



## DOMESTIC LEGAL FRAMEWORK ON MARINE POLLUTION – A CRITICAL APPRECIATION

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### Abstract

*This scholarly inquiry undertakes a comprehensive and critical analysis of marine pollution (MP) as it pertains to the domestic legal framework of Pakistan, with particular emphasis on the paramountcy of oceans and the mounting exigencies confronting them. Marine pollution poses deleterious ramifications for ecosystems, living resources, human health, and maritime activities. In the context of Pakistan, multifarious causal antecedents underlie this phenomenon, encompassing industrial and agricultural runoff, shipping-related incidents, and the pervasive scourge of plastic pollution. Despite the existence of international conventions and domestic legislative enactments aimed at redressing this environmental malaise, the practical implementation thereof faces notable challenges, including shortcomings in enforcement and regulatory efficacy.*

*To mitigate marine pollution in Pakistan, substantive efforts have been pursued, notably entailing the proscription of plastic bags, the deployment of advanced technologies for marine waste disposal, and the proactive advocacy of extended producer responsibility. Paramount among the international conventions are those mandating ship-owners' liability for oil spills, pivotal in safeguarding the sanctity of marine environments.*

*Intrinsically intertwined with humanitarian and ecological import, the preservation of marine life mandates the promulgation of comprehensive legal edicts that assiduously protect marine ecosystems and proffer due reverence to the rights of marine denizens. Notwithstanding, the exigency to confront implementation obstacles within the Pakistani legal milieu accentuates the imperative for resolute enforcement mechanisms.*

*Addressing these intricate challenges necessitates the adoption of proactive measures, notably the institutionalization of an autonomous industrial reporting system and*



*exacting compliance with stringent environmental impact assessments.*

*In summation, the efficacious resolution of marine pollution imperatives within Pakistan obliges the cultivation of a robust and meticulously enforced legal framework, profoundly attentive to sustainable marine resource management. Harmonizing international conventions with domestic jurisprudence holds indubitable import in perpetuating the sanctity of marine ecosystems and buttressing the well-being of humanity. Through rigorous legal scrutiny and judicious enforcement, the collective aspiration to ameliorate marine pollution resonates with heightened resonance and veracity.*

**Keywords:** Environment Impact Assessment, Sustainable Marine Resource Management, Autonomous Industrial Reporting System, Regulatory gaps.

## **Introduction**

It is consequential to identify and prioritize oceanic issues that encompass the ill-defined condition of "marine pollution" (MP) given the significance of oceans to humanity and the increasing pressure they face. Marine pollution is a stimulus with a negative impact on the environment and living beings and causes changes to the ocean's biota and ecosystem. Pollutants may cause a number of biological effects, including phenological and genetic mutations, mortality, and metabolic abnormalities. They ultimately affect fitness and cause additional problems. A decline in biodiversity is being observed by dwindling populations of sensitive species, which may impact how ecosystems function by altering habitat, the food chain, and productivity patterns.

The term "pollution" refers to any type of contamination in an ecosystem that harms the organisms living there, alters how quickly certain plant or animal species grow and reproduce, or has an adverse effect on people's comfort, health, or property values (Dahms, 2014). The phrases "contamination" and "pollution" are used in a broad sense to refer to any physical change that affects the flow of energy or radiation in an environment such as the existence of a heat source or radioactive material, as well as even the presence of an invasive species.

Accordingly, marine pollution is defined as "the introduction by man, directly or indirectly, of substances or energy into the marine environment (including estuaries) resulting in such deleterious effects as harm to living resources, hazards to human health, hindrance to marine activities, including fishing, impairment of quality for the use of seawater, and reduction of amenities" in Article 1.4 of the UN Convention on the Law of the Sea (Malone, 1983).

## **Marine Pollution in Pakistan**

Oceans are a significant geophysical feature of the earth yet they are even more important in the case of Pakistan as it stands at the entrance to the Persian Gulf. Pakistan, therefore, has an excellent chance to gain from its geostrategic position because it extends way to the landlocked central Asian nations to connect to the sea. Unfortunately, the nation is facing serious degradation of



marine resources and rising sea levels in the coastal regions and now has recognized them as serious environmental challenges that require prompt response. There are 240,000 square kilometers of the nearby coastal zone in the Northern Arabian Sea that Pakistan's 990 km of coastline together with, can be investigated and developed into additional ports, tourist destinations, and industrial locations. It consists of two separate units: the passive Sindh margin, which spans 370 km, and the active Balochistan coast edge, which spans 760 km. But there's a long way to go in the making coastal region of Pakistan as accessible as proposed because of certain challenges in the face of marine pollution.

### **Causes of Marine Pollution in Pakistan**

It is required to do a root-level analysis of the situation to address the grave position concerning marine pollution Pakistan has reached today. Finding the sources is the first issue that needs to be addressed since only by identifying the sources can causes and effects be accurately identified and addressed. Overall, there are four different sources of pollution that end up in the seas and oceans. The majority of the pollution originates on land and is released into the atmosphere or into rivers as run-off and discharges. The causes of a small portion of all pollution are shipping mishaps and maritime activity. The remainder is made up of the discharge of waste and sewage, as well as the effects of offshore drilling and mining. In the case of Pakistan, the deep analysis of all possible and studied causes of marine pollution is discussed below;

- **Industrial and Agricultural Runoff**

The main causes of the pollution issues are the careless discharge of effluent from industrial and agricultural sources as well as the disposal of untreated liquid and solid wastes produced at home into the coastal environment. Rivers are the primary conduit for the movement of pollution from the land to the sea. Diverse types of garbage from the land are gathered by rivers and eventually end up in the oceans. The urban and industrial sewage systems that are emptied in rivers carry the greatest direct load of pollutants; these systems are frequently preceded by a sanitation step in a water sanitation facility. Karachi has both little and big industrial facilities. You can divide this up into various industrial zones. These include the Hub Trading Estate Gadani in the west, along the Balochistan Coast, the Landhi Industrial Estate in the east, the Korangi Industrial Area in the south, and the Sindh Industrial Trading Estate in the north. The export companies' use of the Karachi Port to transport their products contributes to a sizable portion of the coastal pollution. Because a large portion of the factories' wastewater is untreated and dumped straight into the port region, these industries are polluting the environment.

According to the 1991 Pakistan National Environmental Plan, numerous minor industrial facilities as well as three major coastal enterprises with the highest amounts of effluents that are close to the port include steel mills, power plants, and refineries. Trade activity at the Karachi Port is anticipated to increase consistently along with expanding export industries. Without changes in the shipping sector, pollution burdens the ecology along the shoreline. Sediments and marine creatures are accumulating heavy metals.



Along with agricultural runoff, this runoff from urban and industrial areas is likewise very rich in nitrogen and phosphorus. Therefore, any balance in aquatic ecosystems in coastal areas might be disrupted by a continuous inflow of water that is nutrient-rich from the land. The microalgae populations find themselves less and less constrained in their growth as the levels of nitrogen and phosphorus rise. This frequently causes large growths of single-celled algae, or "algal blooms," in the ocean. The bacteria that mineralize the biomass left over when they die absorb so much oxygen that the water beneath the blooms turns anaerobic. There, any fish or invertebrate life will inevitably perish. As a result, the equilibrium of the marine ecosystems will be severely distorted by the so-called eutrophication brought on by the influx of nutrients.

- **Shipping of Oil, Oil Spills and other Problems arising from Ships**

Periodic oil spills contribute to marine pollution as well. With its extensive oil transportation and accompanying dredging operations, the coastal line also has an impact on the ecosystem. Oil is one of the main port imports due to the nation's growing reliance on oil imports. Within the port, there is no infrastructure for receiving or treating oily ship trash. Dredging is a method used to get rid of the silt that accumulates in ports from ship entry and exit (Qayum & Zhu, 2018). To maintain the port, dredging material is dumped into the ocean. The lack of a system for tracking trace metal in dredged material is probably making the ecosystem much worse. When importing oil, which Karachi Port does frequently, there is a constant risk of spills. Because the nation urgently needs to produce more energy, oil importation is anticipated to constantly rise.

People produce a certain amount of dirty sewage water, which adds to another issue with ships in Pakistani oceans. A certain amount of "grey water" (polluted sewage water) is created while people live aboard ships, in the kitchen, in the showers, etc. The oceans can handle raw sewage through natural bacterial action, but some of that spills overboard. To avoid issues, a certified installation is necessary. The zinc and aluminum that are present come from corroding sacrificial anodes, which are made of highly active metals and employed to shield the ship's hull's less active material surfaces from corrosion. The term "sacrificial" anode refers to the fact that the sacrificial anode will be consumed instead of the metal it is protecting (Clark, Frid, & Attrill, 2001). The water around the hull is where the zinc ions from these anodes dissolve. Last but not least, it's possible that occasionally ships may lose a portion of their cargo as a result of human error, storm wind, and waves.

- **Plastic Pollution in Oceans**

Every aspect of human activity has been influenced by plastic, from ordinary items to decorations, the packing business, buildings, and most significantly, the medical industry. The widespread overuse of plastics has, on the one hand, made life easier and, on the other, has made it difficult to properly dispose of them, which is dangerously increasing environmental contamination. The over usage of plastic products has caused soil, land, air, and marine pollution. The massive and pervasive use of plastics in Pakistan has also resulted in health risks and other problems. The irrigation system of Pakistan is one of the largest gravity flow irrigation systems in the world including dams,



barrages, head-works, secondary and tertiary canals and water courses, bridges, siphons, and other hydraulic structures (Mukheed & Alisha, 2020). Tourism, the local population, agricultural, industrial, and other activities that result in the movement of discarded plastic bags, bottles, and other items into streams and rivers owing to wind or water flow actions are the main causes of plastic pollution in mountain ranges catchment areas.

### **Way Forward to Curb Marine Pollution in Pakistan**

Marine pollution has long been a problem throughout the history of modern shipping. But it has just recently attracted more notice than before. The IMO and the United Nations have made major contributions to the development of international regulations to protect the maritime environment. While it is true that the maritime ecosystem is still being harmed in places where practically all main sources of marine pollution have adequate legal protection, the impact of IMO and UN conventions has greatly reduced the level of pollution. However, there is still a need to safeguard the maritime environment with greater strength. Pakistan is already a signatory to a number of treaties conventions and protocols in order to save its oceans from further harm. These international bindings include MARPOL, the Kyoto protocol, the international sea bed authority, the RAMSER convention, the Pakistan fisheries ordinance, the convention on biological diversity, etc. Despite being a member of London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, Pakistan has substantially violated its marine health by irresponsible disposal of metal impurities, proliferation of plastic waste, release of noxious hospital and industrial material and unregulated sewage discharge. It is imperative to take following measures to safeguard and sustain coastal resources and to avoid proliferation of marine pollution any further, including the measures already taken by the government of Pakistan;

- a. In 2019, Government of Pakistan introduced a stringent ban on the production of plastic bags. It was accompanied with awareness campaigns, inclusion in curriculum and policy making in this respect which also imposed heavy financial penalty between 500 to 500,000 Rupees.
- b. Lately, Pakistan Navy under Green and Clean Pakistan drive has initiated the employment of technology in convenient marine waste disposal using conveyor belt technology called Marine Debris Collections Barge (MDCB). The belt electronically collects the waste and dump in the waste disposal basket (Amjad, 2019).
- c. Government has also pressed into service a dynamic policy called, 'Extended Producer Responsibility' which levies additional responsibility on producers to take care of the disposal or treatment of post-consumer products.
- d. To curb plastic pollution which significantly contributes to marine pollution in Pakistan, government intends to launch a five-year program aimed at waste minimization, enhancing recyclability of plastic waste and adoption of technology-friendly ways to limit its spread. For this, government is employing evidence based strategies to admit the grass root situation of plastic pollution and make relevant policies pursuant to it (Khan, 2021).



- e. Government can borrow the strategy of Monaco's government 'Responsible Trading' by which government only encourages those industries which are pursuing eco-friendly policies through incentives and subsidies including tax rebates (Gillani, 2019).
- f. To prevent oil spillage in oceanic water, Pakistan needs to strictly follow the commitments made in International Convention for the Prevention of Pollution from Ships (MARPOL) 1973 (Dekkers, 2018);
1. The construction of oil tankers must be with due regard to certain formative guidelines including segregated ballast tanks, the limitation of the size of cargo tanks, double hull and bottom requirements and requirements related to pumping and piping.
2. Prevention of spillover of Noxious Liquid Substance with major hazardous content.
3. Prevention of pollution spread by harmful substances in packaged form can be avoided by paying serious attention to documentation of packages, their stowage and quantity limitations.
- 4.

#### **Legal Analysis of Marine Pollution**

The issue of marine pollution in Pakistan has got domestic as well as international perspective to it. The set legal rules and regulations by international community and internal legal arrangements of Pakistan are adequate to fight the menace of sea-borne pollution but devoid of active implementation. Karachi harbor is a key contributor to marine waste in Pakistan and its domino effect has pervaded over other regions as well. In the last few years, government of Pakistan has made certain commitments to reduce marine pollution by enhancing strict compliance with international and domestic legal instruments. In 1996 Marine Pollution Control Department was set up to control and efficiently manage diversified pollutants from land and sea based sources on Karachi harbor of around 62 sq. kms. Other than this, it includes operational wastes and emissions from shipments and debris from various industrial and commercial premises situated on the outlines of Karachi harbor. For the effective application of these instruments, certain policy provisions have also been made to carry out the purposes of these environmental legislations.

Oil tankers spillover in oceanic milieu is one of the major causes of marine environment degradation. To reduce its impact, technological installations have been made and certain precautionary measures adopted. Also, to deter reckless behavior of ship-owners law has been formalized to impose liabilities with respect to it. The main international legal regime governing ship-owners' liability for scant regard paid to release of oil pollution from ships/commercial vessels is established by Civil Liability Convention (CLC) of 1969 and 1992. In addition to it, International Convention for the Prevention of Pollution from ships 1973 also contains certain rules and regulations to ensure secured movement of shipments without oil spillage. The quantum of liability may differ on the basis of extent of damage caused by a party or the involvement of a party as well. If the victim has either negligently or intentionally contributed to oil leakage in a manner unwarranted by law then the liability shall also be shared by the party upon whom the damage has been inflicted. This principle is commonly referred to as '*Volenti non fit injuria*'. Moreover, the convention doesn't only deal with operational discharges but also with accidental slips. This significantly makes the offences under the convention strict liability offences, which incur law-specified penalty irrespective of intent involved



behind the commission of crime. The reason for categorizing such offences as strict liability is to raise the deterrence against such offences. It is because of an apparent reason that the incidents of oil leakage can seriously damage marine environment and may initiate a chain reaction which ultimately affects the human lives. With the advent of Chinese-led economic corridor, Pakistan not only needs to set up a domestic legal regime for the effective management of marine pollution but also the ratification of existing international legal instruments to ensure harmonious interaction between the two legal systems (Aqeel, 2020). Erecting such commercial projects would increase incidents like oil-spilling. Therefore, in order to encourage the FDI without compromising the integrity of oceanic environment, making law making is instrumental.

The *pari materia* scrutiny of Punjab Environmental Protection Act, 1997 and Baluchistan Environmental Protection Act, 2012 makes it abundantly clear that their categorization of waste is comprehensive in terms of effective disposal of marine pollution, including agricultural waste, industrial waste, hospital waste, municipal waste, nuclear waste and their incinerated residue. Baluchistan statute has recognized two other types of waste i.e. electronic waste and clinical waste. This would more profoundly affect the effort to stem the tide of marine pollution because increasingly recognizing more categories of waste would resultantly enhance the scope of law and policy regarding marine pollution. Moreover, distinctively the statute of Baluchistan also contains a provision regarding oil spillage in oceans. Section 23(3) of the statute makes it incumbent on the ship owners or movers to dispose of the waste in a manner to as to protect marine environment. This makes it clear that the provision only deals with accidental slips and discharges. It remains inadequate because it doesn't ensure any safeguard and protocols for pre-discharge situation nor does it lay down principles of liability in the event of oil spillage.

Furthermore, marine and coastal biome has been subjected to extensive exploitation as a result of widespread and unhindered marine pollution (Marine and Coastal Ecosystem of Pakistan – Climatic Biome, 2021). Inhabitants of marine environment ultimately make up the food content of humans and for other economic purposes as well. Jurisprudentially, looking into its humanitarian benefit and human being the end consumer of marine life makes it critically important to save the integrity of marine environment. However, the protection of marine life can sometimes be for the purposes of protection of animal life in there. Here two perspectives are identifiable here;

- a. Protection of marine life because of human being its end-consumer
- b. Protection of marine life because its inhabitants are carriers of rights and dignity as well.

Pakistan's legal system has not been able to legally or judicially distinguish between the two approaches; however, the protection of marine environment is important for many other reasons as well.

Moreover, other than inadequacy of laws - there are certain identifiable issues of legislative implementation as well (Ahsan & Saima Amin Khawaja, 2013);



1. Provisions have been made for the issuance of licenses only to those people who are the handlers of hazardous material. The legal rules and policy arrangements are limited to the paper only because the rules drafted in 2003 has not been notified yet therefore its implementation can't be pressed into service.
2. Provincial governments are allowed to impose pollution charges under the expressed statutory powers given if the magnitude of pollution exceeds National Environmental Quality Standards but it hasn't been imposed even to this day because of the conflict between Environmental Protection Agency and provincial government as to the collection of fine received.
3. Self-Monitoring and Reporting System (SMART) is an autonomous industrial reporting system, where industries are required to report their environmental performance to the government. It is an innovative and progressive measure in theory but when it comes to implementation suffers a deadlock because industries generally don't regularly report and government has to this day failed to make it a mandatory requirement. Also, industries don't provide accurate and correct information.
4. Environmental protection agency is empowered to conduct Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) of commercial and industrial projects based on the environmental impact it renders or expected to incur by their commercial undertakings. However, no matter how much effective the system is in theory the implementation falls short. In reality, less than 25 EIAs were decided in in federal areas, Sindh, and KPK, while no EIA was passed in the province of Baluchistan, and only Punjab had more than 50 EIAs passed yet.





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