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Sovereign Rights over Indonesian Natural Resources: An Archipelagic Concept of Rational And Sustainable Resource Management*

Professor Mochtar Kusumaatmadja*

Tulisan ini membahas secara singkat hal-hal yang terkait dengan permasalahan lingkungan hidup, ekologi, dan oseanografi, bersamaan dengan potensi Laut Cina Selatan serta perairan di sekitarnya untuk perkembangan kerjasama penelitian ilmu kelautan serta perlindungan terhadap lingkungan hidup di wilayah tersebut.

I. SOUTH EAST ASIAN SEAS¹

Introduction

The Waters and Islands between Asia and Australia and between the Pacific and the Indian oceans from a geographical unit because of their special structure and position. In geographical

* Tulisan ini pernah dimuat dalam buku yang berjudul *Rights Over Natural Resources, The Indonesian Experience*, yang diterbitkan oleh Center for Archipelago, Law and Development Studies bekerjasama dengan Penerbit Alumni Bandung, 2002. Pemuatannya kembali dalam IJIL edisi kali ini dengan pertimbangan bahwa pemikiran penulis mengenai pemanfaatan *natural resources* sangat bermanfaat untuk diketahui oleh masyarakat luas.

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¹ From *Marine Environmental Protection the South East Asian Seas*, Report by Mochtar Kusumaatmadja to the SEAPOL International Conference, Denpasar (Bali), 28-30 May 1990. This section is largely based on paper by Dr. Aprilani Sugiarto as material for discussion in the Workshop on South China Sea, Managing Potential Conflicts, held in Bali, 22-24 January 1990. It is included in this article with the consent of the author and with some alterations.

terms, the whole region is part of Asia and is referred to as South East Asia. In oceanographic terms, the waters of the region are part of the Pacific Ocean, which is separated from the Indian Ocean by the islands of Sumatra, Java and the Nusa Tenggara (Lesser Sunda). The seas in the region are filled with water from the Pacific, to which they provide access.

The South East Asian waters comprise the Andaman Sea, the Straits of Malacca and Singapore, the South China Sea, parts of the Indonesian and Philippine archipelagic waters, and the Arafura, the Celebes Seas. The whole body of water covers 8.94 million square kilometers in area, which represents about 2.5% of the world's ocean surface.

This section briefly reviews the environmental, ecological and oceanographic features as well as the potential of South China Sea and adjoining waters for developing cooperation in marine scientific research and the protection of the environment in the region.²

Physical Setting

The South China Sea, centre of the South East Asian seas region, is a semi-enclosed sea bordered by the ASEAN member States (Brunei Darussalam, Indonesian, Malaysia, the Philippines, Singapore and Thailand), the Indochina States (Vietnam and Kampuchea), China, Hong Kong and Taiwan. The South China Sea is connected to the Java Sea and the Straits of Malacca and Singapore to the south and to the Straits of Taiwan and Bashi Channel to the north. For the purpose of discussion the South China Sea also includes the adjoining Gulf of Thailand and the Gulf of Tonkin.

The distribution of land and sea in the region is of relatively recent geological origin and is largely a product of the retreat of the continental glaciers of the northern hemisphere and their final

² For a more detailed review of the South China Sea, see Kent and Valencia 1986, Soegiarto 1981 and 1985 and Wyrki 1961.

disappearance about 10,000 years ago. Before that, the island of Borneo, Sumatra and Java were joined to the mainland of Asia, and much of the southern part of the South China Sea was dry land.

Volcanism, coastal instability and the high rate of erosion and deposition associated with a humid tropical climate have produced substantial changes in land distribution in the region. Extensive coastal plains are found on the Chinese mainland opposite the islands of Hainan; on the west coast of Taiwan; in central and southern Vietnam; and in many parts of Borneo. Where the large rivers enter the sea, deltas are formed, and shallow offshore waters such as the Red and Mekong Rivers in Vietnam and Chao Phraya in Thailand are turbid but rich in nutrients, providing the basis for the highly productive fisheries of the region.

Coral reefs and mangroves are predominant coastal ecosystems in the South China Sea. Reefs occur along the more exposed coasts and around small islands where river run-off is minimal. On the other hand, mangroves are found in association with rivers, estuaries, and sheltered bays. Both ecosystems support many valuable but vulnerable species and their conservation and protection are becoming increasingly the concerns of the region.

The South East Asian seafloor is characterized by a relatively flat continental shelf that extends from the coast to about 200 meters in depth and has numerous islands. The continental shelf depth in the South China Sea are between 0 and 100 meters. The depths in the Gulf of Thailand are no greater than 80 meters.

The bottom topography of the central part of the South China Sea is interesting. There are many deep and narrow valleys of up to more than one thousand meters in depth interspersed with steep underwater plateaus. Some of the peaks even emerge above the surface as islands. The more well known of these are Paracels, sitting on a board with depths of 200 to 1,500 meters and the Spratly Islands (shown on many nautical charts as the "Dangerous ground") west of the Philippine island of Palawan.

The Asia mainland shelf reaches a maximum depth of 278 meters between the islands of Hainan and Taiwan and is relatively featureless. It continues along the mainland of China and narrows to about 50 miles south of Hainan. Depths are 60 to 80 meters in the Taiwan Strait and 20-40 meters in the Hainan Straits. The mainland shelf includes all of the Gulf of Tonkin, which has a central valley of 70 meters in depth. The shelf narrows off the coastal of Vietnam and broadens into the Sunda Shelf, South of Can Ranh Bay.

Monsoon influence on the oceano-graphic features

Located between the Asian and the Australian continents, the South East Asian region is strongly influenced by the monsoons. South East Asian waters are thus ideal for studying the effects of the monsoons on both water circulation and the seasonal distribution of its physical, chemical, and biological properties.

In describing the monsoon influence on the oceanographic features in the South China Sea, it is impossible to separate the influence of monsoons from the larger phenomena occurring throughout the whole South East Asian seas and the interactions between the Pacific and the Indian Oceans.³

The equatorial pressure trough moves according to the position of the sun, crossing the equator twice each year. In the northern summer, a low-pressure area develops over the Asian continent as an extension of the equatorial pressure trough. In winter, a high-pressure area forms over the continent, forming part of the subtropical high-pressure system. The monsoons develop between the winter hemisphere 'high' and the 'low' in the southern hemisphere. Because the pressure distribution is stationary, the winds are quite constant, especially over the sea. The wind forces are, however, generally slight. Storms and typhoons are observed only over the northern parts of South China Sea and the Philippines, over the Andaman Sea, and north of Australia. During the full

³ See also Wyrki, 1961 and Soegiarto, 1983.

monsoon the trough is deviated over land in the direction of the monsoon, owing to the thermal influence.

The north monsoon in the South East Asia lasts from December to February and the south monsoon from June to August. The rest of the year represents the transition from the north to the south monsoons (March-May) and from the south to the north monsoons (September-November).

The variation of atmospheric circulation described above parallels the corresponding variation of the water circulation. Because of the high constancy of the monsoons and the regularity of appearance, and the ocean currents show the same characteristics. Just as the monsoons change direction twice a year and are practically reversed at the time of their strongest development, the oceanic circulation is also reversed over large areas. This complete reversal is typical of the circulation in these waters.⁴

Existing marine scientific research in the region

The distribution of water and land in the South East Asian region is probably one of the most complex structures on earth. The numerous large and small islands divide the waters into different seas connected by many channels, passages, and straits. Many major international oceanographic expeditions have been drawn to the region because of its complexity, such as the *Challenger* (1872-75) the *Gazelle* (1875), the *Valdivia* (1899), the *Siboga* (1899-1900), the *Planet* (1906-7), the *Snellius* (1929-1930 and 1984-1985), the *Albatross* (1948), the *Spencer F. Baird* (1947-50), and the *Galathei* (1951). In recent years, a few oceanographic cruises have been organized, locally or as part of cooperative regional studies, such as the Intergovernmental Oceanographic Commission (IOC) Study of Kuroshio, which covers also the South China Sea,

⁴ For a more detailed description of the surface current systems in South East Asian waters, the report of FAO/IPFC Secretariat 1976 and Wyrski can be consulted.

and the International Indian Ocean Expedition (IIOE). We are thus fortunate that as a result of these international expeditions, we have a fairly good picture of the general oceanographic characteristic of these waters.⁵

The geological and geophysical cooperative research in the region in particular in the exploration for oil, gas and mineral resources in the South China Sea and the surrounding seas, has been carried out in many cruises under the supervision and coordination of the Committee for the Coordinating of Joint Prospecting for Mineral Resources in Asian Offshore Areas (CCOP).

TABEL I

Table 1. Information related to marine and coastal zones in the ASEAN member States							
	Land area (1000 km ²)	Marine area including 200 miles of extended jurisdiction (1000 km ²)	Length of coastline (km)	Area of Angrove (1000 ha)	Population in 1989 (million)	Percentage of Population living in coastal zone	GNP per Capita 1989 (US \$)
Brunei Darussalam	5.8	0.7	130	18.4	0.2	86	17,000
Indonesia	1,904.0	6,841.7	81,000	4,250.0	175	70	550
Malaysia	333.8	138.7	4,800	113.3 (west) 538.9 (east)	16.9	60	1,775
The Philippines	297.0	551	18,417	106.1	59.7	67	630
Singapore	0.6	0.1	193	1.8	2.6	100	7,550
Thailand	513.0	94.7	3,219	297.3	54.5	60 (approx)	850

Source: Soegiarto, 1988.

Table 1 shows various data related to the dependency on marine and coastal resources of the six member States of ASEAN. At present knowledge and experience in the region are still too limited to make decisions on alternative courses of actions for developing and managing guidance of the ASEAN Committee on Science and Technology (COST), a concerted marine scientific and technological program is being developed, involving the establishment of regional cooperative and expanding and improving research facilities. The ASEAN Subcommittee on Marine Sciences

⁵ Wyrki 1961 and Soegiarto and Birowo 1975.

was established to coordinate and supervise this regional program, which includes, among others:⁶

- ASEAN-Australia Cooperative Project on Marine Science which consist of two components: (1) living coastal resources with emphasis on mangrove, coral reef and soft bottom communities, (2) regional ocean dynamics with emphasis on the study of tidal phenomena;
- ASEAN-US Cooperative Project on Coastal Research Management;
- ASEAN-Canada Cooperative Project on Establishment of criteria on Development and Management of Living Marine Resources and Human Health Protection.

At present, two additional cooperative projects are still under consideration. They are:

- ASEAN-UNDP Cooperative Project on Sea-grass Restoration for Fishery Development in Coastal Areas;
- ASEAN-EU Cooperative Project on Oceanography and Pollution Monitoring in the ASEAN Marine Region.

Other cooperative marine scientific research projects that are still in the development stage are those of the Sub-commission on the Western Pacific of the International Oceanographic Commission (IOC-Sub-commission, WESTPAC). In this fourth session (Bangkok, 22-26 June 1987), WESTPAC proposed a number of regional programs that could also be implemented in the South East Asian seas, including among others, cooperative research on:

- margin of active plates;
- banding of Porites corals, as a component of ocean climate studies;
- ocean dynamic in the Northwest Pacific;
- assessment of river inputs in the sea in the WESTPAC region;
- monitoring of heavy metals and organo-chlorine pesticides using a mussel watch approach.

⁶ AWGMS, 1989.

In addition, IOC also has a number of global programs that have been or can be implemented in the South East Asian seas, in particular the South China Sea, for example:

- Tropical Ocean Global and Atmosphere Programme (TOGA);
- World Ocean Circulation Experiments (WOCE);
- Tsunami Warning System;
- Global Investigation of Pollution in the Marine Environment (GIPME); and
- Global Sea Level Observing System (GLOSS).

Protection of the marine environment

It has been fully recorded that the marine and coastal region of South East Asia is probably one of the world's most productive areas. Blessed with warm, humid tropical climate and high rainfall, it allows extensive coral reefs and dense mangrove ecosystems to flourish along the coastline. Due to the economic benefits that can be derived from these rich and diverse ecosystems, the coastal zones of South East Asia are densely populated. Over 7 % of the population in the region lives in the coastal areas, resulting in a relatively high level of exploration of natural resources and degradation of the environment. Population pressures are associated with high economic degradation of the coastal and marine environment. Increasing pollution, both land as well as marine based, has in the last decade compounded the problems faced by the South East Asian region.

Human existence depends on a stable and sustainable natural resources base. The marine and coastal environment in South East Asia harbors such a resources base. Thus, there is a value in maintaining the marine and coastal environments in a state of supporting sustainable use of marine resources. On the other hand, overuse of marine resources has implications for long term conflicts between politics for developing marine and coastal resources on the one hand and conserving and protecting on the other. Development verses conservation issues in this region includes: over fishing,

destructive fishing methods, habitat destruction, conservation of endangered marine species, and marine pollution.

As a result of the new U.N Convention on the Law of the Sea (LOS Convention), coastal states are obligated and preserve the marine environment and to cooperate directly or through international organizations. An action plan for the conservation of nature in the ASEAN region has recently been formulated by the International Union for Conservation of Nature and Natural Resources (IUCN) Priorities set by this plan are:

- Establishment of a network of natural reserve in the ASEAN region;
- Enforcement of measures to protect endangered species;
- Establishment of a mechanism for information exchange on research and management;
- Establishment of a regional training program on conservation management.

The need to maintain essential ecological processes and life support systems to preserve genetic diversity, and to ensure the sustainable utilization of species and ecosystem has been emphasized. A network of nature reserves, such as marine parks, biosphere reserves, and wild life sanctuaries, has been regarded as one of the most effective ways to conserve ecosystems and the genetic resources they contain.

On marine pollution, Part XII of the LOS Convention entitled "protection and Preservation of the Marine Environment," provides the basis on the enforcement of regulations designed to prevent, reduce, and control pollution. Articles 223-233 prescribe various safeguards that must be obeyed in carrying out enforcement procedures.

The problem of enforcement of regulations against pollution of the sea by toxic, noxious or radioactive materials has two aspects: one concerning pollution from mobile shipboard sources

and the other from fixed sources of shipboard pollution is from tankers transiting the region or calling at the oil terminals.

The United Nations Environment Programme (UNEP) has supported a number of program activities related to marine and coastal environments in South East Asia. For example, activities under the Regional Programme on East Asian Seas which is concentrated in the ASEAN region. The UNEP implementing counterparts in ASEAN are Coordinating Body of South East Asian Seas (COBSEA) and ASEAN Expert Group on Environment (AEGE), which now has been elevated to become ASEAN Senior Officials on Environment.

In 1988 UNEP, in cooperation with COBSEA and AEGE, formulated an ASEAN Environment Programme III (ASEP III), a five-year plan that will be carried out between 1988 to 1992. The ASEP III is continuation and extension of the ASEP I (1978-1982) and ASEP II (1983-1987). The ASEP III has been officially endorsed by COST, the ASEAN Standing Committee (ASC) and the Third ASEAN Ministerial Meeting on the Environment.

Seven areas have been given high priority in the ASEP III namely: environmental management, nature conservation and terrestrial ecosystem, industry and environment, marine environment, urban environment, and environmental education, training and information and remote sensing. With the catalytic role of UNEP, ASEAN has adopted the: "Action Plan for the Protection and Development of the Marine Environment and Coastal Areas" (see further below).

II. PROBLEMS AND CONSTRAINTS FOR COOPERATION

The above two section have outlined various marine scientific research and environmental protection programmes and issues in the region, ranging from resource-oriented activities (renewable and non-renewable), to (1) marine and coastal environments, (2) global climatic change, (3) research, monitoring and abatement of marine

pollution, (4) physical, chemical, biological and geological oceanography, (5) tsunami and other ecological hazards. However, there are some problems and constraints in implementing them in ASEAN sub-region and South East Asian seas.

- (1) Not all programmes have been specifically planned for implementation in the ASEAN sub-region and the South East Asian seas. In fact most are carried out only in the southern part of the South East Asian seas, in particular around the ASEAN region. Non-ASEAN coastal States around the South East Asian seas should be consulted and invited to participate in the programmes. One of the main problems in this regard is that procedures, mechanism and institutions to organize such programmes are yet to be developed. ASEAN institutions, mechanisms and procedures could form the nucleus for a programme encompassing the whole of the South East Asia marine environment protection.
- (2) Most of the existing cooperative programmes are still financially dependent on the 'dialogue partners' and on international and regional organizations for their implementation. The participating countries in the region have up to now been able to offer only counterpart budgets in kind and services and almost no contributions in real cash. Recognizing the importance of marine environments as shown below, ASEAN countries should provide support for their marine environmental protection policy decisions in their respective national budgets.
- (3) Based on the new concept in the LOS Convention extending the jurisdiction of coastal States to 200 nautical miles from their baselines, there is virtually no unclaimed area in the South East Asian seas today. Compounding this problem, some of the claims overlap. It is estimated that probably 90% of the living resources and almost all of the presently exploitable non-living resources are found in the 200-mile EEZ. Therefore marine scientific research is particularly important to the development and management of resources in the EEZ. According to the new LOS Convention, consent has

to be obtained from the relevant coastal State whenever research activity in its EEZs or continental shelf is envisaged.

Possible institutional arrangement

In formulating, developing and implementing regional cooperation programmes on marine scientific research and the protection of the marine environment in the South China Sea, there are a number of regional and international bodies actively involved. They include:

- The Association of South East Asian Nations (ASEAN). In particular: Committee on Science and Technology (COST), Committee on Food, Agriculture and Forestry including fisheries (COFAF), and ASEAN Senior Officials on Environment (ASOEN);
- Sub-commission of the Western Pacific of the Inter-governmental Oceanographic Commission (IOC Sub-commission on WESTPAC);
- Economic and Social Commission for Asia and the Pacific (ESCAP).

Unfortunately, however none of those regional bodies deal specifically with South East Asian seas or South China Sea. While ASEAN is limited to the ASEAN member countries, WESTPAC and ESCAP cover much larger areas of the Asia and Pacific region.

With ASEAN in the vanguard the countries of South East Asia should endeavor, within this context, to identify their common interests and needs and direct their plans and policies accordingly.

Although this article deals with the ASEAN sub-region, it is hoped that, by utilizing the existing machinery already effectively operating within the sub-region on matters related to marine scientific research and protection of the marine environment, the ASEAN States will soon be joined by other countries of South East Asia.

Conclusions and Recommendations

- (1) The ASEAN sub-region and the South China Sea are part of the South East Asian seas area. This area is largely a semi-enclosed sea (South China Sea) connected to the Java Sea and the Straits of Malacca and Singapore in the south and the Strait of Taiwan and Bashi Channel in the north, the whole South East Asian seas in effect constituting a series of interlinked semi-enclosed marine spaces mostly under the national jurisdiction of the countries in the sub-region. The monsoon has a strong influence on the climate in the region. In turn, the monsoon climate also governs the oceanographic features of the South East Asian seas.
- (2) A number of international and regional oceanographic expeditions have been carried out in the region and there are many existing cooperative programmes on marine scientific research and the protection of marine and coastal environment in the South East Asian waters that could and should be implemented.
- (3) There are various source of pollution that could endanger the marine environment in the South East Asian seas, such as pollution caused by ships, either by tankers or ballast cleaning; pollution as the result of industrialization in coastal areas; the deterioration of the marine environment as a result of dumping and the introduction of toxic waste to the marine environment; and environmental changes as the result of global climatic changes.
- (4) It is therefore essential for the governments around the South China Sea area to be fully aware of the environmental issues in the South East Asian seas and accordingly to raise the level of awareness of their own people.
- (5) Broadly speaking, environmental problems transcend national boundaries. Regional cooperation, and in some cases even global cooperation, is necessary to protect the marine environment. For this reason, industrial and advanced countries, especially those that are users of the South East Asian seas, should help the South East Asian Seas in their efforts to protect their marine environment.

- (6) It should be realized that the need for development and the need for environmental protection should not contradict each other. It is possible to achieve development and, at the same time, protect the environment. The need for sustainable development is therefore becoming greater in the South East Asian seas. The South East Asian States should learn from the mistakes of some of the development countries of the world that have caused environmental degradation. The South East Asian States should participate actively in international efforts and international conferences to protect the global and regional environment, and to cooperate among themselves in protecting the marine environment in the South East Asian seas.
- (7) Programmes on marine scientific research and environmental protection should be formulated in accordance with the needs of the participating member States, the availability of expertise and trained manpower, research infrastructure and facilities, and the budget. Some of the priorities could be: (a) *baseline studies* for developing and managing renewable and non-renewable resource; (b) *oceanographic studies* to monitor the climate global change in the region, with particular emphasis on the South East Asian sub-region; (c) *monitoring marine and coastal pollution* and its impact on the productivity of the South East Asian seas; (d) *studies on coastal ecosystems* such as mangrove, coral reefs, sea-grass, soft bottom, estuaries, deltas; (e) *establishing reserves, protected areas, and marine parks* in the South East Asian seas area.
- (8) A regional body could be established to coordinate all aspects of cooperation in or regarding the South East Asian seas.
- (9) Lastly, the countries bordering the South East Asian seas should establish and develop a regional contingency plan to protect the marine environment, particularly from oil pollution and the introduction of other toxic substances in the sea. As a practical step towards this goal the feasibility of the participation of non-ASEAN South East Asian countries in a broadened ASEAN contingency plan should be considered.

III. ARCHIPELAGIC WATERS REGIME AND RIGHTS OVER RESOURCES

The regime of archipelagic waters, recognized in the part IV of the 1982 LOS Convention has great significance for Indonesia, as it confirms its attempts to have exclusive rights over the resources contained within the boundaries of the Indonesian Archipelago, including the living and mineral resources of the seabed and subsoil.

Article 49 states that:

“Legal status of archipelagic waters, of the air space over archipelagic waters and of their bed and subsoil.

- 1. The sovereignty of an archipelagic state extends to the waters enclosed by the archipelagic baselines drawn in accordance with Article 47, described as archipelagic waters, regardless of their depth or distance from the coast.*
- 2. This sovereignty extends to the air space over the archipelagic waters, as well as to their bed and subsoil, and the resources contained therein.*
- 3. This sovereignty is exercised subject to this Part.*
- 4. The regime of archipelagic sea-lanes passage established in this Parts shall not in other respects affect the status of the archipelagic waters, including the sea-lanes, or the exercise by the archipelagic states of its sovereignty over such waters and their air space, seabed and subsoil, and the resources contained therein.”*

Equally important for the undisputed exclusive right over the natural resources thus secured through the archipelagic regime in international law is the precise delimitation of the boundaries of the territory under internal jurisdiction. Indonesia's initiative since 1969 to conclude boundary agreements with its neighbors should be seen in this light. So far 15 boundary agreements have been concluded, including the Timor Gap Treaty recently concluded with Australia. As the new LOS Convention also recognizes limited claims to jurisdiction beyond the territorial sea, these boundary agreements are not limited to agreements on continental shelf and territorial sea limits.

The establishment of extensive jurisdiction over the adjacent seas based on the archipelago regime, ever since declarations by the Indonesian government on 13 December 1957 followed by the conclusion of boundary delimitation agreements and treaties with her neighbours has secured for Indonesia an exclusive right over all resources, living as well as non-living, found within the limits of these boundaries. There is a huge potential which has been tapped only partially, a considerable part in the case of oil and gas and only a small part as far as the living resources (fisheries) are concerned.

While constituting a considerable addition to the resources found in her land domain, this huge potential in marine resources also presents Indonesia with several problems.

One is that of sharing the resources with other possible claimants or interested parties. The negotiation and conclusion of boundary delimitation agreements with the neighbouring countries of Malaysia, Singapore, Thailand, India, Papua New Guinea, and Australia partially solves this problem, but only partially because the boundary delimitation agreements are absolutely effective only with regard to minerals or oil and gas. They are only partially effective with regard to living resources, as moving fish to not recognize boundaries agreed upon by sovereign countries, unlike companies exploring or exploiting mineral resources or looking for oil and gas.

In other words, with regard to the living resources, especially free-moving fish, other agreements may be needed besides the boundary delimitation agreements. With immediate neighbours such as Malaysia and Singapore, negotiations over fishing rights may have to recognize the existence of traditional fishing rights, as the waters now within the Indonesian Archipelago have traditionally been fished by Singaporean and Malaysian fishermen. There is also great potential for negotiating a fisheries agreement with Thailand, a country with a large distant-water fishing fleet.

The second and perhaps more important problem for Indonesia with its new potential living marine resource is the vulnerability of the Indonesian marine space to pollution. Degradation of the marine environment is for Indonesia a very serious matter indeed as it may affect the marine resources contained within the marine space over which it has now jurisdiction, which is not only recognized by its neighbours by virtue of bilateral agreements concluded with them, but also because of the recognition of the archipelagic regime by the LOS Convention.

The third set of problems is the question of how the best exploit the natural resources contained in the Indonesian marine space, both living and mineral resources, including oil and gas. It is with regard to the exploitation of these natural resources that this article examines the available concepts develop in Indonesia, distinguishing between simple exploitation of resources and a rational management of resources making possible a policy of sustainable development.

The article approaches the subject resource-by-resource by first giving short description of the Indonesian experience in exploiting its living resources, followed by the concepts developed in Indonesia with regard to the development of mineral resources, especially oil and gas.

IV. UTILIZATION OF LIVING RESOURCES IN THE NATIONAL MARINE SPACE

Subsistence or traditional fishing

As a consequences of the recognition of the archipelagic state regime in the new international law of the sea, Indonesia has national or sovereign rights over all natural resources, living as well as non-living, found within its national waters as defined under the archipelagic state regime. As explained above, besides the archipelagic waters (all waters within straight baselines) the national waters of Indonesia also comprise the territorial sea (a 12-

mile belt around the archipelago measured from the straight baselines connecting the outermost points of islands in the archipelago).

In these national waters, Indonesia has full sovereignty over its natural resources. In addition, it has exclusive rights according to the LOS Convention over natural resources in the 200-mile EEZ surrounding the archipelago. This provides Indonesia with an additional area of 800,000 miles over which it has exclusive rights over natural resources.

An attempt will be made below to give a description of how Indonesia utilizes these natural resources, starting with a description of the institutions and mechanisms involved in utilizing its living resources. A description of how Indonesia manages its non-living resources, especially oil and gas, will follow.

With regard to the utilization of living resources in waters under national jurisdiction, whether full sovereign rights as in the case in national waters or exclusive rights as in the case of the EEZ, a distinction must first be made between two kinds of living resources utilization: (1) the fishing of living resources carried out in a traditional way with simple methods of fishing or other forms of living resources exploitation and (2) commercial fishing activities.

The traditional fishing carried out in Indonesia is of a subsistence nature. Although not significant in money terms, subsistence fishing (which is very often also coastal fishing) is very important from the socio-political point of view. Traditional or coastal fishing in the late 1970s was the main source of income for between one and two million fishing families scattered all over the coastal areas of the Indonesia archipelago.

Traditional or coastal fishing was carried out along the whole east coast of Sumatra, including the Riau archipelago, the whole north coast of Java and the island of Madura, the whole west coast

Kalimantan or Borneo, its southern and eastern coast and the whole coastal area of western and south western part of Sulawesi (Celebes). It also covered a larger part of the coastal area of northern Sulawesi. Coastal fishing is further to be found in the Moluccas and in parts of west Irian.

Methods employed cover all kinds of fish-traps used in shallow coastal areas, use of coastal sailing craft and small-motorized vessels of limited capacity. Most of the traditional fisheries carried out by local inhabitants are pelagic with some pearl diving in the eastern part of the archipelagic (Arafura Sea).

The Coastal Fisheries Act of 1972 established four coastal fishing belts. The three inner belts respectively of a three miles, four miles and five miles width each reserved for coastal or traditional fishing. In these three inner belts which all together measured 12 miles from the lower-water mark, commercial fishing is prohibited. Trawling, formerly allowed in Indonesian waters, has been prohibited for some time after protest from coastal fishermen against commercial fishing interests in the early 1980s. Trawling is now permitted only in the Indian Ocean and some parts of eastern Indonesia with specially designed trawls approved by the the Director General of Fisheries.

Agreed figures for catch and landings of coastal fisheries are not available but the total is estimated to be slightly over 1.2 million tons annually.

Foreign fishing interests are allowed to participate in the utilization of Indonesian fishery resources on the basis of special agreements. Below is short description of such agreements, which is given for its historic interest as these agreements have been discontinued.

Agreements with foreign countries⁷

Agreements concluded by Indonesia with other countries include the following historic examples:

- (1) An arrangements concluded with Japan for the exploitation of tuna in the Banda Sea;
- (2) An agreement concluded with South Korea regarding cooperative efforts in matters concerning fisheries;
- (3) An arrangement negotiated between Indonesia and its neighbours specifically Singapore and Thailand, allowing adjacent neighbouring States of Indonesia to continue their traditional fishing activities within specified areas of Indonesian archipelagic waters.

(1) Arrangement with Japan.

The Japanese government claimed that its fishermen had traditionally fished in distant waters of Indonesia, including the Banda Sea area. This claim certainly ran counter to the Indonesian assertion of archipelagic principles since 1957.

Various efforts by two countries to resolve the matter finally succeeded when both parties signed the 'Interim Arrangement' on 27 July 1968. This arrangement, concluded between the government of the republic of Indonesia and the representatives of the National Federation of Fisheries Cooperatives of Japan and the Federation of Japanese Tuna Fishermen Cooperative Association, regulated tuna fishing by Japanese fishermen who are members of the two associations 'in the waters between the Indonesia islands'. The area covered by the arrangement was the Banda Sea which is within the archipelagic waters of Indonesia, with coordinate 124° E 2°S, 120°E2°S, 132°E3°S, 132°E8°S, 124°E8°S and 124°E2°S, all specified in the Interim Arrangement. Japanese fishermen undertook not to operate in areas other than that specified in the arrangement.

⁷ This section is taken from an article by Dr. Hasyim Djalal, "Fishing agreements with foreigners", ICLARM Conference Proceedings No. 2, Manila 1980.

The form and the contents of this arrangement were peculiar. First, it was negotiated between the representatives of the Indonesian and Japanese governments but it was signed between the government of Indonesia and the National Federation of Fisheries Cooperatives of Japan and the Federation of Japanese Tuna Fishermen Cooperative Association, both private organizations. It seems that while the Japanese government was eager to protect the interests of its fishermen, it was nevertheless reluctant to conclude an official agreement with the government of Indonesia. Perhaps Japan feared that such a bilateral agreement might be interpreted from legal point of view as its indirect but *de facto* or *de jure* recognition of the Indonesian archipelagic concept.

Second, the arrangement regulated Japanese fishing activities in waters between Indonesia islands. From the very start, the Indonesian government disagreed with this formulation and preferred the phrase simply to read in the Indonesia waters. The implication was clear: the Indonesian government wanted clear, legal recognition by the Japanese of its archipelagic concept, while the Japanese side insisted on maintaining some semblance of legal non-recognition through the formulation.

Thirdly, the Japanese side was willing to pay for access to the tuna fisheries in the Banda Sea. Although Indonesia considered the amount paid to be very little or meaningless, it nevertheless viewed the payment as an act, which constituted Japan's recognition of its archipelagic concept. The Japanese side, of course, simply viewed the payment as a fee to enter an Indonesian port since the Japanese fishing vessels operating in the Indonesian archipelagic waters had to report the results of their operations to the predetermined Indonesian port.

Fourth, the arrangement was valid only for a limited time-one year. Thus, it had to renew every year, and each time, the discussions would centre on the need for such an arrangement and on the points previously mentioned. Basically, Indonesia did not consider the arrangement beneficial to it and therefore wanted to

modify the terms to better suit its needs. Yet the Japanese side considered the arrangement to be extremely important, primarily because it involved activities and the economic life of a particular sector of the Japanese electorate; thus it was politically significant for any Japanese government in power. Each time the negotiation bogged down, political pressure would be applied to Indonesia. As a result, the arrangement was renewed five times and replaced by a new arrangement in 1975. Between 1968 and 1975 the arrangement generated less than US \$ 10 million for the Indonesian government: US \$ 147,640 in license fees, US \$ 1,929,186 in the form of aid (grant), and US \$ 7,856,285 in the form of credit for project aids.

By the 1975 the Indonesian government had become very reluctant to continue with the arrangement. However, it had to continue giving special consideration to this peculiar Japanese interest because the Japanese government considered the solution of the issue essential for its position on the archipelagic states in the Law of the Sea Conference. Before Prime Minister Tanaka could agree to express sympathetic views vis-à-vis the archipelagic principles when he visited Indonesia in 1974, Indonesian approval to continue the arrangement in the archipelagic waters had to be secured first.

By 26 September 1975 the validity of the Interim Agreement had expired. Again, new negotiation was begun. Both sides decided against a sixth renewal of the Interim Arrangement. Instead a new arrangement was made, this time between an Indonesian State Fishing Enterprise, the Perikanan Samodra Besar (PSB)⁸ and the same Japanese Fishing Associations mentioned above. The new arrangement embodied provisions for tuna fishing cooperation on the basis of a profit-sharing arrangement. The new arrangement also required the association to prepare and transmit to the PSB a sailing plan for tuna fishing for each year. The plan is to be carried out after due acknowledgement from the PSB 'which will be given

⁸ The PSB was established under Government Regulation No. 12, 1969, Government Regulation No. 16, 1972, and the Articles of Association No. 37 of 12 May 1972 and domiciled in Jakarta on the basis of the Minister of Agriculture's Decision No. 350/KPTS/UM/8/1975 of 20 August 1975.

expeditiously' (Article II of the Contract). The area of operations under the new arrangement remained the same, e.g. 'the waters between the Indonesian archipelagic islands', as provided for in the Interim Arrangement. In the Interim Arrangement, Japanese fishing vessels were not allowed to operate within the limits of 30 miles from the island of Ambon, but unlike the Interim Arrangement, Japanese vessels were not to operate within the limits of 15 miles from other specified groups of islands, such as the Geser, Gorong, and Banda Neira groups. The restriction that Japanese vessels should engage mainly in tuna fishing and only by long-line method remained. The maximum catch was now reduced to 8000 tons/year and the number of long-line vessels less than 80 grt class (class A) between 80 grt and 300 grt (Class B) vessels. The maximum number of class B vessels was limited to 33. Likewise, Japanese vessels operating under the contract were required to bear markings, the details of which were indicated in the contract. The vessels were also not allowed the use of mother ships or transporting vessels.

One new provision in the contract was the profit-sharing arrangement. Under the contract the associations were to relinquish to the PSB 40 % of the profit accrued from their operations. The detailed formula for the circulation of the profit was to be decided by both the associations and the PSB. The associations were to bear all operating expenses incurred in the operations of the vessels as well as to transmit to the PSB reports of the operations and their results, including a profit and loss statement. On the other hand, the PSB was to take administrative steps to obtain necessary documents to facilitate the operations and assist the association in obtaining the necessary port entry permit. The Japanese vessels operating under the contract were also required to carry certificates issued by the Indonesian Embassy in Tokyo.

The contract was to take effect on 17 October 1975 and was to be valid for three years beginning from the date the Interim Arrangement expired. Again, the implementation of the contract during the three years was not encouraging to Indonesia. The profit from the operations was calculated only at 2.5%. Since PSB's share

of the profit was calculated 40%, the PB gained only 40% out of the 2.5%, namely about 1% of the total gross proceeds. The amount received by the PSB was not even enough to cover administrative costs, such as telegrams, verifications, etc. Furthermore, the number of Japanese vessels reporting under the contract was less than the maximum allowable number. While 100 vessels per year were allowed to operate under the contract, only 23 reported verification in 1975-76, 35 in 1976-77 while 77 applied between September 1977 and June 1978. Between September 1977 and April 1978, only 35 vessels reported for verification and checking at Ambon.

During the three-year period of the contract, aside from the negligible 1% profit sharing, Indonesian side also obtained one training vessel along with equipment valued at US \$ 1.8 million as grants and another repair shop for the PSB valued at US \$200,000.

Strict enforcement of the arrangement with Japan presented many problems. First, the area covered by the arrangement was relatively large, making it difficult for Indonesia's law enforcement agencies to supervise. Second, other vessels, including fishing vessels, also used the area as a transit route between the Indian and the Pacific Ocean, thus making it difficult for law enforcement agencies to distinguish vessels covered by the arrangement from those merely passing through.

Third, the enforcement of the arrangement required an improvement in the efficiency of various enforcement agencies in terms of personnel, equipment, methods, as well as coordination.

Fourth, even if the enforcement activities at sea worked smoothly, the process of judicial solution through courts would still be monumental. A vessel apprehended at sea for violating the arrangement of Indonesian rules and regulations on fishing had to be brought to the court, which could be 100 miles away from the site of apprehension. A few weeks or even months could pass before the case was finally settled. Financial damage to both the

vessels and the Indonesian government (which had to feed the crew during the waiting period) could enormous.

To avoid this, since early 1970s the Indonesian government has used the peaceful fine system under which a vessel alleged to have violated Indonesian fishing laws and regulations may be allowed to leave Indonesian fishing waters immediately upon paying specified amounts as fines to the Indonesian government through the law enforcement authority that apprehended it at sea. The idea was to avoid lengthy and costly judicial procedures for the benefit of both the vessels and the Indonesian government. Unfortunately, this attempt also met with many difficulties and abuse of enforcement powers was discovered later on. As a result the system was ended.

On the other hand, vessels which finished illegally in Indonesian waters were also much to blame for the difficulties encountered in enforcing the arrangement. Some of these vessels would rather bribe the corrupt government officials than stand trial, which in any case would surely cost them more time and money.

Licenses have also been given by the Indonesian government to various Japanese companies to fish through joint venture agreements with Indonesian private fishing companies. Dating back the earlier years, such licenses were used in the Arafura Sea of shrimp and others. These were simple joint venture agreements within the context of Indonesian Foreign Investment Law. Like all joint venture investment agreements, they were governed by Indonesia laws and therefore did not create the same problems.

(2) Arrangement with Republic of Korea.

South Korea has been developing distant-water fishing capabilities. It was therefore logical for the government of South Korea to consider possible fisheries cooperation with Indonesia, and vice versa. Officials of both countries first met in Seoul in July 1972 to discuss the possibilities of establishing fisheries joint

ventures in Indonesia. South Korea agreed to encourage the participation of Korean companies in such joint ventures, while Indonesia expressed its readiness to support activities, including trial fishing. Both parties also agreed to promote fisheries technical cooperation through an exchange of scientists and technical and scientific data, and in the field of education. South Korea further expressed its willingness to explore the possibility of importing fishing vessels from the Republic of South Korea.

A second meeting was held in Jakarta in September 1972. The Korean fishing company agreed that as a first step toward the establishment of fisheries joint ventures in Indonesia under Indonesian law, it would 'in the very near future' send three tuna vessels and two stern trawlers to 'Indonesian waters' to perform trial operations in cooperation with Indonesian private companies for a period of six months. Both sides agreed to the immediate implementation of the trial operation. Also discussed in the meeting were a technical cooperation arrangement between the two countries, the possibility of conducting a joint survey in Indonesia and its adjacent waters, and the possibility of importing fishing vessels from the Republic of Korea.

A third meeting took place in Seoul in May 1974. At this meeting it was agreed that the Republic of Korea would share its fishing experiences and techniques which Indonesia to develop the latter's coastal and distant-water fisheries. Both countries also agreed to further strengthen existing technical cooperation; to cooperate in research and survey of marine resources in the waters of Indonesia; to encourage joint ventures between private enterprises of each country in the field of tuna long-line, skip jack pole-and-line, and shrimp trawling and to arrange through the private sector the export of fishing vessels from the Republic of Korea to Indonesia.

In practice, there has not been extensive fisheries cooperation between Indonesia and South Korea and there has not been any joint venture agreement concluded between private enterprises of each country. The question of enforcement of the

Indonesian-South Korean cooperative was therefore not very prominent. The issues were primarily those of South Korean vessels transiting Indonesian archipelagic waters and how to prevent them from fishing while in transit. The issue was not so much that of enforcing agreements with other countries but the implementing Indonesian laws and regulations vis-à-vis the transiting fishing vessels.

(3) Arrangements with neighbouring countries.

In 1969, possibly taking the hint from the Interim Arrangement between Indonesia and Japan, Malaysia took the initiative in concluding an agreement on fishing activities by Malaysian nationals in Indonesian waters in the Strait of Malacca. After some lengthy negotiations, however, the attempt failed to achieve concrete results because Indonesia was reluctant to apply the interim arrangement system with regard to fishing activities in the Strait of Malacca.

Indonesia was, however, prepared to cooperate with Malaysia on the basis of the Indonesian Foreign Law Investment Law of 1967 (Indonesian Law No.1 1967) to the effect that Malaysian private companies would be encouraged to invest through joint ventures with Indonesian fisheries cooperatives or companies. This idea was not so attractive to Malaysia and therefore no agreement on fisheries has been concluded between the two countries.

Relation with Singapore was also issue. Singapore claimed that for years its fisherman had traditionally fished in certain parts of Indonesian archipelagic waters. Moreover, for years, Singapore vessels had been visiting and plying the waters between Indonesian islands to buy fish from Indonesian fishermen. The latter activities were more commercial and trading activities than fishing activities.

Foreign investment and joint ventures

Disappointed with the Banda Interim Agreement on fisheries with Japan has led Indonesia not to conclude similar agreements for the exploitation of living resources in the Banda Sea with any party after the termination of the arrangement with Japan, and the profit-sharing experiment concluded afterwards.

Since then, the Banda Sea and indeed the whole sea area of the eastern part of the Indonesian archipelago has been reserved for foreign investment ventures and joint ventures. The idea of exploiting the marine resources of the eastern seas only on the basis of the Foreign Investment Law of 1967 was based on the principle that having become part of Indonesian national territory.

As condition for living resources extraction under the Foreign Investment Law are more strict there have not been many companies availing themselves of this opportunity, except some Japanese companies that have made investments in the eastern part of the archipelago off the coast of Irian Jaya and the Arafura Sea, concentrating mainly on shrimp culture. The Japanese companies operate on the basis of a joint venture with local Indonesian firms. Japanese companies are also involved in pearl cultivation in the Arafura Sea area. These foreign investments and joint ventures have proved to be very successful and are important contributors to Indonesian foreign exchange earnings.

With greater interest now being paid to the eastern part of the Indonesian archipelago, it is expected that foreign investment and joint ventures in development of marine resources in the eastern part of the Indonesian archipelago will increase.

Such a development should be welcome as it would enable the development of the economy of the eastern part of Indonesia to be based on marine resources which are under-exploited in the area. It is believed that marine living resources (especially tuna) in the Banda Sea and the eastern part of the Indonesian archipelago are under-utilized.

Exploitation of marine resources in the Indonesian EEZ

Since the promulgation of the Indonesian Law on the Exclusive Economic Zone in 1985, exploitation of the living marine resources of the Indonesian EEZ has been on the basis of licensing. Licenses have been given to foreign fishing fleets of different nationalities, mainly Korean, Taiwanese, and Thai. The experience, however, has been a disappointment from the Indonesian point of view due to the high cost of policing the fishing activities of the licensed companies and the inadequate compensation received for the living resources extracted.

The policy of marine living resources exploitation in the Indonesian EEZ is now under review. In the meantime, however, the Indonesian government has reached an understanding with Thailand to enhance cooperation between the two countries in the development of marine living resources in the Indonesia EEZ. If carried out properly, such Indonesian-Thai cooperation should be beneficial to the both parties, as Indonesian and Thailand complement each other in the particular case of the development of marine living resources in the EEZ.

Because of its legal title to the marine living resources, Indonesia has huge marine living resources base in its EEZ with a very low capacity to exploit it. Thailand, on the other hand, because of its well-developed long distance fishing fleet has an overcapacity to exploit marine living resources with a very small marine living resources base in the Gulf of Thailand, which is at present, over-utilized. Indonesian-Thai cooperation to develop marine living resources in the Indonesian EEZ if carried out in the proper manner and in good faith would be another example of ASEAN cooperation and should also remove one potentially serious source of friction between the two countries.

Conclusion

Indonesia's experience in the exploiting marine living resources in the Indonesian marine space has been mixed. A record

of success, especially with regard to the development of the shrimp industry and the pearl cultivation industry has been offset by disappointment in the exploitation of other marine living resources (e.g. tuna) on the basis of bilateral agreements or licensing agreements.

Part of the reason for the limited success has been limited Indonesian experience in the exploitation of marine living resources on a commercial scale, experience since colonial times being based primarily on traditional or subsistence fishing. The Director General of Fisheries of Indonesia has only gained experience in regulating commercial fishing since the interim arrangement with Japan in the Banda Sea was started in 1960s. The state fishing companies, Perikani and Perikanan Samudra Besar, have not developed sufficiently to cope adequately with the problem. It is only recently that improvements have been made.

Part of the problem lies in the Indonesian administrative infrastructure dealing with the regulation of the fishing industry. Continuing past colonial administration policy, fisheries have been dealt with by the Director General of Fisheries, marine fisheries being dealt with by a Directorate, as part of Department of Agriculture and Fisheries. While such an administrative structure and apparatus may have been adequate to deal with subsistence fishing by indigenous or local inhabitants in an agricultural society, such a structure is clearly not adequate to deal with the greatly changed marine living resources situation after independence, especially after adoption of the archipelago principle.

Now that the archipelagic State regime has become law and accepted under the new international law of the sea, it is high time for Indonesia to revise the administrative and institutional machinery dealing with fisheries regulation.

V. UTILIZATION OF NON-LIVING MARINE RESOURCES: MINERALS, OIL, AND GAS

In contrast to marine living resources, the utilization of mineral resources, especially oil and gas, presents a different story. In 1960, Indonesia enacted two laws, namely Act Number 37, 1960 on Mining and Act Number 44 on Oil and Gas which radically changed the philosophy and manner of mineral, oil and gas extraction in Indonesia. The two new laws basically changed the system of mineral, oil and gas extraction from a system of concession or licensing to a system of mineral and oil and gas resources development using foreign mining and oil and gas companies as contractors.

The Indonesian system based on these two new laws has to be properly understood to appreciate that the difference is fundamental and not merely cosmetic. It has ended the era of exploitation of mineral, gas and oil resources by foreign oil companies without proper supervision or control by the government into a system whereby the Minister of Mines as custodian of the government's right over these resources concludes agreements with foreign mining, oil and gas companies which act as contractors to develop these resources on the basis of a contract or agreement. For these purposes, Indonesia has developed the concept of *Kontrak Karya* (Contract of Work) for hard minerals and a 'product sharing contract' (PSC) for oil and gas.

The basic difference between the old concession type of agreement or licensing arrangement is that the *Kontrak Karya* and the PSC do not leave the foreign mining and oil and gas companies' freedom to exploit the natural resources as they see fit. This was possible under the old concession or licensing agreements because the holders of concession or licenses were free once the concession or licenses were given. Any Supervisory or control system was bound to be ineffective as concession contracts and license agreements ensured the greatest freedom for the contractor licensee. Government supervisory regulations or control were measured after the fact and hardly proved effective. The *Kontrak Karya* and oil and

gas PSC changed this by treating the foreign companies and oil and gas companies as contractors who have to perform on the basis of a work programme and budget negotiated periodically, usually with the contract of 30–40 years duration for a period of five years each.

In order to gain an inside understanding of the system, a short description of the *Kontrak Karya* and PSC is therefore necessary.

The Indonesian national policy on the exploration and exploitation of mineral resources (including hydrocarbons) in the archipelagic waters constitutes a system of mineral and hydrocarbon production development as part of a national energy and mineral resources development policy. This approach is made possible by the fact that in Indonesian law the right to minerals (including oil and gas) is vested in state, unlike in the USA where the right or title on the land includes the right and title to the minerals (including hydrocarbons) found underneath the surface of the land (right of capture).

The Indonesian concept of a right to mineral resources separate from the right to the land is a continuation of a legal tradition introduced by the Dutch in the then *Netherlands Indische* in the *Indische Mijnwet*, 1899.⁹ When Indonesia replaced the old colonial law on mining with national legislation, two separate laws were enacted, one dealing with hard minerals (*Undang-undang Pertambangan*, 1960, amended 1967) and one with oil and gas (*Undang-undang Minyak dan Gas Bumi*, 1960). They both retained, however, the basic principle that *the right to the minerals* (including oil and gas) remain vested in the state rather than in the holder or owner of the land. This is the first factor in Indonesia's national policy on mineral resources (hard minerals) and energy (oil and gas) development.

⁹ *Indische Mijnwet* (Mining Act of the Indies), 23 May 1899, *State Gazette* No.214 (1899), lastly amended by an Act on August 1938, *State Gazette* No. 618 and 652 (1938). See Articles 1, 4, 7, 13, and 35.

As Indonesia views its marine space in the same way as its land space, both being integral parts of the nation's territory (national space), the laws on mining both hard minerals and hydrocarbons (oil and gas) are applicable equally to mining and oil and gas operations on land as well as offshore.

The second element in the system concerns the method of extraction. The Dutch licensing system (*concessie*) was replaced by the 1960 Mining and Oil and Gas Law with a completely different system based on native Indonesian legal thinking, taking into account the realities the nation faced in the early 1960s of aspiring to explore and exploit its mineral resources and hydrocarbons without possessing the necessary financial resources and technology.

Both the *Kontrak Karya* (for hard minerals) and the production-sharing contract (for oil and gas) are essentially based on the concept of the owner of the resources (the state) engaging a third party, a mining company in the case of hard minerals and an oil company in the case of hydrocarbons, as contractors. The proceeds of the contractor's work or activity (i.e., the production) being shared between the state and the contractor on the basis of a previously agreed formula, after the subtraction of costs. In assessing the nature of the *kontrak karya* and production sharing contract, production sharing should not be confused with profit sharing. Profit sharing is very often not advantageous to the owners of the resource, as he has no control at all over costs. To simplify the discussion I will concentrate on describing the production-sharing contract used in the development of hydrocarbon resources.

The regulatory agency at the Ministry of Mines in charge of supervising oil and gas production is the Directorate General Migas (*Minyak dan Gas Bumi*). This agency makes sure that hydrocarbon resources production and development is in line with the government's program and policy. The operational agency in charge of hydrocarbon production and development is the State oil company, Pertamina. It is Pertamina on behalf of the State which is

the holder the right to mine. Consequently, by law it is also Pertamina which is the holder the oil-and-gas work area (*wilayah kerja pertambangan migas*). The work area is offered to prospective contractors by a bidding system, the successful bidder obtaining a contract area (*wilayah Kontrak Kerja*). Usually a signature fee is paid by the contractor obtaining a contract area at the signing of a product-sharing contract.

Up to this point there appears to be no big difference between a production-sharing system of oil-and-gas production and concession system. It is the structure and content of a product-sharing contract that the differences become apparent.

Basic features of the Production Sharing Contract (PSC) for oil and gas¹⁰

As already stated, a PSC is a contract between the owner of the resources that is the Indonesian State, represented by the state oil company Pertamina and the contractor, i.e. the oil company assigned a certain contract area. The production-sharing concept has been developed since 1966, and initially comprised the following principles:

- (1) The state oil company has control over management;
- (2) The contract is to based on the sharing of the production rather than profit
- (3) The foreign company –as contractor to the state oil company– is to bear pre-production risks, cost-recovery to be limited to 40% of the oil produced annually if oil is discovered and produced;¹¹

¹⁰ This section is largely based on the author's book, *Mining Law*, Padjadjaran University Law School, Bandung 1979 (Survey of Indonesian Law).

¹¹ This ceiling was lifted when oil prices were low in early 1989 and replaced by a 20% government share taken from the first *tranche* (phase) of production. The split between Pertamina and the contractor now is usually 85:15,

- (4) The remaining 60% of production (or more when cost amortization is below the 40% maximum) is to be split, with 65% going to the State Oil Company and 35% to the contractor;
- (5) Title to all project-related equipment bought by the contractors is to pass to the State Oil Company upon entry into Indonesia, the cost to be recovered from the 40% of the oil produced and set aside for recovery cost.

Those five principles enumerated above reflect some basic ideas on petroleum resources development not embodied in the *kontrak karya* agreements on oil signed in 1963 between the Government of Indonesia and CALTEX and STANVAC Oil Companies.¹² One is that management of the operation should be controlled by the owner of the resource, i.e. the State or the State-enterprise rather than by the contractor. As it is the contractor who bears the risks, in practice this means that the relationship between Pertamina and the contractor is one of joint management. Second, to ensure a role for the State-enterprise in marketing and to eliminate disputes over prices, the product is to be shared rather than profits. The limitation of cost recovery is a logical corollary of these two basic principles.

It should be noted here that, although Pertamina is given the power of management, in the early years it only used this power to keep tight over costs. There are several reasons for this: (1) Pertamina felt that cost is the most important aspect of management from their point of view, because the incentives (especially the 40% of output allowed for cost recovery) are such that the contractor's interest in keeping costs down may not be as great as the interest of Pertamina; (2) Pertamina had to economize on the use of its trained

in some cases 80:20. A higher percentage in the production split and other incentives are provided in marginal cases and in remote areas, considered "frontier areas".

¹² These were the first and last *kontrak karya* agreements on oil and gas. This type of agreement later was used exclusively for hard minerals.

personnel, for it did not have them in unlimited number; (3) there was a feeling among management at Pertamina that foreign investors, who are risking their capital, must, in fairness have an important say in management matters, especially those matters in which the interests of the foreign investor and of Pertamina are similar or do not conflict.

At least three months prior to each contract year the contractor must submit to Pertamina a work program and budget. From the point of view of Pertamina, this is a basic management tool, the work programme containing the essential elements for an exploration program. It defines the types of exploration activities proposed to be conducted, the length of period, disposal of data and information, expenses and its proposed, relinquishment of area, etc.

Pertamina obtains all the data gathered by the contractor during the exploration stage. If the contractor finds a prospective spot or structure, the matter is discussed with Pertamina after test drilling has ascertained the viability of the next step, i.e. production.

It is at this stage that the difference between the production-sharing system and the concession system becomes apparent. Under the concession system, the decision is entirely up to the oil company. Its decision is usually based on the company's production policy and program, which in the case of big oil companies are integrated into their worldwide production program. They may proceed with actual production or cap the well, as the case may be.

As the decision left to the discretion of an oil company may not always be a good one seen from the point of view of Indonesia's energy development program, these consultations are very useful. If the size of the deposit and the nature and composition of hydrocarbon (oil and gas) is attractive, a decision may be made to enter the next stage of development, which is the actual production of oil and gas.

Recently, incentives have been given to oil companies concluding exploration contracts with Pertamina in marginal both in

the sense of productivity potential and/or accessibility and convenience (remoteness).

The original production sharing contract stipulated that all equipment purchased by the contractor and brought into Indonesia for purposes of exploration and production becomes the property of the State Oil Company Pertamina. As a cost element it is written off according to a formula agreed upon between the State Oil Company and the contractor. Experience, however, has shown that the contractor very often subcontracts the drilling even at the exploration stage to other companies as sub-contractors, so that this provision is no longer considered advantageous to Pertamina. One other consideration making the old provision of equipment becoming automatically property of Pertamina of dubious advantage to the State Oil Company is the question of the cost of removal after a work area or contract area has been abandoned.

Other provisions in the contract contain stipulation on the transfer of technology, Indonesianization of staff and other matters to ensure that Indonesia will be able in a reasonably short time to run its own oil industry. The contracts also contain provisions on marketing and requirements to fulfill the oil needs of the domestic market.

To a large extent the objectives set out by the designers of the PSC had been achieved. Not only Pertamina is doing its job as a manager of Indonesia's oil and gas development programme but many service companies supporting or supplying Pertamina and the oil contractors are now run or owned by Indonesians, including drilling contractors. Work or services requiring high technology or large capitals inputs, however, are still provided by foreign firms or operates as joint venture. To the writer's knowledge up to the present there are no private Indonesian oil companies working as independent contractors to Pertamina.

With the introduction of the new tax law some years ago, the tax provisions in the PSC have been largely re-written. In the original PSC no tax was paid; tax payments being included in the

cost component deducted from gross revenue to arrive at net production (revenue) to be shared between Pertamina and the contractor. This was gradually changed over the years and at present the picture is much clearer. It is known that the oil industry is one of the big tax contributors to the Indonesian Treasury in all stage of its operations up to and including the gas pump. At the production stage, no consolidation of taxes is allowed as a matter of general principle, as indeed no consolidation of costs is allowed even between different contract areas worked by one company operating within Indonesia.

One provision in the PSC with merits special attention is the clause on mutuality which stated that:

"Pertamina and Contractor undertake to carry out the terms and provisions of this contract in accordance with the principles of mutual good will and good faith and to respect the spirit as well as the letter of and said terms and provisions."

One can read this mutually clause in a number of different ways and react to it accordingly. It can certainly be said to be somewhat unusual, especially when thought of in the context of transaction involving millions of US dollars. Nevertheless, the clause reflects the atmosphere surrounding the PSCs in 1960s, which should be viewed as laying down the rules for a partnership in search of oil and gas, with one partner, i.e. Pertamina, as the custodian of the resources providing the opportunity and facilities and taking the responsibility for all burdens involving administrative, fiscal, and government-related matters and the foreign partner, i.e. the contractor, concentrating on the financial, technical, and commercial aspects of oil exploration production.

One area in which this mutually clause could become very important is the decision to exploit or not exploit a marginally economic oil deposit. Here the interest of the partners may be different: the contractor's interest is in recovering costs plus a good return, whereas Pertamina's interest is in getting its fair share. This

conflict has not yet given rise to disputes, however, because so far all of the deposits found have been fairly substantial.

There is certainly room for improvement in the production-sharing contract, especially for a more precise formulation of some of the rights and duties of both parties. However, this should be done without disturbing the mutually of trust and goodwill which so far have characterized these contracts in their actual performance.

New application of the PSC

On 11 December 1989, Indonesia and Australia signed the Treaty on the Zone of Cooperation in the Seabed area South of East Timor (the so-called Timor Gap), embodying the principles contained in the joint statement referred to above. The treaty, which was signed by the Foreign Ministers of Indonesia and Australia in an aircraft circling over the area, has three annexes: Annex I delimiting the zone of cooperation, consisting of Area A (Joint Development Zone), Area B and Area C; Annex II, containing a mining code especially designed for the Joint Development Zone (Area A); and Annex III comprising a model production-sharing contract, applicable exclusively to the Joint Development Zone (Area A). In other words, oil and gas companies operating as contractor in Indonesia or companies holding rights under Australian law in Australia cannot use or claim right based on the provisions contained in this special PSC.

A discussion of the provisions of the treaty, the mining code and the model PSC would require a special article and is clearly beyond the scope of this paper.¹³ Suffice it to say that the system employed in the exploration and production of oil and gas in the so-called 'Timor Gap' area of the seabed between Indonesia and Australia closely follows the production-sharing system pioneered by Indonesia and now widely used throughout the world.

¹³ *Perjanjian Indonesia-Australia di Celah Timor (The Indonesia-Australia Treaty on the Timor Gap)*, by Mochtar Kusuma-Atmadja, pp 32, paper read at the University of Gadjah Mada Yogyakarta, 9 February 1990.

The PSC as a system of oil and gas resources development

As described above, the PSC system is truly a system of oil and gas resources development as opposed to a system of mineral resources extraction followed under the concession or licensing system, the difference being that the title to the oil and gas management in the PSC system are both held by the state company (Pertamina) on behalf of the state as the custodian of the nation's resources (Article 33 of the Indonesian Constitution). This system, which is a manifestation of the principle of sovereignty over national resources, if properly handled and implemented, provides a balance between the public interests represented by the State Oil company and the private enterprise interests represented by the oil company (contractor).

The system has worked well in Indonesia, because the Pertamina State oil company has since its inception handled its mandate with good sense adhering to generally accepted good oil practices. The same can be said of the foreign oil companies, which have learned to behave as partners in development rather than ordinary oil companies purely motivated by profit. The mutuality clause succinctly expressed the spirit of cooperation and partnership from mutual benefit.

The PSC system of oil and gas resources development is now nearly 30 years old and has been widely adopted around the world. The system is good for a developing country because it provides the basis for sound mineral resources development as opposed to a system of mineral resources extraction. Furthermore, the PSC system for oil and gas and the *kontrak karya* system for hard minerals have provided a stable environment for investment and production for foreign companies who are conducting themselves as partners in developing Indonesia's resources and are therefore treated accordingly not only by the government but also by the communities in which they operate. In remote areas, this can be very important for the successful operation of a mining venture.

The various provisions on personnel development transfer of skills and expertise and the experience gained in management and environment protection are all useful from a developing country's point of view. The opportunity that PSC and *Kontrak Karya* give to Indonesia to husband its scarce mineral resources is perhaps the most important advantage from a resource development point of view. The difficulties experienced by the mining companies at OK Tedi and Bougainville copper mines in Papua New Guinea are a telling example of troubles that can arise from a mineral resources extractions system, which can to a large extent be explained by the different system employed and different philosophy underlying it.

It may be perhaps be said with some justification that the PSC system for oil and gas and the *kontrak karya* system for hard minerals are important contributions by Indonesia to the concept of mineral resources development as opposed to minerals extraction. They do at least provide a system of mineral resources management in keeping with finite mineral resources and concerns for the environment in a rapidly shrinking world.

VI. PROTECTION OF THE MARINE ENVIRONMENT

It is clear that as part of the South East Asian seas the archipelagic waters of Indonesia are very vulnerable to degradation of the marine environment by pollution. The Indonesian archipelago is in fact a series of interconnected semi-enclosed seas. Most major rivers find their way into these semi-enclosed seas and hence are a very important source of land-based pollution. With rapidly growing cities on the island of Java and expanding industrial areas, land-based pollution is increasingly being recognized as a serious cause of the degradation of the marine environment. The island of Java is one of the most densely populated areas in the world, so even without industrialization the Java Sea has potentially a significant land-based pollution problem. Historically, however, it is pollution from vessels that has attracted the most attention in the South East Asian region and has been the direct cause of a heightened

awareness of the problems of marine pollution as a cause of degradation of the marine environment.

It was combination of a greater awareness of matters concerning the human environment and the dramatic grounding of the oil tanker *Showa Maru* which proved instrumental in stimulating a greater awareness of the need to protect the marine environment in South East Asia. The tripartite agreement on the Traffic Separation Scheme (TSS) in the Strait of Malacca and Singapore has struck a good balance between the protection of the coastal states' interests and the interests of international navigation, and is proof that with necessary good will and common sense the most difficult questions can be solved. It is fortunate that both Indonesia (the country with the longest coastline of the three riparian states and therefore of problem solving through consensus.

This consensus-seeking rather than adversarial attitude has in my opinion been helpful in finding solutions between the competing interests of coastal and user states. It is more in keeping with our present day world, which is becoming infinitely more complicated and has been made much smaller because of the advance of technology, the growth in population and increased dependence on the sea as a resource of wealth and wellbeing. The results achieved by these treaties and agreements is a good example of how to strike a balance between the coastal state's interest in the protection of its marine environment and shipping nations' interest in protecting their interest in shipping and navigation. The position of Singapore in the history of the tripartite agreement on the Straits of Malacca TSS is particularly interesting.

On February 24, 1977 a Tripartite Agreement on the Safety of Navigation in the Straits of Malacca and Singapore was signed in Manila by the Foreign Minister of Indonesia, Malaysia and Singapore. The signing of this agreement was the culmination of a process, which started with a joint statement made by the governments of Indonesia, Malaysia and Singapore made in 1971 which stated *inter alia* that any rule relating to the regulation of traffic in the straits would be the concern of the coastal states only,

and that any move to internationalize the straits would not be acceptable.

The joint statement further stated that the safety of navigation in the straits was the joint responsibility of the three coastal states. It is also stated that tripartite cooperation through the straits composed only of three coastal states would be established. The statement also points out that the water of the straits of Malacca and Singapore do not constitute international straits. Their use for international shipping in accordance with principles of international passage was, however, fully recognized. The firm stand in the joint statement reflected the positions of Indonesia and Malaysia, whereas Singapore's position was indicated as merely taking note of the statement.

The Joint Statement of November 16, 1971 described above was a response to a Japanese initiative, which proposed to Intergovernmental Maritime Commission (IMCO) that an internationally recognized traffic separation scheme for the Straits of Malacca and Singapore be established. Prior to this, Japanese interest had conducted hydrographic surveys of the waters in the Straits of Malacca and Singapore and attempted to negotiate with the three riparian states on an equal basis. The Japanese side was constituted by Japanese shipping and oil interest and did not represent the Japanese Government. For this purpose the Straits Malacca Council was established in 1969, the Japanese initiative (unilaterally) to conduct hydrographic surveys, which was prompted by the concern at an increase in volume and density of tanker traffic through the Straits of Malacca and Singapore, was not acceptable to the riparian states of the Straits of Malacca and Singapore especially not to Indonesia and Malaysia which had previously declared the Straits as part of their territorial waters. In fact Indonesia and Malaysia had concluded treaties with Malaysia and Singapore in 1971 and 1972 respectively delineating the boundary between the territorial waters of Indonesia and those of Malaysia and Singapore respectively. The declaration made by the three riparian states in their Joint Statement of 16 November 1971 in which Indonesia and

Malaysia took strong positions with Singapore taking note of these positions was therefore an accurate reflection of the position of the three riparian states on the matter.

To the credit of the Japanese shipping and oil interests, it must be said that once they became aware of the strong positions the riparian state held on the matter they proved to be very cooperative in carrying out the decisions recommended by the technical experts of the three coastal states.

The Tripartite Agreement between Indonesia, Malaysia and Singapore on the Safety of Navigation in Straits of Malacca and the Traffic Separation Scheme of 24 February 1977 were adopted by IMCO on 14 November 1977 by resolution A.375/Res.375 (X) entitled "Navigations through the Straits of Malacca and Singapore". The document has six annexes containing the details of the traffic separation scheme and navigational aids to be installed.

The traffic Separation Scheme which came into effect in May 1980 and was supplemented by a Revolving Fund for the payment of compensation and damages arising out of pollution of the marine environment caused by accidents related to oil spills is an example of successful cooperation between coastal states and shipping interests to overcome a contemporary hazard faced by nations bordering narrow and shallow straits. It shows what can be done when expert groups from nations work together to solve in a pragmatic manner a problem, which in itself is very complicated. The fact that the three ASEAN member countries involved had the political will to solve the problem was important. It was also helpful that the Japanese oil and shipping interest involved were very cooperative.

The experience with the tripartite agreement on the traffic separation scheme in the Straits for Malacca and Singapore had a by-product in the form of an oil spill contingency plan which was later formulated. No significant marine casualty has occurred in the waters off the coast of Indonesia, Malaysia and Singapore to test the contingency plan, so that we cannot say with certainty how it works

in actual fact. The important thing is that it is there and the machinery to respond to marine casualties and oil spills is in place. What is important is that the plan has the support of the Malacca Strait Council and the shipping and oil interests represented in the Japanese bodies involved in the navigation scheme and arrangements in the Straits of Malacca and Singapore.

Experience with the traffic separation scheme in the straits of Malacca and increased activity in offshore production of oil and gas in South East Asia seas has increased considerably the concern and awareness of the need to protect the marine environment providing the impetus for the third area of cooperation in the law of the sea.

This indeed is one of the outstanding features in the development of the law of the sea in the ASEAN seas region. If at first these concern were focused on the protection of the marine environment from oil spills and other hazards created by shipping and offshore installation activities, this increased attention on the part of the ASEAN governments led in particular by the governments of Indonesia, Malaysia, and Singapore later led to policies and measures of a much broader scope related to the protection of the marine environment.

In 1985 and 1987 important decisions were made by ASEAN ministerial meetings, dealing respectively with the protection of the environment and sustainable development of (marine) resources.

On 9 July 1985 an agreement was signed in Bangkok by the ASEAN foreign ministers representing their governments on the conservation of nature and natural resources. Article 1 states *inter alia* that:

- (1) Contracting Parties that share natural resources cooperate concerning their conservation and harmonious utilization, taking into account the sovereignty, rights and interests of the Contracting Parties concerned in accordance with generally accepted principles of international law
- (2) To that end, they shall, in particular:
 - (a) cooperate with a view to controlling, preventing reducing or eliminating adverse environmental effects which may result in

one Contracting Party from the utilization of such resources in another Party

- (b) endeavor to conclude bilateral or multilateral agreements in order to secure specific regulations of their conduct in respect of the resources concerned.

There should also be a duty for advance notifications of pertinent details of plans to initiate, or make a change in, the conservation or utilization of the resource. There is also an obligation to enter into consultation notification of emergency situations or sudden grave natural events which may have repercussions on the environment. Whenever appropriate (sharing) Contracting Parties should engage in joint scientific studies and assessments, with a view to facilitating cooperation with regard to environmental problems related to a shared resource, on the basis of agreed data. Paragraph 3 of Article 19 provides that:

- (3) Contracting Parties shall especially cooperate together and, where appropriate, shall endeavor to cooperate with other Contracting Parties, with a view to:
 - (a) the conservation and management of
 - the border or contiguous protected areas;
 - shared habitats of species listed in Appendix I;
 - shared habitats of any other species common concern
 - (b) the conservation, management and, where applicable regulation of the harvesting of species which constitute shared resources
 - by virtue of their migratory character; or
 - because they inhabit shared habitats

Article 20 states that:

"contracting parties have the responsibility to ensure that activities under their jurisdiction or control do not cause damage to the environment or natural resources under the jurisdiction of other contracting parties or of areas beyond the limits of national jurisdiction."

The article further provides that:

- (1) In order to fulfill this responsibility, Contracting Parties shall avoid to the maximum extent possible and reduce to the minimum extent possible adverse environmental effects of activities under their jurisdiction of control, including effects on natural resources, beyond the limits of their national jurisdiction.
- (2) To that effect, they shall endeavor:
 - (a) to make environmental impact assessment before engaging in any activity that may create a risk of significantly affecting the environment or the natural resources of another Contracting Party or the environment or natural resources beyond national jurisdiction;
 - (b) to notify in advance the other Contracting Party or Contracting Parties concerned of pertinent details of plans to initiate, or make a change in activities which can reasonably be expected to have significant effects beyond the limits of national jurisdiction;
 - (c) to enter into consultation concerning the abovementioned plans upon request of the Contracting Party or Contracting Parties in question;
 - (d) to inform the Contracting Party or Contracting Parties in question of emergency situations or sudden grave natural events which may have repercussion beyond national jurisdiction.
- (3) Contracting Parties shall, in particular, endeavour to refrain from actions, which might directly or indirectly adversely affect wildlife habitats situated beyond the limits of national jurisdiction, especially habitats of species listed in Appendix I or habitats included in protected areas

In a meeting in Jakarta on 29-30 October 1987, the Deputy Minister of Development of Brunei Darussalam, the State Minister of Population and the Environment of the Republic of Indonesia, the Minister of Science, Technology and the Environment of Malaysia, the Secretary of Environment and Natural Resources of the Republic of Philippines, the Minister for the Environment of the Republic of Singapore, and the Minister of Science, Technology and Energy of the Kingdom of Thailand signed the Jakarta Resolution on Sustainable Development. The operative paragraphs of the resolution state:

1. Those ASEAN member countries adopt the principle of sustainable development to guide and to serve as an integrating factor in their common efforts.
2. That ASEAN cooperative efforts be focussed upon those common resources and issues that affect the common well-being of the peoples of ASEAN, including, but not limited to:
 - the common seas;
 - land-resource and land-based pollution;
 - tropical rain-forests;
 - air quality; and
 - urban and rural pollution

The above is a description of attempts within the ASEAN framework to deal with the problem of environmental protection in scientific and ecological terms supported by the political will and policies of ASEAN member governments. As stated earlier this concern for the protection of the environment in the ASEAN region originated with concern for the protection of the marine environment.

VII. CONCLUSIONS

Having sketched in rough outline the main problems and issues of Indonesia's resources and their rational management, I would like to conclude by making the following observations.

- (1) Having established the legal regime of archipelagos over its national territory and obtained international recognition for its archipelagic regime, Indonesia has laid the foundations for rational management of its living resources and non-living or mineral resources, including oil and gas.

The establishment of this legal regime has been strengthened and confirmed by the conclusion of boundary delimitation agreements with neighboring countries. The basis has thus been laid not only for a rational management of Indonesia's national resources, but also for the sustainable development of those resources in cooperation with its neighbors.

- (2) Having achieved the objective of delimiting the boundaries for the exercise of national sovereignty over its resources, it now remains for Indonesia to put the principles of rational resources management and sustainable development into actual practice.

The description given above has tried to show that the record is uneven. Especially with regard to living resources, Indonesia has not adjusted its policies to the new situations created by developments since the 1960s. Policies and practices in this area still very much reflect a continuation of past policies and practices initiated under the Dutch colonial administration.

- (3) A drastic overhaul of policies and practices in the utilization of Indonesia's marine living resources is only possible if badly needed institutional and structural changes are made, first and foremost in the administrative and government apparatus dealing with the utilization of marine living resources. More specifically, the existing structure dealing with the problem – i.e. a Directorate General of Fisheries both for inland and marine fisheries as part of the Department of Agriculture – is grossly inadequate.

For a country of Indonesia's size with its huge national marine space, fisheries and utilization of marine living resources should be entrusted to a separate department or ministry. By way of comparison, Thailand for instance with a much smaller national marine space has a department of fisheries headed by a minister.

- (4) One of the biggest concerns in the utilization of marine resources is the need to protect the marine environment from all possible sources of marine pollution and the degradation of the Indonesian marine environment.

Pollution from offshore installations and activities related to the production of oil and gas is the best managed and gives the least reason for concern.

With regard to ship-or vessel- borne pollution it can be said that pollution caused by marine casualties has been well under control since the establishment of the Tripartite Agreement between Indonesia, Malaysia, and Singapore on the establishment of the traffic separation scheme in the straits and marine environment contingency plans developed since then both on a bilateral basis and in the context of ASEAN cooperation are in place though are not yet tested in actual practice.

Other form of vessel-borne pollution (e.g. the routine cleaning of ballast tanks and other activities related to normal shipping practice) may also be a serious source of marine pollution. The increasingly stringent regulations of the Marpol Convention of 1973 and its amendments if properly implemented should go a long way towards preventing this source of marine pollution from becoming a serious cause of the degradation of the marine environment. We have reason to believe that Indonesia, Malaysia, and Singapore who are all participants of the Marpol Convention and its amendments are doing the best they can do to adhere to its provisions.

The most serious cause of marine pollution and degradation of the Indonesian marine environment is land-based. Until four or five years ago. When several drastic measures were taken to ban several pesticides and insecticides and the use of chemical fertilizers was rationalized, river-borne pollution and air-borne pollution of these substances led to serious marine pollution

At present the more serious potential sources of marine pollution are city and industrial wastes brought into the sea by rivers. This is becoming especially serious in cities with substantial industrial activities such as Jakarta and Surabaya. Improvements need to be made in the legislation and administrative regulations governing city and industrial waste treatment and disposal to prevent these two types of waste from becoming a serious problem in the near future.

- (5) Assuming that all the above measures to protect the marine environment can be carried out, the next question that needs to be addressed is the rational utilization and management of the living resources. Because of structural constraints (i.e. the Directorate general of Fisheries being part of the department of Agriculture and the huge national territory to be administered) fishery and living resources administration management is far from adequate.
- (6) Assuming that the institutional changes can be made in the near future, a clear division of power and functions between the central agency and the provincial offices dealing with fishing and marine resources is of prime importance. Indonesia is a mixed economy where capital-intensive and advanced technology industry works side by side with a subsistence economy. A clearly stated policy on the utilization and rational management of fisheries and living resources giving a rightful place to both interests should be formulated and developed.

Traditional or subsistence fisheries should not be sacrificed for the sake of economically ore attractive forms of marine living resources and industry development. Ways should be found or subsistence fishing, though not very significant in economic terms, is very important from the political point of view.

- (7) Another critical area is coastal zone management. With the rapid growth of cities and industrial development which tends to occur in coastal areas, coastal zone management should be employed to halt the deterioration of mangrove along Indonesia's coast. A better understanding of the problem in recent years has brought some improvements and mangrove destruction is no longer on the scale it was some years ago.
- (8) Assuming that a reasonable balance can be maintained between the maintenance of the traditional or subsistence type of fisheries (which is very important because of its political significance) and the need to expand a modern capital-intensive and technologically advanced fishing industry, the future of Indonesian marine resources utilization and management does not necessarily have to bleak. Stock seems to be abundant, especially in the eastern part of Indonesia and in the exclusive economic zone in general. Some vast stretches are definitely under-utilized, e.g. the whole west coast of Sumatra and the coastal zone south of Java.
- (9) Clear policies and guidelines should be established for investment in living marine resources and fishing industries so as to attain the best result not only from the revenue point of view but also from the point of view of the rational utilization of fisheries and marine living resources and sustainable development. If managed rationally and well, Indonesia's fishing living marine resources are not only adequate for Indonesia's own needs but may well be shared with its neighbors.

As final and perhaps optimistic concluding remark, the problems of resources utilization management and sustainable development in Indonesia marine space are still manageable. Much work remains to be done and careful planning and cooperation between Indonesia and its neighbours interested in the development of Indonesia's marine resources will be needed to reach the best results.