rapid urbanization, and a substantial increase in transportation vehicles, directly affect local environmental conditions such as air pollution, access to safe drinking water, and waste disposal, especially in high population density areas. It also has a major impact on the common regional environment of the South China Sea. The increasing trade and transport of raw materials, fossil fuels, and commodities across the region's shipping lanes also contributed to the pollution of the South China Sea through oil spills and ocean dumping.

The rapid devaluation of several Asian currencies in 1997 may slow economic growth and energy demand in the region; however, this is likely to be a temporary pause. According to one recent study, "Asian energy consumption will rise again sharply in two or three years. The reason is that...the conditions for high growth - discipline, flexibility, high savings, rapid absorption of technology, an embrace of international markets, and strong entrepreneurial networks - are still in place (Yergin, Eklof, & Edwards, 1998)." Despite the economic slowdown in several countries in the region, population growth and urbanization continues to expand coastal cities and energy production remains a high priority on national agendas throughout the region.

Symptoms

Dense clouds of smoke haze were widely evident in satellite photo-images of the South China Sea during the last half of 1997. Most of this air pollution came from forest fires in Sumatra, Kalimantan and East Malaysia. Additional large quantities of carbon and sulphur emissions came from smokestacks of coal-fired power stations, aluminum smelters, and cement and steel factories in southern China. Motor vehicles also generate additional particulate and aerosol pollution, especially in highly urbanized areas along the coastline of the South China Sea.

There are many environmental problems in Southeast Asia, including land degradation, water shortages, plummeting air quality standards, hazardous additives, and untreated waste disposal. Each one has multiple causes and inter-related consequences. However, no topic evokes more outrage nor prompts more resentment than the decrease of Southeast Asia's tropical hardwood forests.

Although forests once covered large tracts of the region, today only Burma, Malaysia and Indonesia count as major timber and timber product exporters; the latter two account for over 80 percent of the world trade in tropical hardwood. The rapidity with which this forest cover has been disappearing troubles many: upland forest watersheds remained abundant until thirty years ago in Thailand, the Philippines and most of peninsular Malaysia. Within a generation's lifetime, a deepening cycle of lowered water tables, flooding, topsoil loss and ruination of irrigation and hydro-electric works has resulted from this deforestation. Comparisons of forested area in 1980, 1990, and 1995 show the rate and extent of primary forest loss throughout the region (See *Table 3. Forest Cover and Change in Southeast Asian Countries, 1980-1995*). In 1990, a flash flood swooping down from the highlands of the Philippine island of Leyte killed more people in one evening than all the victims of a 22-year communist insurgency (Clad & Siy). During the summer of 1998, flood waters on the Yangtze River reached record levels, causing widespread damage and dislocation. Deforestation was widely cited as a major cause of the flooding. The Guangdong State Council issued an emergency order calling for an immediate halt to all illegal forestry and a one year moratorium on all conversion of forest land to other purposes. A \$2 billion five-year reforestation program was initiated to reduce soil loss on the upper reaches of the Yangtze and Yellow River and so reduce silting at the Three Gorges and Xiaolangdi dams as well as flood risk. In addition, the state timber company work force will be cut by one million workers and a wood production will be reduced by 10 million cubic meters (US Embassy-Beijing).

Deforestation is also a major contributor to both regional transboundary air pollution and greenhouse gas emissions. Perhaps the most dramatic and destructive case of this was the forest fires and smoke clouds of 1997. The *1998 State of the World Report* (Brown, 1998) noted that:

A plume of smoke larger than the continental United States has spread across Southeast Asia, turning the skies dark and leaving at least 20 million people choking on air that has become a toxic soup, killing hundreds outright. The areas affected include Brunei, Indonesia, Malaysia, Papua New Guinea, the Philippines, Singapore, Thailand, and Vietnam. The massive forest and peat fires swept Borneo and Sumatra in the fall of 1997 and sent life threatening pollution to cities more than 1000 kilometer away.

Causes

Forest fires are not normal in tropical rainforests. Why, then, did they have such a devastating effect? What caused the fires? The immediate cause is clear: the fires were started by pulp, palm oil, and rubber plantation owners to clear natural forest in Indonesia, and then they spread to at least 2 million hectares of forest and underground peat deposits. Tens of millions of people were sickened, hundreds died, and schools, transportation, and businesses were shut down. Enormous amounts of carbon dioxide - perhaps as much as emitted in the United Kingdom in one year - were added to the atmosphere (Abramovitz, 1998).

Some observers attributed the devastating fires to the drought caused by the onset of El Niño. However, human activities clearly played the major role. Over the last twenty years, forests have been opened up by roads and logging, and have become drier and more vulnerable to fire. Large plantation companies and farmer settlers have come from the more densely populated provinces of Indonesia and are provided homesteads in the relatively sparsely populated areas of Sumatra and Kalimantan. They have joined the traditional shifting cultivators who have lived in the area for a long time, clearing small sites for planting crops until the soil's nutrients have been depleted and then moving to other sites. All these groups use fire as the most economical way of preparing forestland for cultivation. For the villagers and residents of the small towns nearby, the burning and smoke are seasonal features of life. The drought means, first of all, a worse inconvenience than usual and, second, the opportunity for faster land clearing, since tropical forests are ordinarily difficult to set alight.

Nicholas Kristof (1997) notes the difficulty of grappling with transborder pollution: "Malaysia and Singapore were particularly hard-hit, and their relatively well-educated populations were more aware of the dangers of breathing the smoke. But they were in effect the hostages of Indonesians who saw the problems as an inconvenience rather than a health crisis." Inasmuch as Djakarta itself was not extremely affected by the smoke haze, many people in the national capital didn't believe in the severity of the problem.

Long-term consequences

In addition to the short-term problems of smoke haze, tropical timber harvesting also has long-term consequences for the environment. The loss of biodiversity through deforestation has attracted considerable interest, especially from Western environmental groups (Clemencon, 1997). In addition, greenhouse gas emissions and the loss of carbon sinks caused by forest fires, along with industrial emissions, contribute to global climate change (See *Table 4. Carbon Dioxide Emissions in Selected Countries*).

The Inter-governmental panel on Climate Change (IPCC) in 1995 confirmed a "discernible human influence on global climate," and estimated that a doubling of CO₂ concentrations - likely to occur in the next century if emissions stay on the current path - will increase global temperature by 1 to 3.5 degrees Celsius (Flavin & Dunn, 1998)." The consequences would be devastating - flooded cities, diminished food production, and increased storm damage. All the countries bordering on the South China Sea would be especially vulnerable.

How would climate change affect Southeast Asia? According to the United Nations Environmental Program's Information Unit on Climate Change (UNEP/IUCC, 1993), the most serious threat to livelihoods in Southeast Asia would come from coastal inundation caused by rising sea levels. Scientists believe that higher atmospheric temperatures would cause a sea-level rise of around 20 cm by the year 2030 and 65 cm by the end of next century. Sandy coastlines backed by densely populated, low-lying plains make the Southeast Asian region particularly vulnerable to inundation. As much as 20,000 km² of land in Malaysia, Thailand, and Indonesia could be threatened with flooding, including some of the most economically productive land in these countries; the city of Bangkok and its surrounding industrial belt is all within one meter of sea level. Meanwhile, as the ocean rose, the "natural" inland retreat of mangrove swamps - critical breeding grounds for fish and prawns - would be obstructed by towns and farms. Coastal farmland would also be lost, and the disappearance of beaches would undermine tourism, an important source of earnings in the area.

Energy, environment, and security links

In a recent Adelphi Paper, Alan Dupont (1998) makes a persuasive argument that environmental problems are unlikely to be the primary cause of a major conflict between states in the Pacific Asia region. However, they may prolong or complicate existing disputes. This can be seen in the links between energy demand, environmental pollution, and security interests around the South China Sea.

As China and the countries of Southeast Asia expand their economies and consume more fossil fuel resources, they also produce more pollution. Many of these countries are now making important decisions about technology and infrastructure with critical implications for long-term environmental change. Many of them face competitive market pressures to produce at the lowest, short-term cost possible. In as much as governments compete with each other for investment in an increasingly integrated world economy, they are reluctant to impose costly regulations to maintain environmental standards which might discourage investment and output. From the individual national, short-term view, pollution control programs may hinder economic performance and increase consumer prices. Nations that do impose charges on polluters are thought to give business enterprises an incentive to relocate in countries with more lenient standards. As a result, many environmental pollution problems are often overshadowed by concerns over economic growth.

Given the long-term trends in population, economic growth and energy use, countries around the South China, there is growing concern in these countries for ensuring adequate energy supplies for rapid industrialization. Despite the current economic downturn, there have been steady shipments of oil imports from the Middle East across the South China Sea. And despite the current low energy prices, there has been increased attention to oil exploration and development in the South China Sea.

How much oil is there in the South China Sea? Conflicting assessments have been made of the potential of the South China Sea as an unexplored source of oil and natural gas. According to a 1995 study by Russia's Research Institute of Geology of Foreign Countries, the equivalent of 6 billion barrels of oil might be located in the Spratly Islands area, of which 70 percent would be natural gas. On the other hand, Chinese media outlets have referred to the South China Sea as 'the second Persian Gulf,' and some Chinese specialists have asserted that the South China Sea could contain as much as 150 billion barrels of oil and natural gas (USIP, 1995). (See *Table 5. Oil and Gas in the South China Sea Region*, and *Table 6. Oil and Gas in the South China Sea – Comparison with Other Regions*)

Despite these optimistic assessments, the cost of drilling in deep-water areas of the South China Sea and assessments of the geochemistry of the Spratly Islands area suggest that, for the time being, the costs of exploration and low likelihood of substantial and easily exploitable yields will remain limiting factors. In any event, the area remains subject to numerous territorial disputes. Not many oil companies are likely to risk the cost of exploration to determine whether the potential yields in the area are commercially viable. Even in the undisputed coastal areas, it might take twenty years or more to exploit reserves, given the low oil prices of the late 1990's.

A "looming energy crisis," caused by increasing competition for energy resources, is producing growing insecurity in the Asia-Pacific region, according to Kent Calder (1996). He asserts that petroleum, coal, and natural gas continue to be in insufficient supply in Asia, which provides only 11 percent of global oil production and 4.5 percent of reserves (Fesharaki et al, 1995). It is not clear whether his estimates include the energy resources of the Russian Far East. Japan, with half the region's economic output, remains 95 percent dependent on oil imports. The growing Chinese economy's hunger for energy has made that country a net oil importer since 1993 despite its status as the top supplier of energy in Asia (with Indonesia). An East-West Center study estimates that Asia's share of oil imports from the Middle East will rise from 70 percent in 1993 to 95 percent in 2010 (Feshi, 1995).

Not only does regional economic growth create greater dependence upon Middle East oil-producing nations, but, most importantly, it raises the issue of reliability of access to shipping lanes from the Middle East to Asia. The approaches to the Strait of Malacca (for smaller tankers) and to the Lombok and Makassar Straits in Indonesia (for larger tankers) are surrounded by Southeast Asian nations (Malaysia, Indonesia, and Singapore) which control those straits and surrounding waters with increasing naval capability. And China's strengthening naval presence and territorial claims to waters of the South China Seas, may reflect its own desire to secure shipping lanes for its energy supply and trading routes. This may heighten tension in the waters of Southeast Asia (May et al, 1996).

The links between energy demand, environmental pollution, and regional security were suggested in a statement by Chinese Energy Minister and former National People's Congress Environmental Protection and Resources Conservation Committee Vice Chairman Yang Jike, who wrote in his introduction to the 1997 edition of the China Energy Development Report [Zhongguo Nengyuan Fazhan Baogao] that China should concentrate on the development of its coal resources. Although this would increase particulate pollution in the PRC and Northeast Asia and would also increase greenhouse gas emissions, the PRC would not have to increase its Middle East oil imports (which might get the PRC embroiled in the Middle East like the United States). Concentrating on energy from coal, Yang writes, would enable China to forego oil drilling in the South China Sea and in Xinjiang so as to avoid offending China's Southeast Asian neighbors and its Uighur minority in Xinjiang (ES Embassy-Beijing, 1997). Recently, however, Chinese leaders have decided to import much more oil from the Middle East, and have planned to invest considerable sums to facilitate this trade (Thomas, 1998).

Who owns the South China Sea? Who has rights of navigation through its waters? Who is responsible for its environment? International law is ambiguous on these questions. To the north, the Pratas Island and the submerged Macclesfield Bank are claimed by Taiwan and China. China and Taiwan have tacitly tolerated each other's identical claim to practically the entire South China Sea because both base their claim on the same historic grounds. All the Paracel Islands are claimed by Vietnam, Taiwan and China, on historic grounds, although these have been occupied exclusively by China since 1974. China and Vietnam disagree over their maritime boundary in the Gulf of Tonkin.

Further south, the Spratly Islands are spread astride strategic sea lanes and are claimed by China, Taiwan, Vietnam, the Philippines, Malaysia, and Brunei. Of the six, all but Brunei have sought to strengthen their claims by establishing a military presence on at least one of the Spratlys. Although their claims to exclusive economic zones overlap, all six allege that their claims are fully supported under international law and under the 1982 United Nations Convention on the Law of the Sea which entered into force in 1994. Finally, the claims of China, Taiwan and Vietnam, overlap portions of Indonesia's claim in the Natuna area (Hull, 1996). These claims are summarized in *Table 7. Territorial Claims in the Spratly and Paracel Islands.*

The United States Institute of Peace (USIP, 1995) reports that:

The question of who owns the 400-plus rocks, reefs, and islands (known as the Spratly Islands) that are scattered within an 800,000-square-kilometer area within the South China Sea was largely ignored until the 1970s.... During the 1980s and 1990s, most of the disputing states have found themselves in a race to bolster their claims to sovereignty by gaining occupation of the islands that can support a physical presence or by establishing markers on the islands where physical occupation is not feasible. In some cases claimants have even built structures on features that are completely submerged at high tide, maintaining a physical presence on these island specks under arduous and mind-numbing physical conditions. Currently, Vietnam occupies more than twenty islets or rocks, China occupies eight, Taiwan one, the Philippines eight, and Malaysia three to six.

Ironically, the United Nations Law of the Sea Convention - which intended to resolve maritime disputes - may have exacerbated them, at least in the short-term. The 1982 convention created a number of guidelines concerning the status of islands, the continental shelf, enclosed seas, and territorial limits. Three of the most relevant to the South China Sea are:

Article 3, which establishes that "every state has the right to establish the breadth of its territorial sea up to a limit not exceeding 12 nautical miles";

Articles 55 – 75, which define the concept of an Exclusive Economic Zone (EEZ), an area up to 200 nautical miles beyond and adjacent to the territorial sea. The EEZ gives coastal states "sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to" (above) "the seabed and of the seabed and its subsoil..."

Article 121, which states that rocks that cannot sustain human habitation or economic life of their own shall have no exclusive economic zone or continental shelf.

The establishment of the EEZ created the potential for overlapping claims in semi-enclosed seas such as the South China Sea. These claims could potentially be extended by any nation which could build a settlement on the islands in the region and attempt to establish a clear title. South China Sea claimants have clashed as they tried to establish outposts on the islands (mostly military) in order to be in conformity with Article 121 in pressing their claims.

The US Institute of Peace report details a few cases of military intimidation in recent years, in addition to China's use of military force against Vietnamese troops to enforce its claim to the Paracels in 1974. One confrontation occurred between the Chinese and Vietnamese over the occupation of Fiery Cross Reef (Yung Shu Jiao) in 1988, at which time the PRC sank three Vietnamese vessels, killing seventy-two people.

Another incident began with the discovery that the Chinese had occupied Mischief Reef, a circular reef within 200 miles of the Philippine island of Palawan, and within the area claimed by the Philippine government as its Exclusive Economic Zone (EEZ). This involved encounters between military vessels from the Philippines and the PRC in March and April 1995. It was the aptly named Mischief Reef confrontation that has catalyzed the most recent wave of interest and concern over the Spratly Islands issue (Sherry, 1998). These and other recent conflicts are summarized in *Table 8. Disputes over Drilling and Exploration in the South China Sea,* and *Table 9. Recent Military Clashes in the South China Sea.*

These disputes and conflicts have led some observers to argue that China has been too willing to resort to force and therefore poses a growing threat to regional security. A recent comprehensive and

detailed study by Greg Austin, however, contends that China seeks to resolve its ocean frontier disputes peacefully (Austin, 1998). Hence, it seems paradoxical, Allen Whiting notes (1995), that before 1997 when defense budgets of the United States, Europe, and Russia were shrinking, all governments in East Asia, except for Vietnam, were increasing their military expenditures. "No active conflict exists in East Asia, nor is one seen as imminent by observers inside or outside the area. No territorial dispute seriously threatens stability in the immediate future. No major military expansion abroad is foreseen on the part of any country. Economic competition, not armed confrontation, characterizes all bilateral relationships except that of North and South Korea. Yet the upgrading of military capability is virtually universal in the arc from Japan to Thailand."

The belief that the South China Sea contains large deposits of resources has exacerbated the problem of territorial disputes (Snyder, 1997). While the claimants have agreed, in principle, to renounce the use of force to resolve the dispute, there is almost no agreement as to how a resolution should be developed. One common suggestion to prevent conflict is the creation of a Joint Development Agreement (JDA). This would involve the claimants agreeing to put aside questions of sovereignty and cooperate in joint resource development in the disputed area. The problem with this approach, however, is there is still little agreement among the claimants as to how this cooperation would work. Given the ambiguous, incomplete, and often contradictory claims to the islands of the South China Sea, a political settlement – not a legal solution – may be the only realistic means of resolving these complex issues.

Inasmuch as a territorial settlement is unlikely in the short term, other avenues of regional cooperation have emerged. Since 1990 a series of workshops on "Managing Potential Conflicts in the South China Sea" have been held under the auspices of the Indonesian government's Research and Development Agency within the Department of Foreign Affairs (UBC, 1998). These non-governmental gatherings, attended by government and military officials in their private capacities as well as by academics from ASEAN countries as well as China, Taiwan, and Canada, have been convened to explore ways to promote cooperation among the nations bordering on the South China Sea. The group has been helpful in coordinating scientific marine research and environmental protection. This, in turn, has provided an authoritative basis for intergovernmental policy within ASEAN.

Responses

ASEAN has had several general discussions about regional environment and security issues for several years. ASEAN Ministers met and passed several resolutions: the 1990 Kuala Lumpur Accord on Environment and Development; the 1992 Singapore Resolution on Environment; the 1994 Bandar Seri Begawan Resolution on Environment and Development, and the 1995 ASEAN Cooperation Plan on Transboundary Pollution.

The 1995 ASEAN agreement was a "landmark" plan to combat air and marine pollution and control hazardous wastes specifically related to the South China Sea. The plan, approved by environment ministers from Malaysia, Indonesia, Brunei, and Singapore as well as representatives from the Philippines and Thailand, marked ASEAN's first "positive step" on regional environmental issues. Malaysia began the drive for the plan after 1994's forest fires in Indonesia, which blanketed much of the region in heavy smog for weeks. Malaysia also proposed extending the agreement to ocean pollution and hazardous wastes after a substantial increase in ships dumping sludge and other materials into the Straits of Malacca.

The accord outlined measures for preventing and controlling forest fires, including an early warning system. Indonesian Environment Minister Sarwono Kusumaatmadja said some parts of the plan had already been instituted: "We have targeted companies which manage large plantations and estates to raise awareness in preventing the use of fire for land clearing." However, according to one recent study (Dauvergne, 1999), there have been few concrete changes in Indonesia's logging practices since the 1995 accord. The underlying and direct causes of tropical timber mismanagement - including the practices of domestic and multinational commercial loggers, corporate traders, and state forest management agencies - may be too diverse, complicated, and contentious for any one country to solve.

Although ASEAN has had a Haze Technical Task Force since 1995, it has also had a policy of noninterference often stymied its efforts. ASEAN serves as a useful forum for promoting economic growth, political stability, and social and cultural exchange in the region; however, it is sometimes subject to a "lowest-common-denominator" syndrome, whereby policies are watered down to satisfy the wishes of members with conflicting interests. "ASEAN operates by consensus. Known as 'the ASEAN Way,' this practice places a priority on consultation and dialogue and the avoidance of public confrontation," observes Kevin Quigley (1997). "All ASEAN policies must be agreed to unanimously by its members.... Important differences are often papered over or postponed. For example, it took nearly 25 years to reach an agreement on intentions for a free trade arrangement."

In 1997 and 1998, however, a few notable exceptions to the ASEAN principles of non-interference and non-confrontation did occur. Thailand's devaluation of the baht, Cambodia's coup d'état, Burma's military repression, and Malaysia PM Mahathir's sacking of Anwar Ibrahim have all generated outspoken and critical comments on government policy from political leaders in neighboring countries (Chanda & Islam, 1998). At the 1998 meeting of ASEAN Foreign Ministers, Thai Foreign Minister Surin Pitsuwan called for a change in ASEAN's cardinal principle of non-intervention. He proposed that members be allowed to openly discuss each other's domestic affairs if these have an impact outside their borders. His proposal, labelled "flexible engagement," received the support of Philippine Foreign Minister Domingo Siazon, but was strongly opposed by the rest of ASEAN officials. Nevertheless, calls for more open debate on controversial domestic policies on human rights and democracy in ASEAN member-states continue to reverberate (Asiaweek, 1998). Amitav Acharya (1998) contends that the economic crisis, along with democratization in Thailand and the Philippines, "will gradually, if not suddenly, undermine ASEAN's norms concerning non-interference."

The ASEAN principle of non-interference does not apply as clearly to the case of regional smoke haze. It may be more appropriately seen as a regional issue in the same category as transportation linkages, energy grids, growth triangles, or regional problems such as piracy, smuggling, or drug trafficking. There is broad agreement that the problem originates in Indonesia and thus it is Indonesia's major responsibility – not ASEAN's – to resolve. Criticism of Indonesian government policy ineffectiveness was especially pointed. Malaysia's opposition leader, Lim Kit Siang, moved an emergency motion calling for a parliamentary debate on Indonesia's failure to put out the fires. Thailand's Nation daily newspaper blamed the Jakarta government for subsidizing logging companies to clear forests with fire. Singapore's Environment Minister, Yeo Cheow Tong, challenged the Indonesian government to control the fires. Finally, Indonesian President Suharto issued two unprecedented apologies to neighboring states for the smoke haze.

The chief significance of the 1997-98 smoke haze crisis is that it may force ASEAN to take a significant step toward institutionalizing a regional environmental policy. There has long been a growing recognition among ASEAN member states that industrial pollution may threaten the resource base of progress and poses a physical danger to those exposed to pollution. The 1995 accords recognized the specific problems of environmental pollution around the South China Sea, but provided no clear mechanisms for dealing with the problem.

Many ASEAN countries are already under increasing pressure from international agencies, the scientific community, and popular environmental movements at home and abroad to pursue sustainable development policies. ASEAN countries have signed and ratified international agreements on numerous environmental problems, especially those with multiple causes and long-term diffuse consequences such as the Framework Convention on Climate Change. This agreement imposes no significant costs of adjustment on ASEAN countries; to the contrary, ratification of the agreement may qualify them for environmental assistance.

An important precedent for a trade-off on environment and development took place in the negotiations dealing with the limitation of chloroflourocarbon (CFC) emissions and protection of the atmosphere's ozone layer. Developed countries agreed to reduce their CFC production drastically, but less-developed countries were allowed to increase their production slightly if it would help their economic development. A fund for technology transfer to less-developed countries was also set up.

Will this precedent based on global environmental issues be followed on regional environmental issues around the South China Sea? In the international area, ASEAN countries have frequently defended their right to use their natural resources to further economic development, as did the industrialized countries before them (Montes, 1997). In 1989 ASEAN acted as a group to overturn proposals to sharply reduce the export of tropical wood to Europe, even as the Philippines and Thailand had already slipped from being exporters to net importers of wood. The implicit position of the resource-endowed countries in the region has been to accept the trade-off between natural resource preservation and economic development. Most Southeast Asian economies have tended to take a "frontier" view of their natural resources. In recent years, however, in Malaysia, the Philippines, and Thailand, local environmental groups have become active in resisting this view and defending natural assets directly connected to the livelihood of local communities.

Environmental agencies in all the ASEAN governments have a high place in the governmental organizational structure. There has also been considerable modernization in environmental standards and regulations in the last ten years, partly supported by activities from the ASEAN secretariat. However, greater attention to the environment is costly to the region's governments in two ways. First, the cost of monitoring and enforcement in remote forest areas and over long coastlines and waterways is prohibitive, not to mention the cost of cleanup when environmental disaster occurs. Second, the political cost can be high; well-connected business people exploit the environment, as in the case of forest burning for plantation clearing, not to mention the political and economic expedience of letting

poor communities fend for themselves by using local natural resources. In each of the ASEAN countries, the emergence of more active environmental policies waits for external pressures, as in the case of criticisms from abroad about tropical timber exports and internal pressures from local groups. Hence, policy regulation and implementation suffer from weak political support.

In the past, ASEAN has usually promoted regional cooperation through bilateral relations, which over time have developed into an overlapping and interlocking network. All of the ASEAN countries, Acharya observes (1992), share the problem of limited resources and capabilities. "As a result several ASEAN states continue to seek separate bilateral arrangements with great powers rather than look to regional cooperation as a means of providing for their security."

It took a sudden and drastic environmental crisis – the 1997 forest fires of Indonesia – to begin ASEAN movement toward a "framework convention" on regional air pollution. ASEAN environment ministers met in December 1997 to devise a Regional Haze Action Plan (RHAP) with three priority objectives: prevention of forest fires through better management policies and enforcement; establishing operational mechanisms for monitoring; and strengthening regional land and forest fire-fighting capability, as well as other mitigation measures, including a regional review of land-use policies and legislation.

They met again in early 1998 to operationalize the Action Plan by coordinating fire-fighting efforts, agreeing that Malaysia would concentrate on fire prevention, Singapore on satellite monitoring, and Indonesia on fire-fighting. Data from the ASEAN Specialised Meteorological Centre (ASMC) in Singapore is now accessible to all ASEAN countries. The link strengthens the region's early-warning system for land and forest fires. Information available includes satellite imagery, wind charts, visibility and air quality information and other meteorological and environmental information for haze monitoring. To improve the region's fire-fighting capacity, an ASEAN Research and Training Centre for Land and Forest Fire Management will be established at the University of Palangkaraya in Central Kalimantan. The Centre will fill the gap which currently exists for fire-fighters armed with the necessary knowledge and skills to snuff out forest, brush and land fires.

The Asian Development Bank (ADB) is supporting the plan with a one million dollar grant to Indonesia for an advisory technical assistance program (ADTA) and another one million dollar grant to ASEAN for a regional technical assistance program (RETA) for strengthening ASEAN's capacity in preventing and mitigating transboundary atmospheric pollution resulting from the forest fires.

The collective effort has the endorsement of Rodolfo C. Severino, Secretary-General of ASEAN, Juwono Sudarsono, Indonesian State Minister of the Environment, and – in addition to the ADB – numerous other international donor agencies.

ASEAN ministers and senior officials charged with tackling the haze problem have met every month or so since November 1997 to make decisions and to review the impact of actions to combat the forest fires and to prevent their spread in the region. Brunei Darussalam, Indonesia, Malaysia and Singapore have taken turns to host these regular meetings. It appears that a genuine regional effort is emerging to deal with a problem that transcends national boundaries. As a result of its implementation, tackling and controlling the fires and the resulting haze is no longer an individual undertaking of the affected countries, but a coordinated and concerted response by the ASEAN member countries.

Conclusions

Over most of the past two decades, industrial output and energy consumption has grown faster in the countries around the South China Sea than anywhere else in the world. The industrial revolution now underway will be only temporarily interrupted by the current Asian economic crisis. As a result of this economic growth, increasing urbanization, fossil fuel consumption, and regional shipping, the South China Sea has become a sink for regional environmental pollution.

Until very recently, regional environmental pollution problems were often overshadowed by economic growth priorities. Countries bordering the South China Sea have been more concerned with maximizing economic growth and ensuring adequate energy supplies than in preserving their common natural resources.

The staking of territorial claims in areas with potential oil and natural gas reserves has made the South China Sea an arena for competing security interests. There is almost no agreement as to how to resolve these conflicting claims. The rival claimants have agreed in principle, however, to renounce the use of force to resolve the disputes.

While little progress has been made on resolving conflicting territorial claims, discussions have proceeded among the nations bordering on the South China Sea on ways to promote cooperation on scientific research and environmental protection. Preliminary proposals within ASEAN were catalyzed in 1997 by the sudden and drastic forest fires of Indonesia toward a "framework convention" on regional air pollution, the Regional Haze Action Plan.

Is the development of the Regional Haze Action Plan a unique case or will it be a precedent for other areas of regional environmental collaboration? Each nation around the South China Sea may find it in its short-term interest to exploit natural resources and provide adequate energy supplies. However, the combined effect of the pursuit of national self-interest and the lack of any constraints on access may lead to overexploitation of a common resource and environmental degradation. This is especially relevant to smoke haze and greenhouse gas emissions which travel easily across borders. This makes it difficult for any national government to control all the pollution in its jurisdiction, even if it were so inclined. National political leaders have had to enter the regional or international arena to find remedies for environmental problems that cannot be met within the political framework of the nation-state.

As capital mobility, spillover pollution, and resource competition have increased over time, there has also been growing pressure for strengthening regional environmental standards and compliance. However, in the absence of any strong regional or international agreement, there is considerable pressure for some countries to be free riders, to avoid the collective cost of pollution control.

It appears that a genuine regional effort may be emerging to deal with a problem that transcends national boundaries. On this issue, there is an evolving regional response with the key ingredients of a framework convention for an international environmental regime (Porter & Brown, 1996). The ASEAN Regional Haze Action Plan provides:

1. a forum to raise issues, define the problem, and set criteria and standards for a solution,
2. a way to formulate prevention and remedial policies,
3. a mechanism to set targets and timetables for implementing solutions, and
4. an ability to ensure compliance by annual reviews and financial incentives.

As a result of this Regional Haze Action Plan, tackling and controlling forest fires and the resulting haze is no longer an individual undertaking of the affected countries, but a coordinated and concerted response by the ASEAN member countries.

In the wake of the Asian currency crises and political instability in several Southeast Asian countries, it is not clear whether this initiative will continue to receive strong leadership. If it does, then this experience – formulating a collective response to a regional environmental problem – could become an important precedent. It has become considerably easier for parties inside and outside ASEAN to raise common environmental and resource-use problems.

**Table 1. Growth in Real Gross Domestic Product in Selected Countries
(average annual percentage change)**

	Population 1996 (millions)	Gross Domestic Product (\$millions)	1980-90	1990-96	1996	1997	1998 (estimate)	1999 (estimate)
ASEAN								
Cambodia	10	3,125	-	6.5	-	-	-	-
Indonesia	197	225,828	6.1	7.7	7.6	4.6	-13.4	-2.0
Laos	5	1,857	3.7	6.7				
Malaysia	21	99,213	5.2	8.7	8.2	7.8	-1.7	0.5
Myanmar	46	-	0.6	6.8	-	-	-	-
Philippines	72	83,840	1.0	2.9	5.7	5.1	1.9	3.5
Singapore	3	94,063	6.6	8.7	6.6	7.8	1.2	2.0
Thailand	60	185,048	7.6	8.3	6.7	-0.3	-6.4	-0.2
Vietnam	75	23,340	4.6	8.5	9.6	8.5	7.5	7.5
Other APEC								
China	1,215	815,412	10.2	12.3	9.7	8.8	7.3	7.6
Hong Kong SAR	6	154,767	6.9	5.5	4.6	5.3	-1.3	1.0
Japan	126	4,599,700	4.0	1.4	2.5	0.9	-0.5	0.9
South Korea	46	484,777	9.4	7.3	6.9	5.5	-3.8	1.4
Taiwan	21.9	362,000			5.6	6.8	5.3	5.7
United States	265	7,341,900	2.9	2.4	2.5	3.8	2.9	2.2

Sources: 1998 World Development Indicators, Washington, DC.: World Bank, 1998 (1980-1996 data), Asiaweek, "What's Ahead for Asian Economies," July 17, 1998 (1996-1999 data) and "Bottom Line" (other Taiwan data)

Table 2. Energy Production and Use in Selected Countries

	Commercial energy production		Commercial energy use		Energy use	Energy use p/c	Net energy imports	
	thousand metric tons of oil equivalent		thousand metric tons of oil equivalent		Average annual % growth	Average annual % growth	% of commercial energy use	
	1980	1995	1980	1995	1980-95	1980-95	1980	1995
ASEAN								
Cambodia	13	22	393	517	2.1	-1.0	97	96
Indonesia	94,717	169,325	25,904	85,785	8.9	7.0	-266	-97
Laos	236	220	107	184	0.1	0.1	-121	-20
Malaysia	15,049	62,385	9,522	33,252	9.8	7.0	-58	-88
Myanmar	1,940	2,167	1,858	2,234	0.2	-1.7	-4	3
Philippines	2,789	6,006	13,357	21,542	3.6	0.9	79	72
Singapore	0	0	6,049	21,389	10.0	8.1	100	100
Thailand	535	19,430	12,093	52,125	11.1	9.4	96	63
Vietnam	2,728	13,808	4,024	7,694	4.1	1.8	32	-79
Other APEC								
China	428,693	866,556	413,176	850,521	5.1	3.7	-4	-2
Hong Kong SAR	0	0	5,628	13,615	6.2	5.0	100	100
Japan	43,247	99,468	346,567	497,231	2.8	2.3	88	80
South Korea	9,644	20,570	41,426	145,099	9.6	8.4	77	86
United States	1,546,307	1,655,644	1,801,406	2,078,265	1.3	0.3	14	20

Source: 1998 World Development Indicators, Washington, DC.: World Bank

Table 3. Forest Cover and Change in Southeast Asian Countries, 1980-1995
(Area in 000 hectares)

	Total Forest					Natural Forest				Plantations	
	Area, 000 hectares			Ave. Annual % change		Area, 000 hectares		Ave. Annual % change		Area, 000 hectares	Ave. Annual % change
	1980	1990	1995	80-90	90-95	1990	1995	80-90	90-95	1990	80-90
Cambodia	13,484	10,649	9,830	-2.4	-1.6	10,642	9,823	-2.4	-1.6	7	0
Indonesia	124,476	115,213	109,791	-0.8	-1.0	109,088	103,666	-1.1	-1.0	6,125	8
Laos	14,470	13,177	12,435	-0.9	-1.2	13,173	12,431	-0.9	-1.2	4	4
Malaysia	21,564	17,472	15,471	-2.1	-2.4	17,391	15,371	-2.1	-2.5	81	15
Myanmar	32,901	29,088	27,151	-1.2	-1.4	28,853	26,875	-1.3	-1.4	235	18
Philippines	11,194	8,078	6,766	-3.3	-3.5	7,875	6,563	-3.3	-3.6	203	0
Singapore	4	4	4	0	0	4	4	0.7	-1.4	0	0
Thailand	18,123	13,277	11,630	-3.1	-2.6	12,748	11,101	-3.4	-2.8	529	8
Vietnam	10,663	9,793	9,117	-9	-1.4	8,323	7,647	-1.5	-1.7	1470	4

Source: World Resources, 1998-99 (World Resources Institute), based on data from the Food and Agriculture Organization and the International Tropical Timber Organization

Table 4. Carbon Dioxide Emissions in Selected Countries

	Total million metric tons		Per capita metric tons	
	1980	1995	1980	1995
ASEAN				
Cambodia	0.3	0.5
Indonesia	94.6	296.1	0.6	1.5
Laos	0.2	0.3	0.1	0.1
Malaysia	28.0	106.6	2.0	5.3
Myanmar (Burma)	4.8	7.0	0.1	0.2
Philippines	36.5	61.2	0.8	0.9
Singapore	30.1	63.7	13.2	21.3
Thailand	40.1	175.0	0.9	2.9
Vietnam	16.8	31.7	0.3	0.4
Other APEC				
China	1,476.8	3,192.5	1.5	2.7
Hong Kong SAR	16.4	31.0	3.3	5.0
Japan	907.4	1,126.8	7.8	9.0
South Korea	125.2	373.6	3.3	8.3
United States	4,515.3	5,468.6	19.9	20.8

Source: 1998 World Development Indicators, Washington, DC.: World Bank

Table 5. Oil and Gas in the South China Sea Region

	Proven Oil Reserves (Billion Barrels)	Proven Gas Reserves (Trillion Cubic Feet)	Oil Production (Barrels/Day)	Gas Production (Billion Cubic Feet)
Brunei	1.35	14.1	145,000	340
Cambodia	0	0	0	0
China*	1 (est.)	3.5	290,000	141
Indonesia*	0.2	29.7	46,000	0
Malaysia	3.9	79.8	645,000	1,300
Philippines	0.2	2.7	<1,000	0
Singapore	0	0	0	0
Taiwan	<0.01	2.7	<1,000	30
Thailand	0.3	7.0	59,000	482
Vietnam	0.6	6.0	180,000	30
TOTAL	7.5 (est.)	145.5	1,367,000	2323

**Only the regions near the South China Sea are included*

Proved reserves as of 1/1/98; 1997 production (except Indonesia, where data is as of 1996). There are no proved reserves for the Spratly and Paracel Islands

Source: "South China Sea Region," United States Energy Information Administration, Country Analysis Briefs, August 1998

Table 6. Oil and Gas in the South China Sea - Comparison with other Regions

	Proven Oil Reserves (Billion Barrels)	Proven Gas Reserves (Trillion Cubic Feet)	Oil Production (Barrels/Day)	Gas Production (Billion Cubic Feet)
Caspian Sea Region	15.4-29.0	236- 337	1,000,000	2846
Gulf of Mexico (U.S.)	2.7	29.4	1,014,000	5100
North Sea Region	16.8	156.6	6,200,000	7981
Persian Gulf	674.5	1718	19,226,000	5887
South China Sea	7.5	145.5	1,367,000	2323
West Africa/Gulf of Guinea *	21.5	126.3	3,137,000	200 (est.)

**Region stretching from Côte d'Ivoire (Ivory Coast) to Angola*

Proved reserves as of 1/1/98; 1997 production (Gulf of Mexico reserves 1/1/97; production 1996)

Source: "South China Sea Region," United States Energy Information Administration, Country Analysis Briefs, August 1998

Table 7. Territorial claims in the Spratly and Paracel Islands

Country	Claim
Brunei	Does not claim any of the islands, but claims part of the South China Seas nearest to it as part of its continental shelf and Exclusive Economic Zone (EEZ). In 1984, Brunei declared an EEZ that includes Louisa Reef.
China	<p>Refers to the Spratly Islands as the Nansha islands, and claims all of the islands and most of the South China Sea for historical reasons. These claims are not marked by coordinates or otherwise clearly defined.</p> <p>Chinese claims are based on a number of historical events, including the naval expeditions to the Spratly Islands by the Han Dynasty in 110 AD and the Ming Dynasty from 1403-1433 AD. Chinese fishermen and merchants have worked the region over time, and China is using archaeological evidence to bolster its claims of sovereignty.</p> <p>In the 19th and early 20th century, China asserted claims to the Paracel islands. During World War II, the islands were claimed by the Japanese. In 1947, China produced a map with 9 undefined dotted lines, and claimed all of the islands within those lines. A 1992 Chinese law restated its claims in the region.</p> <p>China has occupied some of those islands. In 1976, China enforced its claim upon the Paracel Islands by seizing them from Vietnam. China refers to the Paracel Islands as the Xisha Islands, and includes them as part of its Hainan Island province.</p>
Indonesia	Not a claimant to any of the Spratly Islands. However, Chinese and Taiwanese maritime zone claims in the South China Sea extend into Indonesia's EEZ and continental shelf, including Indonesia's Natuna gas field.
Malaysia	Claims are based upon the continental shelf principle, and have clearly defined coordinates. Malaysia has occupied three islands that it considers to be within its continental shelf. Malaysia has tried to build up one atoll by bringing soil from the mainland and has built a hotel.
Philippines	Its Spratly claims have clearly defined coordinates, based both upon proximity as well as on the explorations of a Philippine explorer in 1956. In 1971, the Philippines officially claimed 8 islands that it refers to as the Kalayaan, partly on the basis of this exploration, arguing that the islands: 1) were not part of the Spratly Islands; and 2) had not belonged to anybody and were open to being claimed. In 1972, they were designated as part of Palawan Province.
Taiwan	Taiwan's claims are similar to those of China, and are based upon the same principles. As with China, Taiwan's claims are also not clearly defined.
Vietnam	<p>Vietnamese claims are based on history and the continental shelf principle. Vietnam claims the entire Spratly Islands as an offshore district of the province of Khanh Hoa. Vietnamese claims also cover an extensive area of the South China Sea, although they are not clearly defined. The Vietnamese have followed the Chinese example of using archaeological evidence to bolster sovereignty claims. In the 1930's, France claimed the Spratly and Paracel Islands on behalf of its then-colony Vietnam.</p> <p>Vietnam has occupied a number of the Spratly Islands. In addition, Vietnam claims the Paracel Islands, although they were seized by the Chinese in 1974.</p>

Source: "South China Sea Region," United States Energy Information Administration, Country Analysis Briefs, August 1998 and Greg Austin, China's Ocean Frontier: International Law, Military Force, and National Development, Allen & Unwin, 1998

Table 8. Disputes over Drilling and Exploration in the South China Sea

Date	Countries	Disputes
1992	China, Vietnam	China signs a contract with U.S. firm Crestone in May to explore for oil near the Spratly Islands in an area that Vietnam says is located on its continental shelf, over 600 miles south of China's Hainan Island. In September, Vietnam accuses China of drilling for oil in Vietnamese waters in the Gulf of Tonkin.
1994	China, Vietnam	Crestone joins with a Chinese partner to explore China's Wan' Bei-21 (WAB-21) block. Vietnam protests that the exploration is in Vietnamese waters in their blocks 133, 134, and 135.
1996	China, Vietnam	Vietnam leases exploration blocks to U.S. firm Conoco in April. Vietnamese blocks 133 and 134 cover half the zone leased to Crestone by China. In May, China reaffirms a national law claiming the South China Sea as its own.
1997	China, Vietnam	Vietnamese protest after Chinese Kantan-3 oil rig drills near Spratly Islands in March. The drilling occurs offshore Da Nang, in an area Vietnam calls Block 113. The block is located 64 nautical miles off Chan May cape in Vietnam, and 71 nautical miles off China's Hainan Island.

Source: "South China Sea Region," United States Energy Information Administration, Country Analysis Briefs, August 1998

Table 9. Recent Military Clashes in the South China Sea

Date	Countries	Military Action
1974	China, S. Vietnam	Chinese seize Paracel Islands from S. Vietnamese forces
1988	China, Vietnam	Chinese and Vietnamese navies clash in the central Spratly Islands. Several Vietnamese boats are sunk and over 70 sailors killed.
1992	China, Vietnam	Vietnam accuses China of drilling for oil in Vietnamese waters in the Gulf of Tonkin, and accuses China of landing troops on Da Luc Reef. China seizes almost 20 Vietnamese cargo ships transporting goods from Hong Kong from June – September.
1994	China, Vietnam	China and Vietnam have naval confrontations within territorial waters claimed by Vietnam over oil exploration blocks 133, 134, and 135. Chinese claim area as part of their Wan' Bei-21 (WAB-21) block.
1995	China, Philippines	China occupies Vietnamese and Philippine-claimed Mischief Reef. Philippine military attempts to evict the Chinese and destroy Chinese markers. Chinese workers soon return to construct piers and barracks.
1995	Taiwan, Vietnam	Taiwanese artillery fire on Vietnamese supply ship.
1996	China, Philippines	In January, three alleged Chinese vessels engage in a 90-minute gun battle with a Philippine navy gunboat near Campones Island.
1997	China, Philippines	The Philippine navy orders a Chinese speedboat and two fishing boats to leave Scarborough Shoal in April; Philippine fishermen remove Chinese markers and raise their flag. China sends three warships to survey Philippine-occupied Panata and Kota Islands
1998	China, Philippines	In January, the Philippine navy arrests Chinese fishermen off Scarborough Shoal.
1998	Philippines, Vietnam	In January, Vietnamese soldiers fire on a Philippine fishing boat near Tennent (Pigeon) Reef.

Source: "South China Sea Region," United States Energy Information Administration, Country Analysis Briefs, August 1998 and Greg Austin, China's Ocean Frontier: International Law, Military Force, and National Development, Allen & Unwin, 1998

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