

# BALANCING THE RIGHT TO LIVELIHOOD AND ENVIRONMENTAL PROTECTION: THE ROLE OF PUBLIC-PRIVATE PARTNERSHIPS IN COASTAL DEVELOPMENT

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## Abstract

With the alarming changing scenario on the Indian coast, especially in the wake of recent cyclones Gulab, Yaas, and cyclone Tauktae, which have impacted the Indian coast in the year 2021, displacing thousands of people and along with a huge death toll. There is an urgent need to critically evaluate the sufficiency of existing legal frameworks and regulatory measures governing disaster management in the current scenario. No doubt the reasons are human induced, be it the greenhouse gas emissions or even polluting the coasts. The living conditions of the people have become dire, posing a significant threat to their safety and well-being. Although Coastal Regulation Zone (CRZ) rules exist, their enforcement and alignment with the Sustainable Development Goals (SDGs) remain questionable, particularly in terms of long-term environmental sustainability and the impacts of ongoing developmental activities. This paper adopts an analytical approach to assess the effectiveness of these regulations and proposes practical measures that are urgently needed to ensure both environmental protection and sustainable development.

## I Introduction

INDIA HAS a 11,098.81 km long coastline spread over the State of Gujarat, Maharashtra, Goa, Karnataka, Kerala on the west coast of the main land; West Bengal, Odisha, Andhra Pradesh and Tamil Nadu in the east coast; Andaman and Nicobar and Lakshadweep islands.<sup>1</sup> The Indian Peninsula faces the Arabian Sea on the west, Indian Ocean in the south and Bay of Bengal towards the east. About 440 million people live in the nine coastal districts and out them about 330 million live within 150 kms of the coastline.<sup>2</sup> A total of 171 million people, which is 14 percent of the Indian population, rely on the marine resources for their livelihood.<sup>3</sup> The peninsular region has time and again witnessed extreme turbulence in the Bay of Bengal and is hit by severe cyclones, tidal waves (1977) and the deathly tsunami (2004). The 2004 Tsunami is a turning point in the history of disaster management both at the national and international level. It may be recollected that the Hyogo

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1 Length of Indias Coastline Circular, *available at*: [https://shipmin.gov.in/sites/default/files/Length%20of%20Indias%20Coastline%20Circular\\_0.pdf](https://shipmin.gov.in/sites/default/files/Length%20of%20Indias%20Coastline%20Circular_0.pdf) (last visited Dec. 19, 2025).

2 DTE Staff “Eyeing the Coastlines”, *available at*: [https://www.downtoearth.org.in/indepth/eyeing-the-coastlines-20524#:~:text=Crippling%20population%3A%20India's%20coastline%20of,150%20km%20of%20a%20coast.\(last%20visited%20on%20Dec.%2012,%202025\).](https://www.downtoearth.org.in/indepth/eyeing-the-coastlines-20524#:~:text=Crippling%20population%3A%20India's%20coastline%20of,150%20km%20of%20a%20coast.(last%20visited%20on%20Dec.%2012,%202025).)

3 Meenakshi Kapoor, “Govt Disregarded 90% Objections to 2019 Coastal Zone Law: Investigation”, *available at*: <https://www.indiaspend.com/govt-disregarded-90-objections-to-2019-coastal-zone-law-investigation/> (last visited on Dec. 12, 2025).

Framework for Action 2005 at the international level and the Disaster Management Act, 2005 at the national level are the legislative responses to this devastating natural calamity. A review of the state government's response reveals a pattern of delayed action, with significant measures being taken only after the disaster has occurred. The lack of a sufficiently effective coastal environment management plan raises concerns that the destruction and loss of life and property could be significantly worsened when mitigation efforts might otherwise reduce such impacts.

The concern of the coastal areas and zones is not limited to major natural calamities such as tsunamis and cyclones. The coastal environment is frequently plagued and threatened with natural processes such as rip currents, beach erosion as well as manmade processes such as unsustainable infrastructural development, marine pollution, oil spills *etc.* Pertinently, CRZ notification does a little to ameliorate the problem at hand. The regulations are amended and modified at the whims and fancies to promote unsustainable development. In the guise of the development of the coast line through Public Private Partnership (PPP) model under Sagarmala Project, the government has passed the buck and the fate of the coastal environment to the private corporations.<sup>4</sup>

In the aforesaid background, this research is being undertaken to analyse and assess the sustainability and effectiveness of the extant policies *vis-à-vis* the coastal zone management and the implication of projects under the PPP Model. The paper commences and discusses the natural calamities and processes as well as man-made processes that contribute to the denigration of the coastal environment, along with the management plans and suggestions for mitigating the impact of the natural calamities and processes. The paper thereafter proceeds with the critical discussion of the existing regulations and policies. It is *vis-à-vis* the protection and sustainability of the coastal zone first before venturing into their effective implementation. In the context of the enforcement of the policies, the paper proceeds further to draw a stark contrast with the coastal environment protection policies and development of the coastal zone under the Sagarmala project and the underlying issues and controversy therein, such as the issues of industrial pollution and oil spills. The paper would remain incomplete without adverting to the stand of the coastal activists and litigants fighting vehemently for the protection of the environment and the role of the Indian judiciary in protecting the coastal environment. The paper concludes with the argument that sustained development of the coastal region while striking a balance between the protection and preservation of the coastal environment ought to be prioritised by the government.

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4 "Environmental Impacts of India's Sagarmala Project: A Critical Review" 8(2) *International Journal of Coastal and Maritime Studies* 45-62 (2020).

## II Processes that contribute to denigration of coastal areas

### Tsunamis

Tsunamis are caused due to generation of long waves resulting from the earthquakes, volcanic eruptions or landslides taking places underneath the sea. Sometimes, a meteorite impact may also cause disturbances to the sea bed, causing tsunamis. The available data suggests that tsunamis are quite frequent in the Pacific Ocean whereas less frequent in Indian Ocean.<sup>5</sup> Though there is no human intervention in the occurrence, they contribute significantly in the damage of the coastal region that leads to the huge destruction of life and property. The Tsunami that hit the Indian coastline on December 26, 2004 proved to be a catastrophic event not only in terms of the loss of life and property but also brought to the forefront the unpreparedness, callousness, insensitiveness of the Indian Government as well as the unsuitability and inefficiency of the extant infrastructure in mitigating the loss of life and property.<sup>6</sup>

The 2004 Indian Ocean Tsunami was the result of the earthquake that manifested at the junction of the Indian and Burma Plate. As per United States Geological Survey Report, the Tsunami affected ten nations and loss of life was estimated at 220,000.<sup>7</sup> The loss of property was estimated at 15 billion US dollars. The readiness in the handling of the devastation is questionable despite the disaster management policies in place especially the sincerity in execution of these policies is really questionable. The Disaster Management Act, 2005, enacted in response to events like the 2004 tsunami, provides a comprehensive framework for disaster preparedness, mitigation, and response. It establishes the National Disaster Management Authority (NDMA) and mandates the creation of disaster management plans at national, state, and district levels. Despite these legal structures, the Act's effectiveness is often questioned due to lapses in coordination and execution during major disasters. Similarly, the National Policy on Disaster Management, 2009, emphasizes preparedness and the integration of early warning systems, but real-world implementation continues to fall short<sup>8</sup>. It does not elude the attention that the first reaction of the government is to announce payments of *ex gratia* compensations after a calamity has hit. This is done to gain political mileage at the expense of the public funds. What lacks is the sincere efforts from the state to take long term preventive or mitigating measures. Once, the calamity is over, the sympathizers move on and people are left to fend for themselves in the face of another tragedy.<sup>9</sup> Similar story unfolded during the 2004 Indian Tsunami.

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5 P Chandramohan, AP Anu, V Vaigaiarasi and K Dharmalingam, "Environmental management and emergency preparedness plan for Tsunami disaster along Indian coast" 8(3) *The International Journal of Ocean and Climate Systems* 144, 146-150 (2017).

6 John Kurien, "Securing the Future against Tsunamis" 40 *Economic and Political Weekly* 98-99 (2005).

7 *Supra* note 4.

8 The Disaster Management Act, 2005.

9 *Supra* note 5.

The insensitivity and lack of coordination amongst the agencies is evident from the reports where the Indian Air Force helicopters dropped ration packets in the places which were not even affected, or the tons of the relief material was rotting at an Air base in Car Nicobar Island.<sup>10</sup>

Critics argue that thousands of lives could have been saved had the CRZ Plans been implemented or the housing sites been provided to the fisherman at the landward side of the coastal roads.<sup>11</sup> This is not to say that total catastrophe can be averted by the government when faced with natural calamities such as tsunamis. However, sustained and long-term coastal zone rehabilitation plans and environmental management plans are the need of the hour to mitigate the extent of destruction and loss.

A survey conducted on tsunamis in Tamil Nadu gave tremendous insights into minimizing the disastrous effects of tsunamis by adopting efficacious environmental management plans. It was observed that the areas behind the natural bio shields, such as sand dunes, mangrove forests, dense vegetation, or offshore coral reefs, experience minimal damage since these bio shields absorbed the maximum kinetic energy of the waves.<sup>12</sup> Planting vegetation cover alongside the coastal zone not only affords protection against the cyclones but can also dissipate the excessive energy of the Tsunami. The planting of vegetation and casuarinas along the coastal line, as well as palm trees and mangroves, plays an important role in trapping as well as stabilizing the sediments, therefore creating a buffer between the sea and the land. The importance of such bio-shields is reflected in the Coastal Regulation Zone) Notification, 2011, which emphasizes the protection of ecologically sensitive areas (CRZ-I) and encourages the use of natural buffers like mangroves and sand dunes to mitigate the impact of coastal disasters. These measures align with Sustainable Development Goals (SDGs), although concerns remain about the enforcement of CRZ norms, especially under the amended CRZ Notification, 2019.<sup>13</sup> The plantation not only prevents the direct impact of the Tsunami but also accelerates the natural recovery process after the damage.<sup>14</sup> Construction of Tsunami Mounds on the beaches, either by using sand or other sediment or rocks, is yet another effective technique for dissipating the kinetic energy of waves during the Tsunami.

In order to mitigate the catastrophic loss of lives during coastal disasters such as tsunamis, regulatory frameworks should mandate the construction of Emergency Rescue Shelters on the mainland, modeled after cyclone shelters, with provisions for

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10 *Supra* note 5.

11 *Ibid.*

12 *Supra* note 4.

13 Coastal Regulation Zone Notification, 2011.

14 *Supra* note 4.

swift evacuation. These shelters must comply with national disaster preparedness guidelines and be equipped with essential supplies, including food, water, power generators, first aid facilities, and cooking arrangements. The specific housing needs of vulnerable coastal communities, especially fishermen, often the first line of casualties in tsunamis, must be prioritized in disaster management regulations. Coordination between governmental agencies such as the NDMA, the National Institute of Ocean Technology (NIOT), and the Indian National Centre for Ocean Information Services (INCOIS) is essential for the development of a robust emergency warning system. Such an integrated approach will ensure a sustained and coordinated rescue operation following a disaster.<sup>15</sup>

### **Beach erosion**

Beaches are the landforms along the seacoast and are the major assets since they provide aesthetics to the sea as well as recreational activities to the people and tourists. Beaches, a dynamic landform, though treated part of the sea, play a critical role in cushioning the impact of the sea conditions and protecting not only the coastal land but also the people living near the coast. The beach is comprised of soil and nutrients from the river, eroding rocks and cliffs, and associated coastal features.<sup>16</sup> The tides and waves constantly force these materials, transporting them *to and fro* and depositing them at a place that favours deposition. As and when the high tide arises or the monsoon seasons arrives the beach gets eroded and inundated with excess water. Cyclones and hurricanes cause destruction not only to the houses but also the beach. The strong winds and heavy rains destroy the sand dunes, causing the sea levels to rise dangerously, thus taking over the beach and washing away the essential soil and nutrients. Beach erosion is a natural process; however, it results in the narrowing of the islands, shrinking of the coastal line, and weakening of the coastal infrastructure.

Lately, the beaches in India have been under tremendous pressure due to the increase in recreational activities, giving rise to artificial constructions in and around beaches, resulting in their erosion. The administration in its enthusiasm to create beaches more aesthetic and recreational have created permanent structures. The classic example being the Ram Krishna Beach in Visakhapatnam, Andhra Pradesh where once can see submarine museums, parks, umbrella shades right on the beach. Since during the high tides and monsoon conditions, stormy weather conditions, the tide energy gets spent on the beach, resulting not only in the erosion of the beach but also the destruction of these man-made structures.

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15 Tsunami Warning System in India. INCOIS Report, 2019.

16 K. Nageswara Rao, P. Subraelu, A.S. Rajawat and Ajay, "Beach Erosion in Visakhapatnam: Causes and Remedies"<sup>14</sup> *Eastern Geographer* 1, 2-5 (2008).

There are several man-made structures as well as naturally forming structures that can be employed in preventing the beach erosion. The natural sand dunes form as a result of wind blowing the sand and building a dune. Once a dune is formed, the same promotes growth of the vegetation that holds the sand thereby making it stable. Often natural sand dunes are substituted by manmade dunes by using bulldozers to pile the sand back. However, manmade dunes instead of preventing erosion rather increases the erosion. These dunes do not encourage the growth of the vegetation and often are more prone to being destroyed during a storm or cyclone. Another of the methods to prevent beach erosion can be construction of off shores barriers, sea walls, bags and sand fences. Offshore barriers, as the name suggests, are the concrete structure that are built offshore. The methodology involves placing of multiple tetrapod blocks with some gap between them in a row on the seabed parallel to the shore to prevent direct action of wave on the beach creating a lagoon type condition. This would prevent erosion as the material and nutrients carried away by waves would get settled along the barriers and can thereafter again come back to the beach. Such an experiment has proven to be quite successful in the case of Kaike Beach of Japan. However, these manmade structures, which are rather expensive to build and maintain, mostly have a negative impact rather than positive impact. These structures hinder the natural relationship of the beach with the sea. The sea ecosystem and habitat of several organisms gets destroyed. Another criticism to such an approach could be the ruin of the aesthetic features of the beach as has been pointed out by the tourists.

### **Rip current related fatalities**

Several of the world's beaches are characterized by the presence of seaward flowing currents that extend from close to the shoreline, through the surf zone, and different distances beyond. Succinctly, rip current is a strong flow of water from the beach back to the ocean. They occur at several beaches with distinct wave conditions and tidal levels. Rip currents may range from 9-45 meters in width, 1-10 meters in depth, and 10-500 meters in the direction of the shore. There are various factors that contribute to the formation, strength, and frequency of the currents; for example, incident wave height, beach terrain, near-shore bathymetry, etc.<sup>17</sup> Rip Currents have been found to be significant in transportation and cross-shore mixing of heat pollutants, nutrients, and biological species. However, rip currents have derived a negative connotation for being responsible for the death of surfers and beach visitors. To predict the rip currents on the beaches of Florida and the United States, Lushine developed the Lushine Rip Current Scale, which is a correlation of the direction of the wind, its velocity, time of tides, and swell heights. The scale has undergone progressive modification over the years.<sup>18</sup>

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17 S. V. V. Arun Kumar and K. V. S. R. Prasad, "Rip current-related fatalities in India: a new predictive risk scale for forecasting rip currents" 70 *Natural Hazards* 313, 314-333 (2014).

18 *Supra* note 12.

The fatalities associated with rip currents are quite frequent in south-eastern India. The data and study with respect to rip current-related fatalities are sparse as no comprehensive study has been taken yet to maintain or evaluate the data of the people who have drowned due to rip currents.<sup>19</sup> This may be attributable to the fact that the population that surfs is negligible; as such, the number of people who are exposed to rip currents is also very low. Despite the fact, that the ratio of people who surf to the people who drown is very low, such a ratio may be a detriment to people visiting beaches, therefore causing a loss to tourism. Even otherwise, it is necessary that there is a predictive index for the rip current to save people's precious lives.

Pertinently, the National Weather Service of the United States has a rip current forecasting technology, and recently, the National Oceanographic and Atmospheric Administration of the United States has launched a forecast model that can predict the rip currents along all the beaches of the United States, thereby saving precious lives.<sup>20</sup> However, India, the Indian INCOIS responsible for forewarning cyclones and tsunamis, does not issue any forecast pertaining to the rip currents.

### III Legal framework : Existing policies and regulations center

The 14<sup>th</sup> Sustainable Development Goal promotes the conservation and sustainable use of ocean, sea, and marine resources. Though India has a long coastline, it does not have a formal statute to protect the environment in the coastal region. It has to fall back on the Environmental Protection Act of 1986, the Indian Forest Act of 1927, the Forest Conservation Act, of 1982, the Wildlife Protection Act of 1972, the Biological Diversity Act of 2002, the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environmental Impact Assessment Regulations 2006 and other general laws for the protection and conservation of nature in the coastal areas.

The only regulation which specifically regulates human activities in the coastal areas is the CRZ notification which is nothing but a subordinate legislation. It may be recollected that in most of the environmental disputes, the Government of India is a necessary party. Since CRZ norms are subordinate legislations, the government has kept modifying them according to convenience and requirements. With an aim to protect and conserve the coastal environment as well as promote sustainable development premised on scientific principles, the Ministry of Environment and Forest and Climate Change, under the *aegis* of the Environment Protection Act of 1986, issued the first CRZ notification in 1991.<sup>21</sup> The notification is intended to

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19 *Ibid.*

20 "NOAA Launches First National Rip Current Forecast Model", *available at*: <https://oceanservice.noaa.gov/news/apr21/rip-current-forecast.html> (last visited on Dec. 14, 2025)

21 The Coastal Regulation Zone Notification, 1991.

reduce ecological vulnerability by regulating activities in the areas that are most ecologically sensitive. The notification was amended several times, and it was replaced by a fresh notification in 2011. Finally, the third notification was issued in 2019. The coastal region is divided into four zones, namely CRZ I, CRZ II, CRZ III, and CRZ IV zones.<sup>22</sup> Developmental activity is prohibited, restricted, and regulated in each zone, depending on the criteria laid down in the notification. This arrangement remains the same in the successive notifications, but the only difference is that each notification is altering the zones and the kind of restrictions that can be imposed on developmental activities in these zones. The 2019 notification has further sub-classified CRZ I into CRZ-I A and CRZ-I B. CRZ-I A comprises eco-sensitive areas (ESAs). Fragile and eco-sensitive regions like the Sundarbans fall within its purview. Under the 2019 notification,<sup>23</sup> certain areas can be designated as Critically Vulnerable Coastal Areas (CVCAs).<sup>24</sup>

Some of the salient features of the new CRZ notification include easing the Floor Space Index (FSI) norm under the CRZ 2011; reducing the No Development Zone (NDZ) for the densely populated areas, increasing and promoting tourism by improving the infrastructure for basic amenities; requirement of CRZ clearance only for the projects that are located in CRZ-I and CRZ-IV *etc.* Interestingly, the new CRZ notifications seem to be in sync with the thrust being given to the industrialization and coastal economic zone projects. In the guise of the new notification, the old stringent notification of 2011 has been diluted. The focus of the new CRZ Notification is on industrialization, lax licensing regime for setting treatment plants, promotion of tourism, and strengthening of the defense system by quick dispensation of defense projects. What the new CRZ notification fails to take into consideration is the fact that relaxed norms would result in an increase in construction activity, jeopardising the coastal ecosystem. The reduction of the NDZ would result into flocking of the real estate lobbies; the reduction of NDZ has been done without even taking into consideration the increasing sea levels and the fragile coastal ecosystem which is already faltering under the erosion. Allowing the CRZ-I the setting up treatment plants with an aim to reduce coastal pollution is short-sighted in as much as the wastewater would only further contaminate and pollute the fragile ecosystem.

What one can understand from these frequent changes in goalposts is that the CRZ norms are as fragile as the ecosystems that they seek to protect. If the law governing the coastal environment, has to be far more predictable and consistent, a formal law passed by the Parliament may be a better option than depending on the whimsical predispositions of the government. Altogether, 6 marine national parks, 25 marine

22 The Coastal Regulation Zone Notification, 2011, *available at*: <https://crz.elaw.in/crz2011.html> (last visited on Dec. 19, 2025).

23 The Coastal Regulation Zone Notification, 2019.

24 Ministry of Environment, Forest and Climate Change Notification, 2019.

protected areas on the mainland, and 130 in the islands of India are notified under the above-stated laws.<sup>25</sup>

### IPCC 2021 Report

According to the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report 2021,<sup>26</sup> there has been increase in the concentration of the Greenhouse gases since 1750 on account of the human activities. Since the last decade, there has been a continuous increase in the annual average of CO<sub>2</sub> (410 parts per million), Methane (CH<sub>4</sub>) (1886 parts per billion), and nitrous oxide (N<sub>2</sub>O) (332 parts per billion). It has been further observed that the surface global temperature has increased in the range of 1.34 to 1.83 degree centigrade every past four decades since 1850. On account of the human induced drivers, there has been global retreat of glaciers since the 1990s and there has been increase in the global mean sea level by 0.20 metres since 1901. The report has also forewarned increase in extreme levels of turbulence in the Bay of Bengal, rise in sea levels and submergence of 12 coastal cities in India.<sup>27</sup> Contributory factors for the environmental degradation of the coastal areas including beach erosion,<sup>28</sup> shoreline changes<sup>29</sup> are construction and operation of ports and marine traffic.<sup>30</sup>

To limit the future climate change, the report suggests that the human induced global warming ought to be limited by limiting the cumulative CO<sub>2</sub> emissions, setting and reaching the goal of net zero CO<sub>2</sub> emission as well as reduction in the other greenhouse gases. The report predicts that if negative CO<sub>2</sub> emissions were to be achieved and maintained globally, the CO<sub>2</sub> induced surface temperature which has been on rise would be consequently reversed, however, other climatic changes such as increase in the mean sea level would take several centuries to millennia to reverse.

It is evident from the report that climate change is going to change the geomorphological features of the Indian coast. This will affect the coastal communities and ecosystems in a big way. Coastal land subsidence would lead to a loss of shelter

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25 Decoding Marine Protected Areas in India- Part I: Understanding the Legal and Policy Frameworks, *available at*: <http://maritimeindia.org>(last visited on Dec. 15, 2025).

26 Sixth Assessment Report — IPCC, <https://www.ipcc.ch/assessment-report/ar6/> (last visited on Dec. 19, 2025).

27 IPCC, "Sixth Assessment Report", *available at*: <http://www.ipcc.ch/report/ar6/wg1#SPM> (last visited on Apr. 15, 2024).

28 A new port in Kerala sparks fears of sea erosion in coastal villages, *available at*: <https://scroll.in/article/846762/a-new-port-in-kerala-sparks-fears-of-sea-erosion-in-coastal-villages>(last visited on Apr. 16, 2024).

29 Pratap K. Mohanty, Shraban K. Barik, *et. al.*, "Impacts of Ports on Shoreline change Along Odisha Coast"116 *Procedia Engineering* 647, 649-652(2015).

30 Antonio Guarnieri, Sina Saremi, *et. al.*, "Effects of marine traffic on sediment erosion and accumulation in ports: a new model- based methodology"17 *Ocean Sci.* 411, 413-427(2021).

and livelihood by a large section of coastal communities. As stated in the report, twelve coastal cities face a threat of submergence. It will cause displacement at an unimaginable scale, especially in the eastern coast. Cities, villages and other human settlements do not grow overnight. Sustained effort is necessary to make them liveable spaces. As per the report, the sea is going to wipe out these cities and other settlements. Building them on the coast and then again rebuilding them elsewhere would come at a cost, human, social and economic. It is difficult to comprehend the amount of environmental damage that human induced climate change is going to cause.

### Ports

India has 13 major and 200 non-major ports. 12 major ports are owned by the Government and one major port namely Mundra port is a private one. The Government of India intends to centralize regulation of ports; privatize them and promote PPP in their operation ports. In 2021 the finance minister in her Budget speech announced that seven major ports will commence operations under private-public partnership mode in 2021-22.<sup>31</sup> To facilitate centralisation and privatisation the Major Port Authorities Act, 2021 was enacted. The government is also introducing the Indian Ports Bill which would replace the Indian Port Act, 1908. Some state governments like Tamil Nadu, Goa and Odisha have raised objections against these two legislative instruments as they would lead to centralisation of governance of minor ports which are being governed till now by state governments.<sup>32</sup> While studies<sup>33</sup> indicate that decentralisation of environmental governance improve the enforcement of environmental regulations the Indian government is further centralising the governance and regulation of ports and shipping activity.

According to the Annual Report 2020-21 of the Ministry of Ports, Shipping and Waterways 95% of the country's trade by volume and 65% by value is moved through maritime transport.<sup>34</sup> Though seaports and harbours are quite necessary for trade and commerce, they come with a cost, environmental and social. The construction and operation of ports adversely impact the quality of water, hydrology of the coasts, contamination of seabed, ecology of the coastal region, the quality of air,

31 "India privatises seven major ports", *available at*: <https://www.ship-technology.com/news/india-privatise-seven-majorports/#:~:text=The%20Indian%20Government%20has%20announced,controlled%20by%20the%20Indian%20Government>. (last visited on Dec. 16, 2025).

32 "The two new port bills", *available at*: <http://www.thequint.com/amp/story/explainers/explained-the-two-new-port-bills-that-have-rattled-the-coastal-states> (last visited on Dec. 16, 2025).

33 Ruth Kuttumuri, Stafania Lovo, "Decentralisation of Environmental Regulations in India" 53 *Economic and Political Weekly* 33, 33-38(2018).

34 SHIPMIN.GOV.IN, *available at* : [https://shipmin.gov.in/sites/default/files/AnnualReport2021\\_0.pdf](https://shipmin.gov.in/sites/default/files/AnnualReport2021_0.pdf) (last visited on Dec. 17, 2025)

sound pollution, waste management and visual quality.<sup>35</sup> It also impacts livelihood of fisher folk and socio-cultural rights of the coastal communities. According to the UN Economic Commission for Asia and the Pacific (UNESCAP) the major sources of adverse effects of seaports are their locations; the construction of ports and their operation which includes ship traffic, discharges from the ships, handling of cargo and its storage; and transportation into the hinterlands.<sup>36</sup> These are being subjected to judicial scrutiny.

#### IV Sagarmala project and the underlying issues

The Government of India with a vision to change the performance of the India's logistics sector and unlock the full potential of waterways and India's coastline launched the Sagarmala Project on April 16, 2016. The project envisions the reduction of the logistics cost as well as aspires to reduce carbon emissions caused by the transportation sector by 12.5 Metric tonne per annum. It is a flagship programme of the Ministry of Shipping under which a National Perspective Plan (NPP) was prepared purportedly to develop India's 11,098.81 km coastline of India: 14,500 km of navigable waterways, and overall, the maritime sector. The Ministry of Ports, Shipping, and Waterways states that the objectives of the Sagarmala Programme are reduce the cost of transportation, locate industrial capacities near the coast to lower the logistics cost, develop manufacturing clusters in and around the ports to improve the export competitiveness; and optimising the time and cost of EXIM containers. The components of the project include enhancement of port connectivity; development of the coastal community; modernisation and development of new ports; develop port proximate industrial clusters; and provide impetus to coastal shipping and inland waterways transport. Pertinently, what is silent in the vision and the objectives of the project is the management and sustainable development of the coastal environment. A further perusal of the institutional framework of the project and the roles of the bodies such as National Sagarmala Apex Committee; Sagarmala Coordination and Steering Committee; and State Sagarmala Committee are all devoted towards the reviewing the progress, guidance, coordination and facilitation between the various state governments and agencies. A body that may independently supervise study and assess the impact of the project on the coastal environment does not exist. Inbuilt environment impact assessment is necessary for major projects of such nature.

The CRZ Notification, 2019 plays a crucial role here, as it regulates coastal zone development by subdividing zones based on ecological sensitivity. However, amendments under the new notification have relaxed several restrictions, particularly

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35 UNESCAP.ORG, *available at*: [https://www.unescap.org/sites/default/files/pub\\_1234\\_ch2.pdf](https://www.unescap.org/sites/default/files/pub_1234_ch2.pdf) (last visited on Dec. 17, 2025)

36 *Ibid.*

reduced the NDZ and easing norms for infrastructure projects, which raises concerns about the long-term environmental sustainability of coastal areas, especially with massive projects like Sagarmala.<sup>37</sup>

Moreover, The Government of India, with the financial assistance of the Asian Development Bank, is taking up the East Coast Economic Corridor project to facilitate connectivity and industrial development between West Bengal and Tamil Nadu. This is to facilitate the growth of international trade further. ADB has already provided a 484 million loan for the development of the Chennai-Kanyakumari Industrial Corridor.<sup>38</sup> The project proponents came up with a finding that when it comes to industrial development, the East Coast is comparatively less developed than the West Coast. The East Coast Economic Corridor is an extension of the Sagarmala project.

It is noteworthy that the Adani group owns most of the private ports in India. Adani Corporate House claims that it has developed ten ports and terminals in India.<sup>39</sup> The Ministry of Ports, Shipping, and Waterways is providing financial assistance to nine of these ports under the Sagarmala project.<sup>40</sup> As the regulatory agencies are allowing the Adani group to flourish in this sector, one can imagine that it has a very good track record. Ironically, this is not the case. A corporate body that is a front-runner in establishing private ports and terminals is involved and caught up in litigation all over the country. Ports developed by this group are under the judicial scanner at various places.

The Adani Ports and Special Economic Zone (APSEZ) faced serious charges of violating court orders in Gujarat. The High Court of Gujarat found fault with its act of cutting down mangrove trees in 75 hectares at Bocha islands near Mundra.<sup>41</sup> The government imposed environmental damages worth Rs 200 crores on APSEZ in 2013, which was subsequently withdrawn in 2016.<sup>42</sup>

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37 *Supra* note 23.

38 Special Correspondent, "Centre sign loan pact for transport connectivity in T.N.," *The Hindu*, (June 16, 2021), *available at*: <https://www.thehindu.com/news/national/tamil-nadu/adb-centre-sign-loan-pact-for-transport-connectivity-in-tn/article34834744.ece> (last visited on Dec. 17, 2025).

39 Adani Ports and Logistics, Adani Corporate House, Ahmedabad. *available at*: <https://www.adaniports.com/Ports-and-Terminals> (last visited on Aug. 25, 2024).

40 Press Information Bureau, Delhi, (Dec. 20, 2022), *available at*: <https://pib.gov.in/PressReleasePage.aspx?PRID=1885078> (last visited on Dec. 25, 2025).

41 *Kisan Vikas Kheti Trust v. State of Gujarat*, WP PIL No. 12 of 2011.

42 "Reports about cancellation of Rs 200 crore fine on APSEZ 'incorrect': Government", *Financial Express*, (July 4, 2016), *available at*: <https://www.financialexpress.com/industry/reports-about-cancellation-of-rs-200-crore-fine-on-apsez-incorrect-government/305503/> (last visited on Dec. 18, 2025).

Machimaar Adhikar Sangharsh Samiti (MASS), a fisher folk collective also filed another writ petition against APSEZ before the High Court of Gujarat contending that it disturbed the ecosystem by removing the sand dunes at Mundra.

The High Court of Gujarat also stayed construction of 12 individual units in the Mundra SEZ as the developer, APSEZ started the development activities without obtaining the mandatory environmental clearance.<sup>43</sup>

Allegations of violation of environmental norms against APSEZ are not confined to the Mundra port. They face similar kind of allegations at the Kandla port in Gujarat,<sup>44</sup> Kattupalli port in Tamil Nadu<sup>45</sup> and Vizhinjam port in Kerala.<sup>46</sup> The Pune based west zone bench of National Green Tribunal imposed 25 crores penalty on the Adani-Hazira Port Pvt Ltd (AHPPL) and its associate Hazira Infrastructure Pvt Ltd for carrying out the work at the port without obtaining environmental clearance.<sup>47</sup> The Goa State Pollution Control Board issued a show cause notice Adani Mormugoa Port Terminal Pvt Ltd, a mechanised coal and coke handling terminal which is operating at the Mormugoa Port Trust (now rechristened as Mormugoa Port Authority) as to why the consent to operate should not be revoked as it was causing environmental pollution in the vicinity.<sup>48</sup> The Goa Foundation and later a few residents of Vasco filed writ petitions before the High Court of Bombay at Goa for permanent closure of coal and coke handling operations at Mormugoa port the by Adani Mormugoa

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43 Anupam Chakravartty, "Gujarat High Court stays construction work at Mundra SEZ", *Down to Earth* (Feb. 14, 2013) <https://www.downtoearth.org.in/news/gujarat-high-court-stays-construction-work-at-mundra-sez—40348> (last visited on Dec. 18, 2025).

44 PTI "Gujarat High Court: New panel to probe green 'breach' by Adani Group at Kandla", *The Economic Times* (Aug. 21, 2014), *available at* :<https://economictimes.indiatimes.com/industry/transportation/shipping-/-transport/gujarat-high-court-new-panel-to-probe-green-breach-by-adani-group-at-kandla/articleshow/40616878.cms> (last visited on Dec. 19, 2025).

45 SV Krishna Chaitanya, "Crucial inspection to decide on Kattupalli Port expansion", *The New Indian Express* (June 4, 2019) *available at* : <https://www.newindianexpress.com/states/tamil-nadu/2019/jun/04/crucial-inspection-to-decide-on-kattupalli-port-expansion-1985603.html> (last visited on Dec. 18, 2025).

46 "NGT reserves order on grant of environment clearance to Adani's Vizhinjam Port", *DNA India* (Aug. 29, 2016), *available at* : <https://www.dnaindia.com/business/report-ngt-reserves-order-on-grant-of-environment-clearance-to-adani-s-vizhinjam-port-2250065> (last visited on Dec. 20, 2025).

47 "NGT penalty: Adani deposits Rs 25 cr fine NGT penalty: Adani deposits Rs 25 cr fine Surat", *Times of India* (March 3, 2016), *available at* : <https://timesofindia.indiatimes.com/city/surat/NGT-penalty-Adani-deposits-Rs-25-cr-fine/articleshow/51231389.cms> (last visited on Dec. 20, 2025).

48 "Adani terminal at MPT gets GSPCB notice for pollution", *Times of India* (December 31, 2014) *available at* : <https://timesofindia.indiatimes.com/city/goa/Adani-terminal-at-MPT-gets-GSPCB-notice-for-pollution/articleshow/45695541.cms> (last visited on Dec. 20, 2025).

Port Terminal Pvt Ltd, South West Port Ltd, and the Vedanta company on the same grounds.<sup>49</sup>

The High Court of Karnataka ordered the staying of the second stage of works of the Karwar Port for carrying out the work without getting an environmental clearance. The court in its interim orders also directed the respondent developers to restore the beach to its original condition.<sup>50</sup> This is again a port being developed under the Sagarmala Project.

Is it not the kind of ‘rogue industries’ that Jeevan Reddy J., was referring to in the *Bichri case*?<sup>51</sup> In most of the cases APSEZ and other port developers filed appeals and got some relief in the appellate courts but the fact that they were found on the wrong side of the law itself shows how much respect they have for environment protection laws. It is also obvious that the regulatory bodies are also hopelessly lax in enforcing the laws. The government, instead of taking stringent action against such ‘rogue industries’ went ahead with diluting coastal regulatory norms. It introduced new Standard Operating Procedures (SOP),<sup>52</sup> the Major Port Authorities Act, 2021, the 2019 Coastal Zone Regulations notification and the Draft Environmental Impact EIA Regulations, 2020 to allow *post facto* environmental clearance,<sup>53</sup> centralisation and privatisation of operation of ports. In fact, the government, in the name of promoting ease of doing business, seems to be encouraging unsustainable developmental projects, which will have disastrous consequences. The revamping of law and the way the government is promoting private players in establishing and operating ports are being done with the help of centralization of power. The litigation revolving around the Sagarmala project is an indicator that centralisation of power will be very counterproductive in protecting and conserving nature.

### **Industrial pollution**

Apart from developing transportation and infrastructure facilities in the landlocked hinterlands, the Sagarmala Project proponents intend to develop industrial clusters.

49 "GOA: HC issues notices on PIL seeking closure of coal operations at Mormugao port", *The Indian Express* (July 25, 2018) available at : <https://indianexpress.com/article/india/goa-hc-issues-notices-on-pil-seeking-closure-of-coal-operations-at-mormugao-port-5274434/> (last visited on Nov. 20, 2025).

50 "Court says Karwar Port work under sagarmala", *The Indian Express* (January 24, 2020) available at: <https://www.newindianexpress.com/states/karnataka/2020/jan/24/court-stays-karwar-port-work-under-sagarmala-2093708.html> (last visited on Nov. 21, 2025).

51 1996 SCC (3)212.

52 "Govt Proposal To ‘Regularise’ Green Violators Is Legally Untenable, Say Lawyers", available at: <https://www.indiaspend.com/earthcheck/govt-proposal-to-regularise-green-violators-is-legally-untenable-say-lawyers-764605> (last visited on Nov. 22, 2025).

53 Meenakshi Kapoor and Krithika A. Dinesh, "Throughout the Pandemic, Environmental Clearance Law Has Been Under the Chopping Block", *The Wire* (Apr. 18, 2022) available at: <https://thewire.in/environment/throughout-the-pandemic-environmental-clearance-law-has-been-under-the-chopping-block> (last visited on Nov. 22, 2025).

This will be in addition to the pre-existing industrial hubs in and around ports which contribute to industrial pollution and oil spills.

The shipping industry is a major contributor to marine pollution in the coast. Other than the shipping industry, oil and petrochemical industries, chemical industries, pharma industries, and thermal power plants discharge untreated trade effluents into the sea. The High Court of Delhi in *Delhi Sainik Cooperative Housing Building Society Ltd. (Regd.) v. Union of India*<sup>54</sup> citing the landmark *AP Pollution Control Board II v. Prof (Retd.) MV Nayudu*<sup>55</sup> and *Narmada Andolan Bachao v. Union of India*<sup>56</sup> held that “right to access to drinking water is fundamental to life and there is a duty of the State under Article 21 of the Constitution to provide clean drinking water to its citizens.” As providing clean drinking water is fundamental to life, judicial engagement with freshwater pollution is far more pronounced and voluminous compared to that with marine pollution. Nevertheless, there is lot of litigation revolving around marine pollution. As the sea is the source of livelihood for the fisher folk, they have been proactive in moving the courts and NGT to keep the seashores clean. They moved different *fora* when power plants let out fly ash into the sea, SEZs discharged hazardous waste, port dredging activity; shipyard breaking yards discharged heavy metals and mercury, untreated chemical effluents discharge, and pharmaceutical industries pollution.<sup>57</sup> The list is endless. It may be illustrative to discuss one such activity in detail to understand its implications. Take the case of oil spills. The fisherfolk lose their livelihood on a large scale. Restoration of the environment is expensive and time-consuming.

### Oil spills

Oil spills are major contributors to marine pollution. Some amount of oil spilling happens on a regular basis while ships are being berthed, loading, and unloading oil and petrochemical products from ships and from offshore oil and natural gas exploration and extraction facilities. Other than these regular leakages, two major oil spill accidents are noteworthy, which occurred near Mumbai in 2011 and Tamil Nadu’s Ennore Creek in 2017.

A ship owned by Delta Shipping Marine Services, a Panama-based company loaded with coaling coke, which was imported by Adani Enterprises Ltd., accidentally sank

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54 “Right To Access to Drinking Water is a Fundamental Right and It is the Duty of State Under Article 21 to Provide It to Citizens,” *Live Law*, available at: <https://www.livelaw.in/news-updates/delhi-high-court-right-to-access-drinking-water-defence-service-enclave-168288> (last visited on Nov. 24, 2025).

55 (2001) 2 SCC 62.

56 (2000) 10 SCC 664.

57 “NGT panel to inspect environmental violations by pharma firm in Vizag”, *The New Indian Express*, (February 23, 2022) available at: <https://www.newindianexpress.com/states/andhra-pradesh/2022/feb/23/ngt-panel-to-inspect-environmentalviolations-by-pharma-firm-in-vizag-2422700.html> (last visited on Nov. 21, 2025).

20 nautical miles away from Mumbai offshore, causing a massive oil spill. When the matter was agitated before the NGT in *Samir Mehta v. Union of India*,<sup>58</sup> it held that the Delta group is liable to pay Rs 100 crores compensation for the environmental damage caused by the oil spill and that Adani Enterprises Co. need to pay Rs Five crores for dumping coaling coke into the seabed. NGT emphatically stated that “no country enjoys the privilege of sailing an unseaworthy ship to another country and dumping the same in the territorial waters, contiguous or economic exclusive zone of that country. Every country has a right to protect its marine environment.”

Two vessels accidentally collided and sank near the Ennore Creek on the Tamil Nadu coast, causing a devastating oil spill that robbed the livelihood of more than one lakh fisher folk who moved the NGT for compensation.<sup>59</sup> The Government of Tamil Nadu, in this case, claimed Rs 240 crores towards payment of compensation to the fisher folk and Rs. 10 crores for restoration of the environment. The erring shipping companies dragged their feet for ten months and failed to comply with the orders of NGT to pay Rs. 141 crores towards interim relief, which is a punishable offence under Section 26 of the NGT Act, 2010. That is the sense of accountability that the shipping companies had towards people, courts, and nature. These acts of impunity must be factored in when policymakers recommend the privatization of ports, shipping, and industries.

If there is anyone who is consistently challenging this environmental onslaught all along the coast, it is the fisher folk community. They’ve been zealously guarding the coast, something the regulatory agencies ought to be doing.

### **Practical recourses**

One of the fundamental limitations of India’s coastal governance framework lies in its fragmented and reactive approach to regulation. Although the Notification on Coastal Regulation Zone is trying to manage activities at the land/ocean interface, it is mainly project-by-project and after the developmental demand has already emerged. It is quite clear that in a project lobby-driven policy environment where administrative discretion is high and environment clearances are largely ex post facto, such a system is grossly inadequate for environmental sustainability. Marine Spatial Planning is a feasible solution that can fill this gap.

“Marine Spatial Planning (MSP) is a public process of analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives that have been specified through a political

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58 2016 SCC OnLine NGT 479.

59 *MeenavaThanthai K.R. Selvaraj Kumar Meenavar Nala Sangam, Rep. by its President M.R. Thiyagarajan v. The Secretary to Government, Union of India, Ministry of Shipping, New Delhi*, Writ Petition No.8249 of 2018.

process.”<sup>60</sup> It is a participatory process through which marine and coastal spaces are mapped in a systematic manner and allocated for different uses: shipping, ports, fisheries, tourism, and conservation, disaster mitigation, among others. Unlike the traditional regulatory mechanisms, MSP is essentially preventive and anticipatory. It decides where or not certain activities may or may not take place before projects are conceived, thereby reducing ad hoc decision-making and the scope for project-specific lobbying. This shift from discretionary clearances towards spatial rule-making becomes particularly relevant in the Indian context, where large-scale projects on the coasts under initiatives like Sagarmala have often proceeded at the cost of ecological integrity and community livelihoods.

India is not institutionally unprepared for MSP. Agencies such as the INCOIS, the NIOT, and the NDMA already generate extensive marine and coastal spatial data. Integrating this data into a formal MSP framework would represent an administrative consolidation rather than a radical overhaul.

Other solution could be Regional Environment Impact Assessment (REIA). Unlike the conventional EIA which is practiced, this evaluates the environmental carrying capacity of a defined coastal stretch before permitting further development. The legal feasibility of REIA is established under Environment (Protection) Act, 1986. The existing EIA Notification, 2006 recognises the concept of culminative impact assessment,<sup>61</sup> but the implementation of EIA in India is not up to the standards required to maintain the sustainable deployment of projects.<sup>62</sup> REIA significantly reduces the administrative discretion and looks after the isolated compliance for a specific project.

## V Conclusion

The coastal environment undergoes tremendous stress not only at the hands of nature but also at the hands of humans, the consequences being the loss of lives, contamination of natural resources, and destruction of property. While the prevention and control of natural calamities such as cyclones, tsunamis, beach erosion, *etc.*, do not lie in the hands of anyone, the implementation of an efficacious disaster management plan and environment management plan, the coastal areas can definitely mitigate the impact of these natural calamities. The measures suggested herein *vis-à-vis* tsunamis, such as bio-shields, natural vegetation, Tsunami Mounds, coordinated communication, and warning system between the governmental agencies, can necessarily

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60 Marine Spatial Planning, Intergovernmental Oceanographic Commission, *available at*: <https://www.ioc.unesco.org/en/marine-spatial-planning> (last visited on Dec. 19, 2023).

61 *Available at*: <https://tgpcb.cgg.gov.in/Uploads/Industry%20Guide/EIA-2006.pdf> (last visited Dec. 19, 2025).

62 Ramesh Vishwakarma, Praveen Singh and Yashwant Singh, *Methods and Applications of Environmental Impact Assessments* (2025).

mitigate the loss of life, property, and damage to the coastal environment. Apart from the aforesaid measures, there is an immediate need to solve the issue of the housing of the fisher folk community who are often the first casualties and the most affected in any natural calamity.

In the face of natural calamities, effective measures can be adopted and implemented by the government with some persuasion. However, the situation changes starkly when it comes to the consequences that are the result of developmental activities and human induced. The government is faced with the choice of either promoting the economy and undertaking developmental activity or protecting the coastal environment. Unfortunately, the current trend is the government's inclination towards development at the expense of the coastal environment. The Sagarmala Project is a prime example. The litigation revolving around the project is a forewarning of the counter-productivism of the project in protecting and conserving nature. The government seems to be revamping the law, in order to promote private players in establishing and operating ports. This is not to say that the coastal region ought not to be developed. The argument is that the coastal region should not be developed at the cost of the coastal environment. Sustained development of the coastal region while striking a balance with the protection and preservation of the coastal environment ought to be prioritized by the government.