

Legislative Arsenal in Relation to Safeguard Coral Reefs: An Indian Framework in a Changed Scenario

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ABSTRACT

World's richest biodiversity areas are found on the coastal zones and the coral reefs are prominent ones among them. Coral reefs are the most ancient and diverse eco-systems on earth. There are a few laws in the country that can be activated for the protection of coral reef areas such as the Environment (Protection) Act, 1986 and the Coastal Regulation Zone Notification (1991) issued under the broad EPA as well as the Wildlife (Protection) Act, 1972 since all coral reef areas in India are protected areas declared under the Wildlife (Protection) Act, 1972. The other laws that would have a bearing on coral reef areas are the Indian Forest Act, 1927, the Forest Conservation Act, 1980 and the Indian Fisheries Act which is of vintage origin.

The present paper focuses on the importance of coral reefs to humans, preservation of coral reefs in India, legal framework of our country in protection of coral reefs and some identified gaps in light of the crises that confront the existence of reefs in India. This study adopted descriptive methodology and is based on secondary data sourced from books, references, journals and reports of Ministry of Environment and Forests.

KEY WORDS: *Legal framework, coral reefs, climate change.*

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I. 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.

The objective of this paper is to throw light on the existing legal framework on coral reefs and also the areas where amelioration is needed in legislative measures.

II. IMPORTANCE OF CORAL REEFS TO MANKIND

Coral reefs are very productive ecosystems. Not only do they support enormous bio-diversity but are also of immense value to human kind. Ecosystem goods and services represent the benefits human populations derive, directly or indirectly from ecosystem functions.³ The following section briefly discusses the provisional, regulating, cultural and supporting services of coral reefs.

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

² UNEP (2003). Background paper by UNEP Coral Reef Unit in collaboration with and WWF Coral Reefs Advocacy Initiative

³ Costanza, R. (1997). The value of the World's Ecosystem Services and Natural Capital, Nature 387, 6630,253

Coral reefs are vital to the world's fisheries. They form nurseries for about a quarter of the ocean's fish, and thus provide primary source of protein. They also generate revenue for local communities, national and international fishing fleets. Coral reefs are often referred as the "medicine chests of the sea". Coral reefs have the potential to provide cures for life-threatening diseases such as cardio-vascular, ulcers, leukemia, lymphoma and skin cancer. In addition coral's unique skeletal structure has been used to make most advanced forms of bone-grafting materials.

Coral Reefs are rich in limestone which is often used as a cement substitute in the construction industry. At an industrial level, the coral sand rich in calcium is also a potential raw material for the cement industry. Healthy reefs act as natural barriers, protecting coastal cities, communities, harbours and beaches from pounding ocean waves and thus prevent erosion, property damage and loss of life. Also barrier reefs help stabilize mangroves and sea grass beds which can be easily uprooted by large waves and h6 currents. Most corals and sponges are filter feeder, which means that they consume particulate matter suspended in the water column. This contributes to enhanced quality and clarity of our near shore waters. Corals use the dissolved carbon dioxide in the ocean water to form new reefs. This gas conversion to limestone shell controls the carbon dioxide levels in the ocean. Without coral's activity, that gas could saturate the ocean and air mass above it. All wildlife, including humans, would be negatively affected with a higher carbon dioxide level.

Coral reefs are often a backbone to the costal economies through extensive tourism. Diving tours, fishing trips, hotels, restaurants, and other businesses based near reef systems provide millions of jobs and contribute billions of dollars all over the world. Studies show that on average, countries with coral reef industries derive more than half of their Gross national product (GNP) from them. Also the reef itself is a tourist attraction, creating water sport economies based on snorkeling and Scuba fees. The recreation, aesthetics and adventure provided by coral reefs may not match any other ecosystem. Thus, sustainably managed coral reef-based tourism can also provide additional sources of income to poorer coastal communities in developing countries.

For many coastal societies around the world, coral reefs and their inhabitants are intricately woven into cultural traditions also. Coral reefs are the source of nitrogen and other essential nutrients for marine food chains. They also assist in carbon and nitrogen fixing along with assisting in nutrient recycling. The fishing industry depends on coral reefs as many fish spawn there and juvenile fish spend time there before making their way to the open sea. The high species diversity in the coral reefs also helps in maintaining a balance in the ocean's food web.

CORAL REEFS IN OUR COUNTRY

India has a coast line of nearly 8129 km. However, the reef formation is restricted to four major centres (1) Gulf of Kutch (2) Gulf of Mannar (3) Lakshadweep Islands and (4) Andaman and Nicobar Islands⁴. Not all these regions have the same types of coral reefs. Reef type and the structure differ from area to area.

The types of reefs include

- (1) Fringing reefs: They are directly attached to the shore and grow towards the sea. These are found in Andaman and Nicobar Islands and Gulf of Mannar.
- (2) Barrier reefs: are separated from a mainland or island shore by a lagoon and are present in Andaman and Nicobar islands.
- (3) Atolls: are circular or continuous barrier reefs and extends all the way around a lagoon without a central island.

Lakshadweep is the only atoll union territory of India.

DANGERS TO CORAL REEFS

Being sensitive, Coral Reefs are prone to various natural and anthropogenic threats. While the natural threats are humanly uncontrollable, the manmade catastrophes leave them in a vulnerable state.

Natural threats include

- (1) Predation by the crown;
- (2) Periodic exposure
- (3) Continuous pounding by waves on the fore reef and
- (4) Bio-erosion

Whereas anthropogenic threats are

- (1) Coral mining and Construction;

⁴ Saroj, J., R.K. Gautam, A.M. Joshi (2016). "Review of Coral Reefs of India: Distribution, Status, Research and Management", International Journal of Science, Environment and Technology, Vol. 5, 3088-3089

- (2) Destructive fishing methods;
- (3) Unsustainable tourism;
- (4) Boat anchors
- (5) Mangrove destruction;
- (6) Coral collecting and
- (7) Pollution.

CORAL REEFS AND CHANGED SCENARIO: IMPACT OF CLIMATE CHANGE ON CORAL REEFS

Warmer water temperatures can result in coral bleaching. When water is too warm, corals will expel the algae (zooxanthellae) living in their tissues causing the coral to turn completely white. This is called coral bleaching. Major coral bleaching event occurred in 1998 around the world. According to NIO, more than 40 countries reported impacts varying from moderate to severe. Globally 16 percent of the reefs were destroyed⁵.

As the planet gets warmer, glaciers melt, causing sea level to rise. As a result, corals are predicted to end up deeper underwater, receive less sunlight and grow more slowly. Another predicted climate change impact is an increase in the frequency and intensity of tropical storms. These storms cause larger and more powerful waves than normal and can break coral branches and overturn coral colonies. As the oceans absorb Carbon dioxide, their chemistry changes and they become more acidic. This makes it difficult for corals and other marine organisms to grow their skeletons and shells. The calcification rates of corals and other reef organisms have already begun to decrease. With increased Carbon dioxide in the water, coral may form weaker skeletons, making them more vulnerable to disease and destruction by storms. When the protective ozone is depleted, the intensity and nature of ultraviolet (UV) radiation that reaches the earth's surface increases. Although corals have a natural sunscreen to protect themselves from UV radiation, at increased levels, this radiation can damage corals in shallow waters.

LEGISLATIVE MEASURES IN INDIA TOWARDS CORAL REEFS

The legal regime towards protection of Coral Reefs in India is still nonexistent. 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. 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 animals⁶.

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 overuse and exploitation by industries and other trade activities⁷.

Under the WLPA, animal article includes an article or object in which the whole or any part of a wild animal has been used⁸. 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 nests⁹. 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 from the reef framework. It

⁵ Goldberg J. and C. Wilkinson (2004). Global Threats to Coral Reefs: Coral Bleaching, Global Climate Change, Disease, Predator Plagues and Invasive Species, Status of Coral Reefs of the World, 67-92

⁶ India. Wildlife Protection Act, 1972, Section 2(36)

⁷ India. Wildlife Protection Act, 1972, Section 9 read with 2(16)

⁸ *Id.* Section 2(2)

⁹ *Id.* Section 2(31)

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 umbrella legislation for protection and improvement of environment and for matters connected therewith. The scope of EPA extends to air, land and water and interrelationship 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 pollution¹⁰. 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 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 bioshields.

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 shortcomings 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.

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 Court¹¹, 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 to have an inter-sectoral approach whereby a balance can be struck between the livelihood of people and biodiversity conservation.

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.’ Recognizing 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 non permitted uses within [them].’

¹⁰ *Id.* Section 6 (3) (d) and 7 (4) (d)

¹¹ Writ Appeal No. 723 of 2004, Madras High Court

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 Andaman, Great Nicobar Biosphere Reserve; and Rani Jhansi Marine National (Richies Archipelago)¹².

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.

GLOBAL OUTLOOK ON 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. The following are major legal regimes which specially provide for the protection of coastal and marine biodiversity with special focus on coral reefs –

- (1) United Nations Convention on the Law of the Sea (UNCLOS), 1982
- (2) Agenda 21, 1992
- (3) Convention on Biological Diversity, 1992
- (4) Convention on International Trade in Endangered Species (CITES), 1973
- (5) United Nations Framework Convention on Climate Change (UNFCCC), 1992
- (6) United Nations Convention concerning the Protection of the World Cultural and Natural Heritage, 1972

A CRITICAL ANALYSIS OF TREATIES AND AGREEMENTS ON CORAL REEFS

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 lead 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.

III. SUGGESTIONS

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 fisher folks as the basis for raising awareness and influencing change in the behaviour of local communities who affect and are affected by coral reefs.

¹² Status of Coral Reefs in South Asia (2002) <http://www.aims.gov.au/pages/research/coral-bleaching/scr2002/pdf/scr2002-06.pdf>

- Synergetic and integrated action between various government departments, research institutions and local communities groups to implement coral reefs management actions plans.

IV. CONCLUSION

Conservation and management of coral reefs is of immense importance for the mankind. They are playing phenomenal role by way of providing various ecosystem services. This is high time that we create awareness among various stakeholders about the need to protect these rich and diverse ecosystems on earth.

REFERENCES

- [1]. Costanza, R. (1997). The value of the World's Ecosystem Services and Natural Capital, *Nature* 387, 6630,253
- [2]. Goldberg J. and C. Wilkinson (2004). Global Threats to Coral Reefs: Coral Bleaching, Global Climate Change, Disease, Predator Plagues and Invasive Species, *Status of Coral Reefs of the World*, 67-92
- [3]. India. Wildlife Protection Act (1972)
- [4]. Saroj, J., R.K. Gautam, A.M. Joshi (2016). "Review of Coral Reefs of India: Distribution, Status, Research and Management", *International Journal of Science, Environment and Technology*, Vol. 5, 3088-3089
- [5]. Status of Coral Reefs in South Asia (2002) <http://www.aims.gov.au/pages/research/coral-bleaching/scr2002/pdf/scr2002-06.pdf>
- [6]. UNEP (2003). Background paper by UNEP Coral Reef Unit in collaboration with and WWF Coral Reefs Advocacy Initiative
- [7]. W. Clive (2004). 'Status of the Coral Reefs of the World' in Report of the Global Coral Reef Monitoring Network (GCRMN)
- [8]. Writ Appeal No. 723 of 2004, Madras High Court

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