ISSUE FOCUS

Legal Protection of Indonesian Coral Reefs in Papua Province

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Coral reefs are a source of marine diversity that must be protected, not only for the relationship between their ecosystem and other biota, but also for their economic value. Indonesia is an archipelagic country with 116 small islands and groups of small islands that are susceptible to ecological damage. Indonesia possesses a great diversity of flora and fauna, including coral reefs. Indonesia's sea territory is two-thirds the size of its land territory, and much of the nation's ecological diversity lies within this water expanse. As coral reefs form a part of Indonesia's marine diversity, we must protect them. This paper will discuss Indonesian regulations pertaining to the protection of coral reefs with a particular focus on Radja Ampat, Papua. The principal sources of relevant Indonesian statutory law are Law No. 23 Year 1997, regarding Environmental Management, and Law No. 5 Year 1990, regarding Biological Diversity and Ecosystems. These laws may be used to protect marine environments, especially coral reefs. At the international level, the United Nations Convention on the Law of the Sea and the Convention on Biological Diversity complement the laws enacted by Indonesia. Radja Ampat is located in Papua Province, and is known as a premier diving site. Surveys have brought Raja Ampat's total number of confirmed species of coral to 537, representing an incredible 75% of all known coral species. Sadly, marine pollution in Radja Amapt is decreasing both the quality and quantity of coral reefs.

Keywords

Coral Reef, Marine Environmental Protection, Precautionary Principle, Pollute Pays, Biological Diversity, CITES

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I. Introduction

Indonesia is an archipelagic country with 116 small islands and groups of small islands, which are susceptible to ecological damage. Indonesia possesses a great diversity of flora and fauna, including coral reefs. Indonesia's sea territory is two-thirds the size of its land territory, and much of the nation's ecological diversity lies within this water expanse. Indonesian coral reefs lie at the centre of global coral reef biodiversity. Coral reefs are critically important for both the ecosystem and the goods and services that they make possible in maritime tropical and subtropical nations like Indonesia.

One national Profile of Indonesia states that: "As a world center of coral diversity (500 species), with 81,000 km of coastline and 5.8 million km2 of marine area, Indonesia's important marine resources represent a significant management challenge to achieve sustainable levels of development."[1] Indonesia maintains a few national conservation parks, including *Radja Ampat* in western Papua, the biggest marine national park in Indonesia, with abundant ecological diversity. Nonetheless, the sad fact is that the quality and quantity of biodiversity in Indonesia is decreasing yearly, due to various causes, including industry, fishing, natural disasters, and tourism.

A coral reef is a reef consisting of coral consolidated into limestone. More broadly, a coral reef is comprised of aragonite structures produced by living organisms and found in marine waters containing few nutrients.[2] In most reefs, the predominant organisms are stony corals, which are colonial cnidarians that secrete an exoskeleton of calcium carbonate. Coral reefs by definition are composed predominantly of *scleractinian* corals (Phylum *Cnidaria*; Class *Anthozoa*; Order *Scleractinia*). Most *scleractinians*, and particularly those that build reefs, are colonial, anemone-like animals that house microscopic algae and secrete skeletal structures composed of calcium carbonate.[3] Coral reefs most commonly live in tropical waters and have economic value in relation to food security, employment, tourism, pharmaceutical research, and shoreline protection.

Radja Ampat is rich in marine diversity, and scientific research has been taken to examine the reef. The scientists surveyed an area of about 3,700 square miles (6,000 square kilometers). The results revealed was allegedly an extraordinary wealth of marine biodiversity: 450 species of hard coral, more than 600 mollusk species, and possibly as many as 1,100 fish species. The question that immediately arises from this

1 *See* Indonesia, *Country Profile*, *available at* http://www.globaloceans.org/icm/profiles/Indonesia (last visited on Aug. 20, 2009).

2 *See* THE COLUMBIA ENCYCLOPEDIA (6th ed. 2008), *available at* http://www.encyclopedia.com/doc/coral.html (last visited on Aug. 20, 2009).

3 *See* Joanie Kleypas, *Coral Reef*, *available at* http://www.eoearth.org/article/coral_reef (last visited on Aug. 20, 2009).

situation is how to protect Indonesian biodiversity, especially coral reefs in *Radja Ampat*, from activities that will do further harm.

One method to protect the environment is by enacting regulations, either in the form of national legislation or international treaties. Indonesia has enacted Law No. 23 Year 1997, regarding Environmental Management, as an umbrella provision to protect the environment, and also Law No. 5 Year 1990, regarding Biodiversity. There are also international conventions that may be applied in Indonesia, including the United Nations Convention on the Law of the Sea ("UNCLOS") of 1982 and the Convention on Biological Diversity of 1992.

This paper will discuss how Indonesian regulations may be used to protect coral reefs as an important marine ecosystem, and will also incorporate an analysis of UNCLOS and the Convention on Biological Diversity.

II. Principles of Marine Environmental Protection

There are several principals of international environmental law that may be used to protect the marine environment, including, the Precautionary Principle, the State Responsibility Principle, the Principle of Sustainable Development, and the Polluter Pays Principle.

A. Precautionary Principle

The Precautionary Principle is related to the Prevention Principle, which provides that States are to take action in the first instance and, if possible, before damage occurs. The Rio Declaration also states that in order to protect the environment, a precautionary approach shall be widely applied by States according to their capabilities: "Where there are threats of serious or irreversible damage, the lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."[4]

The Precautionary Principle provides guidance in the development and application of international environmental law where there is scientific uncertainty. By this principle, States have to act carefully and with foresight when taking decisions that concern activities that may have an adverse impact on the environment.[5]

4 Rio Declaration on Environment and Development ("Rio Declaration"), Principle 15. *See* U.N. Doc. A/CONF.151/26 (Vol. I, 1992).

5 Philippe Sands, Principles of International Environmental Law I 209 (2003).

The Precautionary Principle is gaining increasing support as part of International Law of the Environment, and should be used where there is otherwise insufficient material to justify action, even if this means acting in advance of full scientific evidential support.[6]

B. State Responsibility Principle

Article 1 of the Draft Article of the Convention on Responsibility of States for Internationally Wrongful Acts[7] declares that: "Every internationally wrongful act of a state entails the international responsibility of a state."[8] Regarding international environmental law, States have the responsibility to protect their territory from any activities that would cause environmental damage. The Stockholm Declaration and the Rio Declaration state that:

> States have, in accordance with the Charter of the United Nations, and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other State or of areas beyond the limits of national jurisdiction. States have the responsibility to ensure that activities within their jurisdiction do not cause damage to the environment.[9]

This responsibility is related to the obligation of all States to respect the rights of other States.

C. Principle of Sustainable Development

In environmental law, this is known as the principle that development that meets the needs of the present without compromising the ability of future generations to meet their own needs.[10] Sustainable development preserves natural resources for the benefit of future generations. Some treaties concerning environmental protection refer to this

6 I.C.J. Reports (1995) at 288. *See* also STUART BELL & DONALD MCGILLIVRAY, ENVIRONMENTAL LAW 48 (5th ed., 2000). *See* UN Doc. A/CN.4/490 & Add. 1-7 (1998); UN Doc. A/CN.4/498 & Add. 1-4 (1999)

7 *R. Wolfrum, Internationally Wrongful Acts, in* 2 EPIL 1398-1403(1995)

8 Charter of the United Nations does not specifically mention the environment, but the Preamble to the Charter states that the United Nations is determined "to promote social progress and better standards of life in larger freedom."

9 *See* Report of the United Nations Conference on the Human Environment ("Stockholm Declaration"), Principle 21 U.N. Doc. UN Doc A/CONF.48/14/Rev.1 (Jan. 1, 1973); Rio Declaration, *supra* note 4 at Principle 2.

10 REPORT OF THE WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT: OUR COMMON FUTURE OF 1987("Brundtland Report") *See* UN Doc. A/42/427. *See* also BELL & MCGILLIVRAY, *Supra* note 6 at 16 (2000).

principle as a concept of sustainable use. The Rio Declaration and Johannesburg Declaration incorporate some principles pertaining to sustainable development.

The Principle of Sustainable Development provides that the right to development must be implemented equitably so as to meet the developmental and environmental needs of present and future generations.[11] In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.[12] Furthermore, all States and people shall cooperate with the essential task of eradicating poverty as an indispensable requirement for sustainable development, in order to decrease the disparities in standards of living and better meet the needs of the majority of the people of the world.[13]

D. Polluter Pays Principle

The Polluter Pays Principle aims at determining how the costs of pollution prevention and control must be allocated. The Polluter Pays Principle requires that the costs of pollution should be borne by the person responsible for causing the pollution and consequential costs.[14] In other words, the polluter must pay. This principle is today a generally recognized principle of International Environmental Law.[15]

National authorities should endeavor to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.[16]

III. Marine Environment Regulation in Indonesia

A. Law No. 23 Year 1997 regarding Environmental Management

Law No. 23 is an umbrella law implemented through regulations. It provides for basic principles of environmental management in Indonesia, namely:

11 Rio Declaration, *supra* note 4 at Principle 3.

12 *Id.* at Principle 4.

13 *Id.* at Principle 5.

14 Sands, *supra* note 5 at 213.

15 Patricia Birnie & Alan Boyle, International Law and The Environment 109 (1992).

16 Rio Declaration, *supra* note 4, at Principle 16.

> Environmental management, which is to be performed based on the principle of national responsibility, the principle of sustainability, and the principle of exploitation, aims to create environmentally sustainable development in the framework of the holistic development of the Indonesian person and the development of an Indonesian community in its entirety which is faithful and devoted to God the Almighty.[17]

Based on the Principle of State Responsibility, on the one hand, and the Principle of the sovereign right to exploit natural resources,[18] on the other, the State guarantees that the use of natural resources will provide the largest possible benefit for the prosperity and quality of life of the community, including both present and future generations. The State also prevents the conduct of natural resources exploitation activities in its jurisdiction that may give rise to adverse impacts on the jurisdictions of other States, and protects the State from the impacts of similar activities occurring outside its jurisdiction. These principles relate to Principle 2 of the Rio declaration 1992, which states that:

> States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.[19]

The other principle is the Principle of Sustainability, which includes the meaning that every person bears an obligation and responsibility to coming generations and to others in the same generation.[20] In implementation of this obligation and responsibility, environmental capability must be preserved. The preservation of environmental capacity becomes a platform for the continuity of development.

Every person (including corporate bodies) in Indonesia has the obligation to protect the environment as follows:

> (1) Every person is obligated to preserve the continuity of environmental functions and protect and combat environmental pollution and damage; and
> (2) Every person carrying out a business or other activity must provide true and accurate information regarding environmental management.[21]

17 Indonesian Law No. 23 1997 on Environmental Management.

18 Sands, *supra* note 5, at 188.

19 Rio Declaration, *supra* note 4, at Principle 2

20 Sands, *supra* note 5, at 199.

21 Indonesian Law No. 23 Year 1997 on Environmental Management, art. 6.

Government has to control all activities relating to the exploitation of natural resources, and so they must make relevant regulations. Article 8 (1) of Law No. 23 (1997) provides that: "Natural resources are controlled by the state and are utilized for the greatest possible public welfare, and the arrangements thereof are determined by the Government." To guarantee the preservation of environmental functions, every business and activity is prohibited from breaching quality standards and standard criteria of environmental damage.[22] In this connection, the Government also has to make quality standards.

The rules of statutory law must be complemented by sanctions, which in this instance consist of administrative sanctions, criminal sanctions and liability to pay compensation. Administrative sanctions provided in Article 25 (1) of Law No.23(1997) state that:

> The Governor/Head of the Level I Region has the authority to carry out administrative sanctions against the party responsible for a business and/or activity to prevent and end occurrence of an infringement, and to deal with the consequences given rise to by an infringement, carry out safeguarding, mitigating and/or remedial measures at the expense of the party responsible for a business and/or activity, except where otherwise stipulated based on Law.

Specifically, Article 27 (1) of Law No.23 (1997) provides that sanctions in the form of revocation of business and/or activity licenses may be imposed in the case of certain infringements. Criminal sanctions include imprisonment for a maximum term of 15 years and a maximum fine of Rp.450, 000,000.

Article 47 of Law No.23 (1997) provides for liability to pay compensation arising from every action infringing the law in the form of environmental pollution and/or damage which gives rise to adverse impacts on other people or the environment. Beside the obligation to pay compensation, persons who pollute the environment are also obligated to carry out certain actions, such as installing or repairing a waste treatment facility such that waste complies with applicable environmental quality standards, restoring environmental functions, and removing or destroying the cause of environmental pollution and/or damage.

B. Law No. 5 Year 1990 regarding Biodiversity

Law No. 5 (1990) was enacted prior to the Convention on Biological Diversity, which was signed in Rio de Janeiro in 1992.[23] Article 2 of Law No.5(1990) refers to conservation

[22] *Id.* at art. 14(1).

[23] The Rio Convention was signed in Rio de Janeiro, Brazil in 1992, and entered into force on December 29, 1993.

of living natural resources, and their ecosystems, based on preservation of the capability and usefulness of living natural resources in their ecosystems in a harmonious and well-balanced manner. Article 3 of Law No.5 (1990) states that: "the purpose of this conservation is to endeavor the realization of conservation of living natural resources and the balance of their ecosystems in order to support the effort to improve community welfare and human living equality."

Conservation of living natural resources and their ecosystems is conducted through the following activities:[24]

- The life buffer system protection;
- Preservation of type diversity of plants and animals together with their ecosystems; and
- Perpetuality of living natural resources and their ecosystems.

The law contains various articles prohibiting activities which may cause damage to living natural resources:

a. Every person is prohibited from conducting activities that may result in change to the integrity of a nature reserve zone;[25]
b. Every person is prohibited from catching, injuring, killing, storing, possessing, nurturing, transporting and trading in protected animals whether in live condition or dead condition;[26]
c. Every person is prohibited from taking any protected animal from a place in Indonesia to another place inside or outside Indonesia;[27] and
d. Every person is prohibited from conducting activities that may result in change to the integrity of the core zone of a national park.[28]

Exceptions from the prohibitions set out in points (b) and (c) may only be made for purposes of research, science, and/or salvage of relevant plant and animal species, with a permit from the Government. Article 36 of Law No.5 (1990) provides the utilization of wild plant and animal species for which exceptions may be granted:

a. Study, research and development;
b. Breeding;
c. Demonstration;

Indonesia ratified it in 1994.

24 Indonesian Law No. 5 year 1990 on Biodiversity, art. 5.

25 *Id.* at art. 19.

26 *Id.* at art. 21.

27 *Id.* at arts. 21 and 22.

28 *Id.* at art. 33.

d. Exchange; and
e. Drug herb cultivation.

Perpetual utilization of living natural resources and their ecosystems may be conducted through the following activities:

a. Utilization of natural conservation zone in environmental condition; and
b. Utilization of wild plant and wild animal species.[29]

Breaches of some provisions of this law may result in criminal sanctions with a maximum prison term of 10 years and/or fine of Rp. 200,000,000.[30]

Indonesia has also signed and ratified the Convention on Biological Diversity, 1992.[31] This is an international agreement pioneered by the United Nations. The objectives of this Convention are to conserve biological diversity around the world; to enhance its sustainable use; and to ensure an equitable sharing of benefits linked to the exploitation of genetic resources.[32] The Convention also emphasizes the exchange of information and cooperation between countries.

Under Article 5 of the Convention, all parties must co-operate for the conservation and sustainable use of biodiversity, in respect of areas beyond national jurisdiction and or other matters of mutual interest. In this regard, Indonesia may cooperate with other States to protect its coral reefs.

Article 7 of the Bio-Diversity Convention further provides that each party to the Convention is required, as far as possible, to adopt the following more specific measures: identify components of biodiversity important for conservation and sustainable use; monitor these components while paying particular attention to those requiring urgent conservation measures and those which offer the greatest potential for sustainable use; and identify and monitor the effect of processes and categories of activities which have or are likely to have significant adverse impact on the conservation and sustainable use of biodiversity.

C. State Minister of the Environment Decree No. 4 Year 2001 regarding Coral Reef Standards

Coral reef standards are intended to establish criteria for measuring changes in the physical characteristics of coral reefs against defined limits of the changes that they can

29 *Id.* at art. 26.
30 *Id.* at art. 40.
31 *Supra* note 21.
32 The Convention on Biodiversity of 1992("CBD"), art. 1.

withstand. Pursuant to this decree, heads of local and regional governments (i.e., regents, mayors and governors) have the duty to protect the marine environment, especially coral reefs. The decree requires these officials to make a report to the Ministry of Environment once every five years regarding the condition of coral reefs in their area of jurisdiction. These reports must describe the condition of coral reefs, whether good or bad. Regents, mayors and governors must create programs for the prevention, reinstatement and repair of coral reefs.[33] If coral reefs are in bad condition, they must monitor the reinstatement and repair, evaluate their effectiveness within one year, and report results to the Ministry. Regional and local governments are required to control activities that may negatively impact or cause damage to coral reefs, particularly in the case of coral reefs located in conservation areas, and they are required to coordinate their activities with other agencies such as those involved with forestry and marine affairs.[34]

Protection of coral reefs is not only the duty of government, but also of society. Any person suspecting or knowing of damage to coral reefs has the duty to report it to the relevant authorities such as police, regents or mayors.[35]

The annex to this decree classifies reefs according to their condition. The annex states that a corral reef is in:

- Bad Condition if 0 - 24, 9 % of the reef's coral remains alive;
- Middle Condition if 25 - 49, 9 % of the reef's coral remains alive;
- Good Condition if 50 - 74, 9 % of the reef's coral remains alive; and
- Very Good Condition if 75 - 100 % of the reef's coral remains alive.

IV. International Law of Marine Environment

Indonesia has also ratified a number of conventions dealing with protection of the marine environment, including the United Nations Convention on the Law of the Sea (UNCLOS) and the Convention on Biological Diversity. The Stockholm Declaration 1972 and Rio Declaration 1992 may also be used to protect the marine environment.

A. The United Nations Convention on the Law of the Sea of 1982[36]

33 Indonesian State Minister of the Environment Decree No. 4 Year 2001 regarding Coral Reef Standards, art. 6

34 *Id.* at art. 9.

35 *Id.* at art. 10.

36 The United Nations Convention on the Law of the Sea("UNCLOS"). 1833 U.N.T.S. 396 (1982). The UNCLOS

UNCLOS entered into force in 1994 after being ratified by 60 countries, and is now ratified by a majority of the world's States. It may therefore be concluded that UNCLOS has attained general acceptance in the world.

Article 192 of UNCLOS provides that States have the obligation to protect and preserve the marine environment.[37] With respect to threatened coral reefs and fisheries resources, this provision has not been fully implemented in Indonesia, because in fact some marine environments are polluted and their coral reefs are damaged.

With respect to the exploitation of their own natural resources, Article 193 provides that "States have the sovereign right to exploit their natural resources pursuant to their environmental policies and in accordance with their duty to protect and preserve their marine environment."[38] Article 195 (2) of UNCLOS further provides that:

> States shall take all necessary measures to ensure that activities under their jurisdiction or control are so conducted that they do not cause damage by pollution to other States and their environment, and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights in accordance with the present convention.

In the context of UNCLOS, there are at least six potential sources of marine pollution:

- Activities in the area;
- Land-based activities;
- Seabed activities;
- Dumping;
- Vessels; and
- The atmosphere.[39]

Pursuant to various articles of UNCLOS, Indonesia has the obligation to protect and preserve its marine environment, including by giving notice of imminent or actual damage and developing pollution contingency plans and scientific research,[40] as well as monitoring, and carrying out environmental assessments of certain activities.[41]

comprises 320 articles and nine annexes, governing all aspects of ocean space, such as delimitation, environmental control, marine scientific research, economic and commercial activities, transfer of technology and the settlement of disputes relating to ocean matters. The full text is *available at* http://www.imo.org (last visited on Aug. 20, 2009).

37 UNCLOS, at Part XII.

38 *Id.* at art 193.

39 UNCLOS, arts. 207-212.

40 *Id.* at arts. 198-200.

41 *Id.* at arts. 204-206. *See* Rio Declaration, Principle 17.

UNCLOS establishes a framework of rules within the Law of the Sea for the protection of the marine environment, particularly in Part XII. Professor Philippe Sands maintained that: "The freedom of states to pollute the marine environment is no longer permissible and the obligation to develop specific rules to give effect to the general obligations of UNCLOS is reinforced."[42]

Under UNCLOS, the protection of coral reefs falls within the national jurisdiction, with Article 6 providing that: "In the case of islands situated on atolls or of islands having fringing reefs, the baseline for measuring of breadth of the territorial sea is the seaward low-water line of reef."[43]

B. The Convention on Biological Diversity of 1992

The preamble of this Convention states that conservation of biological diversity is a common concern of humankind, and that although States have sovereign rights over their own biological resources, they are also responsible for conserving their biological diversity and for using their biological resources in a sustainable manner.[44] In light of concern that biological diversity is being significantly reduced by certain human activities, this Convention calls upon mankind to manage human activities that threaten marine diversity.

The objectives of this Convention, to be pursued in accordance with its provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and appropriate funding.[45]

Article 3 of the Convention provides that while States have the sovereign right to exploit their own resources, they are also responsible to ensure that all activities in their jurisdiction do not cause damage to the environments of other States.[46] The Cooperation Principle is found in this Convention and requires that:

> Each Contracting Party shall, as far as possible and as appropriate, cooperate with other Contracting Parties, directly or, where appropriate, through competent international organizations, in respect of areas beyond national jurisdiction and on other matters of mutual interest, for the conservation and sustainable use of

42 Sands, *supra* note 5, at 296.

43 Mary Davidson, *Legal Protection for Coral Reef, in* CORAL REEF RESTORATION HANDBOOK 153 (W. PRECH, ED. 2006).

44 *See History of the Convention, available at* http://www.cbd.int/history (last visited on Aug. 20, 2009).

45 CBD, art. 1.

46 This principle is similar to Principle 21 of the Stockholm Declaration and Principle 2 of the Rio Declaration.

biological diversity.[47]

States have several obligations set out in this Convention, such as:

To develop national biodiversity strategies, plans and programs and to identify the most important actions it must take to ensure the conservation and sustainable use of its biodiversity;[48]

To identify ecosystems, habitats, species and genetic resources important to the conservation and sustainable use of its biodiversity;[49] and

To establish a system of protected areas or other areas where special measures are taken to conserve biodiversity in-situ, relating to the use of systematic processes to identify critical areas for the conservation of biodiversity.[50]

C. Convention on International Trade in Endangered Species of Wild Fauna and Flora ("CITES")

CITES was signed in 1973 and amended in 1979. CITES is an international agreement for species conservation and protection, and the only international instrument for endangered species trading. In relation to the protection of coral reefs, Article IV is entitled "Regulation of Trade in Specimens of Species Included in Appendix II" and may be used to protect coral reefs. There are three appendices to CITES:

- Appendix I lists species that are the most endangered among CITES-listed animals and plants.[51] They are threatened with extinction, and CITES prohibits international trade in specimens of these species except when the purpose of the import is not commercial.[52]

- Appendix II lists (a) all species which although not necessarily now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival; and (b) other species which must be subject to regulation in order that trade in specimens of certain species referred to in sub-paragraph (a) of this paragraph may be brought under effective control. It also includes so-called "look-alike species", i.e. species of which the specimens in trade look like those of species listed for

47 CBD, *supra* note 32, at art 5.

48 *Id.* at art. 6.

49 *Id.* at art. 7(a). *See* also Report of the Second Global Biodiversity Forum, Nassau Bahamas: IUCN 996.

50 *Id.* at art. 8(a).

51 CITES, art. 2, para. 1.

52 *Id.* at art. 3.

conservation reasons.[53]

- Appendix III is a list of species included at the request of a party that already regulates trade in the species and that needs the cooperation of other countries to prevent unsustainable or illegal exploitation.[54]

Coral reefs are included in Appendix II. Article IV further states that international trade in specimens of Appendix-II species may be authorized by the granting of an export permit or re-export certificate. No import permit is necessary for these species under CITES (although a permit is needed in some countries that have taken stricter measures than CITES requires). Permits or certificates should only be granted if the relevant authorities are satisfied that certain conditions are met, above all that trade will not be detrimental to the survival of the species in the wild.[55]

Coral reefs are one sea commodity that is traded as a variety of products, including live reefs for food fish, traditional food fish, curios, traditional medicines, live marine ornamentals, coral and live rock for aquaria, limestone production, and construction materials. Each of these arenas has its own set of issues, management regimes, and industries but all are subject to some degree of international control or scrutiny.[56] According to some studies the analysis of CITES records for black corals (from 1982-1997) and stony corals (from 1985-1997) revealed that 70 nations imported a total of 19,262 tons from 120 exporting nations over this period.[57]

The opening paragraph of the Convention explicitly recognizes that each species of wild fauna and flora is an integral component of the natural ecosystem in which it is found. It also acknowledges that wild fauna and flora are to be conserved in perpetuity, in the wild.

V. Indonesian Marine Diversity

Indonesian marine life is one of the largest sources of biological diversity in the world. Indonesia has 51% of Southeast Asia's reefs, and is home to 16% of the world's coral reefs. These coral reefs are among the most biologically rich in the world, containing the greatest diversity of reef fish. Unfortunately, at least one scientist has found that as

53 *Id.* at art. 2, para. 2.

54 *Id.* at art. 2, para. 3.

55 *Id.* at Appendix.

56 *See* Susan Lieberman & John Field, *Global Trade and Consumer Choices: Coral Reefs in Crisis, available at* http://www.aaas.org/international/coralreefs (last visited on Aug. 20, 2009).

57 *Id.*

much as 86% of Indonesia's reefs are severely threatened by human activities.[58] To protect the nation's marine diversity, the Indonesian government has established some marine national parks and nature reserves:[59]

a. *Karimun Jawa* National Marine Park in Java;
b. *Bunaken* National Marine Park in North Sulawesi;
c. *Taka Bone Rate* National Marine Park in Central Sulawesi;
d. *Wakatobi* National Marine Park in East Sulawesi;
e. *Kepulauan Seribu* National Marine Park in Java;
f. *Sawu* Sea Nature Reserve in Sumba/Timor;
g. *Anambas* Sea Nature Reserve in Riau Sumatra;
h. *Banda Naire* National Park in Maluku;
i. Sea Nature Reserve *Kaimana* in Papua;
j. Sea Wildlife reserve *Raja Ampat* in Papua;
k. Sea Nature Reserve *Sambas* Borneo; and
l. Sea Nature Reserve *Sebatik* Borneo.

Coral reefs are the weakest marine ecosystem, because they are fragile, and easily damaged. For this reason, it is important to manage the coral reef ecosystem. According to Tomascik Research, 1997, Indonesian coral reefs extend approximately 85,707 km, comprising:

- Fringing reefs	14.542 km
- Barrier reefs	50.223 km
- Oceanic platform reefs	1.402 km
- Atolls	19.540 km

A. The Sources of Coral Reef Damage in Indonesia

There are several sources of coral reef damage in Indonesia, such as:[60]

- Sedimentation, arising from the impact of mining and agriculture activities on river streams, and also deforestation of mangroves, damaging the land and causing erosion. Eroded land is drawn into rivers and flows into the sea as sludge and sand, covering coral reefs and causing damage;

58 *See* World Resources Institute, *Scientists call for better management of Indonesia's Coral Reef* (2002), *available at* http://www.wri.org (last visited on Aug. 20, 2009).

59 *See* Indonesian Ministry of Marine Affairs and Fisheries, Development Prospect Regional Protected Marine Area, *available at* http://www.dkp.go.id. (last visited on Aug. 20, 2009).

60 Supriharyono, *Coral Reef Damage and its Management in Indonesia,* Inaugural Speech at Diponegoro University, Semarang of 2003.

- The use of poison or small dynamite for fishing causes damage to coral reefs, because of their fragility. The damage done to coral reefs also decreases the stock of fish, which live in the coral reefs;

- Water drainage is a source of marine pollution arising from land-based activities, such as industry, domestic waste and tourism. River water flows to the sea, so if a river is polluted, sea pollution also results. Moreover, the particular substances comprising fertilizer and similar products increase the fertility of algae, covering a coral reef. Coral reef damage results when the algae cover depletes oxygen and blocks sunshine from reaching the reef;

- Land reclamation also damages coral reefs, because of the additional land mass heaped on shorelines, as does the exploitation of beaches;

- Beach tourism activities, especially in sea areas with beautiful coral reefs and fish, must be managed carefully. Tour boats need to follow instructions, such as how to throw their anchors into the sea, and not to dump or leak fuel oils into the sea, because these activities may damage coral reefs. Divers must be qualified with diving licenses, to ensure that they do not stand on coral reefs and engage in other harmful activities;

- Trade in coral reefs and fish for aquarium or other purposes includes trade in coral reefs as accessories. This activity plainly causes damage to coral reefs by decreasing stocks in the wild; and

- Global warming can cause sea temperatures and levels to rise, causing damage to coral reefs.

B. Protection and Preservation of Coral Reef in Indonesia

There are several ways for protecting and preserving Coral Reef in Indonesia.[61]

a. Increasing social awareness of the importance of coral reefs, namely, the role of coral reefs as a source of biodiversity in Indonesia. Society has a role to play in maintaining the environment, and in particular, the marine environment. The socialization of the preservation of coral reefs, as an important part of the sea ecosystems where sea inhabitants live and feed, is necessary. Coral reefs may be viewed as a national commodity, used in cosmetics, foods and medicines.

b. Coral reef management may be conducted not only by the government, but also by local peoples. At several places in Indonesia, such as Kepulauan Seribu

[61] *Id. See* also Department of Forestry Republic of Indonesia, *available at* http://www.dephut.go.id (last visited on Aug. 20, 2009).

(Thousand Islands) Sea Park, local residents manage a coral reef preservation area producing coral reefs to be sold, including as handmade accessories, so that they do not extract the remaining coral reef. The government helps by accommodating the preservation area and giving training on coral reef preservation.

c. Coordination is necessary among government institutions, in the area of coral reefs preservation, such as the Department of Seas, the Department of Forestry and the State Minister for the Environment, as well as regional governments.

d. Monitoring activities related to the preservation of coral reefs, including training local authorities to whom local residents may report any violation of rules for the protection of coral reefs or any or damage to coral reefs, including information dissemination on other issues related to coral reefs.

e. Law enforcement is vital in curbing coral reef damage. Indonesian laws and regulations are sufficient to protect coral reefs from damage. However, the more important question is whether the authorities are willing and able to enforce laws and regulations.

C. Rehabilitation and Repair

The difficult tasks are rehabilitation and repair damaged coral reefs, which require significant time, and cost significantly more money than prevention. There are two means to rehabilitate and repair damage done to coral reefs:[62]

a. Zoning (division into several zones). Rehabilitation and repair of coastal ecosystems requires that the coast be divided into several zones. Each zone is treated by a different response, depending on the zone's condition and utilization. The public may still make use of some zones, although other zones may only be used for research and conservation.

b. Rehabilitation and repair of coral reefs may be done by active rehabilitation such as increasing the population of coral reef species, and decreasing algae volumes. It is also important to improve specific fish populations that are deeply integrated into coral reef ecosystems, and to increase mangrove forest coverage to reduce coastal abrasion.

[62] *See* Ministry of Marine Affairs and Fisheries Regulation Number 02/Men/2009 on Marine Conservation Zone. *See* also National Secretariat CTI-CFF Indonesia, Ministry of Marine Affairs and Fisheries Coral Triangle Initiative, Indonesia National Plan Actions (2009).

VI. Protecting Papua Marine Diversity

A. Papua Marine Diversity

Indonesian marine diversity, widely considered to be among the richest in the world, is on full display at *Radja Ampat* (Four Kings), which is very popular with divers and specifically protected as a sea wildlife reserve by Minister of Forestry Decree No. 81/KPTS-II/93. Some research has been done, proving the richness of life in this area.[63]

Raja Ampat, located in western Papua in the eastern part of Indonesia, is an archipelago encompassing more than 9.8 million acres of land and sea off the northwestern tip of Indonesia's West Papua Province. *Raja Ampat* is part of the Coral Triangle, the heart of the world's coral reef biodiversity. *Radja Ampat* encompasses the four large islands of Waigeo, Batanta, Salawati, and Misool, instead of hundreds of smaller islands. This archipelago is part of an area known as the Bird's Head functional seascape, which also contains Cenderawasih Bay, the largest marine national park in Indonesia.

Photo 1: *Raja Ampat* Islands

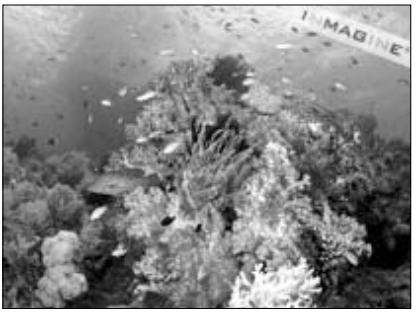
Source: http://www.rajaampat.org (last visited on Aug. 20, 2009)

An international team of marine biologists who visited the *Raja Ampat* recently to examine the reefs said that they found what may be an unparalleled array of species-corals, fishes, and mollusks-including some species never seen before. [64]

63 *See* Asia Center for Marine Protected Areas, *The Raja Ampat Islands* (2002).

64 *See* John Roach, *Coral Reef Paradise Found in Remote Indonesian Islands, in* NATIONAL GEOGRAPHIC (Aug. 2001), *available at* http://news.nationalgeographic.com/news/ 2001/08/ 0808_ irianjayacoral.html (last visited on Aug. 20, 2009).

Photo 2: Beautiful Coral at *Raja Ampat*



Source: http://www.inmagine.com/rds107/rds107320-photo (last visited 20 Aug. 2009)

In 2002, the Nature Conservancy and its partners conducted a scientific survey of the *Raja Ampat* Islands to collect information on its marine ecosystems, mangroves, and forests. The survey brought *Raja Ampat*'s total number of confirmed corals to 537 species, an incredible 75% of all known coral species. In addition, 899 fish species were recorded, raising the known total for *Raja Ampat* to an amazing 1,074. This survey continued in 2006, which covered the eastern coastline of Papua from *Cenderawasih* to *Kaimana*, including the world's biggest nesting area for leatherback turtles, and the migratory activity of sperm and *Bryde*'s whales, as well as orcas and several species of dolphin. The result of this study discovered over 50 new species, including previously unrecorded specimens of fish, mantis shrimp and corals.[65]

B. Protection of the Marine Environment

It is a sad fact that the marine environment in Papua is deteriorating. The deterioration arises first and foremost from the increasing size of the local population, which places a premium on income earned from marine tourism. In addition, other sources of damage to the Papua marine environment include:[66]

a. Global warming, because rising sea temperatures are a direct cause of death for coral reefs;
b. Exposed or shallow reefs at reef edges tend to cause ocean waves to break, showing white foam as the cresting waves appear;

[65] R. Donnelly, D. Neville, & P. Mous, Report: The Nature Conservancy Southeast Asia Center for Marine Protected Area (2003). *See* also *Conservation International's 2006 Expedition, available at* http://www.dive-the-world.com/reefs-and-park-Indonesia-2006 (last visited on Aug. 20, 2009).

[66] Agung Trihandono, *Kelestarian Terumbu Karang Dihadapkan Desakan Kebutuhan Ekonomi Masyarakat* (Coral reef protection and the need of local society), Indonesian Ministry of Marines Affairs and Fisheries (Sept. 2007).

c. Net and spear fishing cause direct damage to coral reefs and take some young fish or egg fish along with other kinds of fish;
d. Use of coral reefs as marine ornaments; and
e. Illegal trade of coral reefs and endangered species of marine flora and fauna.

The above activities not only cause damage to the marine environment generally, but especially to coral reefs. Efforts to protect the marine environment in Papua may include:[67]

a. Only sustainable fishing is permitted in Papua, such as following a generations-old practice of restricting fishing and line fishing, although in some areas which are particularly rich with diversity, fishing is further restricted or not permitted;
b. Traditional management of coral reefs with public participation;
c. Enforcement of regulations intended to protect the marine environment in Indonesia generally and Papua in particular; and
d. Creation of an effective monitoring for to all activities in Papuan waters.

In June 2009, Indonesia hosted the World Ocean Conference in Manado. As a result of this conference, six Coral Triangle Initiative ("CTI") Countries are focusing on preparing and agreeing on a Regional Action Plan to protect coral reefs.[68] The CTI initiative is intended to preserve and protect coral reefs in the region within the context of sustainable development of marine resources.[69]

The Coral Reef Triangle is home to the largest number of diverse coral species on the planet, and while it remains relatively healthy right now, researchers know that it is only a matter of time before climate change and pollution do their damage. This is the crux of the need to put in place appropriate laws and regulations now.[70] The World Ocean Conference also set out a six-step plan for saving the world's coral reefs:[71]

a. Allow margins of error in extent and nature of protection, as insurance against unforeseen threats;
b. Spread risks among areas;
c. Aim to create networks of protected areas which (a) protect all the main types of

67 *See* (Coral Reef Rehabilitation and Management Program (COREMAP) II) *National Policy and Strategies for coral reef management*, *available at* http://www.coremap.or.id. *See* also *Direkorat Marines Affairs and Coastal area, available at* http://www.KP3K.dkp.go.id (last visited on Aug. 20, 2009).

68 The Coral Triangle Countries members are Indonesia, Malaysia, Philippines, Papua New Guinea, Solomon Islands and Timor Leste.

69 CTI Summit Meeting 2009, *available at* www.cti-secretariat.net/cti-summit (last visited on Aug. 20, 2009).

70 World Ocean Conference 2009, *available at* http://www.woc2009.org/woc (last visited on Aug. 20, 2009).

71 Report of World Ocean Conference (Manado, 2009). *See* also Jaymi Heinbuch, *6 steps to Saving the World's Coral Reefs, available at* http://www.treehugger.com/files/2009 (last visited on Aug. 20, 2009).

reef creatures, processes and connections, known and unknown; (b) achieve sufficient protection for each type of reef habitat type, and for the whole region; (c) achieve maximum protection for all reef processes (d) contain several examples of particular reef types to spread the risk;

d. Protect whole reefs where possible; place buffer zones around core areas;
e. Allow for reef species to spread over a range of distances, especially 20 km; and
f. Use a range of conservation approaches, including marine protected areas.

The purpose of the laws and regulations is to ensure that even in areas where research about problems like global climate change, over-fishing, and pollution is sparse, there are nonetheless steps that may be taken to preserve the habitat. However, one of Indonesia's greatest weaknesses is in the management and monitoring of coral utilization, especially live coral trade. The Government needs input and advice for reviewing the existing regulations and cooperation with other stakeholders to improve management mechanisms.

The Precautionary Principle, as discussed above, can be applied to protect the marine environment in Papua. Principle 15 of Rio Declaration on Environment and Development states that:

> In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

The preamble of Ministerial Declaration of the International Conference on the Protection of the North Sea reflected a consciousness that States must not wait for proof of harmful effects before taking action, since damage to the marine environment can be irreversible or remedial only at considerable expense and over long periods.[72]

VII. Conclusion

Indonesia is an archipelagic state with amazing marine biodiversity, especially in national marine parks like *Radja Ampat* in Papua. Coral reefs are some of the important marine diversity related to food security and have economic value. Indonesian laws, such as Law No. 23 (environmental management) and Law No. 5 (biodiversity),

[72] Sands, *supra* note 5, at 209.

discussed above, state that every person is obliged to preserve the continuity of environmental functions and protect and combat environmental pollution and damage. Natural resources are controlled by the state and are utilized for the greatest possible public welfare, and the arrangements thereof are determined by the Government. International conventions such as UNCLOS, CBA and CITES, require that Indonesia protect its environment, including its marine environment. Indonesia must also act to protect coral reefs as an important source of Indonesian marine biota, which is among the most biologically rich in the world, containing a great diversity of reef fish. Indonesia is obligated to protect its environment, including its marine environment, by reason of its having ratified UNCLOS and the Biodiversity Convention. There are additional ways to protect Indonesian coral reef as mentioned in the 2009 World Ocean Summit. Furthermore, Indonesia as a member of Coral Triangle Initiative, has its own Action Plan to manage their coral and fish diversity. The Ministry of Marine Affairs and Fisheries and Department of Forestry play their role to protect Indonesian coral reef. Present regulations should be sufficient to permit Indonesia to protect its coral reefs, but unfortunately recent research finds that the quality of coral reefs in Papua continues to decline annually.