



LAW
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LEGAL REGIME TOWARDS PROTECTING CORAL REEFS:
AN INTERNATIONAL PERSPECTIVE AND INDIAN SCENARIO

Rajesh Sehgal



VOLUME
2/2

LEAD Journal (Law, Environment and Development Journal)
is a peer-reviewed academic publication based in New Delhi and London and jointly managed by the
School of Law, School of Oriental and African Studies (SOAS) - University of London
and the International Environmental Law Research Centre (IELRC).

LEAD is published at www.lead-journal.org
ISSN 1746-5893

*The Managing Editor, LEAD Journal, c/o International Environmental Law Research Centre (IELRC), International Environment
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Rajesh Sehgal*

*This document can be cited as
Legal Regime Towards Protecting Coral Reefs:
An International Perspective and Indian Scenario',
2/2 Law, Environment and Development Journal (2006), p. 183,
available at <http://www.lead-journal.org/content/06183.pdf>*

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* The Author is thankful to the Ministry of Environmental & Forest (MoEF), Govt of India for providing financial support for the project titled 'National Actions for Conservation of Coastal & Marine Biodiversity Pursuant to CBD and Synergies with other MEAs'. Author is also thankful to Ms Nidhi for providing the research assistance in writing this article. The views expressed in this paper are entirely the author's view and should not be attributed either to IUCN, WWF or MoEF.

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1

INTRODUCTION

The coral reef ecosystem performs a range of functions. It provides a habitat to fish and protects coastlines from erosion and natural calamities. Corals are home to a variety of species of plants and animals thus, constituting an important link in the marine biodiversity. Millions of people depend on coral reefs for their sustenance and livelihood, yet these vital resources are in great danger today. 27 per cent of the world's coral reefs have been lost and it is estimated that another fourteen per cent will be destroyed in the next ten to twenty years.¹ This beautiful ecosystem faces threats due to human activities. The causes of this loss attributable to human action fall into four major categories: over fishing, pollution, sedimentation and climate change.²

The current legal regimes towards protection of coral reefs are often inadequate. Though, the international community has already begun to address the crisis in the last decade, the efforts have not had any effect to stave off the large-scale disappearance of coral reefs. While there exists a wide array of local, State, national, and international initiatives that attempt, in varying degrees, to protect and preserve these ecosystems, the primary focus of this note is on the principal national (India) and international legal instruments that may provide for coral reef protection.³

The next section of this brief note explains the importance of coral reefs to humans and the human-caused threats to reef ecosystems. This part also describes the condition of coral reefs and the difficulty in understanding their perilous situation. Part III examines India's efforts to preserve coral reefs and

potential sources of law and policy assistance for reef conservation. Part IV looks at international legal instruments (MEAs) that currently address coral reef preservation and other soft-law mechanisms that could be used to protect reefs. The final two sections set forth recommendations for increased legal and policy protections for coral reefs in the world and some identified gaps in light of the crisis that confronts the existence of reefs in India.

2

THE IMPORTANCE OF REEFS TO HUMANS

To a layman, coral reefs may look like a bunch of rocks, but they are actually extremely complex ecosystems of plants and animals that occur primarily in shallow tropical waters. They are also some of the most ancient and biologically diverse ecosystems on the planet. In fact, though they occupy less than a quarter of one percent of the earth's marine environment, they are home to more than a quarter of all known marine fish species.⁴

The disappearance of coral reefs could have disastrous consequences for both human and marine life. In many communities around the globe coral reefs are a vital source of food, a draw for much needed tourist dollars, and a protective buffer for vulnerable coastlines. One-fifth of all protein consumed by humans comes from marine environments, and one billion people in Asia alone depend on reefs for their food.⁵ Reefs all over the world protect shorelines from natural calamities like Tsunami and hurricane waves and serve as breakwaters for islands. Many of the small Caribbean island economies are dependent on the coral reefs. If the reefs fail completely, an important food and medicine source and many island economies would be devastated.

1 W. Clive, 'Status of the Coral Reefs of the World', in *Report of the Global Coral Reef Monitoring Network (GCRMN)* (2004).

2 Convention on Coral Reefs (Background paper by UNEP Coral Reef Unit in Collaboration with and WWF Coral Reefs Advocacy Initiative, 2003).

3 Due to the limitation, I have chosen to consider the international legal instruments with the widest possible application. However, this in no way diminishes the importance of locally based initiatives, which in the end may be the most sustainable approach to ecological problems.

4 Dirk Bryant et al., *Reefs at Risk: A Map Based Indicator of Threats to the World's Coral Reefs* 9 (1998).

5 *Id.*

A. Human Stresses to the Reefs

Coral reefs are distributed throughout the world in 101 countries and covers an estimated 284,300 square kilometres (110,000 square miles), yet they make up only one-tenth of one percent of the total ocean area.⁶ Still this small region is home to approximately one-fourth of all marine species of the world. Since underwater exploration and marine science only developed in the last couple of decades with the advent of scuba diving, scientists do not know how many species are housed in coral reefs. As per an estimate, there are more than four thousand species of fish alone on coral reefs. It is somewhat ironic that coral reefs, among the richest ecosystems on the planet in terms of biodiversity, tend to exist in areas with high human population concentrations and in the economically poorest regions of the world. As population pressures force more and more fishermen to chase fewer and fewer fish, their techniques become more extreme. Factory type fishing trawlers that scrape the sea floor clean are one of the biggest destroyers of both fish stocks and coral reefs. In some developing countries including India, fishermen use dynamite to blast the reefs, which stuns and kills all marine life in the area.⁷

Another common practice used to supply live reef fish to restaurants and the aquarium market involves squirting cyanide to stun tropical fish. In the process, the fishermen kill much of the surrounding coral. Despite laws that make cyanide fishing illegal, more than one million kilograms of cyanide have been used on reefs in the Philippines since the 1960s, and the practice of cyanide fishing is spreading to regions as far away as Africa. Though cyanide is not used in India for catching fish, a new trend – use of organochlorines – has been noticed in the Gulf of Kutch.⁸ Though, not much details about these fishermen and their *modus operandi* is available, it is certain that reef poisoning is happening.

Coral reefs are highly sensitive to climatic influences and appear to be among the most sensitive of all

ecosystems to temperature changes. Some scientists believe that climate change and ozone depletion currently pose the greatest threats to corals. During the nine months of 1998 in which scientists recorded the largest ever El Niño and La Niña climate changes, approximately sixteen percent of the world's reefs were destroyed by a phenomenon called 'coral bleaching'.⁹ The increase in greenhouse gases resulting from human activity is likely to raise the Earth's average temperature from one to three degrees Celsius during the next century, introducing 'new stresses to coastal and marine ecosystems, which are already under multiple stresses'.¹⁰ Klaus Toepfer, Executive Director of UNEP, says that 'each of these pressures [increased ocean temperatures, overfishing, poisons, sedimentation, sewage, and fertiliser run-off] is bad enough in itself, but together, the cocktail is proving lethal [to coral reefs]'.¹¹ Just as human activity is the main cause of reef degradation, human activity is required to ensure the future survival of coral reefs.

3

LEGAL AND POLICY FRAMEWORK IN INDIA TOWARDS PROTECTING CORAL REEFS

India, despite having approximately a 6000 km long coast line, has very few coral reefs off its mainland coast. Corals are mostly concentrated around the Gulf of Kutch to the northwest, and the Gulf of Mannar in the southeast. Reefs are highly developed in the area of Lakshadweep and the Andaman and Nicobar islands. Total coral reef area in India is approximately 5790 km² with almost 270-300 numbers of species.

The legal regime towards protection of Coral Reefs in India is still non-existent. Though, Government of India (GoI) has taken initiatives to protect coral reefs. The Ministry of Environment and Forest as a nodal ministry has been entrusted with the task of monitoring, conservation and management of coral reefs in India.

6 United Nations Environment Programme-World Conservation Monitoring Centre, *New Atlas Maps the World's Fast Disappearing Coral Reefs*, available at http://www.unep-wcmc.org/marine/coralatlas/PRESs_RELEASE.htm (2001) [hereinafter UNEP-WCMC].

7 M. Spalding et al., *World Atlas of Coral Reefs* 55-58 (2001).

8 D. Apte, 'The Poison Tide, Green Governance', 7-8 *Quarterly Newsletter on Biodiversity and Business* 51, 52 (2005).

9 Spalding et al., note 7 above at 59.

10 *Id.*

11 UNEP-WCMC, note 6 above.

The Indian Coral Reef Monitoring Network and the Indian Coral Reef Initiative were established in late 1990s to provide a cross-sectoral approach for coral reef conservation and management in India.

Government of India has also set-up a National Committee to protect and manage the coral reefs sites and has included the corals in the Schedule-I list of the Wild Life Protection Act, 1972 to provide them legal protection. However, the degradation of coral reefs areas is still continuing. This is primarily attributed to the lack of enforcement through government agencies and community awareness of the problems facing the coral reefs.

There are few legal statutes in the country that have been activated towards the protection of coral reefs, such as the Wild Life (Protection) Act, 1972 (WLPA), Environment (Protection) Act, 1986 and the Coastal Regulation Zone (CRZ) Notification of 1991. Towards providing them legal protection, the Ministry of Environment and Forest *vide* its notification dated 11 July 2001 has included all the hard coral in the Schedule List of WLPA of 1972, since almost all coral reefs areas in India are protected areas as declared under the Act. WLPA offers protection to wild animals, birds and plants. Four species of corals are included in Schedule I Part IVA of the WLPA. Hence for the purposes of the Act, Reef-building corals, Black corals, Organ Pipes, Fire corals and Sea Fan are wild animals.¹²

The list also offers protection to associated species that share a close interdependence with the coral reefs such as sharks, sea horses, groupers, sea cucumbers and 52 mollusc species. Once these species are included in the list of wild animals they can be offered protection from over use and exploitation by industries and other trade activities.¹³

Under the WLPA, animal article includes an article or object in which the whole or any part of a wild animal has been used.¹⁴ A trophy has been defined as whole or any part of a wild animal which has been kept or preserved through natural or artificial means and as including an antler horn, rhinoceros horn, feather, nail,

tooth, musk, eggs and nests.¹⁵ The coral reef is an intricate ecosystem and contains a diverse collection of organisms and is formed by the deposits of hard calcareous skeletons over the years form the reef framework. It is important that these hard calcareous skeletons are not left open for exploitation and should be included in the list of trophies as well.

Another statute which can have large bearing towards protecting marine biodiversity is the Environment Protection Act, 1986 (EPA). The EPA is an umbrella legislation for protection and improvement of environment and for matters connected therewith. The scope of EPA extends to air, land and water and inter-relationship between them and with all the creatures therein. It provides a framework for Central Government to coordinate the activities of various authorities setup under different Acts. The Central Government is empowered to take steps, as it deems necessary for furthering the object of the Act. Notifications such as Eco-sensitive Areas and Coastal Zone Regulation have been notified under this Act. The legislative framework for controlling marine pollution is provided by the Territorial Waters, Continental Shelf, EEZ and Other Maritime Zones Act of 1976. The Act confers exclusive jurisdiction to the Central Government to preserve and protect the marine environment and to prevent and control marine pollution.¹⁶ Other than these general provisions, there are no specific regulations to regulate use of trawlers and other activities such as coral mining etc., which greatly damage the coral reef structures in India.

Coastal Regulation Zone Notification (CRZ) 1991 was notified in the year 1991 under the EPA with an object to protect Indian coasts from degradation. The CRZ-notification issued is the only law that explicitly outlaws, coral mining in India. The CRZ Notification also places restrictions on industries, operations and processes in the CRZ areas (which extend up to 500 m from the High Tide line and the land lying between the Low Tide Line and the High Tide Line). The Notification intends at regulating development activities. The coastal stretches within 500 metres of High Tide Line (HTL) on the landward side are classified into four categories, namely CRZ – I, II, III and IV. CRZ – I that includes areas that

12 India, Wildlife Protection Act, 1972, Section 2(36). [hereafter WLPA, 1972]

13 *Id.* Section 9 read with 2 (16).

14 *Id.* Section 2(2).

15 *Id.* Section 2(31).

16 *Id.* Sections 6 (3) (d) and 7 (4) (d).

are ecologically sensitive and important, specifically mentions corals and coral reef areas.

CRZ – IV takes within its ambit, coastal areas of Andaman & Nicobar and Lakshadweep and small islands which are not covered by CRZ – I. In CRZ – IV construction activities are prohibited. Besides, there is a specific ban on use of corals and sand from the beaches for construction and other purposes. Another noteworthy prohibition in CRZ – IV is on dredging and underwater blasting in and around coral formations. These prohibitions are very important and essential from the coral conservation perspective and should be applicable to other coral reef areas also and not just restricted to Andaman, Nicobar and Lakshadweep. It is true that these two have rich coral reefs but there are other areas of reef development, such as Mannar and Kutch, which need protection from certain commercial activities posing serious threat to coral reef.

Besides putting a ban on certain activities, action needs to be taken for positive protection as well. As suggested by the Swaminathan Committee Report, one should take measures to conserve corals through means such as regeneration of coral reefs and developing coastal bio-shields.

Various State fisheries Acts would be also relevant for conservation and management of coral reef areas. It must, however be noted that even under the WLPA, coral reef areas have no separate legal status and short comings of the WLPA in affording protection to coral reef areas have been already discussed above. However, the national laws that are applicable to coral reef areas involve various departments of government agencies (State forest departments, fisheries departments and most recently the State Coastal Management authority at the State level). The laws are inadequate as they are not area specific and do not distinguish coral reef areas from other islands, coastal and marine areas.

India has a vintage Fisheries Act, which dates back to 1897. This Act makes fishing by poisoning of water and use of explosives a penal offence. It should be suitably amended and regulate fishing as per the needs and threats of modern times. Today, there are more threats to fisheries than mere poisoning and use of explosives. Due to population pressure and decreasing resources in the seas, local fisher folk and fishing industry resort to fishing by means such as poisoning, use of

dynamite or use of trawlers etc. The Act should be sensitive towards the need for an overall conservation and wise use of biodiversity. For example, use of trawlers, which are a big threat to coral reef, should be undertaken in a judicious manner. In fact, use of trawlers for fishing should be regulated either zone-wise or periodically.

Since Fisheries is a State subject, different States have their own State policies governing fishing resources. However, there is one Comprehensive Marine Fishing Policy, 2004. The Policy aims at *inter alia* sustainable development of marine fisheries with due concern for ecological integrity and biodiversity. It imposes a strict ban on all types of destructive methods of fishing. These destructive types have not been defined and are left to be decided by the competent authority. Since the policy deals with marine fisheries and there is a close inter-dependence between coral reef and marine fish, it is important that the policy ensures that fishing methods allowed, are compatible with the existence of not just fisheries resources but overall marine biodiversity including corals. There is a need for a broader and more comprehensive approach.

Coral Bleaching is another phenomenon, which is responsible for large-scale coral degradation. Bleaching occurs when coral polyps, stressed by heat or ultra violet radiation, expel the algae that live within them. This algae leaves the coral white or bleached when expelled. It has been found that the *El Nino* effect (1998) induces maximum bleaching. However, there is no specific policy with respect to climate change existing in India. Although various studies have been carried out on the impact of climate change, there is a need for incorporating these results with the development of various policies. A cross-sectoral approach to the issue is called for.

Even the Indian judiciary has to show sensitivity and awareness towards the nature of corals and the threat they face. A recent case of Madras High Court,¹⁷ which allowed the local fishermen to collect dead corals 'washed ashore', shows how the courts need to wake up to the impact of degradation of corals. However, all is not lost as can be shown by the fact that the High Court ruling was rejected by the Supreme Court of India recently. At the policy level, it is the need of the hour

17 Writ Appeal No 723 of 2004, Madras High Court (on file with Centre for Environmental Law).

to have an inter-sectoral approach whereby a balance can be struck between the livelihood of people and biodiversity conservation.

4

MARINE PROTECTED AREAS (MPAs)

Marine Protected Areas (MPAs) are also an important tool for marine conservation and management. MPAs refer to an existing patchwork of local, State, and national efforts to protect corals. These efforts preserve, to varying degrees, certain areas of the nation's waters, including some areas with coral reefs. In India, MPA is an umbrella term that includes 'national parks & sanctuaries, eco-sensitive zones, protected areas, State conservation areas, national marine sanctuaries etc.' Recognising that the seas have generally been treated as 'commons' available to everyone, even within a country's boundaries, MPAs have specific boundaries with 'permitted and nonpermitted uses within [them].'

In India, the MPAs which have coral reefs come under the charge of the Ministry of Environment and Forests. There are 36 MPAs in India of which twenty are entirely coastal areas (intertidal, mangroves, coral reefs, estuaries, beaches), and thirteen have major marine ecosystem components. There are a total five coral reef MPAs in India: Gulf of Mannar Biosphere Reserve which includes Gulf of Mannar Marine National Park, Gulf of Kutch Marine National Park, Mahatma Gandhi Marine National Park in Andamans, Great Nicobar Biosphere Reserve; and Rani Jhansi Marine National (Richies Archipelago).¹⁸

An MPA may be established for a variety of reasons, such as maintaining fisheries through 'no-take' zones, high species diversity, critical habitat for particular species, special cultural values (historic, religious, or recreational), or tourist attractions. Some MPAs restrict or forbid human activity within the protected area, while others simply manage an area to enhance ocean use.

18 Status of Coral Reefs in South Asia (2002) available at <http://www.aims.gov.au/pages/research/coral-bleaching/scr2002/pdf/scr2002-06.pdf>.

5

INTERNATIONAL LEGAL REGIME TOWARDS PROTECTION OF CORAL REEFS

A variety of international legal instruments either directly or indirectly provide protection for coral reefs. Though these measures offer promise for enhanced protection of reefs, the level of protection depends on the ratification and enforcement of these instruments. The United Nations Convention on the Law of the Sea, 1982 (UNCLOS) remains the guiding document for ocean issues, but many other specialised Conventions potentially afford greater protections for coral reefs. However, this note only addresses major legal regimes which specially provide for the protection of coastal and marine biodiversity with special focus on coral reefs.

A. United Nations Convention on the Law of the Sea (UNCLOS), 1982

UNCLOS¹⁹ is the principal Convention regarding the use of the ocean and its resources. UNCLOS grants every State 'the right to establish the breadth of its territorial sea up to a limit not exceeding twelve nautical miles, measured from baselines determined in accordance with this Convention.'²⁰ The Convention states that 'waters on the landward side of the baseline of the territorial sea form part of the internal waters of the State.'²¹ Moreover, Articles 56 and 57 of the Convention give coastal States sovereign rights in an 'exclusive economic zone' up to 200 miles.²² Because most reef formations are limited to waters of less than 50 meters depth, this places the majority of coral reefs within some States' internal waters and exclusive jurisdiction.

UNCLOS was a landmark treaty in the development of international environmental law because it contains many conservation-oriented provisions. Specifically, it requires

19 United Nations Convention on the Law of the Sea, Montego Bay, 10 December 1982, 21 *ILM* 1261 (1982). [hereafter UNCLOS].

20 *Id.* Art. 3 at 400.

21 *Id.* Art. 8 at 401.

22 *Id.* Arts. 56-57 at 418.

States to protect and maintain their marine species, even within internal waters.²³ The Preamble to UNCLOS states that among the primary objectives of the 1982 Convention is the 'study, protection and preservation of the marine environment.' UNCLOS provides 'the first comprehensive statement of international law on the issue.....a movement towards regulation based upon a more holistic conception of the ocean as a resource that is exhaustible and finite, and ocean usage as a resource management question.'²⁴ Even within the exclusive economic zones of coastal States, UNCLOS states that 'the coastal State . . . shall ensure through proper conservation and management measures that the maintenance of living resources in the exclusive economic zone is not endangered by overexploitation.'²⁵

UNCLOS contains many positive obligations that affect marine resources in national waters, such as coral. Part XII of the Convention sets forth many of the international legal requirements pertaining to the marine environment, including a system for enforcing those requirements. Article 192 sets forth the general obligation 'to protect and preserve the marine environment.' Article 193 recognizes the 'sovereign right [of States] to exploit their natural resources' but this is subject to the 'duty to protect and preserve the marine environment.'²⁶ Some of the special requirements include taking measures necessary to 'prevent, reduce and control pollution of the marine environment,'²⁷ and to ensure that activities 'are so conducted as not to cause damage by pollution to other States and their environments.'²⁸ States must consider all sources of pollution to the marine environment, including the following: harmful or noxious substances from land-based sources, the atmosphere, or dumping; pollution from vessels; and contamination from other installations used to explore the seabed and subsoil.²⁹

The duties expressed in Articles 192 to 194 are binding on States party to the Convention. Since 157 States have signed UNCLOS and 138 have ratified it. Prior to the 1982 UNCLOS, there was little international regulation

of the marine environment, particularly its conservation. UNCLOS's provisions for the protection and preservation of the marine environment reflected the growing awareness of what was happening to our oceans. Unfortunately, many nations did not ratify the Convention, in part because of its controversial deep seabed provisions. Therefore, a major issue today is whether the Convention reflects customary international law so that it is binding on all nations, irrespective of their membership in the Convention.

B. Agenda 21, 1992

Ten years after the drafting of UNCLOS, more than 178 governments adopted Agenda 21, the final document of the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992.³⁰ Agenda 21 reaffirmed many of the goals of UNCLOS but also recognized that '[d]espite national, subregional, regional and global efforts, current approaches to the management of marine and coastal resources have not always proved capable of achieving sustainable development, and coastal resources and the coastal environment are being rapidly degraded and eroded in many parts of the world.' Chapter seventeen of Agenda 21 gives the protection of coral reefs high priority and calls for an integrated, international approach for their protection and use.³¹

To implement Chapter seventeen and other international conventions, the International Coral Reef Initiative ('ICRI') was created at the Small Island Developing States Conference in 1994.³² Through ICRI, over 80 developing countries with coral reefs 'sit in equal partnership with major donor countries and development banks, international environmental and development agencies, scientific associations, the private sector and NGOs to decide on the best strategies to conserve the world's coral reef resources.' ICRI has developed 'action plans' for all regions of the world and is now working with national governments and organisations to implement those plans.³³ Like the

²³ *Id.* Arts. 192–94 at 477–78.

²⁴ *Id.* Preamble at 397.

²⁵ *Id.* Art. 61 at 397.

²⁶ *Id.*

²⁷ *Id.*

²⁸ *Id.*

²⁹ *Id.* at 478.

³⁰ Agenda 21, *in* Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3–14 June 1992, UN Doc. A/CONF.151/26/Rev.1 (Vol. 1), Annex II.

³¹ *Id.* Chapter 17.4 at 168.

³² International Coral Reef Initiative (ICRI) at <http://www.icriforum.org>.

³³ *Id.*

CRTF, ICRI is still relatively new, and whether either body succumbs to bureaucratic wrangling or becomes an important force in the fight to preserve coral reefs remains to be seen.

Chapter fifteen of Agenda 21, titled 'Conservation of Biological Diversity,' calls for immediate action in protecting the diversity of plant and animal resources. Chapter fifteen states: Despite mounting efforts over the past twenty years, the loss of the world's biological diversity, mainly from habitat destruction, over-harvesting, pollution and the inappropriate introduction of foreign plants and animals, has continued. Urgent and decisive action is needed to conserve and maintain genes, species and ecosystems, with a view to the sustainable management and use of biological resources. Chapter fifteen is especially significant for coral reefs because of their high biodiversity.

C. Convention on Biological Diversity, 1992

The CBD sets commitments for maintaining the world's biological diversity. The Convention establishes three main goals: conservation of biological diversity, sustainable use of its components, and a fair and equitable sharing of the benefits of genetic resources.³⁴

Conserving the diversity of life in the sea (especially coral reefs) calls for creative solutions that appeal to individual and national needs. COP-II of the CBD in 1995 adopted the Jakarta Mandate which outlined the program of action for implementing the Convention with respect to marine and coastal biodiversity.³⁵ Decisions pursuant to Jakarta Mandate recapitulate the five elements of the CBD program on coastal and marine diversity. These are: integrated marine and coastal area management; marine and coastal living resources including genetic resources; marine and coastal protected areas; mariculture; and alien species and genotypes.³⁶ Coral bleaching is an element of the programme, and a

work plan on the physical degradation and destruction of Jakarta Mandate and some of the provisions specially provided for conservation of marine habitats can be applied to preserve coral reefs at the national level.

As of November 2005, there were 188 Parties to the Convention, and ten countries that had signed, but not yet ratified it.³⁷ India has also signed and ratified the CBD and has enacted the Biological Diversity Act, 2002 along with Rules towards its implementation at the national level. The CBD is a framework treaty and has been described as containing 'primarily aspirational provisions, with matters of substance left to future development by its own Conference of Parties.' These objectives are connected through a principle known as 'common but differentiated responsibility.' This principle holds that 'developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.'³⁸ A balanced approach to conserving biodiversity must take account of how various levels of development affect a State's management of its natural resources.

D. Convention on International Trade in Endangered Species (CITES), 1973

India was amongst the few States to sign and ratify the Convention on International Trade in Endangered Species of Wild Flora and Fauna ('CITES') in 1973. CITES specifically addresses the problem of international trade in endangered species, including many species of corals. A monitoring organisation reports that 'coral reef organisms are subjected to an increasing international trade. Live and dead marine organisms are used for multiple purposes such as aquaria, swimming pools, decoration, souvenirs, jewellery and precious stones.'³⁹ Recently, a study by TRAFFIC USA found that 'Indonesia supplies 95 per cent of the world's coral

34 N. Arif, *International Environmental Law* 279 (New Delhi: School of International Studies & The Indian Society of International Law, 2001) and *Convention on Biological Diversity* (1993). [hereafter CBD].

35 L.A. Kimball, *International Ocean Governance* 41 (IUCN, 2003).

36 P. K. Sharma, 'Legal Protection of the Oceanic Environment and Living Marine Resources through International Cooperation', 9 *National Capital Law Review* 101, 116 (2004).

37 Secretariat of the CBD, Parties to the Convention on Biological Diversity/Cartagena Protocol on Bio-safety, at <http://www.biodiv.org/world/parties.asp>.

38 G. Singh, 'Legal Aspects of Biodiversity. Convention', 17 *Delhi Law Review* 121 (1991).

39 TRAFFIC Network, *Legal Determination of Coral and Marine Organism Identification* at http://www.traffic.org/making-CITES-work/mcw_nl-coral.html.

trade, while the United States imports 85 per cent of the dead coral and 98 per cent of the live coral in the international trade.⁴⁰

One hundred and sixty nine nations have already signed CITES, which provides varying degrees of protection to more than 30,000 plant and animal species.⁴¹ Member countries agree to ban commercial international trade in an agreed list of endangered species and to regulate and monitor trade in others that might become endangered. CITES entered into force in 1975, and the CITES Secretariat says that 'not one species protected by CITES has become extinct as a result of trade since the Convention entered into force.'⁴² CITES protects those species listed in the three Appendices to the Convention.⁴³ Any party to CITES may propose amendments to Appendices I and II, and III if the named species is within that Party's jurisdiction. CITES forbids trade in endangered species on the list in Appendix I except in extraordinary circumstances. The exporting and importing States must certify that specific criteria have been met to ensure that the species is not further endangered.⁴⁴ CITES authorises the trade in species listed in Appendices II and III, subject to a permit system which allows States to monitor and even limit exports, if necessary.⁴⁵ In 1985, member nations of CITES listed all stony or reef-building corals on Appendix II as a response to the effect of the coral trade on reef ecosystems. Now, black corals, blue corals, and antler coral are all listed in Appendix II of CITES and require a permit from the country of origin in order to be traded on the international market.⁴⁶ There are approximately 230 species of coral listed by their common names on the CITES Species Database.⁴⁷

Enforcement of the Convention is not always successful. In some cases, 'coral collected in countries where collection is illegal (such as the Philippines) is often exported and sold under the pretext of having been collected legally in a different country.'⁴⁸ Another problem is the difficulty in identifying the corals that are listed in the CITES Appendices. For example, a CITES monitoring organisation found that 'the trade in corals and other marine organisms is increasing and there have been many instances where CITES-listed corals have been shipped without the necessary permits, or with incorrect permits, often resulting in sizeable confiscations.'⁴⁹ Part of the problem has been traders claiming that corals are 'living rock' rather than 'hard coral,' and are thus exempt from the CITES permit requirements.

Since only specialists could differentiate between living rock and marine organisms such as corals, the CITES governing body adopted a resolution in April 2000 to include live rock in its definition of coral rock, thereby making the live rock subject to the Convention.⁵⁰ Another problem for reefs is that protection under CITES is not always broad enough. CITES does not list many other reef species such as 'puffer fish, seahorses, starfish, sea urchins, sea fans, sponges . . .'⁵¹ These reef dwellers are an integral part of the coral reef ecosystem and the collection of them for souvenirs and private aquariums can be just as detrimental to the reefs as the collection of corals themselves.

CITES is useful for regulating the trade in discrete coral species, but it does not protect the entire ecosystem. Nonetheless, with effective enforcement and by raising public awareness about the need to purchase only properly documented coral species, CITES is an effective tool to fight the destruction of coral reefs.

E. United Nations Framework Convention on Climate Change (UNFCC), 1992

The UNFCC has the ultimate objective of stabilising greenhouse gas concentration in the atmosphere at a

40 CITES and International Coral Trade, National Oceanic and Atmospheric Administration, available at <http://www.publicaffairs.noaa.gov/iyorwk22.html>.

41 CITES Secretariat, available at <http://www.cites.org/eng/disc/species.shtml>.

42 CITES Secretariat, What is CITES, available at <http://www.cites.org/eng/disc/what.shtml>.

43 R. Bajaj, 'CITES and the Wildlife Trade in India', *International Environmental Law Series* 17-20 (New Delhi: Centre for Environmental Law-WWF, 1996).

44 *Id.*

45 Arts. IV-V, Convention on International Trade in Endangered Species of Wild Fauna and Flora, Washington, 3 March 1973, 12 *ILM* 1085 (1973).

46 *Id.* Art.IV.

47 UNEP-WCMC note 6 above.

48 Coral Reef Alliance, *Trade in Coral Reef Species*, available at <http://www.coralreefalliance.org/aboutcoralreefs/trade.html>.

49 *Id.*

50 CITES, Trade in Stony Coral, Conf. 11.10 (Rev. CoP12), available at <http://www.cites.org/eng/res/11/11-10.shtml>.

51 *Id.*

level that would prevent dangerous anthropogenic interference with the climate system.⁵² Such a level is to be achieved in a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

UNFCCC receives scientific information on climate change from the Intergovernmental Panel on Climate Change (IPCC), an independent body of the World Meteorological Organization and UNEP, conducting periodic scientific assessments. IPCC research includes assessing the impacts of climate change on coral reefs. Results show that the expected increase in seawater temperature, sea level rise, changes in storm patterns and water currents, as well as changes in rainfall patterns and increased sedimentation will all affect coral reef ecosystems.

Based on the guidelines, parties to the UNFCCC prepared National Communication and gather greenhouse gas inventory data that provide an overview of national circumstances related to climate change.⁵³ National Communication includes information on all affected ecosystems; actions underway to mitigate impacts and to assess vulnerability and adaptation; activities related to research and systematic observation; and education, training and public awareness.

Parties may, as appropriate, use National Communications as a means to provide information on coral reefs. In addition, results of assessments of research by the IPCC and other relevant institutions on the impacts of climate change on coral reefs may be used by Parties to the Convention to develop policies, projects and activities to sustainably manage coral reefs as part of National Adaptation Programmes of Action and other strategies.

F. United Nations Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972

The United Nations Convention Concerning the Protection of the World Cultural and Natural Heritage

⁵² Framework Convention on Climate Change (FCCC), New York, 9 May 1992, 31 *ILM* 849 (1992).

⁵³ *Id.* Article 12.

(‘World Heritage Convention’) provides another means for protecting coral reefs. The Convention is under the auspices of the United Nations Educational, Scientific, and Cultural Organization (‘UNESCO’).⁵⁴ It notes that the world’s cultural and natural heritage is ‘increasingly threatened with destruction’ and that the ‘deterioration or disappearance of any item of the cultural or natural heritage constitutes a harmful impoverishment of the heritage of all the nations of the world.’⁵⁵ The Convention defines ‘natural heritage’ as physical and biological formations of ‘outstanding universal value from the aesthetic or scientific point of view.’⁵⁶ Under the Convention, an Intergovernmental Committee for the Protection of the Cultural and Natural Heritage of Outstanding Universal Value maintains a ‘World Heritage List’ of property forming part of the cultural and natural heritage, with the consent of the State concerned.⁵⁷ The Convention makes available a variety of technical and even financial assistance. This may include assistance in getting a site included on the World Heritage List, providing experts and others to help with the preservation of a listed site, or training staff and specialists in the identification and conservation of the cultural and natural heritage.⁵⁸

There are 160 natural properties on the World Heritage List.⁵⁹ Eleven of those sites contain coral reefs. Three are in Australia, including the Great Barrier Reef, and two are in Indonesia.⁶⁰ Belize, Mexico, the Philippines, the United States, the United Kingdom, and the Seychelles each have one site according to UNEP.⁶¹ However, India has one site (Gulf of Mannar) listed as World Heritage Sites which contains coral reefs ecosystem.

It is clear that World Heritage Site designation will not protect a site in the face of wilful destruction such as the Taliban’s destruction of two giant Buddha statues

⁵⁴ Convention for the Protection of the World Cultural and Natural Heritage, Paris, 23 Nov. 1972, reprinted in 11 *ILM* 1358 (1972).

⁵⁵ *Id.* at 1.

⁵⁶ *Id.* Art. 2 at 2.

⁵⁷ *Id.* Arts. 8 and 11 at 4.

⁵⁸ *Id.* Arts. 19-26 at 11-12.

⁵⁹ UNESCO, The World Heritage List, available at <http://whc.unesco.org/en/list/>

⁶⁰ UNEP-WCMC, note 6 above.

⁶¹ UNEP-WCMC, note 6 above.

in Afghanistan in 2001. But for countries, like India that do want to protect their cultural and natural heritage, World Heritage Site designation does provide a level of recognition, and even assistance, that can make the difference in saving that country's heritage for future generations.

6 MULTILATERAL ENVIRONMENTAL AGREEMENTS AND CORAL REEFS – A CRITIQUE

Much like the patchwork quality of the Indian provisions, international treaties and conventions have provided protection, though not comprehensive, for marine ecosystems. Meaningful international protection for oceans has only occurred in the last two decades. Most of the international agreements take an ecosystem approach, which is important for the long-term viability of coral reefs. The 1982 UNCLOS provides the most general protection for coral reefs through its requirement to preserve and protect marine environments.

Agenda 21, adopted ten years later, built on UNCLOS and specifically identified coral reefs as an area of high priority and led to the creation of ICRI, an international task force devoted to coral reef preservation.

The World Heritage Convention has, to date, named twenty coral reefs areas as World Heritage Sites, leading to more domestic legal protection and sometimes financial and technical assistance from UNESCO. The CBD provides a framework for conserving coral reefs because of their high biological diversity especially under its Jakarta Mandate towards protection of coastal and marine biodiversity. In addition to the ecosystem approaches in the Conventions named above, CITES provides another level of protection for coral reefs by regulating the trade in various species of coral. Overall, the international provisions will prove valuable so long as there is international will to abide by them and its effective implementation at regional as well national level.

7 RECOMMENDATIONS FOR IMPROVING THE LEGAL PROTECTION OF CORAL REEFS

As can be seen above, coral reefs are not adequately protected currently, and they are rapidly disappearing. The following are recommendations for ensuring the long-term viability of the remaining reefs by altering human interaction with the reefs.

A. Establish No-Take Zones

An emerging practice in ocean management is to establish no-take zones that prohibit harvesting of marine resources. Efforts to control fisheries in India and elsewhere have traditionally involved regional authorities setting 'restrictions on vessel size and power, total allowable catches, types of gear, time and area closures, and size and sex of the catch.'⁶² Currently, less than one percent of the continental shelf is set aside in no-take zones.⁶³ Some scientists believe that setting aside no take zones is necessary to re-establish certain depleted fisheries. Regeneration of fish populations will occur by allowing fish to mature, breed, and produce more eggs. The goal of the no-take zones is 'to make sure enough of those fish grow large and breed to maintain the population.' When these no-take zones are enforced, and the breeding grounds are given a rest, scientists see real benefits.

B. Improved Fishing Practices

In lieu of banning all fishing in no-take zones, countries with coral reefs may also limit fishing methods to reduce the damage to fish stocks. This is also necessary to reduce the livelihood impact on communities depends on the fishing for their livelihood. Banning just one known, harmful method of fishing allows other, more sustainable fishing practices to continue and does not entirely cut

⁶² J. Sanchirico, *Marine Protected Areas as Fishery Policy: A Discussion of Potential Costs and Benefits (Resources for the Future)* (2000), available at <http://www.rff.org/Documents/RFF-DP-00-23-REV.pdf>.

⁶³ *Id.*

off the livelihood of those who depend on the reef. At the same time, it permits the fisheries to replenish themselves.

C. Add More Reef Species to CITES

CITES is another avenue for protecting creatures that live and depend on the reef. Currently under CITES, of all the non-fish and non-turtle species that live in coral reefs, only hard coral and giant clams are listed in Appendix II.⁶⁴ However, no marine ornamental fish or invertebrates typically found on reefs are covered by CITES.⁶⁵ Therefore, any estimates of the extent of international trade in those species are simply guesses. Moreover, UNEP established the WCMC to gather information on the sustainable use of the world's living resources.⁶⁶ The WCMC could be a valuable resource in determining the extent of the trade in ornamental fishes and other invertebrates from coral reefs. Since almost all marine ornamentals pass through a relatively small number of wholesalers, the records of those businesses would be an excellent source of material on the marine ornamentals trade. Currently the reporting is voluntary,⁶⁷ but an obligatory reporting regime would be invaluable.

D. Increase World Heritage Site Designations

Given the prediction that as much as sixty percent of the world's reefs will be gone in thirty years, UNESCO should expand the protection to reefs offered by the World Heritage Site designation. The World Heritage Committee could add the most endangered reefs to the List of World Heritage in Danger under Article 11.⁶⁸

Those reefs at high risk in Southeast Asia and elsewhere should be included on the World Heritage list. Under Articles 19 and 22, a party State containing a designated reef is eligible to request international assistance in the form of technical cooperation, loans, and even grants.⁶⁹ These funds may be used in a variety of ways, ranging from training staff to providing experts, and even

supplying equipment.⁷⁰ UNEP has already identified a number of coral reefs that it would like to be added to the World Heritage List.⁷¹ UNESCO's World Heritage Program already highlights the threats to a variety of ecosystems.

8

GAPS IDENTIFIED TOWARDS IMPROVING THE CONSERVATION OF CORAL REEFS IN INDIA

Legal protection for coral reefs has begun relatively recently in India. In addition, existing protection consists of piecemeal laws and policies that serve either directly or indirectly to protect only certain coral reefs. By all scientific accounts, coral reefs are at a crisis point in India, and their preservation requires more coordinated measures to protect these treasures at the State and national level. Some of the gaps identified towards improving the conservation of coral reefs in India are as follows:

- There is an urgent need to provide training and awareness across India on concepts of conservation and sustainable use of coral reef resources.
- Network of coral reef information providers which includes Government Institution/NGOs/MEAs Secretariat and International inter-governmental organisation (like UNEP/IUCN) should be developed and strengthened to provide synergies for policy and programs to conserve coral reef habitat.
- Capacity Building in terms of environmental and socio-economic assessment should be enhanced, with support and partnership of local communities and fisherfolks as the basis for raising awareness and influencing change in the behaviour of local communities who affect and are affected by coral reefs.
- Synergetic and integrated action between various government departments, research institutions and local communities groups to implement coral reefs management actions plans.

64 CITES, see note 45 above.

65 *Id.*

66 UNEP-WCMC, note 6 above.

67 UNEP-WCMC, Global Marine Aquarium Database, available at <http://www.unep-wcmc.org/marine/GMAD/>.

68 World Heritage Convention, note 54 above at 6.

69 World Heritage Convention, note 54 above at 11-12.

70 World Heritage Convention, note 54 above, Art. 22 at 12.

71 Bryant, note 4 above.

*LEAD Journal (Law, Environment and Development Journal) is jointly managed by the
School of Law, School of Oriental and African Studies (SOAS) - University of London
<http://www.soas.ac.uk/law>
and the International Environmental Law Research Centre (IELRC)
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