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Marine pollution laws: A conceptual analysis

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Abstract
Pollution being a pre-dominant and multi- faceted phenomenon, the evolution of law also was dynamic and multi-pronged. Therefore to locate the routes, the evolutionary aspects need to structure such models in some types of analysis. A chronological analysis of evolution of the effected law is to be detailed and must comprehend the multiple dimensions of the marine pollution.
It is a fact that pollution from seabed activities are caused by the release of harmful substances arising directly from the exploration, exploitation and processing of seabed materials. The pollution from the marine environment accounts for one per cent, although some regions namely, the Arabian Gulf have a proportion higher due to the oil exploration activities. Unfortunately, international legislations on pollution from seabed and subsoil activities are to a great extent undeveloped. The United Nation Convention on Law of the Sea establishes a basic framework of general commitments which have been supplemented by the general. The rule was established in most regional seas with various agreements with some specific regional treaties. This paper sought to trace the evolutionary development of marine pollution law.

Keywords: Marine pollution, Treaties, implementation, activities, Liability

Introduction
The marine pollution is subject of the international law its part of operational scope. The question of application of law and its effectiveness mostly depends on the regional agencies. Marine pollution is defined in article one of the law of the sea convention, [1] by the United Nation Educational Scientific and Cultural Organization. However the Oceanographic Commission of the Inter-governmental and the experts from United Nation Group on the Scientific Aspects of Marine Pollution, as follows: "*The introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities"* [3].
The paper illustrates three streams of development towards laws related to marine pollution. The sources of pollution at the international and regional levels were raised by multi-lateral and regional treaties. The development of the laws related to marine pollution in the United States of America and the limitation of liability laws.

Structure of Analysis
The preliminary tracking of the source of marine pollution and the evolution of law is through its custom or the treaties. The aspect of these treaties are traced at three levels generally, multi-lateral level, the regional and bilateral treaties level and at operational level. All of these are connected towards the law of the sea convention (1982) [4].

Sources of Marine Pollution
The developed laws are traced and routed to the sources of various marine pollutions to raise these issues such that it is addressed by the interantional organisation to enact as a law. Customary international law as referred in Corfu Channel Case (1949) and in the Trail Smelter Arbitration Case (1938-41) held that each state was under an obligation 'not to allow knowingly its territory to be used for acts contrary to the rights of other states' [52] or as referred in the High Seas Convention. The states are to exercise acceptable reasons and interests of other states. But such plain and simplistic would not serve as an effective and speedy recourse to address such complex issues of marine pollution. This in fact has raised the deficiencies of customary international law the nation states have taken recourse to treaties specially to address the issues on marine pollution. The multilateral treaties witness the engagement of an international organization right from its start and usually retain supervisory function in relation to these treaties. Shipping and dumping related areas have provoked a number of these multilateral treaties which now governs these areas but sea bed activities and shore based atmospheric pollution have not seen much developments.
The regional treaties governing marine pollution have been single framework treaties along with obligation protocols. Many organizations are addressing all of the pollutants used at sea. One more important aspect concerning regional treaties is that they have entered into the next generation surpassing basic principles like precautionary principle and to sustain this developments and biodiversity. All said, but the regional treaties have significantly proved its adaptation and evolution and its effectiveness as the greatest at international law. A bilateral treaty deals with more specific or as referred by the local communities' issues connected to the pollution [6].
The law of the sea convention leaves the specific cities and in particular marine pollution addressed by the above two levels of international law focusing only on the operational functions.

This defines the jurisdictional rights and obligations of the flag, coastal and port states [7].

Pollution from Ships

Ship based pollution is deliberated and measures to regulate them have evolved at three junctures. They are:

Operational Pollution

Operational pollution implies pollution emanating in the course of the business of the ship. It can be:

- Oil disposed of before a new cargo is taken on board or the residues of oil in ballast water
- Discharge of residues containing noxious liquid substances
- Discharge of sewage
- Discharge of garbage
- Discharge of air pollutants-sulphur and nitrogen oxide, shipboard incineration, on board use of ozone-depleting substances such as halogens and CFCs

There are three levels of the international law (treaties, conventions), the law has evolved:

General Multilateral Treaties: The 1954 Oil Pollution Convention was the first multilateral attempt to regulate the operational pollution arising from the tankers (oil discharges). The Convention was of limited effectiveness and is of historical interest now. The 1954 Convention has been superseded by the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL Convention) [8]. MARPOL Convention is intended to deal with all forms of intentional pollution of the sea from ships, other than dumping. Detailed pollution standards are set out in six annexes. These are concerned with oil (Annex 1), noxious liquid substances in bulk (Annex II), harmful substances carried by sea in packaged forms (Annex III), sewage (Annex IV), garbage (Annex V) and air pollution (Annex VI). The acceptance of Annexes I and II is obligatory for all contracting parties, but acceptance of the remaining annexes is optional [9].

Treaties like SOLAS (1974), IMDG Code (1966) and the Basel Convention on the Control of Trans boundary Movements of Hazardous Wastes and their Disposal, 1989 brought into force for an objective other than regulating pollution have the ancillary effect and the objective of regulating pollution.

Regional Treaties

Among the important regional conventions which try to regulate pollution from the ships are-

- The Mediterranean Convention, 1976
- The Baltic Convention, 1992
- The Waigani Convention, 1995
- The Kuwait Convention

These regional treaties attempt to effectively regulate and enforce international standards of pollution control or even stricter implementation of these standards. They even make cross reference to the MARPOL Convention.

Law of the Sea Convention

United Nation Convention on the Law of the Sea as stated before defines the jurisdictional rights and obligations of the states-both the legislative and enforcement jurisdiction. In order to understand how the jurisdictional rights have evolved necessary to look at the position of the flag state, coastal state and the port state prior to UNCLOS III and then take a view of their position after UNCLOS III 1982.

Flag state

- Under customary international law flag state had the jurisdiction to prescribe antipollution rules. They had the judicial jurisdiction in respect of violations committed. They could arrest its vessels in the high seas or in its own territorial sea.
- Under MARPOL, the flag state has to apply the Convention's pollution standards. Flag states must also inform IMO of the enforcement action they have taken on the erring vessels.
- Under LOSC, the legislative competence of the flag states are not reduced but the enforcement jurisdiction (enforcing penalties, issuing certificates) has been widened.

Coastal state

- Prior to UNCLOS III could prescribe any legislation relating to pollution that it wishes for foreign vessels in its territorial sea but could not hamper innocent passage.
- Under MARPOL Convention the coastal state had the obligation to prescribe the convention's provisions for all vessels in the territorial sea.
- Enforcement jurisdiction implied arrest and initiating legal proceedings.
- LOSC [10] reduced the legislative competence of the coastal state in respect of kind of pollution regulations which may be adopted but increased it with respect to the geographical area (by including EEZ in its ambit). The limitation has set in, for instance, by curbing the coastal states from legislating with respect to the design, construction manning and equipment of the ships and by holding the sanctity of the innocent passage and transit passage. The enforcement jurisdiction of the coastal states have been strengthened much by making them competent to physically inspect the ship, to initiate legal proceedings and even to arrest the ship.

Port state

- Under the customary international law, the port state may adopt anti-pollution legislation for foreign vessels in its ports. They can even make the observance of the laws a condition for entry into its port. The enforcement jurisdiction implied right to initiate legal proceedings and even arrest.
- Under MARPOL the port state had the obligation to prescribe to Convention's provisions and it gave the port state the competence to inspect and to detain the ship if the situation so warrants. The port state also has the obligation to inform the flag state of the erring vessels.
- Under LOSC, the legislative competence of the port state did not witness any change. But the enforcement jurisdiction underwent radical innovation. The port state could prosecute the vessels if they were held for any violation of the pollution norms in its territorial sea or it's EEZ. Art 218 of LOSC gave right to the port state to initiate legal proceeding if there was any discharge against the norms even outside its territorial sea or its EEZ. It also enabled the port state to take administrative measures to prevent sailing if the ship was found unseaworthy [11].

Accidental Pollution

The law in this area has evolved on three fronts. Schematically it can be represented as:

Global Conventions

Conventions of the nature as MARPOL and SOLAS point towards the effort of the international community to address the issue of accidental pollution through the preventive approach. But once the accident has happen what rule of law govern the mitigating and rescue operations? What measures coastal state can take to prevent or reduce pollution? This was sought to be formulated and codified in the Intervention Convention, 1969 (The International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Causalities). The Convention defined 'maritime casualty', the extent of measures that could be taken by the coastal state, and the geographical extent of operations. The 1973 Protocol to the Convention extended coastal states powers of intervention to casualties involving substances other than oil. At this juncture mention should be made of the Torrey Canyon incident, wherein Britain intervened to mitigate the pollution casualty which happened beyond its territorial extent. The ready acceptance of Britain's act has been interpreted in the literature as the evidence of the emerging rule of customary international law whereby a coastal state can intervene beyond its territorial limits to mitigate pollution incidents. This emerging customary is seen as being crystallized in the Intervention Convention and the LOSC.

Concerning co-operation, MARPOL and LOSC sets the stage by laying down that information concerning pollution law violations and causalities must be shared and channelized to the concerned states. The general provisions of MARPOL and LOSC are given more substance in the International Convention on Oil pollution, Preparedness, Response and Co-operation, 1990. Co-operation in terms of establishing a national system for responding to the oil pollution incidents, sharing of research and development information, technical assistance and assisting each other in the event of an actual casualty is in the above convention. The International Convention on Salvage, 1989 rectifies the traditional rule of 'no cure no pay' in salvage and allows the salvor to be paid if he prevents or minimizes damage to the environment, even if he does not save the ship [12] This also seeks to contribute to the effort to rescue the marine environment from pollution incidents.

Regional treaties

The regional treaties like the Mediterranean, the Baltic conventions and the UNEP regional conventions seek to co-operate through sharing of information. The Red Sea and the Kuwait Conventions establish a regional emergency center. Similar regional endeavors are seen in the North Sea Agreement, 1983 and the Nordic Agreement, 1971, the Accord of co-operation for the Protection of the Coasts and Waters of the Northeast Atlantic, 1990 and the Antarctic Treaty [13] The efforts to co-operate involve measures like creating zones of responsibility, providing them with equipment to deal with oil slicks at sea and developing contingency plans.

Liability for Pollution Damage

The Civil Liability and the Fund Conventions:

The main aim for avoiding the marine pollution at sea is the primary cause of the ship owners and the people who use the ocean for maritime related activities. However the word compensation is used by the law for the sole avoidance of marine pollution. It has proved by the very disaster of the ship Torrey Canyon at the high seas causing much environmental pollution and bringing that to the coast too. This cause has disturbed the coastal community as well with numerous questions asked based on the cause of such incident and its future safety at sea. The following are the extract of the possibilities for meeting the above mentioned incidence:

- Law to pay for the cause of pollution as the right of the parties
- Jurisdiction and law that would govern the claims
- Proof of fault in case of claims for compensation
- Limitation of liability of owners
- The type of loses that could be covered- whether pure economic loss could be covered
- Cost of clean-up operations
- Enforcement problems
- Lack of provision of compulsory assurance
- Law which held that there would be no liability without proof of negligence or unseaworthiness (the Inverpool decision).

After the Torrey Canyon incident the British Government submitted a Note to the Inter-Governmental Maritime Consultative Organization (IMCO). The subject was 'changes in international law governing liability for pollution by oil and possibly other hazardous and noxious substances'. Means while 'Comite Maritime International, (CMI) established an International Torrey Canyon Sub-Committee to examine the private law aspects and to work in co-operation with IMCO. The deliberations so initiated led to the drafting of the Civil Liability Convention (CLC) which provides that where oil escapes or is discharged from a ship and causes damage on the territory, including the territorial sea of a contracting state, the ship owner (subject to three exceptions) is strictly liable for such damage and the cost of any preventive measures taken. CLC 1969 mooted two levels of compensation. The primary liability being that of the ship owner, who in the 1969 convention was liable for oil pollution claims up to a limit of 2000 francs per limitation ton.

The second tier of compensation was sought to be established from the fund received from the oil receivers. This second tier of compensation was established through a Diplomatic Conference in Brussels in 1971. The 1971 Conference adopted the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage-known as the Fund Convention 1971. The Fund Convention provides that where the ship owner is not liable at all under the Civil Liability Convention by reason of the exceptions or, in cases where the ship owner is liable but financially incapable of meeting his obligations in full or if the pollution damage exceeds the limits of his liability, compensation will be paid to the victim from the Fund. The Fund Convention also provides that it is to relieve the ship owner some of the financial burden imposed on them by the CLC by paying that part of the Ship owner's liability which is in excess of 100SDRs per ton or 8.333 million SDRs, whichever is less. In 1984 two Protocols to amend the Civil Liability and the Fund Conventions were adopted, but neither Protocol came into force because the US refused to ratify them. Two further Protocols, with similar substantive provisions to the 1984 protocols, were adopted in 1992 and they came into force in 1996. They require the parties

to denounce the Civil Liability and Fund Conventions in their original form. For such parties the protocol effectively creates two new conventions: the 1992 Civil Liability and Fund Conventions. The main change made by the 1992 Protocol to CLC is to increase the maximum limits of liability under the Convention to three million SDRS for ships under 5,000 tons and to a maximum limit of 59.7 million SDRs for larger ships. The Protocol to the Fund Convention raises the maximum limit of liability under that Convention to 200 million SDRs when certain conditions are fulfilled [14]. the third tier of compensation has been envisaged and is available under the Supplementary Fund Protocol 2003. It is for the payment of additional compensation in major incident [15].

Industry Liability Schemes:

As a response to the Torrey Canyon incident and the political response it evoked, seven major oil companies who owned a high proportion of oil cargoes and also operated a significant part of the world's tanker fleet introduced TOVALOP- Tanker Owners Voluntary Agreement Concerning Liability for Oil Pollution which was to be administered by a new entity called the International Tanker Owners Pollution Federation (ITOPF). Detailed terms of TOVALOP agreed voluntary assumption of strict liability, subject to limited exceptions, up to a fixed limit. TOVALOP was highly successful with 97% of the total tonnage had been enrolled in it [16].

At the wake of the establishment of the second tier of compensation under the Fund Convention, 1971, oil industry developed a scheme which would be acceptable to its participants and would provide a model for the proposed convention. An agreement was reached on 14th Jan, 1971 among numerous oil companies and CRISTAL (the Contract Regarding an Interim Supplement to Tanker Liability for Oil Pollution). To administer the scheme the industry established the Oil Companies Institute for Marine Pollution Compensation Ltd (known as the Institute). Its main purpose was to pay compensation for oil pollution damage in cases where the incident involved an oil cargo owned by a CRISTAL member and the claims exceeded the amounts recoverable from the ship owner under TOVALOP.

TOVALOP and CRISTAL were very effective schemes however the boards which administered the schemes decided that the two schemes should end in February 1997 to encourage the ratifications of the CLC and the Fund Conventions.

Liability for hazardous and noxious substances

International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, 1996 more widely referred to as the HNS convention is modelled on The Civil Liability and IOPC Fund Conventions. Since it was not ratified by the requisite number of member countries, a Protocol to HNS Convention was adopted in 2010 which focused on addressing the practical problems the countries faced with respect to the convention. The Convention envisages a compensation regime for the damage caused by the spill of hazardous and noxious substances as specified in the IMDG Code. Two tiers of liability are conceived in the Convention but both are included in the same single instrument.

The basic features of the convention include:

- Strict liability
- Compulsory insurance cover for the ship owner-which forms the first tier of the compensation
- Limited liability worked out in terms of the size of the ship
- A second tier of compensation which imposes liability on the various receivers of HNS goods

The provision for second tier of compensation clearly has the potential to significantly affect HNS receiver countries that are also member states to the Convention.

Liability for radioactive matter

Pollution in this case may result from either an accident to a ship carrying radioactive matter or from the operation of or an accident to a nuclear powered ship. In either case the operator of the nuclear installation is held to be strictly liable. The concerned conventions are:

- The Paris Convention on Third Party Liability in the Field of Nuclear Energy of 1960
- The Vienna Convention on Civil Liability for Nuclear Damage of 1963
- The Convention relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material of 1971.

In the absence of a Convention governing nuclear powered ships, the present situation is such that all naval\government nuclear powered ships are protected under the sovereign immunity clause and the few private players are protected by bilateral agreements.

Liability for other substances

Bunker spills from other than tankers are governed by International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001 which came into force in 2008.

Dumping

Dumping had been referred in high seas convention where the states were required to take measures to prevent marine pollution from the dumping of radioactive wastes (HSC art 25(1). This action has resulted in one convention that is worldwide in scope and a number of regional agreements. This global convention is the Convention on the Prevention of Marine Pollution by the Dumping of Wastes and Other Matter, 1972 (London Convention). The London Convention defines dumping as the deliberate disposal of wastes from ships and aircraft, but excluding the disposal of waste incidental to the operation of ships and aircraft. Wastes are divided into three categories. The first category consists of substances listed in Annex I (the black list), the substances on this list are totally prohibited from dumping. The second category of wastes comprises of less noxious substances and forms the grey list encoded in Annex II. The dumping of such substances is permitted only if a prior special permit (issued by the national authorities of a contracting party) has been obtained [17]. The third category comprises of all the wastes not on the black or the grey lists: such wastes may nevertheless be dumped only if a prior general permit has been obtained [18]. The Convention embodied permissive approach, propelled legislative action by the contracting states, required record keeping and evaluation. Parties to the London Convention must meet not less than once every two years to evaluate the performance of the working of the Convention and to develop further guidelines [19].

Since 1990 the operation of the Convention went on a drastic change. The attitude of permissive approach was abandoned for a more precautionary approach and a holistic working was

adopted for waste management. Phasing out of dumping of all radioactive wastes, incineration at sea of noxious liquid wastes and dumping of industrial wastes was initiated under this era. The main substances which it is still permissible to dump are dredged materials, sewage sludge, and fish processing wastes, vessels and continental shelf and gas installations.

Regional treaties

The first regional treaty to be concluded was the Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft, 1972 (the Oslo Convention). This Convention applies to the North-East Atlantic and the North Sea and takes a similar approach as that of the London Convention. In 1992 the parties to the Oslo Convention signed the Convention for the Protection of the Marine Environment of the North-East Atlantic (the Paris Convention), which, on its entry into force in 1998, replaced the Oslo Convention. The Baltic Convention in 1974 took a stricter approach to dumping than the London and Oslo Conventions, reflecting the particular vulnerability of the Baltic to pollution damage, only three of UNEP's Regional Sea Agreements, those concerning the Mediterranean, South Pacific and Black Sea have detailed provisions dealing with the dumping, in the shape of separate protocols. Also there are a number of regional treaties which, while not primarily concerned with marine pollution, deal with dumping. Three of the regional denuclearization treaties, the 1985 South Pacific Nuclear Free Zone Treaty, the 1995 African Nuclear-Weapon-Free Zone Treaty and the 1995 Treaty on the Southeast Asia Nuclear-Weapon-Free Zone prohibit the dumping of any radioactive material or waste [20].

Law of the Sea Convention

Article 210(5) of LOSC provides that dumping within the territorial sea and EEZ onto the continental shelf shall not be carried out without the express approval of the coastal state, which has the right to permit, regulate and control such dumping after due consideration of the matter with other states which by the reason of their geographical situation may be adversely affected thereby. In relation to enforcement, article 216 provides that national laws and applicable international rules and standards are to be enforced by flag states, by coastal states and by States in whose territories waste is loaded [21].

Pollution from the Sea Bed activities

Pollution from sea bed activities can either be operational or be accidental. The main form of pollution from sea-bed activities is that arising from operations in the territorial sea and on the continental shelf for the exploration and exploitation of oil and gas. Accidental pollution can result from a blow-out; rupture of a pipeline; a collision between a ship and an installation; an accident when a tanker is being loaded from an installation; or destruction of a suspended well-head or sub-sea completion system.

Global treaties

Interestingly there exist no global treaties concerning pollution from sea-bed activities, either operational or accidental. This field has seen general exhortations to the nation states in the Geneva Convention and LOSC and some soft law instruments developed by the UNEP.MARPOL provisions concerning pollution from sea bed activities are legally binding but they apply to the release of pollutants arising from those activities other than exploration and exploitation.

Regional agreements

More extensive provisions to regulate pollution from sea bed activities have been developed in the regional agreements. In fact the LOSC and the UNEP Guidelines call on states to harmonize their policies at the regional level. The Baltic Convention of 1974, the Mediterranean Convention and the Kuwait Convention have developed specialized protocols on pollution from sea-bed activities. The international legislative exercise at the regional level has resulted in the development of a wide range of measures which in practice should minimize operational pollution from sea-bed activities. The measures include EIAs (Environment Impact Assessments), Licensing, stipulation to use the best available technology etc [22].

Like the scenario in the operational pollution from sea bed activities, there exist no global treaties governing accidental pollution from sea bed activities. General rules of international law in this area seeks to prevent accidents by insisting on sea navigation to be maintained, fairways and routing systems to be followed and due publicity to be given for charts and navigational aids. Regional agreements exist, and they lay out the platform for co-operation in the financial and technical competence. Concerning liability though there have been some efforts in this direction none have materialized and have come through at the international level.

Pollution: sea-bed mining

Pollution from sea-bed mining is primarily governed by the Law of the Sea Convention. Article 145 of LOSC provides that the International Sea Bed Authority is to adopt rules to prevent pollution from deep sea mining. Pollution rules are to be framed by the Legal and Technical Commission and to be formally adopted by the Council and Assembly. For any sea bed mining which might take place outside the agenda of the Convention, little international law is at present applicable.

Land Based-Atmospheric based sources of Marine Pollution

Although pollution from land based is the most significant source of marine pollution only a limited amount of international legislative effort so far been taken to tackle this form of pollution. Land-based pollution is the most 'national' source of marine pollution. It emanates from an area that is under the sovereignty of a State and therefore to legislate upon such a subject matter internationally would be politically very difficult. The LOSC contains general exhortations to states to prescribe and enforce laws regulating land based sources of marine pollution, say as in Art 207 and 213. But this subject matter has seen a number of soft law instruments being adopted especially under the aegis of UNEP and UNCED. The major ones are the Agenda 21 (1992) and the Washington Declaration (1995) [23] World Bank's Global Environment Facility seeks to assist the developing countries financially to adopt technology that would help them to reduce land based sources of pollution [24]. soft law instruments though not legally binding on the nation states were very successful in enunciating principles such as the polluter pays principle, precautionary approach principle and the principle of sustainable development. These principles then got crystallized in the regional agreements

which mutated with the help of protocols to incorporate these principles and devised effective measures to implement them.

Regional agreements

The first regional convention to tackle land-based marine pollution in detail was the Convention for the Prevention of Marine Pollution from Land-based Sources, 1974 frequently known as the Paris Convention, which applies to the North East Atlantic and the North Sea. The first Baltic Convention was drawn up at much the same time as the Paris Convention and lays down a general obligation on State parties to 'take all appropriate measures to control and minimize land-based pollution'. The UNEP Regional Sea Agreements and the Mediterranean Protocol also follows similar line. Also to note is the fact that most pollutants entering rivers will eventually finish up in the sea. It therefore follows that treaties adopted specifically to curb pollution of rivers will also help marine pollution. In this context it is appropriate to mention UN Economic Commission for Europe's- Convention on the Protection and Use of Trans boundary Water Courses and International Lakes and the Rhine agreement, 1976, (protocol-1991) [25].

And now the general agreements on atmospheric pollution include:

- UN Economic Commission for Europe's Convention on Long-Range Trans-boundary Air Pollution of 1979, Protocols-1985, 1991, 1994
- Vienna Convention for the Protection of the Ozone Layer, 1985
- Montreal Protocol on Substances that Deplete the Ozone Layer, 1987
- Kyoto Protocol, 1997 focusing on Green House Gases

The analysis of the regional agreements show that mutated through protocols in order to incorporate the principles enunciated in the multilateral forums. The first and the prominent change was the movement from the permissive approach to precautionary approach. The protocols stipulated that the polluting emissions of substances that are persistent, toxic and that are liable to bio accumulate are to be reduced at source. The mutation also suggested a movement away from the substance-by-substance approach to a more holistic treatment of the pollutants. They emphasized on UES (Uniform Emission Standards), WQOs (Water Quality Objectives) and EIAs (Environment Impact Assessments) [26]. They also worked out regular reviews and timetables to reduce emissions and finally the phasing out of the toxic substances. They emphasized upon the use of Best Technology Available and the Best Environmental Practice. Another innovative approach is the source control conceived in the Kuwait Convention whereby the pollution is sought to be controlled at source by changing the raw materials, processes and recycling, industrial location planning, combined effluent treatment, licensing etc.

Protection of Special Areas

Positive measures are needed to protect and preserve rare or fragile ecosystems and are best exemplified in the protocols on specially protected areas attached to some of the UNEP Regional Sea Conventions. The first of these UNEP protocols to be concluded was the Protocol on Mediterranean Specially Protected Areas, adopted in 1982. The protocols to the East African, South-East Pacific and Caribbean Conventions, adopted in 1985, 1989 and 1990 respectively, contain provisions on the establishment of protected areas very similar to those of the first Mediterranean protocol. IMO also plays a role in the protection of these sensitive marine areas. In 1991 the IMO Assembly adopted a resolution containing a set of Guidelines for the Designation of Special Areas and the Identification of Particularly Sensitive Sea Areas. Special Areas are those which are subject to stricter measures under the MARPOL Convention [27] Particularly Sensitive Sea Areas (PSSAs) are areas which need special protection through action by IMO because of their significance for recognized ecological, socio-economic or scientific reasons and which may be vulnerable to damage by marine activities. The kind of measures which might be taken for such areas include designation as special area under MARPOL, the adoption of routing measures including designation as an area to be avoided, compulsory pilotage, the adoption of vessel traffic management system, special construction requirements and speed restrictions. Measures for PSSAs lying beyond the territorial sea would need to be international in character, i.e., based on an existing treaty. The first PSSA to be designated by the IMO is the Great Barrier Reef Marine Park [28]

Marine Pollution Laws in United States of America

Another thread of development that has to follow apart from the above described is the development of marine pollution law in US. Prior to 1967 the law on pollution and claims for damages largely ran parallel to the law of tort. The main differences were to be to be noticed in the US laws:

- New York Harbor Act of 1886
- Refuse Act of 1899
- Oil Pollution Act of 1904

But enforcement provisions were penal in nature and limited assistance was available to a party seeking to recover damages. Also to mention are:

- Oil Pollution Act of 1924- the first law to impose specific liability for the discharge of oil from vessels into the navigable waters of the US.
- Federal Water Pollution Control Act (FWPCA), 1948
- Water Quality Act of 1965- to enhance the water quality of water resources- but no laws specifically addressed ship-source pollution.
- Clean Water Restoration Act of 1966: amended Oil Pollution Act of 1924, civil liability for the cost of clean-up was introduced for the first time in the US, no assurance whether vessel owner would be able to meet his obligations, no provision for third party liability.
- During 1967-1977, US though ratified the Intervention Convention did not ratify the CLC. The main reason was its strong economic position and its political need to preserve the autonomy of the states in a federal set up. Then came the incident of the blow out in the drilling platform-Santa Barbara (California) and the consequent passing of the Federal Water Quality Improvement Act which introduced strict liability and set a new limitation (not under 1851 Limitation Act). Then the Clean Water Act of 1977 which introduced increasing liability and financial responsibility but state legislation was not pre-empted (express provision). The state autonomy in pollution laws were upheld in the following notable case laws:
  - American Waterways Operators v Askew
  - Portland Pipeline Corporation v Environmental Improvement Commission

- In the ensuing scenario though the State law prevailed there was no uniformity and ambiguity ruled the course. The notable departure in the judicial view point came in Ray v Atlantic Richfield Company where it was held that uniformity of laws was of prime importance and therefore the Washington statute was invalid and that the Supremacy clause would prevail. Following this judgment there was plethora of legislations but no comprehensive legislation ensued. The dramatic and the conscience shaking incident to prompt a comprehensive work upon the subject matter came through the Case of Exxon Valdez and the Oil Pollution Act of 1990 was legislated upon. OPA of 1990 is now the ruling legislation in case of marine pollution in US now [29].

Limitation of Liability

Though not directly related to the subject under study, in order to draw a fine concluding line, it was best to mention the evolution of the limitation of liability laws as well.

"Limitation of liability is not a matter of justice. It is a rule of public policy which has its origin in history and its justification in convenience". Lord Denning in the case of Bramley Moore [30].

- Statutes of Hamburg of 1603, the Hanseatic Ordinances of 1614 and 1644, the Marine Ordinance of Louis XIV of 1681 are a few historic examples of legislative efforts which sought towards limitation of liability.
- In UK: Action in rem, the Responsibility of Ship owner's Act 1734, 1786, An Act to Limit Responsibility of Ship Owners in Certain Cases, 1813 and The MSA, 1854 would comprehensively draw the evolutionary trajectory of the limitation laws.
- The modern efforts are summarized in the three conventions: The 1924 Convention, the 1957 Convention and the LLMC1976.

Conclusion

The achievement of the development of marine pollution on national and international perspective were not need and effort based by the international community in the perspective of the various treaties implemented and observed, once they have come into force.

Further effective regional standards are necessary because national practice can diverge in the absence of such standards. An Example of this can be seen by comparing the practice of two major oil producing states of the North Sea, Norway and the United Kingdom. In the period 1981-1986, before the adoption of any standards by the Paris Commission, installations on the United Kingdom's Continental Shelf, where offshore activities were roughly two to three times greater than the Norwegian shelf, discharged seven times more oil from operational sources as opposed to the ones on the Norwegian shelf. Marine pollution laws are needed for efficacy in the terms of the application; it is the obligation of the all nationals and international, regional and intergovernmental organizational communities to come up with better options for the prevention of marine pollution.

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