
BLUE OCEAN STRATEGY: A LEGAL AND POLICY FRAMEWORK FOR SUSTAINABLE MARINE ECONOMIC DEVELOPMENT AND BIODIVERSITY CONSERVATION

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ABSTRACT

The Utilization of ocean in a renewable manner is grabbing global attention towards future prospects. The institution established for this purpose must assess the impact over the use of such resources and predict all the risk exposure to stop the marine ecosystem from deteriorating. In today's world, pollution of marine biodiversity is of a great concern. These pollutants can cause serious side effects upon wildlife and humans as well as on the surrounding environment. This urges the need to maintain international agreements in order to hand over the same to our future generation without exploiting the currently available resources. For this purpose, even our government has framed many legislations pertaining to the preservation of aquatic life. The main objectives of these laws focus to regulate those activities that affect the biodiversity of marine environment and to foster sustainable practices. Although, regardless of the presence of those legal instrument, there are several challenges faced not only by India but all the countries around the world regarding the conservation of marine biodiversity and its impact on climate change. India and many other nations are still working on it, to give their best towards to combat degradation of marine biodiversity. For, this purpose India has planned to send "Matsya 6000 submersible", one of the Samudrayaan mission (India's deep see goal) in order to conduct exploration in the deep ocean and to facilitate the study of ocean's resources and biodiversity, at a depth of around 6,000m. Hence, the current need is the cooperation between the government and citizens to bear the fruit and appropriate application of related legislations not particularly to the protection of marine ecosystem, but must additionally conserve the beings that it supports.

Keywords: Marine biodiversity, conservation, National and international legal instruments, Samudrayaan mission, issues and challenges.

1. Introduction:

“Health to the ocean means health for us”- Sylvia Earle

More than 300 crore people worldwide depend either directly or indirectly on the oceans for homes, food, medicine, and other necessities. The basic liquid that makes life as we know it possible is water, which is known as the "elixir of life." Water covers more than 70% of the Earth's surface. Climate change and human activities like garbage dumping, oil spills, and massive seabed mining have had a detrimental effect on the quality of seas and the health of a variety of marine plants and animals. In today's world, pollution of marine biodiversity is of a great concern. These pollutants can cause serious side effects upon wildlife and humans as well as on the surrounding environment. This urges the need to maintain international agreements in order to hand over the same to our future generation without exploiting the currently available resources. For this purpose, even our government has framed many legislations pertaining to the protection of marine biodiversity. The main objectives of these laws focus to regulate those activities that affect the biodiversity of marine environment and to foster sustainable practices. The Indian Judiciary has broadened the interpretation of Article 21 to encompass the right of each citizen to access a safe, clean and healthy environment. Demonstrating a strong interest in environmental issues impacting various aspects of human life, the Judiciary has issued relevant writs, directions, and orders against individuals who adversely affect the surrounding environment. Furthermore, a significant obstacle in marine environmental conservation is the insufficient awareness among citizens, requiring appropriate attention and resolution.

2. Marine biodiversity legislations in India:

India has a rich biodiversity of the oceans and is an adobe to an array of unique marine habitats. The marine ecosystem and related habitats do play a crucial role in the bringing India's economic and ecological stability. This shows how essentially marine biome intervenes in our lives, thus necessitating not only India but also other nations around the world to have extensive legislations for governing biome related practices. Therefore, India has enacted certain legislations pertaining to marine and costal activities in India.

“The legislations are:

- The Indian Maritime Zones (Regulation of Fishing by Foreign vessels) Act, 1981
- The Indian Fisheries Act, 1897
- The Water (Prevention and Control of Pollution) Act, 1974
- The Biological diversity Act, 2002
- The Coast Guard Act, 1978
- The Coastal Regulation Zone (CRZ) Notification, 2011
- The Wild Life (Protection) Act, 1972”¹

2.2.The Indian Maritime Zone (Regulation of Fishing by Foreign Vessels) Act, 1981:

This Act predates the UN Fish Stocks Agreement and convention framed in the year 1982, leaving various obligations unaddressed. The Act focuses especially on “fishing” activities, while its definition stands out of date and seems inadequate as it does not contain any proviso for contemporary aspects and modern elements such as attempting to find or search fish using aircrafts. “A wide range of requirements under those, and related instruments are not implemented. It applies to “fishing” activities, but the definition of such activities is weak and not up to date in two major respects. First, it refers to “catching, taking, killing, attracting or pursuing fish”, all of which contemplate the presence of fish. Modern definitions in national and international instruments refer also to searching and attempting to search for fish including use of aircraft. Second, it is defined to include processing, preserving, transferring, receiving and transporting of fish. Modern definitions separate fishing activities from these “related activities”, for administrative and legal purposes. For example, control over a carrier or reefer vessel is usually legislated in order to regulate transshipment at sea and prohibit supporting illegal fishing activities. “The definition of fishing, key to the effective implementation of the Act, needs strengthening and updating. The Act’s main provisions deal with the grant of licenses, prohibition of Indian citizens using foreign vessels, procedures for granting of permits or licenses, and the responsibility of permit holder for compliance. It requires unlicensed foreign vessels to stow their fishing gear when entering any maritime zone and allows scientific

¹ <https://indianwetlands.in/wp-content/uploads/library/Legal-FrameworkMarine-Environment-of-India.pdf>

research. Other provisions relate to powers of search and seizure, offences and penalties and miscellaneous items such as presumptions, and place of trial. The Act relies on rules to elaborate many of the requirements, such as the manner of stowing gear and terms and conditions for scientific research. The alternative would be to allow scope for setting requirements in writing, or by a simpler mechanism than adoption of rules in certain cases where the authority would not be abused. For example, a fisheries manager may wish to identify certain conditions for scientific research that are consistent with a management plan, but which do not form part of the rules. However, this is not done and there do not appear to be any rules as foreseen in the legislation.”²

2.3.The Indian Fisheries Act, 1897:

“Fishing, traditionally passed down through generations, is a hereditary occupation involving the participation of virtually every family member to some extent. The socio-economic status of fishermen was notably impoverished, as they belonged to the lowest social stratum. Fishing, in general, was commonly viewed as one of the least esteemed trades and professions. The Government of India (GOI) deputed Dr. Francis Day to investigate the fresh water resources of South India and then for the whole of India and Burma. Dr. Day of Madras Medical Service who worked as Surgeon Major with the British troops in Bengal and who functioned as the Director General of Fisheries of India in 1864 published two reports in 1878; the Freshwater Fish and Fisheries of India & Burma and Sea Fish and Fisheries of India. Dr. Day in his pioneering effort brought legislative measures to conserve the fisheries. On that basis the Indian Fisheries Act (Act IV of 1897) was passed for the whole of India, by which dynamiting and poisoning of waters for killing fish were absolutely prohibited. This Act empowered the erstwhile Provincial Governments to frame rules for regulating (a) the erection and use of fixed engines, (b) the construction of weirs, and (c) the dimension and kind of nets to be used and the mode of using them; and for prohibiting all fishing in specified water for a period not exceeding two years. The enactment of this Act was an important event that took place in the history of Fisheries of India. Days endeavours also resulted in the grant of duty-free salt for curing fish.”³ “This Act is a concise one that intends to prohibit the use of toxic substances and explosives within internal waters and along the coastlines. The legislation also empowers the State Government to create rules for safeguarding fish and related activities. The

² <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=50056>.

³ <https://www.fisheries.tn.gov.in/History>.

term “water” has been defined in the Act as “the sea within one marine league of the seacoast (i.e., 3 nautical miles)” refers to such location where required measures can be taken for fish protection. However, there is a gap in legislation meet India’s obligations towards nationals, including people and vessels, as mandated by the UN Fish Stocks Agreement and convention framed in the year 1982. During 19th century, the fisheries was the only source of sustenance for a segment of the population living in the coastal region, and on the banks of rivers, lakes and canals in India”

2.4.The Water (Prevention and Control of Pollution) Act, 1974:

This Act was the first in our country among the series of legislations enacted by our Indian government after attaining independence that relate to the environmental issues. This law had its roots especially due to high water contamination caused by industrial as well as domestic activities. The main focus of this Act is to regulate water contamination and prevent water pollution. In order to serve this purpose, the Act contains provisions for the establishment of national as well as state pollution control boards along with the authority and responsibility that are vested upon them for pollution control. The Act prohibits the discharge of any noxious, poisonous or polluting material or sewage or other pollutants into the flow of water, whether stream or lake or any other kind of waterbodies. The duty to interfere and prevent such activities is in the hands of State Pollution Boards. A clause has also been incorporated in this Act to maintain and renew the healthiness of aquatic resources. Even though this legislation not expressly enumerate regarding protection of marine biodiversity as it deals only relating to the regulation of water pollution, which is one of the reasons that endanger marine habitat, it could be interpreted as a regulation safeguarding the diversity of marine life.

2.5.The Coast Guard Act, 1978:

“India is blessed with an expansive marine ecosystem and biodiversity that supports a diverse array of species. The coastal population relies on the resources derived from this marine ecosystem. The preservation and safeguarding of the marine environment, along with the regulation of marine pollution, fall under the jurisdiction of the Indian Coast Guard. The global recognition of the imperative to safeguard this ecosystem is evident, and UNCLOS 1982 assigns the Coastal States the responsibility for preserving and protecting the marine environment and its associated resources. In 1986, the Indian Coast Guard was designated as the Central Coordinating Authority for responding to oil spills in the Maritime Zones of India.

Coast Guard officers have been authorized, under the Merchant Shipping Act of 1958, to undertake necessary actions against those responsible for pollution. Furthermore, in 1993, the Government of India approved the National Oil-spill Disaster Contingency Plan (NOSDCP), which assigned functional responsibilities for oil-spill response in India's Maritime Zones to various ministries and departments”⁴

2.6.The Coastal Regulation Zone (CRZ) Notification, 2011:

The Coastal Regulation Zone (CRZ) Notification of 2011, became operational on January 6, 2011, superseding the 1991 CRZ notification. This notification is issued in accordance with the provisions of the Environment (Protection) Act of 1986. The formulation of the CRZ Notification, 2011, involved thorough deliberation and consultation, incorporating dedicated provisions for safeguarding marine regions. Unlike a hierarchical approach, the notification classifies coastal areas based on their geographical location. Its primary objective is to safeguard and preserve coastal stretches, their distinctive environments, and associated marine areas. Additionally, the notification emphasizes the aim of ensuring livelihood security for fisher communities and other local populations residing in coastal areas. While the CRZ explicitly forbids the establishment of new industries and the expansion of existing ones, this prohibition is not absolute. Certain industries and activities are allowed within the CRZ. The CRZ notification enforces a range of regulations and restrictions across different categories, serving as a crucial legal tool that limits the setting up and growth of industries. It also governs activities, operations, and processes in coastal areas, encompassing creeks and the adjacent landward side. Moreover, the CRZ notification allows for the reconstruction and repair of dwelling units for local communities, including fisher communities. It also permits activities such as fish drying and the establishment of hatcheries.”⁵

2.7.The Wildlife (Protection) Act, 1972:

“It is the primary legislation in India that concerns regarding protecting wildlife, which also includes marine wildlife. It prohibits the hunting of animals specified in the six schedules of this Act and monitors the trade involving these animals and their parts. It also permits the designation of sanctuaries where human activity is restricted. These two strategies

⁴ https://indiancoastguard.gov.in/content/246_3_MarineEnvironmentProtection.aspx

⁵ 24.anita desale.pdf, Scholarly Research Journal for Interdisciplinary Studies Online ISSN 2278-8808, SJIF 2021 = 7.38.

have achieved certain levels of success in safeguarding terrestrial wildlife—by prohibiting hunting, regulating species through scheduling, and establishing protected areas. Nevertheless, their efficacy in preserving marine ecosystems remains a subject of debate. In its original form, the WLPA primarily focused on terrestrial aspects. For nearly two decades after its enactment, the legislation did not differentiate between protected areas in terrestrial and marine ecosystems. There were no distinct procedures outlined for declaring marine-protected areas, and the Schedules included only a limited number of marine species. The Act and its various provisions are aimed at the establishment of protected areas within the terrestrial landscape and even certain provisions of it have been incorporated into subsequent amendments, primarily to meet its international obligations, to include marine areas within its scope, however, as the legal analysis demonstrates, treating territorial areas as equivalent to reserve forests is problematic, both in terms of community rights and long-term conservation goals”⁶ “Inclusion of a number of marine animals in Wildlife Schedule I has also not resulted in the desired effect and has instead compounded the problem by endangering the livelihoods of fisherfolk.”⁷ “However, responding to global advancements in marine conservation, the Ministry of Environment, Forests, and Climate Change of India (MoEF&CC) integrated existing terrestrial-oriented policies onto marine ecosystems. More than 30 marine protected areas (MPAs) have been established in peninsular India, and over 100 in the Indian islands. In addition to crocodiles and turtles, initially listed in the WLPA schedules, numerous elasmobranchs, coelenterates, and mollusks etc., comprising a significant portion of the marine species have been included in the schedules since 2001. Even post-2001, fishes have not received sufficient protection under the WLPA. A major contributing factor to this has been the insufficient availability of scientific data.”⁸

3. International initiatives pertaining to conservation of marine environment:

Various measures have been adopted by the international community with the goal of protecting, preserving, and conserving the integrity of the marine environment. The renowned 'Stockholm Conference' took place in 1972, followed by the United Nations Conference on Environment and Development, commonly referred to as 'Rio-Earth Summit,' held in Rio de

⁶ <https://snrd-asia.org/wp-content/uploads/2018/04/CMPA-Technical-Report-Series-No.-02.-Legal-Framework-for-Conservation-of-Coastal-and-Marine-Environment-of-India-A-Review.pdf>

⁷ 24.anita desale.pdf, Scholarly Research Journal for Interdisciplinary Studies Online ISSN 2278-8808, SJIF 2021 = 7.38.

⁸ <https://india.mongabay.com/2021/06/commentary-conserving-marine-ecosystems-through-the-wild-life-protection-act-is-not-very-effective/>

Janeiro in 1992. The 1992 Earth Summit gave rise to the creation of the Convention on Biological Diversity, as well as various other environmental agreements. Numerous international conferences have been conducted, leading to the establishment of various conventions and treaties. For example, the United Nations Convention on the Law of the Sea in 1982, which address the issues related to national jurisdiction, including the delineation of contiguous zones, territorial seas, exclusive economic zones and continental shelf.

“The first United Nations Conference on the Laws of the Sea (UNCLOS-I), which took place from February 24 to April 29, 1958, four conventions collectively referred to as the 1958 Geneva Conventions were adopted and the Commission initiated its efforts to formulate laws of the sea in 1949. These four conventions encompass: (i) the Convention on the Territorial Sea and Contiguous Zones; (ii) the Convention on the High Seas; (iii) the Convention on High Seas Fishing and Conservation of Living Resources; and (iv) the Convention on the Continental Shelf.”⁹ “The United Nations Environment Programme (UNEP) Regional Seas Programme, 1974 is an international collaborative approach to protect the marine environment and its resources, the main aim of the Programme is to address the degradation of the seas by engaging neighbouring countries in a collaboration to support the achievement of international environment and development targets. The UNEP regional Seas Programme today supports more than 140 countries in marine resources management programmes around the world.”¹⁰

“India has signed several international instruments and conventions pertaining to the marine environment. Some of these include:

1. United Nations Convention on Law of the Sea (UNCLOS), 1982
2. Convention on Biological Diversity (CBD)
3. International Whaling Commission (IWC)
4. Tuna Commission
5. Convention on Migratory Species (CMS) or the Bonn

⁹ 24.anita desale.pdf, Scholarly Research Journal for Interdisciplinary Studies Online ISSN 2278-8808, SJIF 2021 = 7.38.

¹⁰ A Study on Legal Aspects of Marine Environmental Protection in India.pdf.

6. Antarctica treaty
7. International Oceanographic Commission
8. Convention of Wetlands of International importance (Ramsar 1971)
9. Agenda 21 - product of earth summit that was organized by the United Nations in 1992 in Rio de Janeiro, Brazil.
10. The International Convention for prevention of Pollution of Sea by Oil, 1954.”¹¹

It is not only India which has ratified these conventions but many countries around the world with the aim to protect and conserve the marine ecosystem and biome.

Case laws:

MC Mehta v. Union of India

“This case is also known as Kanpur Tanneries case, which is a Public Interest Litigation that requested a directive from the Supreme Court to compel the tanneries in proximity to Kanpur city to refrain from releasing industrial effluents into the Ganga River until they establish effluent treatment facilities as the industries released effluents into the river without installing primary treatment facilities, resulting in the release of untreated wastewater into the river for an extended period. Upon hearing the Court mandated for cessation of operations in the tanneries.”¹²

Rural Litigation and Entitlement Kendra, Dehradun vs. State of Uttar Pradesh

“In this specific instance presented before the Supreme Court of India, the members from the Rural Litigation and Entitlement Kendra, Dehradun, communicated to the court that the unauthorized limestone mining in the region of Mussoorie-Dehradun was resulting in environmental damage in that specific area. The Supreme Court considered this letter to be a Public Interest Litigation under the Article 32 of the Indian Constitution. The Court after hearing on both the sides and conducting sufficient inquiry, issued an order for the closure of

¹¹ A Study on Legal Aspects of Marine Environmental Protection in India.pdf.

¹² MC Mehta v. Union of India, AIR 1988 SC1037

all illicit mining activities in a number of limestone quarries.”¹³

Vellore Citizens Welfare Forum v Union of India and Others

“Palar River in the State of Tamil Nadu is the main source of drinking water supply to the residents of the State. The tanneries and other industries that were proximate to the Palar River released the untreated effluents and wastes into it resulting in water pollution. The Supreme Court mandated the establishment of an authority in accordance with the Environmental Act to address the challenges posed by tanneries and other industries polluting the river in the State. The authority was further instructed to develop and implement schemes which aims at remedying the ecological and environmental harm caused due to pollution in the State of Tamil Nadu. Fines were imposed upon those related tanneries and other industries for their actions and in case of failure of payment of such fines, the court directed for its closure.”¹⁴

Indian Council for Enviro-Legal Action v Union of India and Others

“In this case, the water in streams and wells of the village Bichhri, which is located in Udaipur district of State of Rajasthan became unfit to consume due to discharge and disposal of untreated toxic substances, which were emitted from industrial complex situated within the boundaries of the village. The Supreme Court ruled that the defendants bore absolute liability to compensate for the damage they inflicted upon the residents in the impacted region and neighbouring areas, as well as the environment.”¹⁵

Ada v. Lin Wen Beau

“In this case, the respondents possessed a valid license for fishing in Papua New Guinea (PNG) waters; however, they failed to adhere to the specified terms of the license. During the trial, the court determined that Section 55 of the Fisheries Act of 1994 exclusively pertained to violations related to fishing without a license, rather than encompassing breaches of terms or conditions within a granted license. On appeal, this ruling was reversed, with the Appellate Court determining that engaging in fishing that violated the terms or conditions of a license also constituted an offense under the provisions of the Act.”¹⁶

¹³ Rural Litigation and Entitlement Kendra, Dehradun vs. State of Uttar Pradesh, 1985 AIR 652

¹⁴ Vellore Citizens Welfare Forum v Union of India and Others, AIR 1996 SC 2715

¹⁵ Indian Council for Enviro-Legal Action v Union of India and Others, AIR 1996 SC 1446

¹⁶ Ada v. Lin Wen Beau, 1996 PGNC 111

Challenges faced in protecting marine ecosystem:

“India has long coastline and its population growth in the coastal regions and islands is continuous due to which the nations ocean biodiversity is confronting many serious anthropogenic perils. Massive fishing operations, environmental contamination and debris in the ocean, modification of coastal and watershed areas, surge in tourism, alteration in land utilization and land exploitation, invasion of species, introduction of exotic species, increased use of chemicals and fertilisers in coastal areas, sedimentation caused due to construction along the coastlines, etc. are certain anthropogenic activities that cause fragmentation, degradation and loss of marine habitats. India is obliged to develop proper management and conservation of the marine habitats, being a signatory to various international conventions and instruments pertaining to marine biome, which includes United Nations Convention on the Law of the Sea (UNCLOS), Convention on Biological Diversity (CBD), International Whaling Commission (IWC), Convention on Migratory Species (CMS) or the Bonn Convention, International Oceanographic Commission, Tuna Commission, Antarctica Treaty, and so on. Despite of the fact that our country’s coastline approximately supports 30 percent of its population, India has not prioritised efforts to promote marine conservation. The main constraints in marine biodiversity protection and conservation include a long coastline, inadequate infrastructure available to enforcement agencies, a lack of coordination among enforcement agencies, a lack of public awareness about the importance of marine biodiversity and ecosystems, insufficient information on the status of marine biodiversity due to a lack of proper survey and monitoring mechanisms, and no mechanism for sharing information among survey and research agencies.”¹⁷

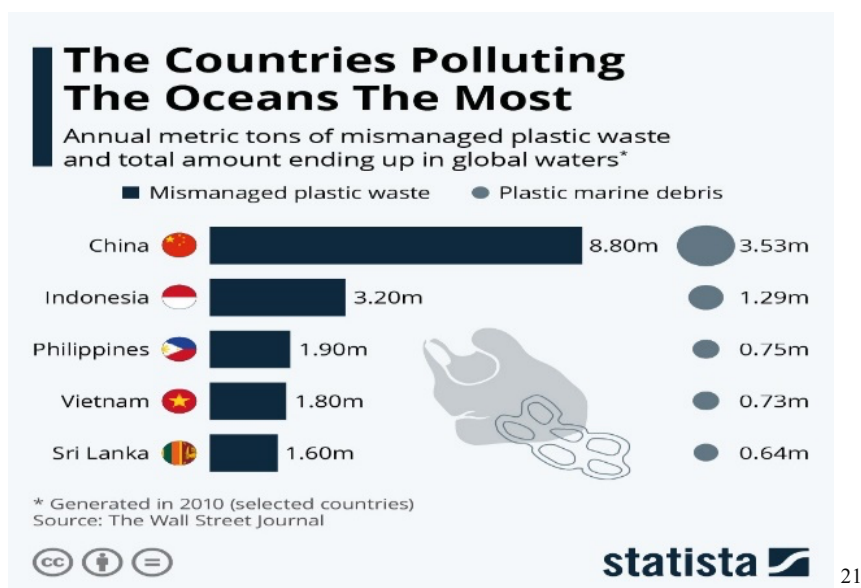
“Even though Marine Protected Areas exist, they are limited to 5 areas which includes 1 Marine Sanctuary and 4 Marine National Parks. There is a need for further more Marine Protected Areas. The management of these protected areas has been governed by Wildlife (Protection) Act, 1972, but there is no specific Act or regulation for protection of marine life and habitats. There is ineffective implementation of Coastline Regulation Zone notification, 1991 of Environment Protection Act, 1986 which deals with coastal area conservation. The traditional laws relating to biodiversity conservation cannot be applied as it has been drafted in such a manner that concerns more on terrestrial issues, which can be witnessed in Wildlife (Protection) Act, 1972. The Act and its various provisions are aimed at the establishment of

¹⁷ <https://www.upsbdb.org/pdf/Souvenir2012/ch-14.pdf>

protected areas within the terrestrial landscape and even certain provisions of it have been incorporated into subsequent amendments, primarily to meet its international obligations, to include marine areas within its scope, however, as the legal analysis demonstrates, treating territorial areas as equivalent to reserve forests is problematic, both in terms of community rights and long-term conservation goals”¹⁸ “Inclusion of a number of marine animals in Wildlife Schedule I has also not resulted in the desired effect and has instead compounded the problem by endangering the livelihoods of fisherfolk.”¹⁹

4. Analysis:

In 2010, “A team of researchers in the United States and Australia led by Jenna Jambeck, an environmental engineer at the University of Georgia, analysed plastic waste levels in the world's oceans. They found that China and Indonesia are the top sources of plastic bottles, bags and other rubbish clogging up global sea lanes. Together, both nations account for more than a third of plastic detritus in global waters, according to a report in The Wall Street Journal.”²⁰ The below depicted data shows the annual amount of plastic waste discharged by different countries ending up in ocean waters as of 2010:



¹⁸ <https://snrd-asia.org/wp-content/uploads/2018/04/CMPPA-Technical-Report-Series-No.-02.-Legal-Framework-for-Conservation-of-Coastal-and-Marine-Environment-of-India-A-Review.pdf>

¹⁹ 24.anita desale.pdf, Scholarly Research Journal for Interdisciplinary Studies Online ISSN 2278-8808, SJIF 2021 = 7.38.

²⁰ <https://www.statista.com/chart/12211/the-countries-polluting-the-oceans-the-most/>

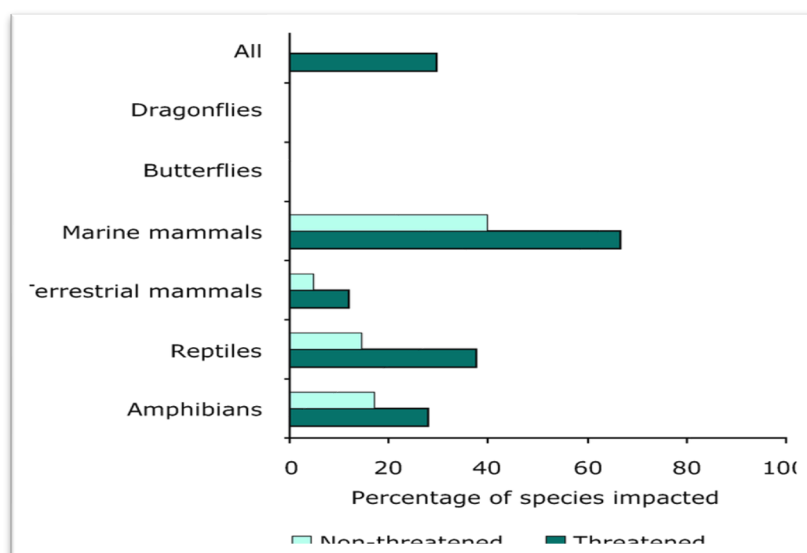
²¹ <https://cdn.statcdn.com/Infographic/images/normal/12211.jpeg>

As of 2023 (recent one):

“Rank	Country	Annual Ocean Plastic Waste (Metric tons)
#1	Philippines	356,371
#2	India	126,513
#3	Malaysia	73,098
#4	China	70,707
#5	Indonesia	56,333
#6	Myanmar	40,000
#7	Brazil	37,799
#8	Vietnam	28,221
#9	Bangladesh	24,640
#10	Thailand	22,806
	 Rest of the World	176,012
	Total	1,012,500”²²

The recent statistics show that India has also become one the polluters. This implies that India must take immediate measures to resolve the same.

²² <https://www.visualcapitalist.com/cp/visualized-ocean-plastic-waste-pollution-by-country/>



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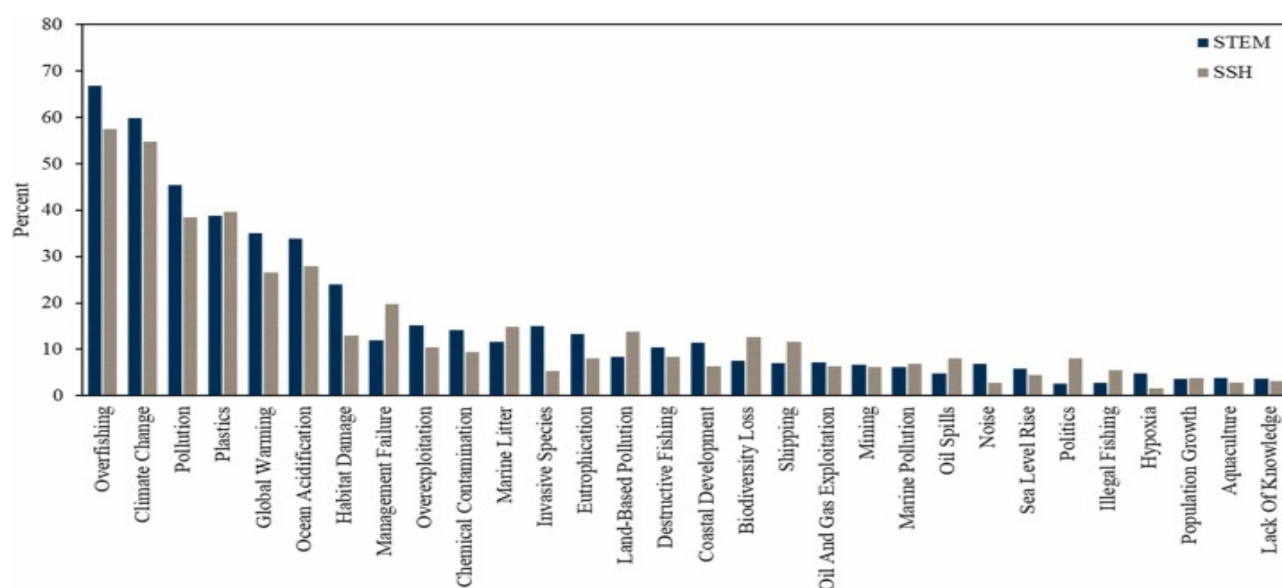
This image indicates that the species which is most threatened among all the species is the marine mammals. Thus, marine species must be prioritised while framing and implementing environmental protection and conservation measures.

Fish Stocks	Statistics	Reasons for Decline
Overfished Species	33.1% of total marine fish	Overfishing Lack of Regulation
Bycatch (unwanted fish caught during commercial fishing)	40% of global fish catch	Inefficient gear Unintended capture of non-targeted species
Habitat Destruction	80% of marine pollution is related to habitat damage	Bottom trawling Coral reef destruction
Pollution	Pollutants from Industries	Oil spills Plastic Waste
Illegal Fishing	Estimated at \$23.5 billion annually	Overcapacity of fishing vessels Black-market trade Lack of enforcement
Poor Fisheries Management	Lack of quotas and regulation	- Insufficient data and research - Political and economical pressure

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²³ https://www.eea.europa.eu/data-and-maps/figures/impact-of-over-exploitation-on/image_large

²⁴ https://media.licdn.com/dms/image/D4D12AQEw0quWHJMV9g/article-inline_image-



This statistical data shows the various types of factors depleting marine ecosystem of which overfishing, climate change and pollution contributes the most.²⁵

5. Measures to combat exploitation of marine ecosystem:

“There are diverse legal instruments available for the purpose of creation as well as protection of marine regions. Different legal frameworks, including wildlife, coastal, environmental, forest, and fisheries laws, are utilized to safeguard marine areas. Nevertheless, no single tool can deliver effective protection independently. Things depend on certain local situations, which includes the types of threats and the viewpoints of the communities residing in and around established and proposed marine areas. It is essential to take into consideration the different factors of coastal ecosystem, such as the environmental functioning, process, flow of oceanic resources, and various other conflicts. Necessary steps include appropriate legislative measures, integrated management practices and socioeconomic analysis for both terrestrial and marine resources. Public awareness campaigns, scientific research and the involvement of the local community has a crucial role. Ultimately, positive outcomes are unlikely unless local and other concerned citizens and groups actively and vigilantly participate in the protection and preservation of marine life. The current imperative involves educating communities about existing laws and garnering active support from them to enforce

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²⁵ <https://ars.els-cdn.com/content/image/1-s2.0-S0308597X22004298-gr1.jpg>

these laws.”²⁶

6. MATSYA 6000:

India is now preparing for a pioneering journey for exploring 6000 meters deep ocean waters through a mission by name ‘Samudrayan’. The plan is to send 3 humans in a cutting-edge submersible in order to undertake exploration and research work in the deep ocean waters, in such a manner that the study pertaining to biodiversity and underwater resources ensures not to disrupt the oceanic ecosystem. Mr. Kiren Rijiju, Minister of Earth Sciences, recently announced regarding the ‘MATSYA 6000’ mission, a submersible which would be the vehicle or the medium for the mission’s underwater venture. The vehicle for this mission is being developed by the National Institute of Ocean Technology, located in Chennai, which is a vehicle with cutting-edge technology that is crafted to transport a trio of individuals. The primary focus of this expedition is upon performing a comprehensive study relating to deep-sea resources and conducting exploration activities in the Central Indian Ocean Basin.

Features of ‘Samudrayan’ mission:

- The 3-person submersible is constructed with 80mm. thick titanium alloy in order to withstand high water pressures in 6000 meters depth in the ocean.
- The submersible has been equipped with Ultra-Shot Baseline [USBL] acoustic positioning system to facilitate tracking and redundancy system to ensure safety.
- It is capable of sustained operation for about 12 to 16 hours with a 96-hour supply of oxygen.
- Rupees of four thousand seventy-seven crores has been allocated for this project.

Timeline of this project:

- The trial of this mission is to take place in the Bay of Bengal in early 2024.
- Aims to complete the mission by 2026.

²⁶ 24.anita desale.pdf, Scholarly Research Journal for Interdisciplinary Studies Online ISSN 2278-8808, SJIF 2021 = 7.38.

- It is an initiative by India to play a leadership role in marine resource development and sustainable ocean exploration.

Objectives of this mission:

- To enhance ocean literacy and tourism.
- Explore marine biodiversity supported by chemosynthesis in hydrothermal vents.
- Examine deep ocean waters for sustainable extraction of resources such as manganese, copper and cobalt.

It is an initiative by name 'Blue Economy', endorsed by P.M. Narendra Modi and object of this 'Samudrayan' mission is to support the same. The mission ensures health of marine habitats as well as sustainable drawing of marine resources that boosts nation's economic growth and empowerment opportunities. Upon launching this mission India looks to set historical in the depths of Earth's Ocean. Thus, 'MATSYA 6000' is a mission that emphasise critical effort taken by India to understand how ocean contributes to sustaining terrestrial life.

7. Conclusion and suggestions:

While numerous laws have been enacted to safeguard biodiversity, there remains a necessity for effective implementation and heightened awareness among the people. The utilization of marine biodiversity is essential, but it should be carried out in a manner that ensures sustainability. The plastic accumulation in the sea demands a solution, particularly regarding its effective removal.

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