CHAPTER SEVEN

CONCLUSIONS AND SUGGESTIONS

“We are just at the threshold of our knowledge of the oceans . . . (This) knowledge is more than a matter of curiosity. Our very survival may hinge upon it.”

John F. Kennedy, 1961

The marine environment has not traditionally enjoyed as much attention as what happens on land, the reason could be attributed to the fact that much of what that goes on in our oceans and seas is not easily observed. Paraphrasing Dr. Sylvia Earle's question, why are tuna, billfish, and sharks not the lions, tigers, and bears of the ocean, deserving of the same status as their terrestrial wildlife counterparts as specially protected elements of our planet? How should we treat the environment of the albatross, which is the world ocean itself. The fact that we have not thought of ocean space and resources in this way is both an error of omission and commission. The error of omission is that ocean spaces and resources have been "out of sight, out of mind" when they no longer need to be.

Oceans, regarded as the “last frontier” on earth, have wielded a decisive influence on world geopolitics, globalisation, socio-economic balance and life on earth. Sea power has served as a major force in the shaping of civilizations, leaving its mark for centuries in the itineraries of shipping history, the migration of peoples, the records of trade and exploration, and the interactions of nations. The ocean supports human health and well-being in myriad ways, including as a source of healthy foods, pharmaceuticals, and other beneficial compounds. The ocean is a source of existing energy and offers numerous opportunities for renewable energy, which can help to secure our energy independence and mitigate climate change. Covering 70% of the planet's surface area, oceans contain diverse habitats that support an abundance of marine life.

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The ocean, which has time and again been described as "the last wilderness" or "a vast commons" is neither of them. The human footprint extends to the remotest possible parts of the ocean. The ocean has become a global repository for much of the waste we generate. Unfortunately, the vast size, productivity, and diversity of life in the ocean have given us false comfort. The marine environment, once thought to be inexhaustible, is showing the damage caused by overexploitation and abuse.

Human activities are unleashing processes of change in the oceans that are without precedent in the past several million years. Technological and industrial changes have greatly accelerated humanity's ability to extract resources and as a consequence to alter the facade of ocean and coastal environments.\(^2\)

With the promise of not many encouraging outcomes this transformation has played with the very capacity of the oceans to persevere to support the marine ecosystems, human populations, and cultures.\(^3\) Worrisome is a phenomenon known as "fishing down marine food webs." Studies have indicated that there is a steady, global decline in the trophic level, or position on the food chain, of global fishery catches.\(^4\) With the ever increasing evidence of collapsing fish stocks, it is clear that the oceans' resources are not infinite and, as a result of human activities, are diminishing at an alarming rate.

Marine ecosystems are open systems with complex interactions within and among them. Since the marine environment is fluid, it possesses a highly interconnected and dynamic nature. Ecological impacts or alterations in one

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\(^2\) Through pollution (from hydrocarbons, chemical and organic pollutants, nutrients, plastics, and sediment), habitat destruction and invasive alien species, Anthropogenic release of greenhouse gases leads to changes in these properties, in response to oceanic absorption of heat and CO\(_2\), respectively.

\(^3\) Many have long assumed that the expanse and mysterious depths of the world's oceans contain vast living resources, ready to be exploited in the ways that its more familiar coastal fringes have. This assumption is very wrong. Of the 362 million square kilometers of ocean on this planet, only 7.5 percent — the continental shelves — are shallower than 200 meters, and some of this shelf area is covered by ice. Shelves and the adjacent slopes, reaching down to 500 m, generate the bulk of the biological production supporting global fish catches, the rest consisting of tuna and other oceanic organisms, which gather their food from the vast, desert-like expanse of the open oceans.

The marine environment is a vital resource for life on Earth. Coastal and marine ecosystems are amongst the most productive ecosystems in the world and provide many services to human society. Marine and coastal ecosystems provide supporting services in the form of a wide range of habitats. The marine ecosystems are being exacerbated by chronic long-term threats such as climate change. Some of the most visible effects of predicted changes in climate will be along the ocean coastlines, where rising seas would flood wetlands and lowlands and hasten coastal erosion. Water tables near the coast would rise, and saltwater would intrude into rivers, bays, and the underground aquifers that supply water for drinking, industry, and irrigation.

An extreme example is the Republic of Maldives, a nation of 1190 small islands, most of which are barely higher than 2 meters in elevation. If mean sea level rises 2 meters, the entire country would be submerged. Even if mean sea level rises 1 meter, a storm surge would be, as the then Maldives President Maumoon Abdul Gayoom told the U.N. General Assembly in 1987, "catastrophic and possibly fatal to the nation." Land-based pollution and activities continue to be major threats to marine ecosystems. Some 80 per cent of pollution entering the oceans comes from land.

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5 These include provisioning services such as supply of food, fuel wood, energy resources, natural products, and bioprospecting; regulating services, such as shoreline stabilization, flood prevention, storm protection, climate regulation, hydrological services, nutrient regulation, carbon sequestration, detoxification of polluted waters, and waste disposal; cultural and amenity services such as culture, tourism, and recreation; and supporting services such as habitat provision, nutrient cycling, primary productivity, and soil formation.

6 Estuaries, mangroves, lagoons, seagrasses, and kelp forests serve as nurseries for both inshore and offshore fish and other species, many of which are commercially significant. Other habitats such as beaches, dunes, saltmarshes, estuaries, and mudflats play an important role in the life cycle of, for example, fish, shellfish, and migratory birds.

7 UNEP (2006) Marine and coastal ecosystems and human wellbeing: A synthesis report based on the findings of the Millennium Ecosystem Assessment. UNEP, 76pp

8 See, Silver, Cheryl Simon, and Ruth S. DeFries, One Earth, One Future: Our Changing Global Environment, (1990)

The state of the world’s oceans has reached a tipping point. Never before in human history has the planet’s most important habitat been in such peril. In spite of the apparent immensity of the world’s oceans, what was once considered inexhaustible and resilient has become finite and fragile. As Van Dyke, puts across in his paper Sharing Ocean Resources—in a Time of Scarcity and Selfishness “The error of commission is that the doctrine of freedom of the seas has remained so long as our principal tenet of ocean governance.” Thus we need to change our mindset since the times are appropriate to develop an ocean governance which brings into its ambit the open seas as well.

INTERNATIONAL OCEAN GOVERNANCE REGIME

Governance entails both power and co-ordination. It also implies an attempt to create some sort of order, although the scale at which this order may be desired and/or achieved can range from a single body to the ‘global order’ itself.

Two thousand years ago the Roman concept of world community was built upon the general convenience of treating the ocean generically as if it belonged to a separate, extra-national, legal order: either the property of no one (res nullius) or the common property of all users (res communis). From a historical perspective the importance of the oceans has evolved, over the last 500 years. When Hugo Grotius expressed the notion of Freedom of the Seas—mare liberum—in 1609, fishing was done with wooden sailboats and it was presumed that the oceans were limitless and inexhaustible. Most of the world’s oceans were too far, too deep, too rough, too cold or too dangerous to fish. In practice, this meant that fishing was only possible in the 10-12% of the world’s oceans that are now viewed as coastal waters.
of the oceans were no-fishing zones: *de facto marine reserves*. This is in stark contrast to the present day fishing scenario since with the increase in technological and industrial efficiency, fishing vessels today are able to fish from the Arctic to the Antarctic and to depths of 2.5 km.\(^{14}\) At the moment, the challenge of governance faces the ocean with all the complexity and contradiction faced on land. The marine safe havens of Grotius' day no longer exist, and the oceans are no longer boundless. The dramatic change over time of ocean usage has, however, altered the highly permissive "freedom of the high seas" regime to a new form of ocean governance centered on "control and regulation".\(^{15}\)

Humanity's future, just like its past, will continue to depend on the oceans, on the intricate interchanges between land and water. The state of the world’s seas and oceans is deteriorating. Most of the problems identified decades ago have not been resolved, and many are worsening. New threats keep emerging. The traditional uses of the seas and coasts – and the benefits that humanity gets from them - have been widely undermined. The picture is not universally bleak. There has been considerable progress, in some places, in reducing harm to the marine environment. But this is continually being outstripped by the pace and scale of the deterioration. The international legal regime for marine environmental protection hinges on growing understanding of how and why impacts occur and on human ingenuity in developing means to avoid impacts. The development of the marine international rules and standards has been motivated by a variety of factors—coastal states' interest in protecting their waters, maritime states' interest in the safety of navigation, and a concern of states generally for the marine environment. But, in large part, the development has resulted from a desire by maritime states to forestall unilateral coastal state regulation.\(^{16}\)


According to Commander Manoj Gupta\textsuperscript{17} a variety of factors have contributed to changes in the nature of the maritime environment. The triads of factors in: geopolitics – end of the Cold War, globalisation and governance standards, security – beyond individual states, empowerment of transnational actors, interdependence of security, development – trade, aid, security maritime environment – new law of the sea, growing dependence on oceans, growth in sea denial capabilities , balance – growth, efficiency, sustainability , Agenda 21 sustainable development – economic, social, environmental; Agenda 21 management concept – precautionary, anticipatory, integrated;-- all put together have underlined the need to look at issues from the ocean towards land rather than take a land-centric view of things.\textsuperscript{18}

Hans Morgenthau, an astute observer of international politics and founder of the modern school of political realism, dedicated his life to the study of the "struggle for power." He wrote in his classic treatise, "All history shows that nations active in international politics are continuously preparing for, actively involved in, or recovering from organized violence in the form of war."\textsuperscript{19}

The body of the existing international environmental law comes within the special area of public international law and has been particularly prone to conflicting regulations. Much of the existing marine environmental regulation has been adopted in a reactive manner in the aftermath of environmental disasters, consequently dealing only with a specific sector, area or environmental medium. The inherent complexity of the field and its sometimes conflicting goals (in particular, the tension between the exploitation and preservation of resources) by itself creates a potential for conflict. Further

\textsuperscript{17} Commander Manoj Gupta is a former submarine officer in the Indian Navy. He holds a Master's degree in Defence and Strategic Studies from the Defence Services Staff College at Wellington, and a second Master's degree in Exclusive Economic Zone (EEZ) Management from the Southampton Institute in the UK. In 2002-2003, he was awarded the Admiral R.D. Katari Fellowship to carry out research leading to publication of his book\textit{ Maritime Affairs: Integrated Management for India}. He is now a PhD candidate at the University of New South Wales at the Australian Defence Force Academy, Canberra.

\textsuperscript{18} See, Gupta, Manoj.\textit{ Indian Ocean Region: Maritime Regimes for Regional Cooperation},(2010)

\textsuperscript{19} Hans J. Morgenthau,\textit{ Politics Among Nations: The Struggle for Power and Peace} 52(1985)
separate regulatory devices only inadequately mirror the interdependence of ecological processes and increase the likelihood of tensions. The result is a global legislative structure that does not deal with environmental problems in a sufficiently integrated manner.\textsuperscript{20} To date, less than one percent of the ocean is protected \textsuperscript{21}

Environmental problems including the ones relating to marine environment are international in character, though some international cooperation and coordination exists, yet it is not nearly to the extent that is necessary. The problem is eloquently stated in the Carnegie Commission report \textsuperscript{22}: "The free passage of winds and currents, without passports, makes environmental matters peculiarly and quintessentially international. Sustained, effective international action requires that the poor develop into the rich and that the rich improve their behaviour with respect to the environment and resources."

The international legal regime for marine environmental protection hinges firstly on growing understanding of how and why impacts occur and secondly, on human ingenuity in developing means to avoid impacts. Over the past several decades, scientists' understanding of the complexities of the earth system has evolved to the point where they now recognize that the components of the system, the atmosphere, oceans, land, and associated living beings including humans—are inextricably intertwined. A change in one part of the earth system has repercussions for other parts—often in ways that are neither obvious nor immediately apparent. Effective environmental governance is critical to respond in a timely fashion to emerging environmental challenges and address agreed environmental priorities.

Complexities in ocean governance have resulted because international law recognizes several distinct geographic jurisdictional zones in the ocean and authorizes coastal nations to assert certain rights and jurisdiction within these zones. There are a number of new and emerging uses of ocean areas that lack a specific legal or management regime, and management of these uses also highlights the potential complexity of federal jurisdiction over ocean based activities.

Governance of the Ocean is fragmented by national boundaries within the coastal zone and between coastal waters and the high seas. Marine ecosystems are not consistent with the boundaries of legal regimes and even where they do match these boundaries to some degree, they are still highly interconnected as a system in terms of exchange of waters, export of productivity and migration of species. This connectivity goes beyond the boundaries of the Ocean and includes adjacent terrestrial and freshwater ecosystems. While we commonly refer to different oceans (Atlantic, Pacific, Arctic, etc.), it is important to recognize that all of these bodies of water are connected and influenced by each other. These linkages require a particular Nation to recognize that it benefits from and affect one global ocean.

NORTH AND SOUTH DIVIDE: THE UNEQUAL WORLD

Serageldin appropriately describes the inequality of the world in the following words: “I see not just a gulf, but a yawning gulf, between the industrialized countries and the developing countries in terms of sheer numbers of scientists and engineers.”

The world’s scientific community is heavily dominated by developed countries, whether one looks at resources, the number of researchers, or

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24 For example there is some congruence between the outer boundary of an EEZ and the continental margin for continental states

scientific "production." The knowledge divide comprises multiple gaps – in basic environmental and social data, monitoring of change, assessments, and more comprehensive research on human and social systems. Developing country officials lack scientific input from their own researchers, but they also experience significant difficulty in coping with the masses of scientific and economic documents coming from the west. This lack of developing country science leads to the presumption of a northern bias in marine environment global assessments.

Professor Salomon makes a statement in the context of a general discussion on the role of science and technology for development, "The world is divided into two civilisations that interact strongly, albeit in a one-sided way. One civilisation is based on the growth of scientific knowledge; the other demonstrates a more or less passive acceptance of results generated by the first." It can, therefore, be logically asserted that the gist of his conclusion is also applicable to environmental governance at the global level, despite a significant and growing scientific enterprise in many developing countries. The natural-science-dominated discourse on global environmental issues, the reluctance to take action under uncertainty, and the limited scientific capacity of the South put developing countries at a disadvantage in the global environmental governance arena. The "globalization" of knowledge based largely on findings in Northern societies and ecosystems presents additional obstacles for developing countries in global deliberations.

A cursory glance at current international environmental cooperation reveals that the developing states are still far from being at par with the industrialized states.

Till date, global environmental issues that hold "the greatest potential for confrontation between the wealthy countries of the North, with their

energy-intensive industry and consumer demand, and the poorer South, with huge and rapidly growing populations that aspire to the same life-styles. The problems affecting the coastal zone are cross-sectoral and complex. Marine issues are too multidimensional in the sense that there are many issues to be taken into consideration. Whatever regime is designed regarding the marine environment, inevitable are the measure for its implementation and monitoring. Terrestrial ecology, wetland ecology, and marine ecology are, for example, distinct fields among the biological sciences. The separation between these and the physical, chemical, and social sciences is even greater, making it difficult to conduct a more integrated analysis.

THE LAW OF THE SEA

Beginning with the earliest Roman customs, evolving to the British and Grotian 'freedom of the seas,' and continuing on to the post war reliance on the consent and abilities of certain 'specially affected' States, the development of the law of the sea has followed humankind's evolving needs and uses in the oceans. Various agreements and administrative tools have evolved to mitigate conflict, protect national interests, and maintain the natural and cultural values inherent in the global ocean.

The United Nations Convention On the Law Of the Sea, 1982 (UNCLOS) is the foundational legal instrument which provides the starting point for any discussion of the rights and responsibilities of states with respect to the ocean and its resources, whether within national jurisdiction or on the high seas. The development of the law of the sea, culminating in UNCLOS,

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28 R.E. Benedict, Perspectives of a Negotiation Practitioner, (1993), 219, at 221
30 It is generally accepted that Part XII of UNCLOS—Protection and Preservation of the Marine Environment—is the strongest and most comprehensive global agreement ever negotiated on the marine environment. It is of major significance for at least two reasons. First, it provides that all states have a general obligation to protect and preserve
serves both as a cautionary tale about the fragility of unmanaged international lawmaking and as an object lesson in how shared interests threatened by the potential for conflict can induce new agreement on a universal basis.

UNCLOS marked a historically important shift in the balance between “control and regulation” and “freedom of the high seas”. The freedoms making up the “freedom of the high seas,” which by the end of nineteenth century had come to be established as a fundamental principle of international law, were now subjected to varying control and regulation. In this new “ocean regime” of interdependence, the centre of political gravity has unendingly shifted from land to oceans, but knowledge and understanding of the oceans is fragmented and specialised.31

Many provisions in the above Convention refer to competing considerations that must be weighed in specific cases. As a result, much work remains to be done in analyzing which specific types of prescriptive and enforcement measures are permissible under the Convention.32

In relation to the marine environment, the 1982 UNCLOS was intended to be an ‘umbrella’ instrument, which would set up some essential principles and norms constituting a basis for concrete rules, regulations and standards to be incorporated into more specific agreements and national legislation.33

The UNCLOS suffers a lacuna in its inability to date to be able to regulate deep sea trawl fishing over deep ocean floor habitats designed to exploit species such as orange roughy and tooth fish. Further the marine environment poses a unique problem: restrictions on international navigation.

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33 These basic parameters often determine the substance and guide the application of other international instruments, both global and regional, insofar as they concern ocean areas, resources and related interests.
Within national jurisdiction, the coastal state’s duty to protect the marine environment allows it to identify marine areas that warrant special protection. It may regulate all activities carried out by its own nationals that affect these areas, but its right to curtail activities by foreign ships is carefully circumscribed by the LOS Convention; for the most part, national measures applicable to foreign ships are subject to agreement in the competent “activities” forum, the International Maritime Organization. Beyond national jurisdiction, special area designations applicable to shipping are also adopted through the IMO. When coastal or marine resources are shared by more than one country or when impacts on one nation’s resources originate elsewhere, national action alone cannot suffice. International ocean law establishes the basis for pursuing sustainable ocean development.34

There is a basic need to draft national regulations that reflect and incorporate the vaguely defined intent of UNCLOS Articles 192 and 194.35 There are no agreed upon scientific criteria to determine the precise meaning of such terms as “prevent, reduce, and control.” It is difficult to determine how to justify and enforce legal prescriptions because of the limitations of scientific and technical knowledge. There is a large gap between acceptance of a vaguely defined legal framework, which moves from “obligations of responsibility” to “obligations of regulation and control,” and the willingness and ability of states to establish and enforce standards and rules. In few other semi enclosed seas are multilateral measures for marine pollution control as

34 The law of the sea in general, and the regime of the EEZ in particular, accommodate two different types of security interests. Most states share both in some measure. One is global mobility; high seas freedoms constitute its legal manifestation. The other is coastal security; coastal state sovereignty and jurisdiction constitute its legal manifestation. The interest in global mobility seeks to avoid impediments to the deployment of forces by sea anywhere in the world. This interest is ordinarily associated with naval powers. In fact, the security of almost every state depends in some measure upon the mobility of the forces of naval powers for the maintenance of stability and security in its region. Global mobility is a predicate of the international security system as it exists at present and for the foreseeable future.

35 These articles charge states with the “duty to protect and preserve the environment” and obligate them “to take all measures necessary to prevent, reduce, and control marine pollution and to ensure that activities under their jurisdiction or control do not cause pollution damage to other states or otherwise spread beyond the seas where they exercise sovereign rights.” UNCLOS, Article 194(2).
deficient as those in the Sea. Indeed beyond coastal waters, most of the Sea is a "mare nullius" in terms of marine environmental protection.\textsuperscript{36}

Within the context of oceans policy, marine environmental protection can be best achieved through the exercise of flag state authority over vessels registered in the state. States may freely elect to become party to marine environmental laws and regulations and then prescribe and enforce those rules on their flagged vessels.

The continental view, in comparison, is that the best method of control is to develop top-down international rules and then compel global compliance. This phenomenon is displayed by coastal states and regional organizations that act unilaterally to purport to apply their regulation to foreign flagged vessels in waters well beyond the territorial seas. Multilateral international organizations also exhibit this behaviour by forcing consensus on dissenting states over strict environmental measures. This was evident at the IMO in 2004-05, when eight Baltic countries sought to impose a PSSA in the Baltic Sea over the objection of the Russian Federation.\textsuperscript{37}

Eventually, Russia did not object after the proposal exempted water under Russian jurisdiction, but adoption of the PSSA affected vessels transiting the Baltic making entry into Russian ports, potentially "zone-locking" Russian oil tankers in Russian waters.\textsuperscript{38} The defining characteristic of the UNCLOS Convention is the extent to which it represents a carefully crafted compromise between the traditionally dominant concept of freedom of the high seas and the extension of coastal state jurisdiction, a pattern that was developing in state practice even as the Convention was being negotiated. This compromise is reflected in two general ways: the extent of coastal state jurisdiction over maritime zones is carefully defined and limited in important

\textsuperscript{37} Hugh O'Mahony, "Battle Looms Over Proposal for Whole of Baltic Sea to be Declared a PSSA: Russia Seeks Fundamental Review of Guidelines",Lloyd's List, Feb.26, 2004, at 7,
respects; and high seas freedoms are for the most part enshrined and protected for areas beyond national jurisdiction. 39

The Convention serves as a powerful tool to shift maritime political disputes from being a cause for violence and naval warfare to a legal based order, approaching the vision of Myres S. McDougal and William T. Burke of a "public order of the oceans." 40 The United States was reaching its objective of replacing the "struggle for power" at sea with the "struggle for law" in the world's oceans, reducing, and perhaps one day eliminating, an entire class of maritime conflicts as a cause of war. 41

Role of United Nations Environment Programme

United Nations Environment Programme (UNEP) has made major contributions to international environmental law, playing an important role in developing such legal regimes as the Montreal Protocol, the Convention on Biological Diversity, and the Convention to Combat Desertification.

At the national level, it has helped more than 100 nations develop environmental legislation and institutions. 42 IUCN also has an impressive track record in drafting and promoting national and international environmental legislation. 43 IUCN has helped over 75 countries prepare and implement national conservation strategies 44 and participated in the drafting of the Convention on International Trade in Endangered Species, the Convention on Biological Diversity, and other major treaties.

39 IUCN, CORDIO and ICRAN (2008), Managing Marine and Coastal Protected Areas: A Toolkit for South Asia. IUCN, Gland, Switzerland and Bangkok, Thailand; CORDIO, Kalmar, Sweden; and ICRAN, Cambridge, UK.
The United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) is the biodiversity policy support arm of the United Nations Environment Programme (UNEP), the world's foremost intergovernmental environmental organisation. The One Ocean Programme is actively involved in bringing together, analysing and disseminating marine and coastal biodiversity knowledge on emerging marine environmental issues, in support of policy and country level decision making.\textsuperscript{45}

The Global Programme of Action (GPA) for the Protection of the Marine Environment from Land-based Activities, whose Secretariat is provided by UNEP, is the only global initiative that directly addresses the link between watersheds, coastal waters and the open ocean.\textsuperscript{46} It provides a mechanism for the development and implementation of initiatives to tackle transboundary issues. Plastic and other types of marine debris are such an issue. To help improve the knowledge base, UNEP has collaborated with the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (UNESCO-IOC) to develop Guidelines on the Survey and Monitoring of Marine Litter.\textsuperscript{47} In collaboration with the Food and Agriculture Organization of the United Nations (FAO), a comprehensive report on abandoned, lost or otherwise discarded fishing gear has been published.\textsuperscript{48}


World Resources (2002–2004) is the result of a unique partnership between the United Nations Environment Programme (UNEP), the United Nations Development Programme (UNDP), The World Bank, and the World Resources Institute (WRI). It is the only instance where UN agencies, a multilateral financial institution, and an NGO work together to determine the content, conclusions, and recommendations of a major environmental report.


\textsuperscript{48} Macfadyen, G., Huntington, T. and Cappell, R. (2009), Abandoned, Lost Or Otherwise Discarded Fishing Gear. UNEP Regional Seas Reports and Studies 185, FAO Fisheries and Aquaculture Technical Paper 523.
UNEP has also played a key role in monitoring and analyzing environmental trends and assembling the data and information on which policy-making relies. This involved publishing a long list of technical reports, atlases, and other specialized compendia, and its *Global Environment Outlook* report which offered a broad overview of environmental conditions and trends. During 2009, the UNEP World Conservation Monitoring Centre (UNEP-WCMC) provided intellectual leadership to advance the collective understanding of the connectivity between linked coastal ecosystems and the transfer, flow and use of ecosystem services across these linked habitats. It convened a group of global experts to explore innovative ways of assessing the flow of ecosystem services between linked marine and coastal habitats, and played a leading role in the preparation of a report *Framing the Flow: Innovative Approaches to Understand, Protect and Value Ecosystem Services across Linked Habitats*.49

**BIODIVERSITY**

"The last fallen mahogany would lie perceptibly on the landscape, and the last black rhino would be obvious in its loneliness, but a marine species may disappear beneath the waves unobserved and the sea would seem to roll on the same as always."50

G. Carleton Ray

The target agreed by the world’s Governments in 2002, “to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth”, has not been met at the global level. Under the goal to promote the conservation of the biological diversity of ecosystems, habitats, and biomes, the most controversial target related to marine and

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49 UNEP (2006) Marine and coastal ecosystems and human wellbeing: A synthesis report based on the findings of the Millennium Ecosystem Assessment. UNEP. 76pp. The Millennium Ecosystem Assessment (MA) was carried out between 2002 and 2005 to assess the consequence of ecosystem change for human well-being and to analyse the options available to enhance the conservation and sustainable use of ecosystems. The main findings of the MA were released on March 30, 2005.

coastal biodiversity was target 1.1. This target read as follows: “at least ten percent of each of the world’s marine and coastal ecological regions effectively conserved.” Two main issues arose: first, whether ten percent was the appropriate percentage for which to aim by the year 2010; and second, whether by including a percentage figure the target was advocating an inappropriate, one-size-fits all solution to marine conservation.51

Despite an increase in conservation efforts, the state of biodiversity continues to decline, according to most indicators, largely because the pressures on biodiversity continue to increase.52 Coastal habitats such as mangroves, seagrass beds, salt marshes and shellfish reefs continue to decline in extent, threatening highly valuable ecosystem services including the removal of significant quantities of carbon dioxide from the atmosphere; but there has been some slowing in the rate of loss of mangrove forests.

While the extent of marine protected areas has grown significantly, a small proportion (less than a fifth) of marine ecoregions meet the target of having at least 10% of their area protected. Protection of marine and coastal areas still lags far behind the terrestrial protected area network, although it is growing rapidly. Marine Protected Areas (MPAs) cover approximately half of one per cent of the total ocean area, and 5.9 per cent of territorial seas (to 12 nautical miles offshore). The open ocean is virtually unrepresented in the protected area network reflecting the difficulty of establishing MPAs on the high seas outside exclusive economic zones. Of 232 marine ecoregions, only 18% meet the target for protected area coverage of at least 10%, while half have less than 1% protection.53 Internationally, marine conservation initiatives

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have emphasized the value of “networks” meeting the objectives of international conservation agreements and conventions.\(^{54}\)

The Convention on Biological Diversity (CBD) is arguably the most important international ‘hard law’ instrument for the protection of biological diversity at the global level. With over 180 signatory States (Parties) it has wide international support. The adoption of the Jakarta Mandate and the CBD program of work on marine and coastal biological diversity represented a major development in international policy relating to oceans and coasts. Together they set out a work programme for the international community to conserve marine and coastal biodiversity. The CBD Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) on marine and coastal biodiversity has recognized that marine and coastal protected areas should be part of a wider integrated marine and coastal area management framework. Furthermore, the SBSTTA has agreed upon a goal for work under the CBD that includes the establishment of a network of marine protected areas by 2012, comprised of representative areas, as well as areas that protect specific habitats, species or ecosystem services.

Presently, biodiversity is in the spotlight as never before. A wide range of indicators are now being used to track the state of biodiversity, the pressures upon it, and the steps being taken to address those trends.\(^{55}\) The number of newly established global and regional Multilateral Environmental Agreements (MEAs)\(^{56}\) is steadily decreasing, demonstrating that legal frameworks are in place to address many important issues. Neither establishing or signing an agreement or convention, however, means that the related environmental problems have been solved. “The clock is ticking on the sustainability of global fish stocks”, highlighting the need for an international agreement on better management of the marine environment. Given that over

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\(^{56}\) Environmental treaties—known as Multilateral Environmental Agreements (MEAs)—are the legal framework for international environmental governance. They are the official expression of the collective will of national governments to protect the environment and steward the Earth.
500 million people globally rely on fisheries and aquaculture for their livelihoods, and that fish help feed three thousand million people, this issue is becoming more urgent than ever\(^57\). Thus making the modern fishing activities the most important threat to marine biodiversity. \(^58\) It is generally believed that the major failings of national programs to protect marine biodiversity rest on failures of governance rather than failures of science.

Despite the existence of a number of international conventions, the problem of plastic and other marine debris in the ocean persists. This indicates a lack of effective global, regional and national strategies to address municipal and other sources of waste. It also suggests deficiencies in the implementation and enforcement of existing regulations and standards, some of which may lack economic support. To be successful, they need to be accompanied by concrete actions and effective implementation, underpinned by information, education, public awareness, capacity-building and technology transfer programmes.

There are instances where terrestrial and marine protected areas have been established under the same primary legislation\(^59\). This brings forth the advantage of acknowledging the fact that many protected areas include both terrestrial and marine ecosystems which have the basic similarities. But at the same time such legislation is often oriented more towards terrestrial protected areas and does not fully address Marine Conservation And Protection Area, MCPA needs. There may be several pieces of primary legislation allowing for MCPA declaration. For example, MCPAs and particularly no-take zones can often be declared under fisheries legislation. There may be benefits in introducing and implementing MCPAs under several pieces of primary legislation that go beyond wildlife protection. In India, for example, spatial and temporal restrictions in the marine environment are better accepted under official and traditional fisheries regulations. However, the same concept when

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\(^59\) India under the Wildlife Protection Act, Sri Lanka under the Fauna and Flora Protection Ordinance, and Bangladesh under the Wildlife (Preservation) (Amendment) Act.
introduced by a Forest Department (which is in charge of implementing wildlife legislation) is met with a great deal of resistance and mistrust.\(^{60}\)

Ramsar and the International Man and Biodiversity Programme both contribute to the development of the global MPA network. The World Heritage Convention allows for the nomination of ‘serial’ or ‘cluster’ sites, which means that several protected areas, or a network, linked by a common theme or feature may together form the WHS. The World Conservation Congress in Barcelona, October 2008, passed a resolution 91 calling for the expansion of MPA networks.

**Vessel Sourced Pollution**

Following each high profile marine oil pollution incident, there seem to be demands for better shipping standards and higher levels of compensation.\(^{61}\) Maritime transport has been truly international in character. Ocean-based commerce through international and domestic shipping has always been a critical and growing component of the global economy. The threats to the global marine environment emanating from this mode of transportation are equally persistent. The tenet of sustainable development necessitates such changes which support the growth in the ocean-based commerce while reducing environmental impacts and maintaining maritime safety.\(^{62}\)

Since seafaring has always been regarded as one of the world’s most dangerous occupations, the international community has held international conferences with the singular aim of laying down universal rules. This was followed by the intergovernmental organizations taking over in order to encourage the adoption of international instruments to regulate safety at sea and prevention of pollution from ships. These measures have been shown to

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\(^{60}\) For many communities living in the vicinity of productive ecosystems (e.g. coral reefs or mangrove forests), these ecosystems represent physically and economically accessible resources that are diverse and highly lucrative. They provide a complex range of benefits that can affect the livelihoods of different groups of people in many different ways.

\(^{61}\) http://earthjustice.org/features/ocean-pollution-global-shipping-and-the-cruise-industry, accessed on 23.01.11

be successful in reducing vessel sourced pollution and illustrate the commitment of the International Maritime Organization and the shipping industry towards protecting the environment. The 1970s witnessed the initiation of a Global Search and Rescue System with the establishment of the International Mobile Satellite Organization (IMSO), which greatly enhanced the ships communication system.63

International law has addressed the problem of vessel-source pollution in two ways: first, by establishing international vessel-source pollution standards that serve as an alternative to coastal state regulation; and second, by setting forth rules governing the jurisdiction of flag, coastal, and port states. The trend also is reflected in the movement toward exploring ways of "alleviating" or finding exceptions to the principle of flag state jurisdiction in other contexts as a way of compelling compliance of foreign flagged vessels.64 The contest over these two philosophies informs much of the debates in oceans law and policy and is a key to understanding the unfolding "struggle for law" in the oceans.65 However, the current approach to setting international standards for shipping tends to be reactive, slow, and based on industry-driven compromises.66

Spilled oil from sea-based activities continues to be a marine pollutant in coastal and offshore waters.67 This is despite many successful regulatory initiatives at international and national levels, and

63 The Global Maritime Distress and Safety System (GMDSS) was adopted in 1988 and began to be phased in from 1992. In February 1999, the GMDSS became fully operational, so that now a ship that is in distress anywhere in the world can be virtually guaranteed assistance, even if the ship's crew does not have time to radio for help, as the message will be transmitted automatically.


the considerable efforts that are being made by the oil and shipping industries to reduce the number of accidents and to reuse, recycle and filter oily wastes aboard ships.68

Oil continues to enter the world’s oceans from shipping and ship-based activities, through accidental spills and intentional discharges, as well as from many land-based sources and natural oil seeps. In coastal areas, such inputs often cause ecological damage and harm to public amenities. 69

The 2001 report, A Sea of Troubles (GESAMP, 2001), along with introducing the precautionary approach stated that the open oceans were suffering some contamination and ecological damage, but compared to coastal areas they were still in a relatively healthy state. From a perusal of its reports, it is apparent that GESAMP’s assessment of the global oceans changed from healthy, to not polluted, to at risk and finally to “troubled”.70

Sub-standard ships and poor shipping practices are leading to massive marine pollution and damage. International law limits the ability of coastal nations to impose and enforce their own environmental and navigation regulations on foreign ships passing through their waters.71 Instead, countries must use international conventions established through the International


71 The political context is a key dimension in any area of law-making, but this is particularly so when such strong interests are present on the international platform. There has been some transfer of competence to coastal and port states, the traditional primacy of flag state jurisdiction remains and therein lies one of the major obstacles to enforcement and compliance.
Maritime Organization (IMO) and the UN Convention on the Law of the Sea (UNCLOS).\textsuperscript{72}

Sub-standard shipping prevails despite increased regulation due to deficiencies in regime formation stemming from the unique features of the shipping industry. There is consequently a lack of incentive to comply with international law, underpinned by lack of enforcement capability in the international structure.\textsuperscript{73} The competitive and secretive nature of the industry and its fragmentation are a significant influence upon regime formers and thus, should be the target for change. The answers lie in sharing the burden and the benefit flowing from the international regime both at the point of formation and thereafter, coupled with the International Maritime Organisation (IMO) playing a more prominent role in implementation and enforcement.\textsuperscript{74}

It is, however, seen that developing states with limited resources and technological backwardness are urged by the developed states to cope with higher international environmental standards. The shipping industry, which is extremely competitive and financially sensitive to disruptions in its routine, as delays in service could cost millions of dollars, has driven many ship owners to operate under “flags of convenience” that are well-known for their leniency in implementing and enforcing international maritime legislation.

The shipping industry is extremely difficult to regulate, as up to a dozen different countries could have a financial interest in the movement of goods from one country to another.\textsuperscript{75} The adoption of internationally-agreed standards is only part of the battle. Legislation alone cannot prevent accidents occurring. Nevertheless, in contrast to the marine living resource sector,

\textsuperscript{72} Available at http://www.sprep.org/att/IRC/eCOPIES/pacific_region/30.pdf see also, http://hqweb.unep.org/pdf/unep_marine_litter-a_global_challenge.pdf, accessed on 23.01.11


\textsuperscript{74} Ibid; These include some radical reforms to the IMO and changes to the requirements for entry into force of IMO Treaties, as well as proposals for much greater flag state control and supervision.

\textsuperscript{75} The economic growth of developing nations has increased international trade volumes and has also created a demand for larger ships (size and capacity) with larger engines. Economists are forecasting a doubling or tripling of trade volumes in some areas, which will bring with it an increase in vessel traffic and air emissions threatening the ability of local communities to meet and maintain health-based air quality standards.
states involved in maritime transport have negotiated a wide array of global instruments to reduce the negative impacts on the marine environment caused by pollution from vessels, dumping at sea and the transfer of invasive aquatic species and the comprehensive environmental protection regime established by the International Seabed Authority (ISA) for mining the deep seabed beyond national jurisdiction.

**International Marine Law**

The international marine law has evolved from two streams: sectoral concerns\(^76\) and concentrated impacts on the marine and coastal environment at the regional level.\(^77\) The third stream is international conventions that protect species or defined geographic areas.\(^78\) To move forward on effective ocean conservation, it is necessary and urgent to achieve a balance between spatial conservation and sectoral integration.

International law has always been a reflector of the world of diplomacy, resting on political foundations, and the 1900-2000 period has seen enormous changes in the structure, compositions, and tempo of inter-state diplomacy. The single largest source of marine pollution is from land-based sources.\(^79\) These sources are more difficult to regulate by international law because they are located within national jurisdictions, sometimes in up-stream states and in watercourses many miles from the ocean.\(^80\)

The most successful approaches to a range of marine pollution issues have been those espoused by regional bodies, often where financing

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\(^76\) e.g., fisheries, and pollution from shipping, dumping, and various offshore and land-based activities like oil and gas development, agriculture, and domestic wastewater.


\(^78\) When human impacts have so depleted the species as to threaten extinction, or where sites valued for scientific research, habitat, aesthetic, or other reasons may otherwise be compromised by human activities.

\(^79\) Whether from direct point sources, such as factories or sewage outfalls, or from diffuse sources, such as run off from agricultural use of pesticides, fertilizers, or even from the atmosphere.

mechanisms like the Global Environment Facility have been involved, such as the Danube/Black Sea area.\textsuperscript{81}

The legal frameworks concerning high seas resources having evolved rapidly and rather fervently are, at times incomplete and contain more uncertainty. However, in general, attempts to apply them have often been poorly resourced, badly planned and ineffectually implemented. On comparing with the land based pollution laws, the marine legal frameworks have been changing more rapidly. The causes vary from expansion of national territories under the Law of the Sea \textsuperscript{82}, rapid development of relatively newer marine resource uses or increasing intensity of existing uses \textsuperscript{83}; emergence of new issues such as conservation and environmental risk reduction; and increasing recognition of the rights of indigenous groups and other groups in coastal and marine resource.

Progress in protecting the marine and coastal environment over the past 30 years has generally been confined to relatively few, mostly developed countries, and to relatively few environmental issues. Overall, coastal and marine environmental degradation not only continues but has intensified. The major threats to the oceans that were recognized in 1972 — marine pollution, the overexploitation of living marine resources and coastal habitat loss — still exist, despite national and international actions to address these problems. The world's oceans, rivers, lakes, and groundwater systems which do not respect political borders continue to be managed in a fragmented way and that is not helping the situation at hand. The primary ingredient missing from national marine environment programs across the globe is political commitment to address the issues in the face of short-sighted resistance from vested interests, such as polluters, fishers and coastal developers. This failure in turn rests on widespread ignorance of the severity of the issues amongst


\textsuperscript{82} And the consequent need to clarify intergovernmental title, jurisdiction, and administration within these expanded territories.

\textsuperscript{83} e.g., petroleum and mineral exploitation and transportation, coastal development, recreation and tourism, aquaculture and sea ranching, renewable energy production.
the general community in all nations, rich and poor alike. In the terminology of international relations theory, international anarchy prevails.84

The 2004 Report of the UN Secretary-General on the Oceans and the Law of the Sea notes that the ecosystem approach is one of the most important concepts of environmental and natural resource management of the past two decades. In contrast, several academic commentators have taken a less assertive view and have suggested that the ecosystem approach is a policy tool and not a positivist legal concept *per se*. Nevertheless, considerable progress has been made by globally over the past decade to move the concept forward into the real world of practical implementation through the medium of secondary legislation.

The existence of a marine environmental protection infrastructure at regional level enhances the potential for extending protection measures to proximate areas beyond national jurisdiction and coordinating their environmental protection programs with the sectoral measures.55 While today states may show an increasing readiness to accept that global marine environmental protection is a common concern of humankind, they do not yet constitute a community that, in the spirit of international solidarity and justice, acts in concert for achieving this end. States are still far from taking joint protective and remedial environmental action that suffices to achieve the aim of preserving and administering our common natural heritage for the benefit of the present and future generations.

In the 35 years since Hardin’s analysis, research has shown that degradation of common pool resources is not inevitable86. In fact, many instances of community management of communal property show that where

traditional ownership systems remain intact, few resources are completely "open access." 87

INDIAN POSITION:

The Indian Ocean is known as Ratnakara in the ancient Sanskrit literature. Ratnakara means "the maker (creator) of jewels". The Indian Ocean is a very 'active' ocean, perceived by many as the emerging centre of gravity in the strategic world. Thus, the words attributed to the maritime strategist Alfred Mahan ring true: "Whoever controls the Indian Ocean will dominate Asia, the destiny of the world will be decided on its waters." This is particularly true in the context of the struggle for gaining maritime influence in the region. 88

This was reiterated by Jawaharlal Nehru's conclusion from our history that we cannot afford to be weak at sea. History has shown that whoever controls the Indian Ocean has, in the first instance, India's sea-borne trade at her mercy and, in the second, India's very independence itself. 89

History shows that India was most prosperous and secure when she was most connected to the world, and that this connection was mainly by sea. In the midst of the third largest ocean in the world, India's location is in many ways her destiny. The 'activity' in the Indian Ocean region is defined by extensive trade, energy transfers and a spectrum that ranges from political turbulence on one witness to a jostle for power, and subsequent shifts in the dynamics of the region. Transport by water remains the cheapest form available. And even when we speak of cyberspace, 95% of internet traffic is at some stage carried under the sea by underwater cables. Maritime trade and energy supplies are critical to India's transformation.

87 In Kenya, for example, each Maasai community reserves dry season pastures that can only be used when no forage is available elsewhere. By accommodating neighboring groups in times of need, each group increases the expectation that they will have access to pasture in lean times, thereby improving their own security.


India has developed a comprehensive set of environmental laws and institutions, including a very active judiciary. Despite a strong policy and institutional framework and some successes, environmental degradation has not been arrested on a large scale. India has made a substantial effort in attempting to address environmental challenges.\footnote{Apart from developing policy and legislative framework in consonance to sustainability, India has designed appropriate models for sustainable development in keeping with national priorities. The Indian government has established sustained partnerships with the people by transferring the management of crucial sectors of the economy to village councils and thus empowering them to manage their own resources and achieve sustainable livelihoods.}

Despite all its downsides the long journey of environmental jurisprudence in India, when viewed in a holistic manner, can be best described in Supreme Court’s own words as: ‘This has been an interesting judicial pilgrimage for the last four decades. In our opinion, this is a significant contribution of the judiciary in making serious endeavour to preserve and protect ecology and environment, in consonance with the provisions of the Constitution’.\footnote{Karnataka Industrial Areas Development Board v Sri. C. Kenchappa & Ors., (2006) 6 SCC 371.}

The real challenge before India is how to preserve its environment, meet the basic needs of its growing population on an overburdened land, fulfill the necessary energy requirements of the people, and yet leave a legacy for future generations so that they may also enjoy the bounty of nature which the present generation is recklessly exploiting.

At the Stockholm Conference in 1972, the then Indian Prime Minister Indira Gandhi stated: "... We do not want to impoverish environment any further, (but) we cannot forget the grim poverty of large numbers of people. When they themselves feel deprived how can we urge the preservation of animals? How can we speak to those who live ... in slums about keeping our oceans, rivers and the air clean when their own lives are contaminated at the source? Environment cannot be improved in conditions of poverty …" \footnote{Quoted in R.P. Anand, (1980), "Development and Environment: The Case of the Developing Countries", Indian Journal of International Law 20, 1, at 10.}

Having a look at the current attitude of developing countries towards environmental protection, it appears that it does not essentially differ from this statement of the early 1970s.
The National Environment Policy, 2006 recognizes that Mangroves and coral reefs are an important coastal environmental resource. The mangrove conservation programme was launched in 1987 and so far 35 mangrove areas have been identified for intensive conservation and management.

The National Environmental Policy (NEP) recognizes the value of harnessing market forces and incentives as part of the regulatory toolkit, and India is one of only three countries worldwide which has established a National Green Tribunal to exclusively handle environmental litigation. On environmental governance, the GOI is contemplating the establishment of the National Appraisal and Monitoring Authority (NEAMA) to carry out environmental appraisals.

The National River Conservation Directorate of the MoEF is engaged in implementing the river action plan under the National River Conservation Plan (NRCP). National Wetland Conservation Programme (NWCP) has been initiated for 66 wetlands across 21 states. Chilka lake, the largest brackish water lagoon in India, is being managed by the Chilka Development Authority in an integrated way.

India is also implementing the integrated coastal area management through the Coastal Regulation Zone Notification, 2011, which provides ample protection to the critical marine and coastal ecosystems, including mangroves and coral reefs.

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93 Available at http://www.envfor.nic.in/nep/nep2006e.pdf
94 New and additional mangrove conservation areas are being identified continuously in consultation with state governments. The National Committee on Mangroves and Coral Reefs has recommended intensive conservation and management of corals in four areas, namely, Andaman and Nicobar Islands, Lakshadweep Island, Gulf of Kachh, and Gulf of Mannar. This will also help in conserving their microbial symbionts gene pools.
95 At present, it covers a total of 31 rivers in the country spread over 18 states. Under the National Lake Conservation Plan (NLCP), a programme for conservation and management of lakes and other similar water bodies, 28 lakes have been taken up so far.
96 The Coastal Regulation Zone Notification prohibits developmental activities and disposal of wastes in the mangrove and coral reef areas. The protected areas under Islands and Coastal Bio-Geographic Zones are proposed to be increased from 18.5 per cent to 36.14 per cent and 6.16 per cent to 7.12 per cent of the geographical area respectively.
Effective management of protected areas including marine and coastal protected areas is one of the key strategies under the National Wildlife Action Plan, 2002.

MoEF is operating an All-India coordinated project on coastal and marine biodiversity which is promoting research in three major areas, viz. survey and inventorization, capacity building, and database development on coastal and marine biodiversity.

The legislative framework for controlling marine pollution is provided by the Territorial Waters, Continental Shelf, EEZ and Other Maritime Zones Act of 1976. EPA provides a framework for Central Government to coordinate the activities of various authorities setup under different Acts. Notifications such as Eco-sensitive Areas and Coastal Zone Regulation have been notified under this Act. The Act confers exclusive jurisdiction to the Central Government to preserve and protect the marine environment and to prevent and control marine pollution.

The MPAs which have coral reefs come under the charge of the Ministry of Environment and Forests. India is a part of the Global Coral Reef Monitoring Network. Though the importance and the conservation of coral species in the coastal system is being given high priority yet other than the 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.

Mariculture activities are regulated through the Aquaculture Authority of India which promotes sustainable aquaculture. Coastal mariculture is

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97 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.

98 Four species of corals are included in Schedule I Part IVA of the Wild Life Protection Act. Hence for the purposes of the Act, Reef-building corals, Black corals, Organ Pipes, Fire corals and Sea Fan are wild animals. 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.
regulated under the Coastal Regulation Zone Notification. There are 25 wetland sites notified by India under the Ramsar Convention on Wetlands, 1971, which are well protected. The Wildlife Act also implements the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973, by regulating trade and commerce in wild animals (listed in various categories depending on whether the species is endangered), animal articles, trophies and derivatives from animals. This would control the illegal trade in wildlife and its products to a great extent. Recently, the Government of India has constituted a Wildlife Crime Control Bureau by a notification dated 4 September 2006.

There are 5 species of Marine Turtles which are listed in Appendix I of the CMS and also listed in Schedule I of the Wildlife (Protection) Act, 1972. This Act provides for a complete ban on the killing of Schedule I species. Despite the fact that they are endangered species, India is not a Party to the MOU concerning Conservation of Marine Turtles of the Indian Ocean and South-East Asia. In the recent COP7, The most important step taken by India for the conservation of migratory species was the proposal for inclusion of the Gangetic Dolphin in Appendix I of the CMS. This proposal was supported by Nepal and Bangladesh and was adopted by COP7.

The *Biological Diversity Act 2002* was born out of India's attempt to realise the objectives enshrined in the United Nations Convention on Biological Diversity (CBD) 1992 which recognizes the sovereign rights of states to use their own Biological Resources. The Act aims at the conservation of biological resources and associated knowledge as well as facilitating access to them in a sustainable manner and through a just process.\(^9\)

In the field of maritime law, India is yet to secure a position of superiority in the international arena. The maritime industries including shipping, concerned government departments agencies, institutions of higher education, etc.

\(^9\) http://moef.nic.in/modules/rules-and-regulations/bio-diversity/, accessed on 03.10.11.
learning, the regulators of legal qualifications and the legal profession itself must all play their respective roles.\textsuperscript{100}

The challenge of environmental management and regulation is immense in a country as large and diverse as India. India is an active player in international forums and has ratified numerous Multilateral Environmental Agreements, \textsuperscript{101} and in addition has also enacted a number of statutory acts for the protection and improvement of environment.\textsuperscript{102}

Since the Department of Ocean Development (DOD), (Now Ministry of Earth Sciences) has been designated as the nodal department to deal with Chapter 17 of Agenda 21 covering the oceans, seas, semi-enclosed water bodies and estuaries, it therefore decided to undertake capacity building exercises and formulated a programme namely, "Integrated Coastal and Marine Area Management (ICMAM)" with assistance from the World Bank. A Project Directorate was established in Chennai to carry out the ICMAM activities.

One of the activities identified for capacity building is “Development of Critical Habitat Information System (CHIS) using GIS” for 11 critical habitats along the Indian coast, comprising habitats such as mangroves, coral reefs, breeding habitats of endangered organisms, areas of high biodiversity, etc.\textsuperscript{103}

\textsuperscript{100} Pillai, V K (1996), Marine pollution in the coastal waters of India. In: Marine Biodiversity: Conservation and management. CMFRI, Cochin, p. 143-151.


\textsuperscript{102} The enactment of the Water (Prevention and Control of Pollution) Act of 1974 has given the statute book its first real foundation for environmental protection. Other major enactments that have followed are the Forest Conservation Act (1981), the Air Prevention and Control of Pollution Act (1986), the Environmental Protection Act (1986), the National Environment Tribunal Act (1995), the National Environment Appellate Act (1997) and the Biodiversity Protection Act (2002).

\textsuperscript{103} The 11 sites chosen are Gulf of Kachchh and Gulf of Khambhat in Gujarat, Malvan in Maharashtra, 7 islands off Karwar in Karnataka, 3 islands of Cochin in Kerala, Kadamat Island in Lakshadweep UT, Gulf of Mannar and Pitchavaram in Tamilnadu, Coringa in Andhra Pradesh, Gahirmatha in Orissa and Sunderbans in West Bengal.
In India, four main categories of waste are governed by separate Rules: hazardous waste; radioactive waste; biomedical waste; and municipal solid waste (the latter being applicable to municipal authorities only).

By way of illustration, the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008, and Bio-medical Wastes (Management and Handling) Rules, 1998 are the outcome of Basel Convention and they are modified according to the convention as per directions of the Apex Court of India. Though the convention may exercise profound influence in bringing about reduction in the movement of hazardous waste yet national efforts in prevention and reduction of such waste are to be accelerated. A large amount of international trade in hazardous substances and wastes is presently under regulation and strict control. Yet there are reports of illegal exports in these hazardous substances and wastes, which require to be strictly monitored and regulated.104

Since the last two decades, the Supreme Court of India has been actively engaged, in many respects, in the protection of environment. The enhanced role of the Court is not unique to cases of environmental jurisprudence in India. In fact, its role has become crucial and significant in every sphere of governance.105 This process of judicial intervention in resolving environmental disputes is viewed as judicial activism in present days.106

The reasons for the increasing concern of Court in governance arenas are varied and complex but one major factor has been failure of implementing

104 Research Foundation For Science v Union Of India (1999)1 SCC 223
106 Judicial activism means essentially that the judiciary expands its own scope and jurisdiction and goes into matters not normally considered to be within its own domain and that the judiciary often goes beyond giving of judgments and issuing of specific directions for executive action and sometimes even monitoring the progress of action, resorting to what is known as ‘continuing mandamus’. See Ramaswamy Iyer ‘Some Constitutional Dilemmas’, 41(21) Economic and Political Weekly 2064 (2006).
agencies to discharge their Constitutional and Statutory duties. This has prompted civil society groups and the people to approach the Courts, particularly the Supreme Court, for suitable remedies. Interestingly, the Court has also responded in a pro-active manner to address different governance problems.

The enactment of a number of laws both by the Central and State governments relating to environment has not made much headway in controlling the environmental degradation process and the laws, by and large, have remained unenforced, misadministered or mismanaged.\(^{107}\) GA Thivakaran of Gujarat Institute of Desert Ecology rued the fact that there was almost absolute lack of research on some marine species. "It could be because of three reasons-lack of money, lack of interest and difficulty in accessibility," he said.\(^{108}\)

While the capacity of the Ministry of Environment and Forests (MoEF), the Central Pollution Control Board (CPCB) and the State Pollution Control Boards (SPCBs) has improved over time, keeping up with the challenges of rapid growth has proved difficult. Many would argue that the judiciary filled the vacuum left by the lack of regulatory oversight.

Very little anthropological and ethnographic research and documentation has been carried out on India's fishing castes and communities; most of what has been done has been geographically focused or caste-specific (for example, in Tamil Nadu, Kerala and small bits in Orissa).

There are huge gaps in our knowledge and understanding of many aspects of marine and coastal biodiversity such as sea grasses, corals, impacts of climate change, etc. There are also gaps in documentation of the anthropological, socio-economic, indigenous knowledge and practices of coastal communities. Moreover, there is no single stakeholder or platform that provides coordination and knowledge-networking.


\(^{108}\) Available at http://www.dnaindia.com/india/report_marine-biodiversity-needs-more-attention_1692805
The last few centuries have been dominated by human beings, and are referred to by some scholars as 'anthropocene', or a period of human domination over the planet.\textsuperscript{109}

The recent oil spills off the Mumbai coast have drawn attention to the fact that India, which has 11 major and 20 minor ports, still does not have the response systems to handle oil spills that were mandated by a 1993 law.\textsuperscript{110} Mumbai has witnessed three oil spills in just one year. Sadly, the full impact of the spills was not fully reported in the mainstream media, and the spills have not provoked any revision of policy. This is something we have come to associate with almost every environmental issue in the country.

The most striking feature of any policy to address the problem of oil spills has been the huge gap between official words and action. It doesn't take much to arrive at the conclusion that policies relating to marine pollution have either not been drafted or not been implemented, in India.\textsuperscript{111}

We have still to put the required infrastructure in place. An important issue here is the involvement of the flag country -- the country where the ship or tanker is registered. As in the Mumbai oil spill, the Indian government could not even approach the flag country, Panama, as India is not a signatory to the International Convention on Civil Liability.

Further legislations needs to address not only ships carrying toxic waste and oil tankers, but also oil platforms and deep water horizon spills.

\textsuperscript{110} The cargo vessel \textit{M V Rak} carrying around 290 tonnes of furnace oil (much worse than crude oil), 50 tonnes of fuel oil, and 60,000 tonnes of coal, sank about 25 nautical miles from the Mumbai coast. Earlier, in another accident when an Indian Oil and ONGC oil pipeline burst, about 30,000 barrels of crude spilled into the Arabian Sea. It amounted to a total of around 4,170 tonnes of oil spillage – much more than any response system in India can handle.
\textsuperscript{111} The Oil Pollution Preparedness, Response and Cooperation (OPRC) Convention, drafted in 1990 and adopted internationally in 1995, aimed to put in place measures to deal with pollution incidents, either nationally or in cooperation with other countries. The convention added a protocol on Hazardous and Noxious Substances (HNS) in 2000, which came into effect in 2007. The OPRC-HNS protocol provides a diplomatic and legal framework for international cooperation in combating major incidents and the threat of marine pollution. Apart from this, India and other South Asian countries like Bangladesh, Sri Lanka and the Maldives are bound to the South Asia chemical pollution contingency plans funded by the United Nations Environment Programme and the International Maritime Organization. Both conventions call for strong risk assessment and mitigation capabilities at major and intermediate ports. Ironically, all of this is missing in the Indian context.
There are no binding international rules or standards for oil platforms, which pose an even greater risk.\textsuperscript{112} For the overview of the situation, we need to study the ministries in India involved with the marine environment. There are four separate government ministries\textsuperscript{113}, each deal with a different aspect of the marine environment and its resources. But there is no central marine authority which oversees the working of the various agencies dealing with the marine environment. For the better management of marine environment in an integrated manner, it is submitted that this missing link be filled in as soon as practical. The aim is to constitute a mean to forge collective understanding of the causes, impacts, and solutions of oceans problems so that all those contributing and connected to each problem find common cause in responding.

There is poor integration of marine and coastal biodiversity concerns in the Environment Impact Assessment Notification, 2006, and lack of awareness and sensitivity towards the issue of marine and coastal biodiversity among the judiciary, policymakers, decision-makers and administrators. These gaps extend to laws that govern conservation and management such as the CRZ which many of these stakeholders are in charge of implementing at the state or district level. The current legislation and institutional

\textsuperscript{112} As yet, no international convention deals with the issue of placing liability. India does not have any major policy or law regarding oil platform safety.

\textsuperscript{113} i) Ministry of Environment and Forest which deals with the following  
Coastal Regulation Zone Notification, 1991  
Forest (Conservation) Act, 1980  
Water (Prevention & Control of Pollution) Act, 1974  
Hazardous Waste Management Act, 1989  
Environmental Impact Assessment Notification, 1994  
Environmental Protection Act, 1986  
The Indian Wildlife (Protection) Act, 1972  
Biological Diversity Act, 2002

ii) Secondly there is the Ministry of Defense which covers:  
Coast Guard Act, 1978  
Maritime Zones Act, 1976

iii) The Ministry of Agriculture or Ministry of Animal Husbandry and Dairying overlooks the following:  
Deep Sea Fishing Policy, 1991  
Indian Fisheries Act, 1987  
Marine Fisheries Regulation Acts

iv) Finally the Ministry of Shipping deals with the following:  
Indian Ports Act, 1908  
Major Port Trust Act, 1963  
Merchant Shipping Act, 1958.
mechanisms for protected area conservation and fisheries are inadequate therefore they should be upgraded to accommodate contextual models and frameworks for marine and coastal management and conservation.

**Suggestions: Future for Our Oceans**

There will come an age, in the far-off years when the Ocean shall unloose the bonds of things, when the whole, broad earth shall be revealed, and when Tethys shall disclose new worlds Thule will not be the Limit of the Land.

Seneca, Medea

‘The tragedy of the commons as a food basket is averted by private property, or something formally like it. But the air and waters surrounding us cannot readily be fenced, and so the tragedy of the commons as a cesspool must be prevented by different means, by coercive laws or taxing devices that make it cheaper for the polluter to treat his pollutants than to discharge them untreated.’ The marine world has for long functioned as an indispensable source of human physical sustenance and security.

States are under the obligation to protect and preserve the marine environment. However this sentence is not limited to the prevention of prospective damage to the marine environment; it rather extends to the preservation of the marine environment. The word ‘protect’ indicates measures relating to imminent or existing danger or injury. The word ‘preserve’ points towards conservation of natural resources and retention of the quality of the marine environment within appropriate limits and standards generally agreed upon. ‘Conservation’ is the term that is normally used to refer to the protection of the living resources. Preservation thus intended requires a more pro-active approach by states to maintain and improve the present circumstances of the marine environment.

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114 In retelling the Greek legend of Medea, Seneca “the Philosopher,” writing during Rome’s Augustan age, foretold that Tethys, the wife of Oceanus, would disclose new worlds. He was referring to maritime exploration and distant seafaring; see also, Dallmeyer, Dorinda G., *Values at Sea: Ethics for the Marine Environment*, (2003).

Protecting the marine environment is the corollary of improved understanding of the marine environment. The broadly defined stewardship responsibility is designed to ensure that resources of the oceans are managed wisely, respect the stated principles, and protect oceans for the benefit and enjoyment of future generations. Protection must consider the degradation of the marine environment including, physical alteration and destruction of marine habitat.  

It is submitted that the efforts both at national and international levels should keep in mind the interdependence amongst systems, such as between air, land and sea while devising integrated strategies for coastal and ocean managements at the apt scale and effectively manage multiple human uses, their collective impacts and interactive effects at the same time.

Marine nature conservation is complicated by the plethora of international, regional, European and national regulations, and the differing impact of each layer of legislation. The inconsistencies between present environmental and emerging trade regimes is an important issue which is to be watched carefully and resolved fruitfully. Marine science provides the vital knowledge and information to enable us to take key decisions on the management of our seas and oceans which will affect generations to come. We should look increasingly to marine science to inform both our understanding and our action so that it serves to help us better to comprehend the past and to plan the future sustainably.

Several weak links in the complex feedback system that comprises ocean management have been categorized. Perhaps the weakest is the ability to collect, organize, and transmit knowledge worldwide. The specialized data and knowledge is required to be integrated to solve complex problems on site, so that the lessons learned in one locality are commonly known for use in other relevant circumstances.

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The terminology surrounding MPAs and MPA networks is often confusing and can hinder the communication of both the measurement and comparison of progress. Therefore common terms need to be agreed and clear definitions and standardised nomenclature for concepts such as MCPAs, MPAs, and networks should be developed by WCPA-Marine, in collaboration with the CBD and other organisations that have adopted certain terms and definitions.

To be effective, the environmental governance must lead to fair and sustainable management of ecosystems.\textsuperscript{117} It is well-established that the fragmented approach of sector-based marine management is a major contributor to deteriorating ocean health. Major gaps and overlaps created by this approach impede the achievement of ocean management goals. Ecosystem-based management (EBM) includes two key underlying principles: a) increased collaboration between ocean management agencies; and b) participation of stakeholders on behalf of all relevant interests in the target ecosystem. However, ecosystems bring their own specific governance challenges.\textsuperscript{118}

Assuming that science can provide the right answers, the ultimate test of the ecosystem approach will be how well it delivers sustainable ocean use and conserves functioning ecosystems in the interest of the common good. Most ecosystems are already impaired in some way, but they remain under heavy use. The endeavor now should be to moderate the uses to allow recovery without disenfranchising those who depend on ecosystems for subsistence and employment.\textsuperscript{119}

Undoubtedly our knowledge of the exact state of the marine environment is not yet as complete as we would like it to be thus making it

\textsuperscript{117} An ecosystem is a community of interacting organisms and the physical environment they live in. They are the productive engines of the planet—the source of food, water, and other biological goods and services that sustain us.

\textsuperscript{118} Ecosystem scales differ: Ecosystems exist at multiple scales, from a single stream, bog, or meadow, to a major river system or regional forest. Uses and users vary: Ecosystems produce many different goods and services—fish, timber, crops, recreation—and must serve many different stakeholders, from local residents to commercial harvesters.

unclear to what extent the open seas are in danger because of pollution. The need of the hour is to strengthen knowledge and capabilities at local, national, and regional levels to diagnose problems and respond to the linkages among them. This all points towards the mounting need for the dialogue between scientists and political and administrative decision-makers in relation to the pressing issues surrounding the marine environment.  

High-quality environmental knowledge should be made available to policy makers and regulators so that their opinion and decisions are informed by the best possible technical information. On the individual level, it is essential that there should be environmental education at all levels of our educational system. Inculcating the understanding of the environmental impact of personal actions can serve to educate the populace of the significance of actions taken at the individual or family level.

The rules of international law have become complex and technical as environmental considerations are no longer addressed in isolation. They are considered with relevance to other fields such as economics, science, social science, and other social fields. As the framework of ocean governance evolves, it is imperative to develop and maintain the interconnectedness of its implementation at all the levels namely local, national, regional and then finally at the International level.

The more that is understood about marine and coastal ecosystems, the more apparent it becomes that sound ocean management must take into account both the interactions among ecosystem components and each system’s functional linkages with other systems and biological communities.

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120 Individuals, firms, and governments to reach a consensus on environmental goals and finally achieve them. Collaboration among climatologists, ecologists, ocean chemists, toxicologists, soil scientists, statisticians, coastal engineers, economists, and practitioners of monitoring and information technology will be needed to develop the information base and linkages necessary to fully assess the condition of the world’s coastal environments.

Many of these processes take place at very large scales. This has led to renewed efforts to delineate viable and logical units of management.  

The capacity of many countries to diagnose marine and coastal problems, identify priorities, and apply environmentally-sound approaches is limited. Global conventions are lacking in key areas, including land-based marine pollution, seabed activities, and protection of forests; nor has a legal regime for protecting marine biodiversity of the deep seabed been developed.

The main constraints to regional cooperation in marine environmental protection are poor political relationships and environmental apathy. Addressing transboundary pollution, coordination of regulations and their implementation, and prevention of a “tragedy of the commons” are the most pressing issues that have to be sorted.

The precautionary principle, and its ‘softer’ version the precautionary approach, appeared in international discussions some decades ago, and have been accepted, like EBM, into international and national laws. Marine protected areas (MPAs), particularly no-take zones that exclude fishing, have received a great deal of attention because they have been shown to work in rebuilding and sustaining fisheries and other marine ecosystem services. By themselves, MPAs are necessary but not

122 “Large Scale Ecosystem Management With Special Reference to the Marine and Coastal Environment,” draft prepared by IUCN, UNEP, and WWF as a discussion document for the workshop convened by the Ecosystem Conservation Group during CSD7 in New York, April 1999; see, “Large Marine Ecosystems and Ecoregions: Tools for Marine Conservation,” a draft prepared by D. Olson (WWF), E. Dinerstein (WWF), K. Sherman (NOAA-NMFS), and J. Waugh (IUCN-US), (1999); and Kenton R. Miller, Balancing the Scales: Guidelines for Increasing Biodiversity’s Chances Through Bioregional Management (WRI 1996).


125 The precautionary principle appears in one of its many variations in the World Charter For Nature 1982, a resolution of the UN General Assembly, and was more formally endorsed in the RioDeclaration1992 (United Nations Conference on Environment and Development).

sufficient. MPA networks alone, even if efficiently managed will not protect all marine biodiversity effectively. It is submitted that they must be mapped within an encompassing scheme of place-based management including traditional fisheries management. Gaps in MPA network development at the regional level could be reduced by improved coordination between government, international organisations including IUCN, the CBD, UNEP-RSP and international NGOs to facilitate and support such networks.

Planning for MPAs should be considered as part of the marine spatial planning process along with any other claims on space in the region. As the answer to the call for improved ocean governance, Marine spatial planning, including the increased use of marine protected areas and marine reserves, should be widely promoted. Here, it would be apt to cite example the of United States of America. In a July 2010 executive order, President Barrack Obama, following up on extensive reports in 2003, 2004 and 2010 that detailed how desperately ocean governance in the United States needs to improve, called for marine spatial planning at the federal level. Marine spatial planning (MSP) is used as a tool that brings together multiple users of the ocean including energy, industry, government, conservation and recreation to make informed and coordinated decisions about how to use marine resources sustainably.

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spatial planning (MSP) is emerging as one of the most promising tools for creating an ecosystem-based management (EBM) approach and ensuring that coasts and oceans are managed to meet current and future demands on ocean resources. It focuses on the most concrete aspects of EBM which is area-based planning and management.

MSP uses maps to create a more comprehensive picture of a marine area identifying where and how an ocean area is being used and what natural resources and habitat exist. Spatial planning in the marine environment is a process that can reduce conflicts, clarify cumulative impacts, identify conflicting mandates, and provide a structure for place-based management. In its broadest sense, marine spatial planning is about “analyzing and allocating parts of three-dimensional marine spaces to specific uses, to achieve ecological, economic, and social objectives that are usually specified through the political process.” However, marine spatial planning cannot be regarded as a panacea that can resolve all marine governance issues.

One particular obstacle in implementing the ecosystem approach which is to be tackled primarily, is the absence of a central body in the Member State with responsibility for law enforcement by providing a statutory basis for the appointment of officers with extensive enforcement powers in relation to licensing, nature conservation and fishing in the marine area. Similarly, the conspicuous absence at the global scale of a global government having an

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135 Marine spatial planning is often confused with ocean zoning, although they are two entirely different concepts. Marine spatial planning, as explained above, is a planning process that looks at the system and all of its uses from a spatial and temporal perspective, similar to comprehensive planning on land. Marine spatial planning can aid in the implementation of ecosystem-based management. Comprehensive ocean zoning is a means of applying marine spatial planning to specific places. Comprehensive ocean zoning, by contrast, is a tool that may be used to control the distribution of human activities in space and time.


137 Where the marine environment is hindered by the root causes of climate change namely emissions of greenhouse gases, the problem cannot be addressed (except in very limited fashion) through place-based marine ecosystem management; instead, climate change mitigation requires different and more international solutions.

authoritative central institution capable of crafting strong environmental protection at the international level and further ensuring compliance of the same, highlights the difficulty of pursuing effective environmental governance. The relative ineffectiveness of international environmental governance is most apparent when compared to the evolving system for international governance of trade and investment.

Not only does the World Trade Organization wield more concentrated authority over trade than any single environmental organization, but international trade agreements have strong enforcement and dispute resolution mechanisms. Moreover, international trade and finance policies have significant impact on the environment and real potential to trump international environmental policies when they come into conflict.

Many environmental leaders rightly argue that global environmental problems are getting worse and the international efforts to solve them are inadequate. They go further to propose the creation of a World Environmental Organization, on the order of the World Health Organization and the World Trade Organization. It is submitted that such an organization if and when constituted would benefit the core cause of marine environment and its conservation immensely at all levels.

Marine and coastal ecosystems are regarded as vital global carbon stores, but their role for carbon in protected management has been largely ignored in international climate change discussions. Even with the most far reaching mitigation strategies, climate change impacts will continue to become more pronounced for decades to come. Therefore, it is necessary to adapt to current and future climate change in order to minimize impacts and increase resilience in both human societies and natural ecosystems.


Oceans, by their very nature, demand international management. Ocean governance regimes in a climate change era should ensure that each protected marine ecosystem has an appropriate level of species-level biodiversity, as judged against a baseline status that reflects minimal human exploitation.\textsuperscript{141} Ocean governance regimes should aim to reduce other stressors on marine ecosystems and to enhance marine ecosystem resilience so that, for as long as possible, existing ecosystems will have the capacity to change as the world changes while still maintaining their current functionality.\textsuperscript{142} Ocean governance must acknowledge that marine ecosystems will change over time, and many of them will shift to new ecological states of being.\textsuperscript{143} One of the most pressing marine issues faced by the world community is the governance of areas beyond national jurisdiction which requires to be streamlined within the ambit of international law. Various regional and sectoral conventions and instruments are increasing efforts to conserve marine biodiversity in open oceans and deep seas, there is an urgent need for further institutional improvements, cooperative mechanisms and agreements on common principles and goals for spatial management of human activities in areas beyond national jurisdiction.

The inherent flag state jurisdiction, together with weak enforcement powers with the International Maritime Organisation and lack of incentive for flag states to enforce has rendered effective marine pollution control impossible.\textsuperscript{144} Nonetheless environmental issues have never been higher on the shipping agenda. The marine industry is under increasing pressure to

\textsuperscript{141} See Jeremy B.C. Jackson et al., (2001), "Historical Overfishing and the Recent Collapse of Coastal Ecosystems", 293 Science 629, 629 (arguing that current ocean management has to take account of much earlier historical baselines, because "overfishing and ecological extinction predate and precondition modern ecological investigations and the collapse of marine ecosystems in recent times, raising the possibility that many more marine ecosystems may be vulnerable to collapse in the near future.").

\textsuperscript{142} Resilience is the capacity of a system to absorb disturbance without shifting to another Systematic state or regime; see, Lance H.Gunderson, Craig R. Allen, & C.S Holling, \textit{Foundations Of Ecological Resilience} xv-xvi (2010).


\textsuperscript{144} This, with the caveat that proposals for action would need to be vetted by IMO for being resource- motivated, bona fide measures that do not interfere with navigation. Other suggested ways forward include changes in jurisdiction pursued through the 'Generally Accepted International Rules (GAIRS) route and sensible use of Particularly Sensitive Sea Areas (PSSAs).
comply with evolving regulations and to become cleaner and greener. Though International Maritime Organisation, UNESCO-IOC, ITOPF and other relevant organizations have worked out plausible strategies to achieve this, it is particularly important to have a mechanism for rapidly updating oil input statistics of all kinds, in relation to ships and sea-based activities.\textsuperscript{145} The collection, analysis and interpretation of oil input data should be coordinated, taking advantage of existing institutional data bases of agencies and industry. The exchange of ballast water from ships and associated introduction of alien species and pathogens in oil shore zones needs to be regulated with binding rules.\textsuperscript{146} Further a global liability regime covering bunker fuels spills from the ships is also required to be formulated.\textsuperscript{147}

The recent times have seen the international community devoting its greatest effort to controlling risks and adverse impacts from hazardous and toxic substances, especially those that accumulate and persist in the natural environment.\textsuperscript{148} A prior informed consent procedure rather than a prohibitory approach has been taken to manage international trade in banned or severely restricted chemicals.\textsuperscript{149} A proactive and highly precautionary approach of only allowing chemicals listed as `safe’ on the market is still opposed.\textsuperscript{150}
Safe and environmentally sound ship recycling is essentially in its infancy and there is no such thing as just one acceptable technique. However noting ‘the growing concerns about safety, health and the environment and welfare matters', the Ship Recycling Convention, the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (the Hong Kong Convention), was adopted at a diplomatic conference held in Hong Kong, was adopted by the International Maritime Organisation. The Convention is aimed at ensuring that ships, when being recycled after reaching the end of their operational lives; do not pose any unnecessary risks to human health, safety and to the marine environment.  

The non-shipping world is looking critically at the marine industry’s contribution to greenhouse gas (GHG) emissions and asking how they can be reduced. One of the major concerns of the ports in establishing regulations to control marine emissions is port competitiveness. Ports profit from the activities of the shipping companies that operate at its facilities. Imposing financial penalties for emitting air pollutants can drive their business to other ports nearby that have not established comparable regulations. Shipping companies face the same problem, if they take actions to reduce their emissions and their competitors don’t then they would be at an economic disadvantage because of the high capital and potential operating costs involved with installing emission control technologies.

The Hong Kong Convention intends to address all the issues around ship recycling, including the fact that ships sold for scrapping may contain environmentally hazardous substances such as asbestos, heavy metals, hydrocarbons, ozone-depleting substances and others. It also addresses concerns raised about the working and environmental conditions at many of the world’s ship recycling locations Upon entry into force of the Hong Kong Convention, ships to be sent for recycling will be required to carry an inventory of hazardous materials, which will be specific to each ship. An appendix to the Convention provides a list of hazardous materials the installation or use of which is prohibited or restricted in shipyards, ship repair yards, and ships of Parties to the Convention. Ships will be required to have an initial survey to verify the inventory of hazardous materials, additional surveys during the life of the ship, and a final survey prior to recycling.

It is estimated that shipping (both domestic and international) contributes 2.7% to global CO2 emissions annually – a similar amount to that emitted by Germany or Japan. The IMO’s Energy Efficiency Design Index (EEDI), in conjunction with the proposed Ship Energy Efficiency Management Plan (SEEMP) and Energy Efficiency Operational Indicator (EEOI) should help the industry achieve fuel efficiencies and a consequent reduction in greenhouse gas emissions. However, these tools are voluntary, and may not yield the expected savings unless they are translated into mandatory regulation.
The methodical deficiencies in the vessel sourced pollution control regime lie in the 'knee-jerk' approach to regulation, time lags in entry into force of conventions and implementation and enforcement impotence. These shortcomings need to be rectified. However, 'profitability and ecological responsibility are not necessarily irreconcilable'. There is a delicate balance to be reached between the competing interests and it is necessary to ensure that the International Maritime Organisation does not alienate its shipping interests by its environmental and safety protection activism.

Gaps in implementation of major commitments and weaknesses in existing governance frameworks compromise our ability to address these major threats to the long-term health and well-being of marine ecosystems and coastal communities. Efforts need to be put in to overcome weaknesses of national structures and deficiencies in national policies and practices which seriously hamper the participation of many countries in international efforts designated to protect and develop institutions, policies and practices.

In many countries the scientific infrastructure is weak, and scientists are little involved in decision-making processes. When and where such circumstances exist, the scientific uncertainties and deficiencies in informational setup need to be dispelled and managed in a better manner. The communication between scientists and government policy-makers and the public needs to be made more effective and functional.

The predicament afflicting the world’s seas and coasts arise partly in the failure of individual governments to provide enough political and financial commitment. One cannot overlook the lack of capability of many nations to take effective action even if they want to. But they are also deeply embedded in powerful social, political and economic driving forces. Science and technology point the way to effective alternate control strategies. They along with economics provide the objective basis for land based marine pollution control.\textsuperscript{153}

\textsuperscript{153} Meng, Qing-nan, \textit{Land-Based Marine Pollution: International Law Development}, (1987).
Moving into the future means travelling into uncharted waters. Some of the way ahead is clear but there is much that cannot be mapped out, even with advanced technologies.\textsuperscript{154} Despite the fact that the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA), continues to be implemented at national, regional and global levels, but the GPA does not "swim alone", therefore the long-term success in protecting the marine environment from land-based activities shall much depend on progressive steps formed in the broader context of international environmental governance. The use of education and outreach programmes to encourage key user groups,\textsuperscript{155} industry sectors and the general public to modify behaviour and assume greater personal responsibility for their actions is strongly suggested.

Our world is evolving in every possible direction. In this progressive era sticking to the traditional pollution concepts will yield inept results. A cause for great concern is that the world’s political, legal and economic institutions from the global to the local level operate on outdated concepts and trail behind in formulating and implementing preventive policies through improved and innovative institutional and financial arrangements. Scientifically, the ability to predict future changes in the environment requires an understanding of the physical, chemical, biological, and social processes that govern the marine world, and of the interaction of these processes throughout the marine ecosystems. Science and engineering should be resorted to develop the tools to address marine environmental problems which are of enormous consequence to our social and economic well-being. Therefore the focus of the research must be to identify development pathways that are environmentally sustainable and ensure a sustainable, sound and healthy marine ecosystem, and achieve marine environmental security. Global institutions need to be equipped for the 21st Century and resolve environmental security challenges by peaceful means.


\textsuperscript{155} Key user groups include individual fishers and their associations, sailors, tourists, consumer groups, sporting bodies, cruise operators and hoteliers.
‘Marine pollution’ and ‘marine environmental protection’ are passive approaches to assess and govern the marine environment. They inevitably lead to the implementation of remedial actions usually after the obvious and irreversible effects on the marine environment occur. On the other hand, ‘Marine environmental security’ is a proactive approach connected to the sustainable development principle. It focuses on the security of the marine environment, and may require us to act before harm on the marine environment can be scientifically demonstrated. Policies and regulations should be formulated to maintain marine environmental security.

Marine environmental security will be an advanced sustainable development viewpoint for marine environmental research and management. Environmental security is the proactive minimization of anthropogenic threats to the functional integrity of the biosphere and thus to its interdependent human component. The marine environmental security concept urges us to focus less on today’s conditions and more on the future ecosystem health and risk in order to make decisions and act before negative effects occur. Since marine environmental security is a sustainability concept of marine environment, and pollution is neither the only, nor necessarily the most severe threat to the health of oceans, we should aspire to consider marine environmental security rather than marine pollution. To accomplish this objective, we ought to change our ideas, escape from traditional pollution concepts, and establish the notion of environmental security. In the present times our intent should be to ensure a sustainable, sound and healthy marine ecosystem, and achieve marine environmental security. To accomplish this, the gap between scientists and environmental managers should be closed, and policies and regulations should be formulated to maintain marine environmental security.

In the oceans realm, early conventions to control marine pollution sought uniform rules to avoid confusion and discrimination among shipping

156 Environmental security reflects the ability of a nation or a society to withstand environmental asset scarcity, environmental risks or adverse changes, or environment-related tensions or conflicts.
157 http://wwf.panda.org/about_our_earth/blue_planet/publications/?18472/Securing-Island-Futures-People-and-Protected-Areas accessed on 23.10.11
nations. With the passage of time, they have emphasized the goals of reducing adverse impacts on human health, marine species, and habitat. International fisheries arrangements are moving from a narrow concept of conserving shared stocks of target fish to multi-species management encompassing predator/prey relationships, habitat protection, and the incidental impacts of fishing on marine species and habitat. New directions favour a broad, bio-geographic approach to marine management based on ecosystems and strive to link species conservation arrangements with those on marine environmental protection. A few incorporate specific applications of a precautionary approach.158

The Convention on Biological Diversity has recognised Integrated Marine and Coastal Area Management (IMCAM) as the most effective tool for its implementation with respect to the conservation and sustainable use of marine and coastal biodiversity. However at times, legal conflicts are very likely to arise between this convention and the other environmental treaties that regulate environmental as well as economic or developmental issues or which encompass economic instruments. For example, with respect to protection and management of marine biological resources and ecosystems, the relationship between UNCLOS and the Convention on Biological Diversity can be conflicting, due to conflicting approaches of the two agreements towards the protection and use of marine living and genetic resources.

Marine protected areas remain a strong foundation to address ocean challenges. However, they cannot be a panacea to the heavy pressures on the coasts and oceans. For them to achieve their objectives, they need to be designed and managed effectively, taking into considerations the socio-economic needs of their surrounding communities. They also need to be part of an effective institutional framework that addresses management across all sectors. Policies, planning and management have to be expanded to look beyond Marine protected areas. They should consider marine biodiversity

conservation and management needs across the entire ocean space, within and also beyond national jurisdictions. Efforts to secure a foundation of well planned and effectively managed MPA networks, as one of the fundamental cores of more comprehensive ocean management strategies, should be accelerated. Marine protected areas are essential for conserving priority sites and processes, however they cannot be managed effectively as islands of conservation in a sea of depletion and degradation. For MPAs to fulfil their conservation objectives and to contribute to ocean conservation and restoration more broadly, the design of the MPA system, and the selection, governance and management of sites should be part of an overall strategy of ocean management. Such a strategy must take into account the multiple factors that influence the persistence of coastal and marine resources, including the structure and function of the natural ecosystem, the existing and potential consumptive and non-consumptive uses, the range of maritime activities and security considerations and the manner in which these interact with and impact the marine environment.

International law, like law generally, must respond to the "felt necessities of the times." To the extent it does not, pressure for change builds and the law cannot fulfill one of its basic purposes: to establish a predictable framework for action. The environmental calculus is difficult. The serious literature makes clear that we have gone beyond the easy part of Manichaean norms, and must mediate between competing goods as best we can. To do so, we must confront the complex choices and enforcement challenges that attend almost every environmental decision.

Management thus entails a complicated feedback system comprised of information, analysis, the testing and refinement of solutions, agreement on effective measures, adoption of laws, and regular progress reviews to inform and revise these measures and ensure that they are complied with. Once laws are in place, they trigger formal mechanisms to review progress and

159 For an examination of the role of normative hierarchy in such a process, see the centennial essay by Dinah Shelton, Normative Hierarchy in International Law, 100 AJIL 291 (2006).
adequacy of the existing measures.\textsuperscript{160} For this the law needs to be constantly evolved, elaborated, and adjusted to take account of newer scientific findings, technological developments, socio-economic analyses, and lessons learned.

The marine environment is a complex system. Marine matters not being a single party’s concern, demand global, regional, sub-regional and national measures in order to promote a legal regime to this end. \textsuperscript{161} “The Oceans are our great laboratory for the making of a new international order, based on new forms of international cooperation and organization, on new economic theory, on a new philosophy.”

The health of the marine ecosystem is recognized to be a vital aspect of the marine environment than simply the presence of pollution. The risks and problems still exist and are threatening the marine environment. There is growing awareness that the escalating crisis in marine ecosystems—from biodiversity losses and transformed food webs to marine pollution and warming waters—is in large part a failure of governance. Problems arise from fragmentation in the governance systems used to manage specific human uses of marine resources, together with spatial and temporal mismatches between biophysical systems and the rights, rules, and decision making procedures created to manage human interactions with these systems. To overcome this lacuna a successful ocean governance capable of dealing with socio-ecological systems that are complex, heterogeneous, dynamic, and prone to nonlinear and often abrupt changes is required.

The precautionary principle should become ubiquitous in all ocean governance. One of the most damaging effects of the long tenure of the freedom of the seas concept has been the de facto notion that governance rules were not needed because of human inability to cause significant detrimental effects on the ocean the inexhaustibility hypothesis. The ocean’s resources are clearly not inexhaustible and resources such as fisheries and

\textsuperscript{160} Secretariat of the Convention on Biological Diversity (2010), Year in Review 2009. Montreal, p 42.

\textsuperscript{161} International Chamber of Shipping; Oceana; IMO; The Independent; Maritime Transport Committee; Sustainable Shipping; New Scientist; Bloombery; Earth Justice; WWF; OECD; Bluewater Network.
coastal water quality are clearly being used in an unsustainable manner. The adoption of a precautionary principle\textsuperscript{162} would be of significant assistance in correcting this misperception in areas such as ocean fishery management.\textsuperscript{163}

The challenges constraining effective protection of the marine environment from land-based pollution and activities are common to many areas of environmental governance. These challenges which need to be addressed are among others: poverty, lack of public education and awareness, limited individual and political wills to take pollution and environmental degradation seriously, over-consumption and materialistic mindsets, limited financial and human resources, fragmented legal and institutional arrangements, and lack of effective compliance and enforcement.\textsuperscript{164}

The world is gearing up to embrace a novel concept of management of natural resources which is known as the 'Blue Economy Concept'. The Blue Economy approach seeks sustainable solutions that are practical, affordable, and informative. The concept of Blue Economy is scaling several dozen projects worldwide. It is inspired and aided by a number of leading scientists, spread across a hundred or so countries, making their vision, knowledge and services available, together with pioneering research inspired by our desire to do more with what we have. The concept of "The Blue Economy" \textsuperscript{165} should be adopted in marine governance since from an environmental perspective; the elimination of waste represents the ultimate solution to pollution problems.


\textsuperscript{163} The best example of a global ocean management regime undergoing the ‘conversion of precaution is the London Convention 1972 and its 1996 Protocol. While the original Convention adopted an assimilative capacity approach to ocean dumping through ‘black list and ‘grey list restrictions allowing most materials to be disposed at sea subject to a permit requirement, the Protocol adopts the precautionary approach through ‘reverse listing whereby only wastes listed on a ‘safe list will be approved for ocean disposal and even then subject to waste audits.


\textsuperscript{165} The Blue Economy permits to respond to the basic needs of all with what we have. As such, it stands for a new way of designing business: using the resources available in cascading systems, where the waste of one product becomes the input to create a new cash flow.
that threaten marine ecosystems at both local and global levels. For industry, Blue Economy means greater competitiveness and represents a continuation of its inevitable drive towards efficiency. For governments, the full use of raw materials creates new industries and generates jobs even as it raises productivity. It is submitted that many lacunae and missing links in the marine conservation efforts can be found within this approach, hopefully.

As far as India is concerned it should bring about more elaborate laws to check marine pollution and also ratify the international agreements relating to marine environment that are made from time to time. The Merchant Shipping Act does not apply to pollution on the high seas. It is submitted however, that for a peninsular country like ours, it is extremely important to have provisions to prevent pollution of the high seas adjoining its Exclusive Economic Zone. The International Convention relating to Intervention on the High Seas in case of Pollution Casualties, 1969, extends the jurisdiction of a coastal state to the high seas, but only when it poses a grave and imminent danger to fishing, tourism and wildlife. India has not yet ratified this convention.

It is submitted that the government departments which deal with the subject of fisheries, aquaculture, forests, environment, town planning, etc, as well as specialised agencies like the coastguard, shipping companies and port authorities, need to be brought into the capacity-building fold. Each of these institutions has its inherent capabilities, the only need is to devise mechanisms to enable them to share their skills and information with each other. The call for a system to manage marine and coastal pollution, with sustained programmes to monitor marine pollution and study the impact of the pollution on marine organisms and ecosystem health is crucial and urgent.

The most important of all pinning requirements is for the country to reinforce its commitment towards the conservation and sustainable management of marine resources through innovative changes and reforms in its current conservation and environmental laws. The present times demand economic evaluation and vouch for ecological economics of marine, coastal biodiversity and ecosystem services along with training and capacity-building of key institutions across the nation.
In many development-related laws, the value of marine and coastal conservation and biodiversity needs to be incorporated obsequiously. Successful public participation must be strategically and carefully planned and executed as part of a long term environmental management program of educating and building capacity of all stakeholders involved. The legislation also requires updating to address new environmental risks.

Furthermore, India needs to start the deliberative process towards putting in place a legal framework to safeguard its continental shelf once it is extended, since there is an increasing competition for the ocean’s resources. The unattended gaps in the conservation of marine resources are in the process of being identified. The need to provide training and awareness on concepts of conservation and sustainable use of marine and coastal resources is urgent and cannot be overlooked any longer. The network of information providers consisting of Government Institutions, NGOs, MEAs Secretariat and International inter-governmental organisation (like UNEP/IUCN) should be further developed and strengthened so that they provide synergies for policy and programs to conserve marine environment.

It is put forward that capacity building in terms of environmental and socio-economic assessment should be enhanced as the basis for raising awareness and influencing change in the behaviour of local communities who affect and are affected by marine environment with the support and partnership of local communities and fisherfolks. Synergetic and integrated action between various government departments, research institutions and local communities groups to implement marine or coastal management actions plans should be worked out.

Every generation selects the world it will live in by conscious choice or by inaction. Considering the significant threats to public health and the quality of the natural environment that face us today, our society is making decisions that shape its environmental future. The international marine environmental governance system is still a work in progress. Nearly all of it has come into

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being in the three decades since the environment began to be a common concern, and it continues to evolve, with new efforts to strengthen key elements mutually agreed upon by the international community.

Heritage is our legacy from the past. Our cultural and natural heritage is an irreplaceable source of inspiration and is priceless not only for an individual nation, but for the mankind as a whole. Our predecessors appreciated Neptune’s bounty, respected Neptune’s power, and were wary of Neptune’s wrath. We should recall their wisdom, but add to it our insights from science, economics, and governance. Restoring our oceans to good health is an investment in all our future.\(^{167}\)

There can be no healthy planet, no “green economy” and indeed no sustainable future without a healthy ocean. States should aim for a bold and courageous agreement at UNCSD to ensure the future viability of ocean ecosystems. This must begin with a strong and holistic negotiating text which addresses the aforementioned ocean elements to move towards sustainable development goals and in tandem create an enabling environment for much needed change.

As rightly put by H. Scheiber “We must develop, as I once termed it, a new "ocean ethos"\(^{168}\) We need a common approach and a set of common goals. We should go into this venture with an open mind, clear objectives, and with all the resources of technology, the social and natural sciences, and the history of the first two millennia available to us as we make the necessarily human value decisions governing human behaviour and the world ocean.\(^{169}\)

Sir Francis Drake\(^{170}\) once expressed that there must be a beginning of any great matter, but the continuing unto the end until it be thoroughly finished

\(^{167}\) http://www.worldbank.org.in/contentMDK:23126181~menuPK:295589~pagePK:2865066, accessed on 12.03.10


\(^{170}\) Vice Admiral Sir Francis Drake (c.1540 – 28 January 1596) was an English privateer, navigator, naval pioneer and raider, politician, and civil engineer, of the Elizabethan period.
yields the great glory. The above statement should be the guiding principle in the context of marine environment protection efforts. The importance of developing sustainable environmental systems for future generations and thus for making the best decisions for protecting, restoring, and managing marine resources is massive. The greater glory would be when for the protection and preservation of marine environment, this generation and the coming ones are well equipped to take on any challenge before them.