Protection of Marine Environment under the Law of the Sea

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ABSTRACT

Pollution in the ocean is a major problem affecting the ocean and the rest of the Earth, too. Pollution directly affects ocean organisms, and indirectly affects human health and other resources. Oil spills and dumping of toxic wastes and other harmful materials into the sea are all major sources of pollution in the ocean.

Marine pollution is an issue that has been of global concern for the past several decades fearing that it will, most probably, continue to be so for several decades more, the international community has formulated rules and regulations and concluded a number of international conventions that comprehensively address the protection and preservation of the marine environment. Among these, the United Nations Conventions on the Law of the Sea lays down the obligations of States to protect and preserve the marine environment which requires States to cooperate on a regional and global basic directly or through competent, organizations, in formulating rules and standards for the protection of the marine environment.

Awareness of the environmental issues has become more critical to the oil industry and regulators in the last decades. In recent years there has been a project concluded between Myanmar and China under which a super tanker terminal, Kyaukphyu Deep Seaport, has been constructed in the Rakhine region in the west coast of Myanmar from where oil is piped across Myanmar to China. This project makes Myanmar become an oil receiver country in millions of tons per annum, so the risk of oil pollution is likely to be significant. The problem encountered by Myanmar is how to deal with it if oil pollution occurred in Myanmar waters. No laws as and regulations concerning marine pollution from the shipping sector have been promulgated yet to safeguard against such risk of pollution nor to deal with the matter of compensation in case of pollution occurring.

The role of government in setting and enforcement of regulation is required means to minimize the potential environmental impact. Therefore, in order to achieve a strong national legislative framework and a national oil spill contingency plan for the protection of the marine environment and the prevention of marine pollution, it is essential for Myanmar to establish the regulatory regime in respect of prevention, response, restoration and compensation, especially as she is party the UNCLOS, MARPOL and OPRC International Conventions and also to the ASEAN_MOU on

Corporation Mechanism for Joint Oil Spill Preparedness and Response,

2014. The Myanmar Environment Conservation Law 2012 does not adequately address the legal issues that stem from the impact of ship-generated marine pollution.

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LIST OF ACRONYMS

AES	International Convention on the Control of Harmful Anti-fouling Systems in Ships

ASEAN	Association of Southeast Asian Nations
BMW	International Convention for the Control and Management of Ships Ballast Water and Sediments, 2004
CLC	International Convention on Civil Liability for Oil Pollution Damage, 1969
EEDI	Energy Efficiency Design Index
EEOI	Energy Efficiency Operational Indicator
EEZ	Exclusive Economic Zone
FUND	International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971
GESAMP	Group of Experts on the Scientific Aspects of Marine Environmental Protection
IAPP	International Air Pollution Prevention
IEE	International Energy Efficiency
IMO	International Maritime Organization
LBSMP	Land Based Sources of Marine Pollution
MARPOL	International Convention for the Prevention of Pollution from Ships 1973/78
MPA	Myanmar Port Authority
NCEA	National Commission for Environmental Affairs
NIC	National Incident Commander
Nox	Nitrogen Oxides
OILPOL	International Convention for Prevention of Marine Pollution by Oil, 1954

OPA	Oil Pollution Act
OPRC	International Convention on Oil Pollution Preparedness, Response and Cooperation 1990

OSLO	Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
POP	Persistent Organic Pollutants
SDR	Special Drawing Rights
SEEMP	Energy Efficiency Management Plan
Sox	Sulfur Oxides
UNCLOS	United Nations Convention on the Law of the Sea 1982
UNESCO	United Nations Educational, Scientific and Cultural Organization
YPIC	Yangon Ports Incident Commander

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INTRODUCTION

Throughout history, the seas have served mankind as a medium of communication, trade and livelihood. But, regrettably, due to its vastness, mankind has over the centuries tended to regard the sea and its resources as limitless and inviolable, no matter the amount of resources extracted or the quantity of pollutants dumped into it. With regard to the historical background of marine pollution, it is obvious that marine pollution is a phenomenon that has been steadily growing over the centuries, brought about by man's uncontrolled exploitation of the sea and its ecological resources.

The oceans are also polluted by various types of human activities. Currently marine pollution is an increasing threat to a healthy marine environment. Indeed, marine pollution may severely damage the environment, including ecosystems, and human health.[1]

Pollution is among the major problems facing the marine environment. This is a global problem as three quarters of the earth is covered by water. When our planet is viewed from space the image instantly conveys the message that ours is a blue planet. These oceans are the largest habitats as the greatest number of marine creatures live in coastal waters. And more than half of the world's populations are living near the coast. The sea plays the principal role in the transport of products. Transportation which is one of the traditional uses of the sea is a major cause of marine pollution. Furthermore, the oceans provide the most economical route for the transportation of goods and such trade underpins economic activities. While the benefits are enjoyed by people the oceans are facing multifaceted problems occurring by intentional or accidental discharges by man.

Pollution is the introduction of harmful contaminants that are outside the norm for a given ecosystem. Common man-made pollutants that reach the ocean include pesticides, herbicides, chemicals fertilizers, detergents, oil, sewage, plastics, and other solids. Many of these pollutants collect at the ocean's depths, where they are consumed by small marine organisms and introduced into the global food chain.[2]

It is therefore, essential that all States including Myanmar individually or jointly shall harmonize their policies to reduce and control pollution from any source. Marine

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[1] Yoshifumi Tanaka, "The International Law of the Sea", 2nd Edition, 2015, p.268.
[2] www.nationalgeographic.com/environment/ocean/critical-issues-marine-pollution.

pollution has been defined by UNESCO's Inter-governmental Oceanographic Commission and the UN's Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP)[3], as;

"The introduction by man directly or indirectly, of substances or energy into the marine environment including estuaries, which result 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".[4]

Article 1 (1) (4) of UNCLOS defines 'marine pollution' as:

"Pollution of the marine environment" means 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.[5]

In this definition, marine pollution is caused by human activities, either by "introduction of substances or energy" such as dumping and oil spill, or by "other legitimate uses of the sea" like deep-sea mining and offshore exploration activities. Shipping, waste from land and fishing can all be sources that bring harm to the marine environment.[6]

This definition is quite similar to the definition of "Pollution" under Article 1(4) of the 1996 Protocol to the London Dumping Convention, 1972, which states;

> "Pollution means the introduction, by man, directly or indirectly, by human activity, of wastes or other matter into the sea which results or is likely to result in such deleterious effects as harm to living resources and marine ecosystems, hazards to human health, hindrance to marine activities, including

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[3] GESAMP-G.J. Timagenis, International Control of Marine Pollution (Dobbs Ferry, NY, Oceana Publications, 1980), p. 24.

[4] R.R. Churchill and A.V Lowe, "The Law of the Sea", 3rd Edition, 1999, Jurist publishing, Manchester University Press, p. 328.

[5] *United Nations Convention on the Law of the Sea,* opened for signature 10 December 1982, 1833 UNTS 3, (entry into force 16 November 1994), Art 1(1)(4) (henceforth known as 'UNCLOS').

[6] Yan Xiaolu, "The International Legal Framework for Prevention of Vessels-source Pollution and Its Implementation in Chinese Legislation", Lund University, 2011.

fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities".

Almost exactly the same definition is found in a number of regional conventions concerned with marine pollution. For example, it can be found in the 1978 Kuwait Regional for Co-operation on the Protection of the Marine Environment from Pollution (Kuwait Convention) the 1981 Convention for the Protection of the Marine Environment and Coastal Area of the South-East Pacific (Lima Convention), the 1992 Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention).

In addition, the prevention of marine pollution as adopted in Principle 7 of the United Nations Conference on the Human Environment at Stockholm in 1972 states as follows:

> "States shall take all possible steps to prevent pollution of the seas by substances that are liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea".

Principle 21 of the Declaration also provides that:

> "States must ensure, in exercising their sovereign right to exploit their resources, that activity within their jurisdiction or controls do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction".

Another writer regards marine pollution as covering all human activities which may change the environment and so affect the marine fauna and flora, fisheries, public health or amenities. It includes therefore the effects of development along the coast, off-shore exploitation of oil and gas, as well as other activities such as the discharge of sewage and industrial effluents, oil pollution and the discharge of radioactive wastes".[7]

Generally, marine pollution occurs through direct discharge of waste into the ocean, run off into the waters due to rain and through the atmosphere to the sea.

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[7]. H.A. Cole, "Marine Pollution", 4 Ocean logy International 69, p.1.

The sources of pollution affecting the world's ocean are as variegated and numerous as the types of human activity. In the first place, they can be divided into major categories: land based and sea based sources. They can also be classified according to the type of human activity as disposal of domestic sewage and industrial and agricultural wastes, deliberate and operational discharge of shipboard pollutants, interference with the marine environment resulting from the exploration and exploitation of marine minerals, disposal of radioactive waste resulting from the peaceful uses of nuclear energy, and military uses of the oceans.[8]

Today the vast number and size of ships provokes great concern about the heightened risk of marine pollution. Another traditional use of the sea, fishing has also seen an unprecedented expansion. Practiced since time immemorial, ocean fishing has transformed into an industry which today impacts upon biological resources in even the farthest and most inhospitable ocean reaches. With the annual total catches of many stocks decreasing, it appears that the limit of sustainable exploitation of marine biological resources is close to being reached. Overfishing is not the only cause for concern; marine living resources also are endangered by other uses of the ocean. In fact, fish now caught are increasingly showing signs of contamination and damage from pollution, including concentrations of carcinogens, tumors, wounds, and malformations, which render them unsuitable for consummation and which threaten their ability to reproduce.[9]

Pollutants differ in their concentration and effects from region to region, but in general it is coastal waters which are the most polluted, while the open ocean is relatively clean.[10]

The phenomenon of marine pollution is a menace that is multi-dimensional in scope. It is devastating effects tend to penetrate almost every facet of maritime activity. The need to protect the marine environment, not only for its own sake, but also to enable society to operate effectively and fruitfully in that environment has been unequivocally recognized.[11]

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[8] E.P. Andreyev, "The International Law of the Sea", Progress Publishers Moscow, 1988, p. 179.
[9] Alexandre Kiss and Dinah Shelton, "International Law", 2nd Edition, 1999, pp. 435- 436.
[10] R.R. Churchill and A.V Lowe, "The Law of the Sea", p. 332
[11] Mensah T.A.,"Legal Problems Relating to Marine Pollution by Oil", in P. Hepple (ed.), Water Pollution by Oil, Proceeding of Seminar, published by the Instituted of Petroleum, London, 1971, p.293.

The rapid advances in technology and development with their ever increasing demand for energy have spurred countries to search for new sources of energy including new reservoirs of oil and gas, both on land and at sea. Needless to say, such activities, especially offshore oil and gas exploration and extraction, are another major contributor to marine pollution. Despite these harmful practices, the world has for many decades past been aware of the need to protect the marine environment from pollution and preserve its resources for the good of future generations.

The legal framework of international law has been created and developed to control and prevent marine pollution. The international maritime law is convention based and stretches from public international law to private international law covering the regulatory law in between.[12]

In the 1970s and the 1980s, treaties regulating marine pollution were increasingly concluded. The International Maritime Organization has developed a number of global legal frameworks related to shipping safety and marine environment in order to accomplish with its mandate of improving the safety and security of international shipping and preventing marine pollution from ships.

The First Law of the Sea Conference was held at Geneva in 1958. This conference adopted four conventions on the law of the sea, namely:

(1) The Convention on the Territorial Sea and the Contiguous Zone
(2) The Convention on the High Seas
(3) The Convention on Fishing and Conservation of the Living Resources of the High Seas

The 1958 United Nations Conference on the Law of the Sea prohibits the pollution of the sea by oil or pipelines as well as by radioactive wastes and wastes resulting from oil drilling on the continental shelf. In 1960, the Second Law of the Sea Conference was held in Geneva.

The United Nations Convention on the Law of the Sea (UNCLOS 1982) is the most comprehensive of the ocean treaties which contains the protection of environment, obliging all nations to protect and preserve the marine environment. Part XII of Articles 192-237 of UNCLOS regards the protection and preservation of the marine environment.

[12] Yan Xiaolu, "The International Legal Framework for Prevention of Vessels-source Pollution and Its Implementation in Chinese Legislation", p.13.

Oil, garbage, sewage and harmful chemicals discharged into the sea are the sources of marine pollution. Apart from polluting the sea they also cause the degradation of the ecological system and are a potential risk to human health. The global demand for petroleum has resulted in an incremental rise in the numbers and size of tankers bringing with it the potential for a corresponding increase in the number of accidental oil spills and associated impacts on the marine environment.

Oil pollution of the seas was recognized as a problem in the first half of the 20th century and various countries introduced national regulations to control discharges of oil within their territorial waters. In 1954, the United Kingdom organized a conference on oil pollution which resulted in the adoption of the International Convention for the Prevention of Pollution of the Sea by Oil (OILPOL), 1954.

In 1967, the "Torrey Canyon" incident, the biggest oil pollution incident ever recorded up to that exposed the deficiencies in the existing OILPOL for providing compensation following accidents time at sea.[13] Thus, the IMO Assembly decided in 1969 to convene an international conference in 1973, adopting the International Convention for the Prevention from Ships (MARPOL), for placing restraints in the contamination of the sea, land and air by ships.[14]

Once a pollutant occurs it spreads over the oceans, waters and rivers adjacent to neighbouring countries. Therefore effective legislation must be an act in the formulation of domestic regulations for marine pollution, the marine perspectives in regional treaties and international conventions pertaining to marine pollution problems should be taken into account. Particularly noteworthy in this regard, are the many comprehensive international conventions providing uniform standards to control worldwide marine pollution.

In this respect it should be borne in mind that marine pollution has no boundaries. The MARPOL convention is the main International Instrument regulating vessel source pollution. This convention covers not only accidental and operational oil pollution but also pollution by chemicals, harmful substances carried in packaged form, sewage, garbage and air pollution.

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[13] http://www.imo.org/en/KnowledgeCentre/ReferencesAndArchives/HistoryofMARPOL/Documents/MARPOL%2073/78%20Brief%20History%20%20List%20of%20amendments%20and%20how%20to%20find%20them.htm

[14] http://www.imo.org/en/OurWork/Environment/PollutionPrevention/Pages/Default.aspx

Marine pollution related international conventions are an effective measure to prevent marine pollution arising from both land and sea based sources. Although most countries are now parties to limited international conventions, these conventions in a number of countries in the ASEAN region still need to be approved for ratification. Many developing nations are still unaware of the benefits as well as the legislative and technical requirements for ratification.

Marine pollution causes serious threats for developing countries such as Myanmar. Myanmar is a littoral State and shares many common maritime and land boundaries, and is located at the crossroads between the Indian and the Pacific Oceans, through which oil thinkers from Middle-East countries who are producers of oil, ship their cargoes of oil to the Eastern Countries like China and Japan who are in need of such energy resources. Myanmar has a long coastline and rich fertile coastal plain and productive offshores waters. As a developing nation, there is very limited port infrastructure and largely untouched seashore; however, the adverse effects of environmental degradation are currently seen to be more profound due to increased localized activities and the emergence of maritime transport in Myanmar. In the near future, it can be expected that as more infrastructure and port extensions start developing the potential risks of marine pollution will correspondingly increase.

Previously, Yangon was the one and only major seaport capable of accommodating up to 20,000 tonnage ships. However, today with the rapid development of deep-sea ports and large special economic zones backed by modern ports, as well as the numerous offshore oil and gas drilling blocks, the pristine coastline of Myanmar and her coastal environment are threatened by major maritime accidents associated with serious marine pollution.

1.1 Scope and Object

This research which is generally to analyze marine pollution under the Law of the Sea is based on the International and National Legal Framework regarding the protection against marine pollution. As such, the scope of this research will primarily cover the sources and prevention of marine pollution as provided in the main international instruments, namely the United Nations Conference on the Law of the Sea (UNCLOS), and the International Convention for the Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), which provide a prevention framework for the protection of the marine environment from pollution.

Provisions relating to the protection of the marine environment as contained in other International Convention such as the International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC 1990) and its Protocol of 2000, the International Convention on Civil Liability for Oil Pollution Damage (CLC), 1992etc, will also be highlighted within the scope of this research. Besides, an analysis of Myanmar's Legal Framework and implementation for the protection of the marine environment from pollution will also be presented within the scope of this research.

This research is intended to cover the various aspects of marine pollution, as addressed by the international conventions, especially the United Nations Convention on the Law of the Sea and the International Convention for the Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78) and other conventions with the objective of gaining an understanding of its causes, effects and prevention.

The main objectives are as follows;

- To establish and implement methods to address marine pollution.
- To manage the marine environmental impact assessment for marine pollution in Myanmar.
- To analyze the importance of the 1982 United Nations Conventions on the Law of the Sea and the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL) 73/78 and other International Conventions related to the protection of the marine environment from pollution.
- To provide Myanmar with a basic framework for the drafting of legal measures in line with International Law on protecting the marine environment from pollution.

1.2 Methodology

Data relating to the protection from pollution of the marine environment will be collected and analyzed from both international and national legal material, namely the United Nations Convention on the Law or the Sea (UNCLOS) 1982, the International Convention for the Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL) 73/78, the International Convention on Oil Pollution, Preparedness, Response and Cooperation (OPRC) 1990, and its protocol of 2000, the International Convention on Civil Liability for Oil Pollution Damage, (CLC) 1992,

etc. and Myanmar's National Laws, such as the Environmental Conservation Law 2012, the Environmental Conservation Rule, 2017 and the Myanmar Port Authority Law 2015, the Inland Water Transport Law 2017.

These National Laws will be critically examined and their inadequacies with regard to protecting the marine environment identified and analyzed.

A review of other related literature such as the writing of scholars, books and documents will also be carried out.

1.3 Structure

This thesis is structured in two parts with each part comprising of two chapters and each chapter composed of two sections. An overview will be made in the first chapter of Part (1) of the sources and prevention of marine pollution based under the Law of the Sea whilst highlighting the various land based , sea based activities, pollution by dumping, pollution from activities in the Area, pollution from or through the atmosphere, oil pollution and vessel pollution. In Part (1), Chapter (2)-The International Legal Framework in relation to the prevention of marine pollution will be studied.

In Part (2), a discussion of the causes and prevention of land based and sea based marine pollution in Myanmar will be made in Chapter (1) whilst Chapter (2) will present an account of Myanmar's National Legal Framework and implementation process for the protection of her marine environment from pollution. The provisions of national legislation will be analyzed under the terms of the current environment related laws which do not specifically address marine pollution. Also, existing arrangements for preparedness and response in the case of an oil spill or other marine pollution emergency as well as regional cooperation mechanisms will be critically studied and discussed.

Finally, the conclusion provides a summary and recommendations.

There are various international instruments that indirectly play a role in the protection of marine pollution in respect of vessel sources, land based sources, dumping, sea bed activities and oil pollution, etc. this research primarily focuses on the main instruments namely the United Nations Convention on the Law of the Sea which provides a prevention framework for protection of marine pollution. Reference will also be made to other international conventions relating to marine pollution.

Part One

Overview of Sources and Prevention of Marine Pollution under the Law of the Sea

Oceans are essential for people. The marine environment, with its vital diversity of marine and estuarine animals and plants is an integral part of the natural and cultural heritage of the world.[15] The world's oceans produce 70 per cent of its oxygen and 80 per cent of its plant and animal life.[16] The quality of the world's oceans are influenced by pollutants. These pollutants are a threat to human health and to animals living in the ocean. Although attempts have been made to solve, this problem it cannot be done with out absolute cooperation among global countries. This being so, the prohibition

[15]Kelleher, G. and Kenchington, R..."Guideline for Establishing Marine Protected Areas, A Marine Conservation and Development Report", 1991, p.8.
[16] Larson D.L., Foreword, "Ocean Development and International Law", 1982, Vol. II/1-2, 1982, p. 2.

of marine pollution resulting from human activities is recognized as a matter that has to be addressed globally.

Marine pollution refers to the introduction of substances by humans into the marine environment, resulting in harm to living resources, presenting hazards to human health, downgrading the quality of seawater and hindering marine activities such as fishing and swimming.[17] Pollution of the marine environment is a concept comprising two aspects: prevention of marine pollution and protection of marine living resources. Virtually all countries have, to varying degrees, already encountered the problem of pollution and are trying to solve it on a national level. Hovever, no nation, no matter how efficiently it works in this direction, can consider itself safe as long as there is a lack of an effective global solution to the problem of environmental protection in areas which are used by all states.[18]

Researchers have indentified that the main sources of marine pollution are from land based sources, vessel based sources, waste dumping at sea, offshore oil and mineral exploitation activities and pollution from or through the atmosphere. Since the effective prohibition of marine pollution resulting from human activities is a very important matter, it is essential that countries make every effort to reduce pollutants causing marine pollution by enacting and enforcing relevant legislation based on international law.

Chapter 1

Sources of Marine Pollution

The sources of pollution affecting the world's oceans are as variegated and numerous as the types of human activity. In the first place, they can be divided into two categories: Land based and Sea based sources. They can also be classified according to the type of human activity as disposal of domestic sewage and industrial and agricultural wastes, deliberate and operated discharge of shipboard pollutants, interference with the marine environment resulting from the exploration and

[17] C R Nichols and R G Williams, "Encyclopedia of Marine Science" (Facts on File, Inc. New York), 2009, p.360.
[18] E P, Andreyev, "The International Law of the Sea", p- 78-179.

exploitation of marine minerals, disposal of radioactive waste resulting from the peaceful uses of nuclear energy, and military uses of the oceans.[19]

The sources of marine pollution are divided into six categories under Section 5 of Part XII of the 1982 United Nations Convention on the Law of the Sea. They are –

(1) Pollution from land based sources

(2) Pollution from sea based activities

(3) Pollution from activities in the Area

(4) Pollution by dumping

(5) Pollution from or through the atmosphere and

(6) Pollution from vessels

International legislation for the prevention of marine pollution has evolved along lines which reflect a generally agreed categorization of the sources of pollution which should be regulated.

Section A. Pollutants from Marine and Pollutants from other Sources

Paragraph 1. Marine Sources Pollutants

Pollution from Land Based Sources

Land based pollution is the single most important cause of marine pollution. Land based sources of marine pollution have become the major contributor of pollution and contamination in the marine environment.[20] Land pollution is a major problem around the world and is caused by a variety of factors. Some of the main causes of land pollution include deforestation, agriculture, industry, mining, landfills and urbanization.[21] Land based pollution can be thus defined as pollution of maritime

[19] E.P.Andrew, "The International Law of the Sea", p.174.
[20] DAUD HASSAN, "Protecting the Marine Environment from Land-Based Sources of Pollution", 2009, p. 1.
[21] http:/7eschooltoday.com/pollution/land-pollution/sources-of/land-pollution-html.

zones caused by discharges from coastal establishments or other sources situated on land or artifical structures.[22] Accordingly land based marine pollution has a national source since it arises from an area under the sovereignty of an individual State.[23]

The threat of land based pollution to the marine environment is a serious one since it mainly affects coastal waters, which are sites of high biological productivity.[24] In other words, marine pollution from land based sources means pollution caused by discharge from land reaching the sea which are waterborne, airborne or directly from the coast including industrial outfalls and pipelines. Contaminants of land based sources are of various kinds, for example sewage, or ineffective sewage treatment, persistent organic pollutants (POPs), radioactive substances, heavy metals, oil nutrients, sediment mobilization, litter plastics and physical alterations including waste from landfills sited near coastal areas, storm water runoff, ship-building yards, and natural disasters and stroms.[25]

Land based marine pollution arises from diversified human activities from both coastal areas and futher inland. The activities include the daily life of humans, agricultural, industrial production as well as military activities. All of them are necessary and unavodiable for the operation of society.[26] Land based pollution also includes garbage and other soild debris, especially plastics, notably polyethlene and polypropylene.

Plastics are also discharged from ships, including fishing vessels that regularly dump nylon fishing nets.[27] Plastics are estimated to make up as much as 95 percent of the marine litter found on coastlines, sea surface, and the ocean floor.[28] Marine litter made of plastic, polystyrene foam, metal, glass, and other materials from land based sources has been found in all the world's oceans.[29] The pollutants from land based sources cover a range of substances, such as chemicals, oil and oily wastes, organic

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[22] United Nations Institute for Training and Research, <http://elp.unitar.org/-land-Based- Marine – Pollution-html>accessed in May 2011.
[23] Zajacck,R., "The Development of Measures to Protect the Marine Environment from Land-based Pollution", James Cook University Law Review, 1996, 3.70.
[24] Yoshifumi Tanaka, "The International Law of the Sea", p. 270.
[25] United Nations Environment Programme Erik Solherim, Marine Litter Legislation: A Toolkit for Policymakers, 2016.
[26] Yan Xiaolu, "The International Legal Framework for Prevention of Vessel- source Pollution and Its Implementation in Chinese Legislation", p. 13.
[27] Donald R Rothwell Tim Stephens, "The International Law of the Sea", 1st Edition 2011, p. 341.
[28] http://ec.eurapa.eu/environment/marine/good-environmental-status/descriptor-10/index-en.htm.
[29] http:// www.theoceancleanup.com/sources.

materials, as well as some radioactive substances and most of them pose a grave threat to the marine environment.[30]

Although a variety of other sources of pollution affect the marine environment, as mentioned, land based sources of marine pollution (LBSMP) are the most serious threat. In fact, Dr. David Vander Zwaag, Canada Research Chair, Ocean Law and Goverence said that " land based sources of pollution are established to be the sources of approximately eighty percent of all marine pollution. Land based sources include both land based discharge and discharge through the atmosphere.

The first treaty to establish detailed rules on land based sources of marine pollution was the Convention for the Prevention of Marine Pollution from Land based Sources, 1974 (Paris Convention), which agreed on the need to protect the marine environment of the North-East Atlantic by supplementing the 1972 OSLO Convention. The Convention was replaced by the 1992 OSPAR Convention. Marine pollution from land based sources is defined in the Paris Convention as pollution of the maritime area:

(i) through water courses;

(ii) from the coast, including introduction through underwater or other pipelines;

(iii) from man-made structures placed under the jurisdiction of a contracting party within the limits of the area to which the present Convention applies.[31]

The 1974 Paris Convention definition of land based sources includes point and diffuse sources on land from which substances or energy reach the maritime area by water, through the air, or from the coast, moreover it specifically includes sources associated with any deliberate disposal under the sea bed made accessible from land by tunnel, pipeline or other means and sources associated with man-made structures placed, in the maritime area under the jurisdiction of a contracting party, other than for purpose of offshore activity.[32]

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[30] Edith Brown Weiss, Stephen C. Mccaffrey, Daniel Barstow Magraw, A. Dan Tarlock, International Environmental Law and Policy ,Aspen publisher, 2006, p.673.
[31] The Paris Convention, Article 3(c)
[32] Philippe Sands, "Principles of International Environmental Law", Part II, Manchester University Press, 1960, p.323.

Other International instruments have defined the concept of LBSMP, along with pollution and marine pollution. The Montreal Guidelines[33], for example, defines land based source as follows:

> (1) Municipal industrial or agricultural sources, both fixed and mobile, on land, discharges from which reach the marine environment, in particular: from the coast, including from outfalls discharging directly into the marine environment and through run-off; and through rivers, canals, or other water-courses, including underground water, ground water courses; and via the atmosphere.
>
> (2) Sources of marine pollution from activities conducted on offshore fixed or mobile factilities within the limits of national jurisdiction, save to the extent that these sources are governed by appropriate international agreement.[34]

A very similar definition can be found in Article 2 paragraph 2 of the Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1992 as follows: the Pollution from land based sources means pollution of the sea by point or diffuse inputs from all sources on land reaching the sea, waterborne, airborne or directly from the coast. It includes pollution from any deliberate disposal under the sea bed with access from land by tunnel, pipeline or other means".

Under the terms of the international and regional agreements, the parties are requried to prevent and eliminate pollution from land based sources, including accidents. Therefore, States are required to set out provisions relating to the prevention of marine pollution from land based sources at global, regional and national levels.

Pollution from Sea Based Activities

Marine pollution can be caused by sea based activities. Pollution from sea based activities is caused by the release of harmful substances arising directly from the exploration, exploitation and processing of the sea bed materials. Sea bed activities include exploration and exploitation of both the territorial sea or continental shelf and

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[33] United Nations Environment Programme, "Montreal Guidelines for the Protection of the Marine Environment against Pollution from land-based sources", 1985.
[34] DAUD HSSAN, "Protecting the Marine Environment from Land-Based Sources of Pollution", p.16.

the international sea bed.[35] Marine pollution caused by sea bed activities usually arises from oil spillage or gas escape during the process of exploration or transmission. But pollution that happens during the transport of seabed oil by tranker should be distinguished as ship-generated pollution which is regulated under vessel source pollution control law.

There are other sorts of pollution resulting from sea bed activities, for example, the mud mixtures which are generated during offshore operations may also bring harm to the marine environment. So, marine pollution may also be caused by drilling operations which produce drilling mud, drill cuttings and produced waters.[36] The drilling mud includes some known toxic pollutants such as hydrocarbons as well as concentrations of heavy metals, including chromium, cadmium, copper, zinc, lead, mercury and nickle.[37] Sewage generated during the operations is also accountable for marine pollution.

In considering pollution from sea bed activities, it is necessary to distinguish between operations in the territorial sea and on the continental shelf (mainly the exploration and exploitation of oil and gas) on the one hand, and mining in the international sea bed area on the other.

Both the Geneva and the Law of the Sea Conventions address general exhortations to States to take measures to avoid both deliberate and accidental sea bed pollution. Every State shall draw up regulations to prevent pollution from pipelines or from exploration or exploitation of the sea bed.[38]States are obliged to take in the safety zones round a continental shelf installation "all appropriate means for the proteection of the living resources of the sea from harmful agents".[39]

Each contracting party shall take all appropriate measures in order to prevent pollution from sea bed activities, and shall also ensure that adequate equipment is at hand to start an immediate abatement of pollution.[40]A similar general obligation is contained in other regional conventions, although protocols to the Mediterranean and

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[35] Douglas M. Johnstam, "The Environment Law of the Sea" (Berlin 1981), p.237.
[36] Yoshifumi Tanaka, "The International Law of the Sea", p. 272.
[37] H.Esmaeili, "The Legal Regime of offshore Oil Rigs in International Law", Aldershort, Ashgate, 2001, pp. 148-149.
[38] The High Sea Convention, Article 24.
[39] The Continental Shelf Convention, Article 5(7).
[40] The Baltic Convention, Article 10

Kuwait Conventions are currently under elaboration to lay down more provisions. It may also be noted that under the Canada- Denmark Agreement of 1983 the parties undertake to take measures to ensure that offshore installtions are designed, constructed, placed, equipped, marked, operated and maintained in such a manner that the risk of pollution of the marine environment is minimised. The parties must also notify each other, and if necessary consult, over the initiation of offshore operations which may create signifficant risk of pollution.

UNCLOS establishes a basic framework of general commitments with regard to this source. National legislation and regional terateis are more effectual in controlling this source of marine pollution. There is an increasing need to regulate sea bed activities in the Area in order to protect the environment there. The role of the International Sea bed Authority is increasingly important.[41]

Paragraph 2. Other Sources Pollutants

Dumping at Sea

Dumping includes not only nuclear waste disposal but also industrial and domestic wastes, all dumped directly or indirectly into the oceans by various States around the world's oceans.

Article 1 (5) (a) of the UNCLOS defines " dumping" as,

(i) any deliberate disposal of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea.

(ii) any deliberate disposal of vessels, aircraft, platforms or other man-made structures at sea.

However, under Article 1 (5) (b),"dumping" does not include:

(i) the disposal of wastes or other matter incidental to, or derived from the normal operations of vessels, aircraft, platforms or other man-made structures at sea and their equipment, other than wastes or other matter transported by or to vessels, aircraft, platforms or other man-made

[41] Yoshifumi Tanaka, "The International Law of the Sea", p. 272.

structures at sea, operating for the purpose of disposal of such matter or derived from the treatment of such wastes or other matter on such vessels, aircraft, platforms or structures;

(ii) placement of matter for a purpose other than the mere disposal thereof, provided that such placement is not country to the aims of this Convention.

Dumping had been a popular way of disposing of waste resulting from land based activities. Such wastes include radioactive matter, millitary materials including absolute weapons and explosives, dredged materials, sewage, sludge and industrial waste.[42] At the global level, dumping is regulated primarily by the 1972 International Convention on the Prevention by Dumping of Wastes and Other Matter[43], which was be superseded by the 1996 London Protocol.[44]

States are required to adopt laws and regulations to prevent pollution of the marine environment by the dumping of sewage, sludge and other waste materials into the ocean. These laws and regulations must be no less effective than global rules and standards.[45]

Pollution from or though the Atmosphere

The marine environment is also vulnerable to pollution from the air which is referred to as atmospheric pollution. Pollution from the atmosphere is essentally a form of land based pollution. Pollutants often originate from land and are transported to the ocean via rivers or through the air.

Pollutants that are transported through the air to the oceans are often categorized as marine pollution through the atmosphere. For exemple, acid rain from the atmosphere enters the ocean causing acidification of the marine environment. Atmosphere pollutants emanate mainly from exhaust emissions from land, which contains Sulphur Oxide, Nitrogen Oxide and Carbon Dioxide. The first two cause acid rain which

[42] Yoshifumi Tanaka, "The International Law of the Sea", p. 272.
[43] 1046 UNEP p.138 (1972) 11 ILM p.1294. Entered into force 30 August 1975.
[44] Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Waste Other Matter. Entered into force 24 March 2006. This Protocol superseded the 1972 London Dumping Convention in accordance with Article 23.
[45] United Nations Convention on the Law of the Sea, Article 210.

results in acidification of the ocean; while the third contributes to global warming which brings results of rising the temperature of the ocean.[46]

All of them harm the marine environment. However, pollution transported via the atmosphere may not, if at all, affect the marine environment of the State on whose land the sources are located.[47] One of the largest sources of atmospheric pollution of the marine envirnment is now carbon dioxide released from human activites including the burning of fossil fuels, industrial processes and land use change. The oceans absorb around one-third of the carbon dioxide produced by human activities, and this gives rise to the chemical process known as ocean acidification.[48]

Other threats are air emissions from planes which are true atmospheric sources of marine pollution. Also identifiable in this category is nuclear weapon testing. The fallout of radioactive particles from the atmosphere threatens the flora and fauna as well.

Section B. Oil and Vessel Sources as Major Pollutants of the Marine Environment

Paragraph 1. Oil Pollution

Oil pollution is a very large threat to the ocean and its inhabitants. It is a sea based pollutant which is the probably worst of the pollutants. Oil in the marine environment comes from a variety of sources. Some of the main causes are oil spills, oil in runoff, and even natural seeping of oil into the ocean due to the breakage of oil tankers (oil ships), oil pipe leakage, drilling activities, human transport or recreational activities, unskilled manpower, failing to check failures, natural causes beyond human control, operational oil spills, cleaning of tanks and runoffs from land pollution.[49]

The term "Oil" means petroleum found in rock underground. "Oily" means of or like oil, covered or soaked with oil, containing much oil. "Oil tanker" is a larger ship with tanks for carrying oil.[50] Crude oil is oil in the natural state or unrefined oil.[51]

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[46] UNEP; Legal Analysis of International Conventions for Prevention of Vessels-Source Marine Pollution; 2013, p. 9.
[47] Nan, Meng Qing, "Land- based Marine Pollution", 1st Edition, Graham & Trotman Limited, London, UK, 1987, p.173.
[48] Daurd Hssan, "Protecting the Marine Environment from Land-Based Sources of Pollution", p.16.
[49] https://www.megaessays.com/viewpaper/1049,htm.
[50] Hamby, A.S., "Oxford Advanced learner's Dictionary of current English", 4th Edition, 1991, p.858.

The definition given in the International Convention for the Prevention of Pollution of the Sea by Oil, 1954, is as follows:

"Oil means crude oil, fuel oil, heavy diesel oil and lubricating oil and oily shall be construed accordingly. Oily mixture means a mixture with any oil content.[52]

According to the International Convention for the Prevention of Pollution from Ships, 1973/78 (MARPOLConvention) "Oil means petoleum in any form including crude oil, sludge, oil refuse and refined products".[53]

Article 1(6) of CLC provides that: "Pollution damage" means loss or damage caused outside the ship carrying oil by contamination resulting from the escape or discharge of oil from the ship, wherever such escape or discharging may occur, and includes the costs of preventive measures and further loss or damage caused by preventive measures. Oil pollution of the ocean comes from shipping activity and offshore oil production. Sea bed activities and oil exploration and production constitute a relatively small part in the general amount of marine pollution with oil tanker vessel accidents being one of the most dangerous sources of oil pollution of the marine environment. Ship operations are one of the main sources of oil pollution of the marine environment, especially operating giant oil tanker vessels to transport oil from production regions to consumers. It is not only the risks for catastrophic oil spills when ships ground or collide but also the fact that all ships also carry fuel oil which may be as bad to the environment.

There are, therefore, many reasons for potential risks of environmental pollution, not only from accidents but also from operation in the field of maritime navigation. For example, dirty water contaminated with even small amounts of oil in the engine room space, causes pollution of the marine environment when pumping out this water into the sea. Further, the oil leaking from fuel oil bunkering into the sea in highly sensitive areas has huge impacts on the marine environment.[54] In short, oil can cause damage to both marine life and the recreational potentials of coastal areas.

Paragraph 2. Vessel Sources

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[51] Ibid; p. 287
[52] The MARPO Convention, Article 1(1).
[53] Ibid, The MARPOL Convention, Regulation 1 (1) of Annex I.
[54] National Research Council, 2002.

Vessel sources pollution means pollution caused due to shipping activities. Shipping is a global carrier in the world trade and an essential mode of transport to the world's economy as over 90% of the trade[55] in terms of cargo volume is carried by sea and it is, by far, the most cost-effective way to move en masse goods and raw materials around the world.[56] Pollution from vessels is caused by operational discharges from ships, such as cleaning of tanks or deballasting, or from discharges following accidents. Pollution from shipping raises a number of questions: standards to reduce or eliminate pollution, the prescription and enforcement of such standards, measures to avoid accidental pollution, action taken by coastal States against pollution casualties, co-operation in dealing with emergencies, and liability for pollution damage.[57]

Vessel source pollution may damage fishing stocks and various other forms of marine life, and it also effects the tourist industries of countries. Given this, pollution from vessels is a real issue, because it is a source that moves from one jurisdiction to another or to the high seas.

Therefore it is clear that pollution from shipping raises a number of issues; standards to reduce or eliminate pollution; the prescription and enforcement of such standards, measures to avoid accidents; action taken by coastal States in respect of pollution casualties; co-operation in dealing with emergencies; and liability for pollution damage.[58]

The quantity of oil and other pollutants discharged from ships depends on the rules and standards developed internationally for the prevention and control of pollution from ships and how effectively they are implemented. In this respect the International Maritime Organization has played, and still plays, a major role.[59]

Vessel source pollution is of two kinds; operational pollution and accidental pollution.

Operational Pollution

[55] Source: International Maritime Organization (IMO). http:// www.imo.org.
[56] http:// business.un.org/en/entitles/13.
[57] RR Churchill and A.V Lowe, "The Law of the Sea", p. 248.
[58] Ibid, p. 338-339.
[59] Guides- Lines for Maritime Legislation, 2nd Edition, UN, p.117.

The operational vessel based pollution happens when substances are discharged from the normal or accidental working of the ship.[60]

The first form of vessel source pollution is caused by operational discharges. These can occur for a variety of reasons. They include the discharge of bilge water from machinery spaces, fuel oil sludge, and oily ballast water from fuel tanks. Commercial vessels other than tankers also contribute operational discharge of oil from their machinery spaces to the sea. In addition to ship related operational discharges there are also discharges from tankers which include the discharge of tank-washing residues and oily ballast water.[61]

The main pollutants from operational discharge are oil and oily wastes. Other chemical substances and noxious wastes, such as toxic chemicals and biological agents, may be containd in bilge water as well. Moreover, when the tankers are used for carrying chemicals and other noxious substances as cargo, residues will always be left after the cargoes are discharged. The most convenient and cheapest way to empty those substances and clean the tanks is again by using the sea water. Those chemical materials however pose big threats to the marine environment and public health.[62]

Before the international regulations presented legislations to prevent vessel-oil pollution, oil tankers, for example, normally washed out their cargo tanks with water and then disposed the follow-on oily substances into the sea. Other vessels pump out the oily wasted from the vessel's engine and cause terrible amount of oil in the marine environment.[63] Also, operational pollution is caused by the effects of anti-fouling systems (paint) used on the hulls of ships although anti-fouling systems may allow saving time and fuel, there is clear evidence of active substances used in anti-fouling products being detrimental to aquatic organisms. Studies have revealed that the compounds accumulate in water for a long time after being released from ships, eradicating sea life even though never attached to vessels, harming the marine environment and affecting the food chain process. Similar to organotin, [64] the

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[60] Rothwell, D. R. and T. Stephens, "*The International Law of the Sea"*, Hart Publishing Ltd, 2010, p.347.

[61] UNEP, Global Maritime Oil Information Gateway, "Operational Discharges of Oil" <http://oils.gpa.unep.org/facts/operational.htm

[62]Proshanto Mukherjee, "The International Legal Framework for Prevention of Vessel-Source Pollution and Implementation in Chinese Legislation", Lund University, 2011, p.21-22.

[63] Birnie, Patricia; Boyle, Alan E.; Redgwell, Catherine, *International Law & the Environment*, Oxford University Press, 3rd. ed., 2009, p. 399-401.

[64] CONTROLS ON ANTI-FOULING SYSTEMS of AFS Convention, Annex 1.

commonly used anti-fouling paint, tributylin, has also caused deformations in oysters and sex changes in whelks, immune response, neurotoxic and genetic affects in other marine species.

Accidental pollution

Accidental pollution is unintentional and it arises due to accidents at sea. This happens when ships are involved in accidents for structural failures, grounding, and collissions and to a lesser extent explosions, breakdowns, fire and ramming.[65] The causes may be faults of the ship such as physical failure or unseaworthiness, wrongful operation, or force majeure. Furthermore, ship wrecks may have the potential to affect adversely not only the safety of lives, goods and property at sea but also the marine environment.

Accidental pollution is well known due to many notorious oil tanker spills starting from 1960s. Examples of these accidents include the "Torrey Canyon" (1967), the Argo Merchant (1976), the Amoco Cadiz (1987), the Exxon Valdez (1989), the Erika (1999) and the Prestige (2000) , Slops (Greece, 2000), Prestige (Spain, 2000), No7 Kwang Min (Republic of Korea, 2005), Solar 1 (Philippines, 2006), Shosei Maru (Japan, 2006), Volgoneft 139 (Strait of Kerch, 2007) and Heibei Spirit (Republic of Korea, 2007) are vessel source pollution incidents.[66]

Accidental vessel source pollution may involve the discharge of dangerous substances, which are transported by sea, including oil, radioactive materials, chemicals and hazardous wastes. Ship wrecks and other marine accidents potentially cause serious harm to coastal communities, fisheries, wildlife and the local ecology where the wreck or spill takes place.[67]

It is estimated that some 20% of sea pollution comes from the deliberate dumping of oil and other wastes from ships, from accidental spills and offshore oil drilling. But of all the sources of marine pollution, the discharge of oily engine wastes and bilge from

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[65] Molenaar, Erik Jaap; "Coastal State Jurisdiction over Vessel-Source Pollution; Kluwer Law International; the Hague", the Netherland; 1998, p.19.

[66] Rothwell, D. R. and T. Stephens. "*The International Law of the Sea"*, Hart Publishing Ltd, 2010, P.359. See Data concerning major oil spill incidents at sea is available at:www.cedre/en/cedre/index.php.

[67] https://www.megaessays.com/view paper/21723.htm.

day to day shipping operations may be the worst, because it is steady and occurs everywhere.[68]

It should, however, be noted that pollution caused by ships is relatively less when compared with land based marine pollution.

Chapter 2

International Legal Framework in Relation to Prevention of Marine Pollution

In the 1960's and 1970's, several regional and multilateral conventions emerged governing various aspects of the marine environment. The principles and standards incorporated in the Declaration and in these various conventions served as a basis for the negotiation of a comprehensive regime for the protection and preservation of the marine environment at the Third United Nations Conference on the Law of the Sea.[69] Various international conventions have been adopted to regulate marine pollution.These series of international conventions ranges from prevention, mitigation to compensation for damages it causes.

Over 50 have been adopted of which international treaty instruments are directly related to ship-sourced pollution and protecting the environment.[70] The United Nations Convention on the Law of the Sea (UNCLOS)[71] 1982 is the most comprehensive of the ocean treaties which addresses the issue of protection by obliging all nations to protect and preserve the marine environment. Another of the main international convention for vessel source pollution is the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL).[72] In addition, there are other conventions which help to prevent marine pollution in one way or the other from ship.

Section A. General Legal Framework under the United Nations Conventions on the Law of the Sea 1982 (UNCLOS)

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[68] http://www.unep.ch/regionalseas/home/shipping.htm.
[69] Louis B. Sohn and Kristen Gustafson, J.D.; "The Law of the Sea in a Nutshell", ST.Poul, Minn. West Publishing Co.., 1984, pp.193-194.
[70] http://www.imo.org/en/Our Work Environment /Pages /Default.aspx.
[71] United Nations Convention on the Law of the Sea, adopted by the Third United Nations Conference on the Law of the Sea (UNCLOS III), Montago Bay,10 December 1982. 21 ILM 1261, 1833 UNTS 3 and 1835 UNTS (Final Act) in force 16 November 1994.
[72] *International Convention for the Prevention of Pollution from Ships*, opened for signature 2 November 1973, 1340 UNTS 184 (entry into force 2 October 1983).

The Law of the Sea provides for the regulation, management and governance of the ocean spaces that cover over two-third of the Earth's surface.[73] The United Nations Convention entered into force on the 16 November 1994. The Law of the Sea Convention covers all oceans, irrespective of any national jurisdiction, and contains over 300 Articles and 9 Annexes. Part XII of the United Nations Convention on the Law of the Sea (UNCLOS), 1982, contains 11 Sections and 46 Articles that set out to provide a general and comprehensive account of the marine environment.

The 1982 United Nations Convention on the Law of the Sea (UNCLOS) requires States to pursue two main environmental objectives: to prevent, reduce and control marine pollution, and to conserve and manage marine living resources. For both objectives, the 1982 United Nations Convention on the Law of the Sea (UNCLOS) establishes rules on information, scientific research, monitoring, environmental assessment, enforcement and liability.[74] This convention includes a number of provisions to protect the marine environment.[75] States have sovereign right to exploit their natural resources pursuant to their environment policies and in accordance with their duty to protect and preserve the marine environment.[76] States shall take, individually or jointly as appropriate, all measures necessary to prevent, reduce and control pollution of the marine environment from any source.[77] It further, provides that States are to ensure that activities under their jurisdiction or control do not cause damage to other States or their environment, or that pollution spreads beyond the areas where they exercise sovereign rights.[78]

In order to achieve the global of marine environment protection, Part XII requires States to cooperate on a global and, as appropriate, regional basis, directly or through competent international organizations in formulating international rules, standards, and recommended practices and procedures.[79]

Paragraph 1. Provisions on Marine Pollution

Pollution from land based sources

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[73] Rothwell, D. R. and T. Stephens, "The *International Law of the Sea"*.
[74] Philippe Sands, "Principles of International Environmental Law I", Framework, Standards and Implementation , Press Manchester and New York, 1995, p.294-295.
[75] United Nations Convention on the Law of the Sea, Article 192
[76] Ibid, Article 193
[77] Ibid, Article 194 (1)
[78] Ibid, Article 194 (2)
[79] Ibid, UNCLOS, Article 197

The United Nations Convention on the Law of the Sea is the only treaty which provides general obligations to prevent land based pollution of the marine environment at the global level. States are required to take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment: and that pollution arising from incidents or activities under their jurisdiction control does not spread beyond the areas where they exercise sovereign rights in accordance with the Law of the Sea.[80] Article 194 (3) (a) stipulates that measures taken pursuant to Part XII shall include, *inter alia*, those designed to minimize to the fullest possible extent "the release of toxic, harmful or noxious substances, especially those which are persistent, from land based from or though the atmosphere or by dumping.[81]

The provisions of Article 207 of the United Nations Convention on the Law of the Sea deal specifically with pollution of the marine environment from Land based activities. According to this Article;

"All States, whether coastal or land-locked, must take measures, including the adoption of laws and regulations, to prevent pollution of the marine environment from land based sources, including rivers, estuaries, pipelines, and outfall structures, taking into account internationally agreed rules, standards, and recommended practices and procedure".[82]

Besides, States have the obligation to protect and preserve the marine environment by co-operating regionally and globally, and to adopt laws and regulations to deal with sources of marine pollution and also laws that take measures to prevent, reduce and control pollution from land based sources and to re-examine them from time to time as necessary.[83]

In addition, Article 213 calls for States to enforce these Laws and regulations and to implement applicable international rules and standards to prevent, reduce and control pollution of the marine environment from land based sources. This latter provision is repeated in Article 207 (5) in the context of release of these substances into the marine environment.

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[80] Ibid, UNCLOS, Article 194 (2)
[81] Yoshifumi Tanaka, "The International Law of the Sea", p.278-279
[82] Ibid, UNCLOS, Article 207 (1)
[83] Ibid, UNCLOS, Article 207 (2) (3) (4)

Pollution from sea bed activities subject to national jurisdiction

The provisions of Article 208 and Article 214 of the United Nations Convention on the Law of the Sea 1982, deal with pollution from sea bed activities subject to national jurisdiction. The coastal States are obliged to adopt laws and regulations to prevent, reduce and control pollution of the marine environment arising from or in connection with sea bed activities subject to their jurisdiction and from artificial islands, installations and structures under their jurisdiction pursuant to Article 60 and 80.[84] Such laws, regulations and measures must be no less effective than international standards.[85] States shall endeavor to harmonize their policies on the regulation of pollution from sea bed activities at the appropriate regional level.[86]

Pollution from activities in the Area

The provisions of Article 209 and 215 of the United Nations Convention on the Law of the Sea 1982, deal with pollution from activities in the Area. International rules, regulations and procedures shall be established in accordance with Part XI to prevent, reduce and control pollution of the marine environment from activities in the Area.[87] States are obliged to adopt laws and regulations to prevent, reduce and control pollution of the marine environment from activities in the Area undertaken by vessels, installations, structures and other devices flying their flag or of their registry or operating under their authority. [88] Enforcement of such international rules and regulations is to be governed by Part XI.[89]

Pollution by dumping

States are required to adopt laws and regulations to prevent reduce and control pollution of the marine environment by dumping. Such laws and regulations shall ensure that dumping is not carried out without the permission of the competent authorities of States.[90] Dumping within the territorial sea and the EEZ or onto the continental shelf shall not be carried without the express prior approval of the coastal State.[91] It is clear that no dumping may be carried out in these waters without the

[84] Ibid, Article 208 (1)
[85] Ibid, Article 208 (3)
[86] Ibid, Article 208 (4)
[87] Ibid, Article 209 (1)
[88] Ibid, UNCLOS, Article 209 (2)
[89] Ibid, Article 215
[90] Ibid, Article 210 (3)
[91] Ibid, Article 210 (5)

consent of the coastal State. National laws and regulations shall be no less effective in preventing, reducing and controlling such pollution than the global rules and standards.[92] In relation to enforcement of laws and regulations with respect to pollution by dumping, this shall be carried out by the coastal State within its territorial sea, economic zone or continental shelf.[93] With regard to vessels flying its flag or vessels or aircraft of its registry, the flag State is required to enforce laws and international rules to prevent pollution by dumping.[94] Concerning acts of loading of wastes or other matter occurring within its territory or at its offshore terminals, any State shall enforce laws and international rules to prevent pollution by dumping.[95] In summary, the Law of the Sea Convention does not prohibit dumping, while requiring States to regulate and control marine pollution by dumping at sea.

Pollution from vessels

States must establish international rules and standards to prevent reduce and control pollution of the marine environment from vessels and adopt routing systems to minimize the threat of accidents which might cause such pollution.[96] They must also adopt national laws for vessels flying their flag or of their registry which at least have the same effect as that of generally accepted international rules and standards. This commits all States to ensuring that their national law complies with, at a minimum, standards generally accepted under international law.[97] Without prejudice to the right of innocent passage, States can establish, internationally or as part of co-operative arrangements, special rules for the prevention, reduction and control of vessel pollution as a condition for entry into ports or internal waters of foreign vessels, provided they are given "due publicity" and communicated to international organizations.[98] States may also adopt laws to combat vessels pollution from passage of foreign vessels in their territorial seas, including those exercising the right of innocent passage.[99] With respect to their EEZ, States may for the purposes of

[92] Ibid, Article 210 (6)
[93] Ibid, Article 216 (1) (a)
[94] Ibid, Article 216(1)
[95] Ibid, Article 216(1) (c)
[96] Ibid, Article 211(1)
[97] Ibid, UNCLOS, Article 211(2)
[98] Ibid, Article 211(3)
[99] Ibid, Article 211(4)

enforcement adopt laws and regulations which conform to and give effect to generally accepted international rules and standards. [100]

The foresaid international rules and standards should include *inter alia* the requirement for prompt notification to coastal States, whose coastlines or related interests may be affected by incidents, including maritime casualties which involve discharge or probability of discharge.[101] In this respect, Article 221 provides that in taking measures to avoid pollution arising from maritime casualties, States have the right under international law to take and enforce such measures beyond their territorial sea so as to protect their coastline or related interest. [102] A "maritime casualty" is described as a collision or vessels, standing or other incident of navigation, or other occurrence on board a vessels or external to its resulting in material damage or imminent threat of material damage to a vessel or cargo.[103]

Pollution from or through the atmosphere

According to Article 212 of the United Nations Convention on the Law of the Sea 1982, States shall take the measures necessary to prevent, reduce and control atmospheric pollution. These measures shall include the adoption of laws and regulations applicable to the airspace under the sovereignty of States parties and to vessels flying their flag or vessels or aircraft of their registry.[104] Certain regional sea treaties also provide that States should take all appropriate measures to prevent, abate, and control atmospheric pollution.[105] States need to establish global and regional rules to prevent atmospheric pollution.[106]

And as required by Article 222, enforce these laws and regulations, besides taking measures to implement international rules and standards established by international organizations or diplomatic conference to prevent, reduce and control pollution of the marine environment from or through at atmosphere. These rules and standards must conform with international rules and standards concerning the safety of air navigation.

Paragraph 2. Flag, Port, Coastal State Provisions on Marine Pollution

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[100] Ibid, Article 211 (5)
[101] Ibid, Article 211 (7)
[102] Ibid, Article 221 (1)
[103] Ibid, Article 221 (2)
[104] Ibid, UNCLOS, Article 212 (1)
[105] Ibid, Article 212 (2)
[106] Ibid, Article 212 (3)

More than other aspects of the LOSC, part XII has being prioritized to deal with the issue of marine pollution where the rights and obligations of states (coastal, flag and port states) regarding the preservation of marine areas is stipulated. [107] While previously States were pretty free to decide how and to what extend they desire to regulate marine pollution, [108] UNCLOS established a flexible balance between the navigational right and the environmental safety and between coastal and flag state's power.

Enforcement by flag States

Article 217 provides enforcement jurisdiction of flag States. Flag States are required to ensure compliance by their vessels with applicable international rules and standards and with their laws concerning regulation of vessels source pollution. Flag States are also obliged to provide for the effective enforcement of such laws and regulations, irrespective of where a violation occurs.[109] Article 217 (2) places an obligation upon flag States to take appropriate measures in order to ensure that their vessels are prohibited from sailing, until they can proceed to sea in compliance with the requirements of the international rules and standards. In relation to this, Article 217(3) imposes on flag States a duty to ensure that their vessels carry on board certificates required by and issued pursuant to international rules and standards; and that their vessels are periodically inspected in order to verify such certificates.

If a vessel commits a violation of rules and standards, the flag State is under the obligation to provide for immediate investigation and where appropriate institute proceeding in respect of this alleged violation, irrespective of where the violation occurred or where the pollution caused by such violation has occurred or has been spotted.[110] At the written request of any State, flag States are obliged to investigate any violation alleged to have been committed by their vessels. If satisfied that sufficient evidence is available to enable proceedings to be brought in respect of the alleged violation, flag States shall without delay institute such proceedings in accordance with their laws.[111]

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[107] Ibid, Part XII.
[108] Brubaker, Douglas R.,"Straits in the Russian Artic", Ocean Development & International Law, 2001, vol.32, p. 263-287.
[109] Ibid, UNCLOS, Article 217 (1
[110] Ibid, UNCLOS, Article 217 (4)
[111] Ibid, Article 217 (6)

Flag States are also required to promptly inform the requesting State and the competent international organization of the action taken and its outcome. Such information shall be available to all States.[112]

In addition, the Article recommends that States include in their laws and regulations, penalties for violations by ships flying their flag and those penalties should be severe enough to act as a deterrent against further violations.

Enforcement by Port States

The United Nations Convention on the Law of the Sea has introduced a new mode of regulation of vessel source pollution by port States, under which it is provided that when a vessel is voluntarily within a port or at an off-shore terminal of a State, that State may undertake investigations and, where the evidence so warrants, institute proceedings in respect of any discharge from that vessel outside the internal waters, territorial sea or exclusive economic zone of that State in violation of applicable international rules and standards established through the competent international organization or general diplomatic conference.[113]

However it limits the jurisdiction of the port State to undertake such proceeding when the violation occurs within the internal waters, territorial sea or exclusive economic zone of another State by providing that such proceedings may be instituted only upon request by that State, the flag State or any State that is damaged or is likely to be damaged by the discharge violation. Also, it may institute proceedings when the violation has caused or is likely to cause pollution in its own internal waters, territorial sea or exclusive economic zone. Port State jurisdiction is further qualified by Article 226 (1) (a) which requires that a foreign vessel shall not be delayed longer than is essential for the purpose of the investigations. Thus, if the investigation reveals a violation of applicable laws or international rules and standards for the protection of the marine environment, release is to be made promptly subject to reasonable procedures such as bonding or other appropriate financial security pursuant to Article 226 (1) (b).

With regard to the investigation and release subject to the bonding, Article 218 (4) requires the records of the investigation shall be transmitted by the port State, upon

[112] Ibid, Article 217 (7)
[113] Ibid, Article 218 (1)

request, to the flag State or the coastal State and that any proceedings instituted by it, may, subject to Section (7) (b) be suspended at the request of the coastal State when the violation has occurred within its internal waters, territorial sea or exclusive economic zone, and in that event, the evidence and records of the case together with any bond shall be transmitted by the port State to the coastal State. Such transmittal precludes the continuation of proceedings in the port State.

Enforcement by coastal States

Article 220 provides enforcement jurisdiction of coastal States. When a vessel is voluntarily within a port or at an off-shore terminal of a State that State, may institute

proceedings in respect of any violation of its laws and regulations of that concerning vessels source pollution when the violation has occurred within the territorial sea or the exclusive economic zone of that State.[114]

Where there are clear grounds for believing that a vessel navigating in the territorial sea of a State has, during its passage therein, violated laws and regulations of that State relating to vessel source pollution, that State may undertake physical inspection of the vessel relating to the violation and may institute proceedings, including detention of the vessel.[115]

Where there are clear grounds for believing that a vessel navigating in the EEZ or the territorial sea of a State has, in the EEZ, committed a violation of applicable international rules and standards for the regulation of vessel source pollution, or related laws and regulations of that State, it may require the vessel to give relevant information required to establish whether a violation has occurred.[116]

The coastal State is allowed to undertake physical inspection of vessels where there are clear grounds for believing that a vessel navigating in the EEZ or the territorial sea of a State has, in the EEZ committed a violation referred to in Article 220 (3) resulting in a substantial discharge causing or threating significant pollution of the marine environment and the vessel has refused to give information or if the information supplied by the vessel is manifestly at variance with the evident factual situation and if the circumstances of the case justify such inspection.[117]

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[114] Ibid, UNCLOS, Article 220 (1)
[115] Ibid, UNCLOS, Article 220 (2)
[116] Ibid, Article 220 (3
[117] Ibid, Article 220 (5)

Where there is clear objective evidence that a vessel navigating in the EEZ or the territorial sea of a State has, in the EEZ committed a violation referred to in paragraph 3 resulting in a discharge causing major damage or threat of major damage to the coastline or related interests of the coastal state, or to any resources of its territorial sea or EEZ, that State may institute proceedings, including detention of the vessels, in accordance with its Laws.[118]

However, whenever appropriate procedures have been established and compliance with requirements for bonding or other financial security has occurred, the coastal State, shall allow the vessel to proceed.

The above analysis of the United Nations Convention on the Law of the Sea shows that it has provided the international community with a comprehensive legal framework for the prevention, reduction and control of marine pollution and for the conservation and management of marine living resources.

UNCLOS imposes a duty upon all States to take measures necessary to ensure the prevention of marine pollution. Therefore, States needs to enact laws and regulation designed to control pollution of the marine environment. In doing so, the legal framework which has been established by UNCLOS, can be utilized as the basis for the production of national legislation targeted at the prevention of marine pollution.

The duty imposed by UNCLOS creates an obligation on flag States, port States and coastal States to enact and enforce laws concerning the regulation of marine pollution in accordance with international law. This is an important point because such an obligation curbs States from exercising their own discretion regarding marine pollution regulation.

Under UNCLOS, the regulation of vessel source pollution is, to a large extent, the responsibility of the flag State. The Convention requires flag States to ensure compliance by their vessels with laws, rules and standards concerning vessel source pollution. In this respect, the obligation of the flag State regarding the enforcement of its jurisdiction is provided in Article 217 of the Convention. However, the fact that UNCLOS also imposes obligations on port States and coastal States to exercise jurisdiction over the control of vessel source pollution, increases the certainty of vessel source pollution being more effectively controlled.

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[118] Ibid, Article 220 (6)

Under Article 220 of the LOSC, a coastal State is allowed to institute proceedings regarding vessel source pollution against a vessel which has committed a violation within its territorial sea or EEZ, but its enforcement jurisdiction does not extend to violations outside its waters.

On the other hand, an important aspect of port State jurisdiction[119] is that when a vessel is within a port or an off-shore terminal of a State, that State may take action against the vessel for any violation it has committed outside its internal waters, territorial sea or EEZ regardless of direct damage to that port State itself. Thus, it is clear that port State jurisdiction can be effectively used to supplement flag State and coastal State jurisdiction with regard to regulating vessel source pollution.

Upon taking the foregoing into consideration, it is obvious that the United Nations Convention on the Law of the Sea is the only international instrument which comprehensively addresses the various aspects of preventing marine pollution.

Section B. Specific legal framework

At the international level, there have been a number of initiatives taken by the international community to address the marine pollution problem. The international instruments are discussed briefly in chronological order below.

Paragraph 1. MARPOL, OILPOL, OPRC

International Convention for the Prevention of Marine Pollution from Ships, 1973 as modified by the Protocol 1978

The primary source of international standards for controlling incidental vessel source pollution is the 1973 International Convention for the Prevention of Pollution from Ships, as modified by the Protocol of 1978 relating thereto (MARPOL), which replaced the earlier 1954 International Convention for the Prevention of Pollution of the Sea by Oil (OILPOL).[120] MARPOL seeks to achieve the complete elimination of international pollution of the marine environment by oil and other harmful substances and the minimization of accidental discharge of such substances. [121]

The convention deals with all forms of marine pollution other than the dumping of land based pollutants. The convention would enter into force twelve months after the

[119] Ibid, UNCLOS, Article 218

[120] Donald R Rothwell Tim Stephens, "The International Law of the Sea", 1st Edition, 2010, p.348.

[121] Preamble of the 1973 Convention.

date on which not less than 15 States, which constitute not less than fifty per cent of the world merchant shipping gross tonnage, have become parties to it. It was experienced that the progressive rate of signatory States responded very slow after open for signature and its signal indicated need to speed up the ratifying process.

The 1973 MARPOL Convention includes regulations aimed at preventing and minimizing pollution from ships-both accidental pollution and that from routine operations and currently includes six technical Annexes:

Annex I	Prevention of pollution by oil from (entered into force 2 October 1983)
Annex II	Control of pollution by noxious liquid substances in packaged from (entered into force on 6 April 1987)
Annex III	Prevention of pollution by harmful substances in packaged from (entered into force on 1 July 1992)
Annex IV	Prevention of pollution by sewage from ships (entered into force on 27 September 2003)
Annex V	Prevention of pollution by garbage from ships (entered into force on 31 December 1988)
Annex VI	Prevention of Air Pollution from Ships (entered into force on 19 May 2005)

MARPOL applies to ships entitled to fly the flag of a Party to the Convention and to ships not entitled to fly the flag of a Party but which operate under the authority of a Party.[122] MARPOL does not apply to any warship, naval auxiliary or other ship owned or operated by a State and used only on government non-commercial service pursuant to Article 3 (3).[123] However, those ships should be subject to appropriate measures in consistent with the legislation implementing the convention. Under this obligation, the government shall provide necessary measures for sanctions against any violations under the law and legal procedures. These actions must also apply to own-flag ships if sufficient information and evidence of a violation is provided by another State Party. Conversely, other ships which contravene within the jurisdiction must be reported to their flag State and provide information and evidence of such violation of the requirements of the present Convention to be prohibited and appropriate sanctions against the ship concerned wherever the violation occurs. Furthermore, such penalty

[122] Ibid, The MARPOL Convention, Article 3 (1)
[123] Yoshifumi Tanaka, "The International Law of the Sea", p.289.

must be adequate and equally severe irrespective of where the violations.[124] National legislation for implementing MARPOL should reflect these requirements, and a marine administration is required to fulfil these obligations.[125]

As far as oil cargoes are concerned, Annex I starts with the definition of oil as petroleum in any form including crude oil, fuel oil, sludge, oil refuse and refined products, however it does not include petrochemicals which are subject to the provisions of Annex II. In addition, the terms “crude oil”, “fuel oil” and “oily mixture” are specifically characterized by precise definition respectively. In terms of classifying ship types, there are categorized as “oil tanker”, “crude oil tanker” and “product tanker”. In respect of discharge criteria it is more stringent in a “special area” which is also defined as sea area where for recognized technical reason in relation to its oceanographically and ecological condition and to the particular character of its traffic the adoption of special mandatory methods for the prevention of sea pollution by oil is required.[126] For the purpose of Annex I, the recognized special areas are Mediterranean Sea, Baltic Sea, Black Sea, Red Sea, Gulfs area, Gulf of Aden, Antarctica, North West European waters, Oman area of the Arabian Sea and Southern South African waters.

Annex III contains regulations for the prevention of pollution by harmful substances in packaged form. It includes standards concerning packaging, marking, labelling, documentation, stowage and quantity limits. “Harmful Substances" include any substance which, if introduced into the sea, is liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.[127]

In Annex VI there are regulations relating to sewage which apply to ships undertaking international voyages, which are 400 gross tonnages or above, or that are certified to carry more than 15 persons. It requires these ships to be equipped with a sewage treatment plant, a sewage disinfecting and comminuting system, or a sewage holding tank. Sewage discharges from ships are required to be limited. More than three nm from the nearest land, sewage may be discharged at a moderate rate if it is from an

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[124] Ibid, The MARPOL, Article 4 (1) and 4 (4)

[125] Under Article 2 (5) of the 1973 MARPOL Convention, “Administration” means the government of the State under whose authority the ship is operating. With respect to a ship entitled to fly a flag of any State, the Administration is the government of that State. Concerning fixed or floating platforms engaged in exploration and exploitation of the sea-bed and subsoil thereof adjacent to the coast, the Administration is the government of the coastal State.

[126] Ibid, The MARPOL Convention, Regulation 1.11of Annex I

[127] Ibid, Article 2 (2)

approved sewage treatment plant, or has been comminuted and disinfected.[128] Beyond 12 nm ships may discharge untreated sewage. Parties undertake to ensure the provision of facilities at ports and terminals for the reception of sewage, without causing undue delay to ships.[129]

The prevention of pollution of the sea by garbage from ships is addressed in Annex V. "Garbage" means all kinds of food, domestic and operational refuse generated during the normal operation of the ship.[130] The disposal into the sea of all plastics, from synthetic fishing nets to plastic garbage bags, is prohibited.[131] Dunnage, lining and packing materials that will float are to be disposed as far as practicable from the nearest land, but not less than 25 nm. Victual wastes and other garbage including paper, rags, glass, metal, bottles, crockery and like may be disposed of no less than 12 nm from the disposal of all garbage except food wastes is prohibited.[132]

MARPOL Annex VI is composed of regulations for the prevention of air pollution from ships. The release of Ozone depleting substances is controlled by a record keeping book. NOx emission versus rated engine speed has been set limits by defining Tier I, II and III and the last tier has fallen within 2016. For restraining Sox has filtered by limiting sulphur content in marine fuels that has to be provided evidence by bunker delivery note. The sulphur content of any fuel oil used on board ships shall not exceed the limits 0.50% m/m on and after 1 January 2020. As the initiatives for GHG emissions control from ships since last few years, the IMO raised a number of concrete draft regulations for the Energy Efficiency Design Index (EEDI) and the Energy Efficiency Operational Indicator (EEOI) and the Ship Energy Efficiency Management Plan (SEEMP).

The stipulation and utilization of port reception facilities for ship-generated wastes and, where applicable, cargo residues are integral parts of the rights and obligations of MARPOL. In practice, it has been experienced that b

oth provision and adequate use of reception facilities are complicated issues. Five out of the six Annexes to MARPOL provide regulations entail the provision of reception facilities: more in detail namely, regulation 38 in Annex I for Oil in loading ports,

[128] Ibid, Annex IV, Regulation 8
[129] Ibid, Annex IV, Regulation 10
[130] Ibid, The MARPOL Convention, Annex V, Regulation 1, 11of Annex I
[131] Ibid, Annex V, Regulation 3
[132] Ibid, Annex V, Regulation 5

ship repair yards, bunkering ports; regulation 18 in Annex II for Noxious Substances in bulk in ports and terminals and ship repair ports; regulations 12 and 12 bis in Annex IV for sewage in ports and terminals; regulations 8 in Annex V for Garbage in all ports handling ships in national and international trade; regulation 17 in Annex VI for Ozone- depleting substances together with equipment and materials in ports, terminals, repair ports and ship-breaking facilities.[133]It is notable that the regulations require government to ensure the provision of reception facilities, by no means, the Government to provide the facility mandatorily. However, the Government may require a port authority or terminal operator to have such facilities.

In article 2(4) of MARPOL, the definition of ship means "a vessel of any type whatsoever operating in the marine environment and includes hydrofoil boats, air-cushion vehicles, submersibles, floating craft and fixed or floating platforms". Again, article 2 (5) stipulates that, with respect to fixed or floating platforms engaged in exploration and exploitation of the sea bed and subsoil thereof adjacent to the coast, the Administration means the Government of the coastal State concerned under whose authority the ship is operating. Chapter 7 in Annex I describes special requirements for fixed or platforms as when fixed or floating platforms are engaged in exploration, exploitation and processing they must comply with the requirements for ships and discharge of oily mixtures is prohibited except when the oil content does not exceed 15 ppm.[134] Like oil tankers and other ships drilling rigs and platforms are required to keep Oil Record Book and Garbage Record Book together with garbage management plan. Platforms and drilling rigs engaged in international voyages must also be in compliance with the relevant requirements of Annex VI to be provided with an International Air Pollution Prevention (IAPP) Certificate and an International Energy Efficiency (IEE) Certificate.

Above all, the primary responsibility for ensuring compliance with MARPOL rests with the Administration.[135] To fulfil this obligation the Administration must have necessary resources to administer, enforce and ensure compliance with the provisions of the convention.

International Conventions for Prevention of Marine Pollution by Oil, 1954

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[133] *International Convention for the Prevention of Pollution from Ships*, opened for signature 2 November 1973, 1340 UNTS 184 (entry into force 2 October 1983). See <http://www.imo.org/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-%28MARPOL%29.aspx> last accessed 1 February 2013.

[134] ppm stands for parts per million that means parts of oil per million parts of water by volume

[135] Ibid, The MARPOL, Article 2(5)

International Convention for the Prevention of Pollution of the Sea by Oil, 1954 (OILPOL 54) amended in 1962, 1969 and 1971**.** OILPOL was adopted in London in 1954 and was a significant achievement at that time. It was a significant exclusively designed to deal with the oil pollution problem. It prohibits the international operational discharge of oil and oily mixtures by certain ships in specified areas of the oceans.[136]

The 1969 amendment was in response to the "Torrey Canyon" disaster which had illustrated some of the weaknesses in OILPOL. The OILPIL mainly regulated pollution resulting from routine tanker operations and from the discharge of oily water from machinery spaces. The problem with accidental pollution was not addressed. There were regarded as the major causes of oil pollution from ships.[137]

The Convention applied to ships of 500 gross tonnage and about except naval auxiliaries and ships engaged in the whaling industry.[138] Originally, the convention contained total 21 articles and two annexes: one defined prohibited zones were defined where the oily wastes discharge into the sea within a designated area-special area- certain distance from land, other for the forms of oil record book.

The International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC), 1990

The International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC), 1990 came into force on 13 May 1995 and its Protocol to the OPRC relating to hazardous and noxious substances (OPRC HNS Protocol) was adopted in 2000.

In March 1989 of the coastal of Alaska some 37,000 tons of crude oil spilled from the tanker Exxon Valdez[139]. On March 24, 1989, the tanker Exxon Valdez, en route from Valdez, Alaska, California, ran aground on Bligh Reef in Prince William Sound. The vessel was travelling outside normal shipping lanes in an attempt to avoid ice. Within six hours of the grounding, the Exxon Valdez spilled approximately 10.9 million gallons of its 53 million gallons cargo of Prudhoe Bay Crude. Eight of the eleven

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[136] Edgar Gold, "Gard Handbook on Marine Pollution", 2nd Edition, 1997, p.66.

[137] http://www.imo.org/en/knowledge Center/References And Archives/ Historyof MARPOL/ Documents/MARPOL%20&#-78%20 Briefy%20 History%20%20 List %20 amendments% 20 and % 20how%20to%20find%20them.htm.

[138] The OILPOL Convention, Article II

[139] NOAA/HMRAD, 1992, OIL SPILL Case Histories 1967-1992, "Summaries of Significant U.S. and International Spills", NOAA/Hazardous Materials Response and Assessment Division, Report N. HMRAD 92-11, Seattle Washington, 1992.

tanks on board were damaged. Due to a storm blowing, spreading the oil widely, eventually, more than 1,000 miles of coastline were fouled, and hundreds of thousands of animals perished. Exxon ended up paying billions in clean-up costs and fines, and remains tied up in court cases to this day. It was the largest spill from ship up to that date in US water and led to the adoption of the Oil Pollution Act (OPA 90), which included a national compensation regime. Four months later in July 1989, a conference of leading industrial nations in Paris called upon IMO to develop further measures to prevent pollution from ships, to commence drafting a convention which endeavours to provide a global framework for international co-operation in combating major incidents or threats of marine pollution.

Of the main objectives of the Convention are:

- Report the pollution accident to the nearest coastal State by ships, aircraft and naval units, ports and utilities, and in case of necessity to report the accident to neighbouring countries that are endangered by this accident.
- Provide technical assistance and equipment to member States
- Provide a national plan to deal with oil pollution in collaboration with all relevant organizations[140]

States must also establish a national system for responding promptly and effectively to oil pollution incidents, including as a minimum the designation of a competent national authority with responsibility for oil pollution preparedness and response.[141] Master must report without delay any event on their ship or offshore unit involving a discharge or possible discharge of oil to the nearest coastal State.[142] On receiving an oil pollution report the coastal State is to assess the seriousness of the event, and then inform, without delay, all States whose interests are affected or are likely to be affected.[143]

This convention recognises the importance of mutual assistance and international co-operation relating to matters including the exchange of information respecting the capabilities of States to respond to oil pollution incidents, the preparation of oil pollution contingency plans, the exchange of reports of incidents of significance

[140] For more information see http://www.persiangulfstudies.com/fa/index.asp?p=pages&id=603. And http://www.imo.org/About/Conventions/ListOfConventions/Pages/International-Convention-on-Oil-Pollution-Preparedness,-Response-and-Co-operation-(OPRC).aspx.
[141] Ibid, The OPRC Convention, Article 6
[142] Ibid, Article 4
[143] Ibid, Article 5

which may affect the marine environment or the coastline and related interests of States.[144]

The OPRC-HNS Protocol applies the rules of the OPRC Convention to pollution incidents involving hazardous and noxious substances, and entered into force in 2007.[145]

The OPRC (HNS) Protocol aims to establish national systems for preparedness and response and to provide a global framework for international co-operation in combating major incident or threats of marine pollution. "Hazardous and noxious substances" means any substances other than oil which, if introduced into the marine environment is likely to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.[146] Under the HNS Protocol, each Party is obliged to apply rules similar to those in the OPRC to these substances.

Paragraph 2. Other Conventions

International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969 (Intervention Convention)

Intervention Convention emerged from the deliberations that took place the diplomatic conference held in Brussels after the "Torrey Canyon" oil spill disaster in 1967. The Intervention convention was adopted by the IMO in 1969, a multilateral treaty which empowers the coastal States to take measures beyond the limits of their territorial sea in case of maritime casualty involving oil pollution from ships which may cause major harmful consequences..[147]

The parties to take such measures on the high sea as may be necessary to prevent, mitigate or eliminate grave and imminent danger to their coastline or related interests from pollution or threat of pollution of the sea by oil, following upon a maritime casualty or acts related to such a casualty, which may reasonably be expected to result

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[144] Ibid, Article 7

[145] Entered into force 14 June 2007. Protocol on Preparedness Response and Co- operation to Pollution Incidents by Hazardous and Noxious Substances, 2000 (London, IMO, 2002).

[146] The HNS Protocol, Article 2 (2)

[147] *International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties*, opened for signature 29 November 1969, 970 UNTS 211. Available at <http://www.imo.org/About/Conventions/ListOfConventions/Pages/International-Convention-Relating-to-Intervention-on-the-High-Seas-in-Cases-of-Oil-Pollution-Casualties.aspx> last accessed 1 February 2013.

in major harmful consequences.[148] However, no measures shall be taken against any warship or other ship owned or operated by a State.[149] "Maritime casualty" as referred to in this provision means a collision of ships, stranding or other incident of navigation, or other occurrence on board a ship or external to it resulting in material damage or imminent threat of material damage to a ship or cargo.[150] The coastal State cannot exercise the right of intervention in the case of operational pollution or dumping at sea.

However, the coastal States is allowed to take only such action as is necessary and after due consultation with appropriate interesting States, in particular, the flag State or States of the ship or ships involved and the ship owners or cargo owners involved, and also independent experts appointed for this purpose where circumstances permit. A coastal State that takes excessive actions beyond permissions under the convention will be liable to pay compensation for any damage caused by such actions.[151] There is a provision provided for the settlement of disputes arising in connection with the application of the convention. The convention applies to all seagoing vessels except warships or other vessels owned or operated by a State and used on Government or non-commercial service.

The scope of the 1969 High Seas Intervention Convention was further extended by the 1973 Protocol.[152] The 1969 Intervention convention is applicable in the event of maritime casualties involving pollution by oil.[153] The convention came into force in 1975. In view of the increasing quantity of other substances, mainly chemical, carried by ships and some of those would cause serious hazards if released to the marine environment; the 1969 Brussels Conference recognized the need to extend the convention to cover substances other than oil. The 1973 Protocol entered into force in 1983 and has been amended subsequently to update the list of substances attached to it.

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[148] The Intervention Convention, Article 1 (1)
[149] Ibid, The Intervention Convention, Article I (2)
[150] Ibid, Article II (1)
[151] Ibid, Article VI
[152] Protocol Relating to Intervention on the High Seas in Cases of Pollution by Substances Other than Oil. 1313 UNTS p.4. Entered into force 30 March 1983.
[153] Ibid, The Intervention Convention, Article I (1)

The Convention on the Prevention of Marine Pollution by the Dumping of Wastes and other Matter, 1972

The convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, is one of the first global conventions to protect the marine environment from human activities and has been in force since 1975.

The convention regulates the deliberate disposal of certain substances at sea, including oily wastes, dredging and land-generated wastes, excluding the oil pollution caused by normal operational discharges of ships and pollution caused by maritime casualties.[154] It contains three factors: the dumping of wastes and other matter listed in Annex I of the aforesaid Convention is prohibited; the dumping of wastes and other matter listed in Annex II of the aforesaid convention require a prior special permit; the dumping of all other wastes or matter requires a prior general permit. "Dumping", defined as the deliberate disposal at sea of wastes or other matter but not discharge from normal operation of ships or from accidents, was permitted unless the substances concerned were established to be harmful.[155]

The objective of the 1996 Protocol is considerably stronger than the 1972 London Convention in that it aims for the elimination, where practicable, of pollution caused by dumping or incineration of waste at sea.[156] The 1996 Protocol entered into force in 2006. Under the 1996 Protocol, dumping is defined as the deliberate disposal into the sea of waste or other matter from vessels, aircraft, platforms or other man-made structures at sea, any deliberate disposal of vessels, aircraft, platforms, or other man-made structures, any storage of wastes or other matter in the seabed and the subsoil.[157] It does not include the disposal of wastes or other matter incidental to the normal operations of vessels, aircraft and platforms.[158] Incineration at sea is defined as the combustion of wastes on board a vessel, platform or other man-made structure at sea for the purpose of their deliberate disposal.[159]

The 1996 London Protocol is a little different from the 1972 London Convention. The 1972 London Convention establishes black and grey lists. The 1996 London Protocol

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[154] Convention on the Prevention of Marine Pollution by the Dumping of Waste and other Matter, opened for signature 13 November 1972, 1046 UNTS 120 (entry into force <http//www.imo.org/About/Conventions/List OF Conventions/Pages/Convention-on the – Prevention-of-Marine-Pollution-by Dumping-of Wastes-and Other_Matter.aspx>last acccessed1 February 2013.

[155]The London Convention 1972, Article III (1)

[156]The Protocol 1996, Article 2

[157] Ibid, The Protocol 1996, Article 1 (4) (a)

[158] Ibid, Article 1 (4) (b)

[159] Ibid, Article 1 (5) (a)

does not find those provisions. It evaluates the precautionary principle and polluter pays principle. In addition, the contracting parties have the obligation to prohibit the dumping of any wastes or other matter that is not listed in Annex I of the 1996 London Protocol requires a permit.[160] In the issuance of permits, the contracting parties shall adopt administrative or legislative measures comply with the provisions of Annex 2.

Dumping of waste or other matter on this reverse list requires a permit. Parties to the product are further obligated to adopt measures to ensure that the issuance of permits and permit condition for the dumping of reverse list include dredged material, sewage sludge: industrial fish processing wastes; vessels and offshore platforms of other man-made structures at sea, inert, inorganic geological material; organic material of natural origin; and bulky items including iron, steel, concrete and similar materials for which the concern is physical impact, and limited to those circumstances where such wastes are generated at locations with no land disposal alternatives.[161]

This London Protocol reflects a more modern and comprehensive agreement on the protection of the marine environment from dumping activities. It contains the provisions of the precautionary approach and the waste prevention techniques, the requirements of the collaboration between the relevant local and national agencies involved with the control of point and non-point sources of pollution. According to those provisions, it should be assumed that the 1996 London Protocol has effectively changed the scope of the original London Convention.

International Convention for the Control and Management of Ships Ballast Water and Sediments, 2004 (BWM Convention)

The International Convention for the Control and Management of Ships Ballast Water and Sediments, 2004 (BWM Convention) was adopted by consensus at the Diplomatic Conference at IMO in London on 13 February 2004. The convention aims to prevent the spread of harmful aquatic organisms from one region to another, by establishing standards and procedures for the management and control of ships' ballast water and sediments. Under the Convention, all ships in international traffic are required to manage their ballast water and sediments according to a ship-specific ballast water management plan.[162]

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[160] Ibid, The Protocol 1996, Article 5

[161] Ibid, Annex I (1)

[162] International Convention for the Control and Management of Ships Ballast Water and Sediments. Opened for signature 13 February 2004. See <http:// www.imo.org/About/ Convention/List Of

Invasive aquatic species are one of the four greatest threats to the world's ocean, and can cause extremely severe environmental, economic and public health impacts. Those species are generally spreading by means of ballast water operation which is generally carried on board's ships for trims and stability purpose. Surprisingly, an approximate amount of 10 billion tons ballast water is transferred by worldwide shipping from one place to another each year. Where the new is outside of their natural geographic range, the species which has been transferred is commonly known as an alien species, alternative terms are non-native or non- indigenous. If the environmental conditions of the new geographic area are suitable, those alien species can not only survive, but also establish and spread, in many cases causing, or even potentially to causing, harm to the local environment, economy, or human health. Such species are generally called "invasive alien species"[163] Unlike oil pollutions; the impacts of invasive marine species are most often irreversible.[164]

"Ballast water" is defined as water with its suspended matter taken on board a ship to control trim, list, draught, stability or stress of the ship. [165] General obligation state for parties to undertake to give full and complete effect to the provisions of the Convention and the Annex thereto in order to prevent, minimise and ultimately eliminate the transfer of harmful aquatic organisms and pathogens through the control and management of a ship's ballast waters and sediments.[166] All ships will also have to carry a ballast water record book and an international ballast water management certificate. Article 5 requires Parties to have adequate reception facilities for the reception of sediments to ensure where cleaning or repair of ballast tanks within their ports and terminals. Each party undertakes to ensure that ports and terminals where cleaning or repair of ballast tanks occurs are equipped with adequate facilities for the reception of sediments in accordance with Article 5 (1). Article 6 describes Parties to promote and facilitate scientific and technical research on ballast water management and monitor the effect of ballast water management in waters under their jurisdiction. Each party is obliged to ensure that ships flying its flag or operating under its authority and subject to survey and certification are so surveyed and certified in accordance with

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Conventions/Pages/International-Convention-for –the Control-and Management-of Ships%27-Ballast-Water-and-Sediments-(BMW).sapx>last accessed 1 February 2013.

[163] Global last: http://globallastimo.org.the—invasive-aguaric-species-2.

[164] Global last, (2010), "The Problem", Retrieved December 20, 2010 from the World Web http://globallast.imo.org/index.asp?page=problem.htm&menu=true

[165] The BWM Convention, Article 1 (2)

[166] Ibid, Article 2 (1)

the regulations in the Annex.[167] A ship to which this Convention applies may be subject to port State control in accordance with Article. In addition, the detailed regulations for the control and management of ships ballast water and sediments are set out in the Annex which forms an integral part of the Convention.

The International Convention on the Control of Harmful Anti Fouling Systems on Ships, 2001

Anti-fouling paints commonly used to paint the underwater area of the bottom of ship. It a specialized coating to prevent the growth of subaquatic organisms that attach to the hull causing increased water friction and a reduction of the ship's speed and on increase in fuel consumption.

The convention defines "anti-fouling systems" as a coating, paint, surface treatment, surface or device that is used on a ship to control or prevent attachment of unwanted organisms.[168] Antifouling paints contain biocides that repel fouling organisms when released at a controlled rate into the water adjacent to the hull by producing compounds which leach into the surrounding seawater. The most effective anti-fouling paints have for many years been tin based chemical compounds, namely organotin, which act as biocides. These compounds slowly "leach into the sea water, killing bamacles and other marine life that have attached to the ship. The harmful environmental effects of organotin based compounds such as tributylin used in anti-fouling paints on vessels hulls and infrastructures were recognized.[169]

Marine Environmental Protection Committee adopted a resolution which recommended that Government adopt measures to eliminate the use of anti-fouling paint containing TBT on non-aluminate hulled vessel of less than 25 meters in length and eliminate the use of anti-fouling paints with a leaching rate of more than four microgrammes of TBT per day.[170]

In November 1999, IMO adopted on Assembly resolution that called on the MEPC to develop an instrument, legally binding throughout the world, to address the harmful effects of anti-fouling systems used on ships. The resolution called for a

[167] Ibid, The BWM Convention, Article 7 (1)
[168] The AFS Convention 2001, Article 2 (2)
[169] http://www.imo.org/en/OurWork/Environment/Anti-foulingSystems/Pages/Default.aspx.
[170] Ibid, http://www.imo.org

global prohibition on the application of organotin compounds which act as biocides in anti-fouling systems on ships by 1 January 2003, and a complete prohibition by 1 January 2008. In October 2001, this instrument was adopted as International Convention on the Control of Harmful Anti-Fouling Systems on ships and entered into force on 17 September 2008. Under the terms of the Convention Parties to the Convention are required to prohibit and/or restrict the use of harmful anti-fouling systems on ships flying their flag, as well as ships not entitled to fly their flag, but which operate under their authority and all ships that enter a port, shipyard or offshore terminal of a party.[171]

Annex I attached to the Convention States that by an effective date of 1 January 2003, all ships shall not apply or re-apply organotin compounds which act as biocides in anti-fouling systems, and by 1 January 2008 (effective date), ships either-

- Shall not bear such compound on their hulls or extends ports or surfaces, or
- Shall bear a coating that forms a Barrie to such compounds leaching from the underlying non-compliant anti-fouling systems.

The applies to all ships (except fixed and floating platforms, floating storage units (FSUs), and floating production constructed prior to 1 January 2003 and that have not been in dry-dock on or after 1 January 2003.

Ships of above 400 gross tonnage and above engaged in international voyages (excluding fixed or floating platforms FSUs and FPSOs) will be required to undergo and initial survey before the International Anti-fouling System Certificate is issued for the first time, and a survey when the anti-fouling systems and changed or replaced.

Ships of 24 meters or more in length but less 400 gross tonnage engaged in international voyages (excluding fixed or floating platforms, FSUs and FPSOs) will have to carry a Declaration on Anti-fouling Systems singed by the owner or authorized agent. The Declaration will have to be accompanied by appropriate documentation such as a point receipt or contractor invoice.

[171] Resolution MEPC 46 (30), (2001), Report of the Marine Environment Protection Committee, 46th session, Agenda item 23, the International Maritime Organization.

Anti-fouling systems to be prohibited or controlled are listed in an annex (Annex I) to the Convention, which will be updated as and when necessary. Annex I also states that all ship shall not apply or re-apply organotins compounds which act a biocides in anti-fouling systems. This applies to all ships (including fixed and floating platforms, floating storage units (FSUs), and floating production storage and offtake units (FPSOs).

States shall be entitled to compensation if it is and unduly detained or delayed while undergoing inspection for possible violations of the Convention.[172]

The convention provides for the establishment of a "technical group" to include people with relevant expertise to review proposals for the other substances used in anti-fouling systems to be prohibited or restricted.[173] Article 6 on the process for proposing amendments to control on anti-fouling systems sets out how the evaluation of an anti-fouling system should be carried out.

Thus, under the Convention, State parties are required to prohibit and/or restrict the use of harmful anti-fouling systems on ships flying their flags, as well as on ships although not entitled to fly their flag but which operate shipyard or offshore terminal of a State party. Surveys will be undertaken before a mandatory international anti-fouling system certificate can be issued and when anti-fouling systems is changed or removed.

Liability and Compensation

States are responsible for the fulfilment of their international obligations concerning the protection and preservation of the marine environment.[174] States are obliged to ensure that recourse is available in accordance with their legal systems for prompt and adequate compensation or other relief in respect of damage caused by pollution of the marine environment by natural or judicial persons under their jurisdiction pursuant to Article 235 (2). With the objective of assuring prompt and adequate compensation in respect of all damages causes by pollution of the marine environment, Article 235 (3) obliges States to cooperate in the implementation of existing international law and the further development of international law relating to liability in this field. Liability

[172] Ibid, The AFS Convention 2001, Article 12
[173] Ibid, Article 7
[174] Ibid, UNCLOS, Article 235 (1)

treaties can be divided into two categories: treaties concerning liability for oil pollution damage and those relating to liability for other pollution damage.

International Convention on Civil Liability for Oil Pollution Damage, 1969 (CLC 1969), and Protocol of 1976, 1984 and 1992

The purpose of the Convention is to pay compensation to that suffering oil pollution damage in a state party to the Convention. However, spills from tankers during ballast voyages and spills of bunker oil from ships other than tankers are not covered by the 1969 Convention.

"The Torrey Canyon" incident in 1967 provided a major stimulus to the development of two voluntary agreements and two international conventions through which compensation was made available to those who incur clean-up costs or suffer pollution damages as a result of a spill of persistent hydrocarbon mineral oil from a tanker. The interim voluntary agreements of TOVALOP [175] and CRISTAL [176] established by the tanker and oil industries in the aftermath of the Torrey Canyon existed far longer than originally expected but their relevance was progressively eroded as States around the world ratified the equivalent international conventions. In view of this both voluntary agreements were terminated on 20 February 1997.

The Civil Liability Convention was adopted under the auspices of the International Maritime Organization (IMO) on 29 November 1969 and entered into force on 19 June 1975. The convention provides strict liability for shipowners.[177] It is the duty of to prove in each case that any of the exceptions should in fact operate. However except where the owner has been guilty of actual fault, they may limit liability in respect of any one incident to 133 Special Drawing Rights (SDR)[178] for each incident. The liability of shipowners is strict, and hence they will be liable to pay compensation for pollution damage caused by the escape or discharge of persistent oil from a ship, even if the pollution was not due to any fault on their part. However, liability apply where it can be established that the damage resulted from an act of war, hostilities, civil war, insurrection, or a national phenomenon of an exceptional, inevitable or

[175] Tanker Owners Voluntary Agreement Concerning Liability for Oil Pollution (TOVALOP) proposal instead of *strict liability*, so-called "reverse burden of proof" was not accepted.

[176] R.G.Marsden, "Marsden on collisions at sea", 12th Edition, London: Sweet& Maxwell, 2003, p 431.

[177] "Owner" means the person or persons registered as the owner of the ship or, in the absence of registration, the person or persons owing the ship. However, in the case of a ship owned by a State and operated by a company which in that State is registered as the ship's operator, "owner" shall mean such company [Article I (3)]

[178] The SDR is an international reserve asset, created by the International Monetary Fund in 1969. The daily conversion rates for SDRs can be found at: www.imf.org/external/np/fin/data/rms-sdrv.aspx.

irresistible character; was wholly caused by an act or omission by a third party with intent to cause damage; or war wholly caused by the negligence of any government or other authority responsible for the maintenance of navigational aids.[179]

Under the 1992 CLC, claims for compensation are to be made against the registered owner of the ship, or the owner's insurer, and not the operator of the ship, or the owner of the oil cargo. Hence no proceedings may normally be instituted against other potential parties who may have had a hand in the incident such as the operator, the charterer, master, crew, pilot or slaver.[180]

Under the convention, the ships are required to maintain insurance or other financial security in sums equivalent to the owner's total liability for a single incident. It applies to all seagoing ships actually carrying oil in bulk as cargo, but only ships carrying more than 2,000 tons of oil are required to maintain insurance in respect of oil pollution damage. The convention covers pollution damage resulting from spills of persistent oil suffered in the territorial waters of a safe party to the convention. One shortfall of this convention is that spills from tankers in ballast or bunker spills from ships other than tankers are not covered nor is it possible to reimburse the expenditure for taking preventive measures so as to be successful that no actual spill occurs. The shipowner cannot limit liability if the incident occurred as a result of the owner's personal fault.

The Civil Liability Convention 1992 was entered into force on 30 May 1996. The 1992 Civil Liability Convention applies exclusively to pollution damage caused in the territory, including the territorial sea, and in the EEZ or equivalent area of a Contracting State.[181] Under this Convention, the registered ship owner has strict liability for pollution damage caused by the escape or discharge of persistent oil from his ship. This means that he is liable even in the absence of fault on his part.[182]

The protocol covers pollution damage as before but environmental damage compensation is limited to cost incurred for reasonable measures to reinstate the contaminated environment. The 1992 Protocol permits States party to issue certificate to ships registered in States which are not Party to the 1992 Protocol, so that a

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[179] The CLC Convention 1992, Article III (1), (2)

[180] Ibid, Article 3 (4)

[181] Ibid, The CLC Convention 1992, Article II

[182] *Protocol of 1992 to amend the International Convention on the Civil Liability for Oil Pollution Damage of 29 November 1969*, opened for signature 27 November 1992, 1956 UNTS 255 (entry into force 30 May (1996).See http://www.imo.org/ About/Conventions/ List Of Conventions/ Pages/ International-Convention-on-Civil-Liability-for-Oil-Pollution-Damage- % 28 CLC % 29. aspx last accessed 1 February 2013.

shipowner can obtain certificates to both the 1969 and 1992 CLC, even when the ship is registered in a country which has not yet ratified the 1992 Protocol. It is particularly important because the difficulties may be encountered by a ship which has only a 1969 CLC to trade to a country which has ratified the 1992 Protocol since it established higher limits of liability.

The 2000 amendments adopted on 18 October 2000 and entered into force on 1 November 2003. These amendments raised the compensation limits by 50 percent compared to the limits set in the 1992 Protocol, as follows:[183]

(a) For a ship not exceeding 5,000 gross tonnage, liability is limited to 4.51 million SDR (US$ 5.78 million)

(b) For a ship 5,000 to 140,000 gross tonnage: liability is limited to 4.51 million SDR plus 631 SDR for each additional gross tonne over 5,000;

(c) For a ship over 140,000 gross tonnage´. Liability is limited to 89.77 million SDR.

The International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971

The International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage was adopted at a Conference held in Brussels on 18 December 1971 and entered into force on 16 October 1978. It is supplementary to the Civil Liability Convention. The main reason for creating the Fund Convention was to balance the contributions for the compensation of oil pollution damage between the owners of the ships and the owners of the cargo and the oil industry.

The 1992 Fund pays compensation when:

(i) the damage exceeds the limit of the shipowner's liability under the 1992 CLC, or

(ii) the shipowner is exempt from liability under the 1992 CLC, or

(iii) the shipowner is financially incapable of meeting his obligations in full under the 1992 CLC and the insurance is insufficient to pay valid compensation claims.[184]

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[183] Amendments of the Limitation Amounts in the Protocol of 1992 to Amend the International Convention on Civil Liability for Oil Pollution Damage, 1969. Adopted on 18 October 2000. Entered into force 1 November 2003 (under tacit acceptance).

[184] *International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage*, opened for signature 18 December 1971, 1110 UNTS 57 (entry into force 16

Contributions to the Fund shall be made in respect of each Contracting State by any person who, in the calendar year referred to in Article 11 (1), has received in total quantities exceeding 150,000 tons of oil by sea in the territory of that State.[185] The aggregate amount of compensation payable by the Fund shall in respect of any one incident be limited, so that the total sum of that amount and the amount of compensation actually paid under the Civil Liability Convention for pollution damage shall not exceed 450 million francs.[186]

The 1992 Fund is to pay compensation to any suffering pollution damage if such person has been unable to obtain full and adequate compensation for the damage under the terms of the 1992 Liability Convention because of three reasons:

(a) no liability for damage arises under the 1992 Liability Convention
(b) the shipowner liable for the damage under the 1992 Liability Convention is financially incapable of meeting his obligation in full, and
(c) the damage exceeds the shipowner's Liability Convention as limited pursuant to Article V (1). [187]

The fund shall pay no compensation if the pollution damage resulted from an act of war or was caused by oil which has escaped from a warship or other government ship used for non-commercial service, or the claimant cannot prove that the damage resulted from an incident involving one or more ships by virtue of Article 4 (2).[188]

The 2003 Protocol establishing an International Oil Pollution Compensation Supplementary Fund was adopted on 16 May 2003 and entered into force on 3 March 2005.[189] The aim of the established Fund is to supplement the compensation available under the CLC 92 and the Fund Conventions with an additional, third tier of compensation. The total amount of compensation payable for any one incident will be limited to a combined total of 750 million SDR including the amount of compensation

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October 1978). See <http://www.imo.org/About/Conventions/ List Of Conventions/ Pages/ International-Convention-on-the-Establishment-of-an-International-Fund-for-Compensation-for-Oil-Pollution-Damage-%28FUND%29.aspx> last accessed 1 February 2013.

[185]The FUND Convention 1971, Article 10

[186] Ibid, Article 4 (4)

[187] Ibid, The FUND Convention , Article 4

[188] Ibid, Article 4 (2)

[189] Protocol of 2003 to the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992. Entered into force 3 March 2005. The text of the Protocol is reproduced in Liability and Compensation for Oil Pollution Damage. As at July 2014, 31 States had become Parties to the 2003 Protocol.

paid under the existing CLC and FUND Convention. The Supplementary Fund will apply to damage in the territory, including the territorial sea, of a Contracting State and in the exclusive economic zone of a Contracting State.

International Convention on the Removal of Wrecks, 2007

The International Convention on the Removal of Wrecks was adopted on 18 May 2007, and entered into force on 14 April 2015.[190] The convention places strict liability on owners for locating, making and removing wrecks deemed to be a hazard and makes State Certification of insurance, or other than from of financial security for such liability, compulsory for ship of 300gt and above. It also provides States parties with a right of direct action against insurers, and shipwrecks may have the potential to affect adversely not only the safety of lives, goods and property at sea but also the marine environment includes an optional clause enabling State parties to apply certain provisions to their territory including their territory sea.[191]

The problems caused to coastal States and shipping in general by abandoned wrecks are three-fold first and depending on its location, a wreck may constitute a hazard to navigation potentially endangering other vessels and their crews, second and of equal concern, depending on the nature of the cargo, is the potential for a wreck to cause substantial damage to the marine and coastal environments, and third in an age where goods and service are becoming increasingly expensive, is the issue of the costs involved in the marking and removed of hazardous wrecks. The convention attempts to resolve all of these and other, related, issues.

The convention provides a legal basis for States parties to remove, or have removed, wrecks that pose a danger or impediment to navigation or that may be expected to result or damage to the coastline or related interests of one or more States. The convention also applies to a ship that is about or may reasonably be expected, to sink or to stand, where effective measures to assist the ship or any property in danger are not already being taken.

[190] International Convention on the Removal of Wreck, 2007, entered into force on 14 April 2015. See http://www.imo.org/en/About/conventions/listofconventions/pages/nairobi-international-convention-on-the-removal-of-wrecks.aspx

[191] The WRECK Convention, Article 3

It makes shipowners financially liable and requires them to take out insurance or provide other financial security to cover the costs of wreck removal. It also provides States with a right of direct action against insurers.[192]

Articles in the convention cover:

- reporting and locating ships and wrecks covering the reporting of casualties to the nearest coastal State; warning to mariners and coastal States about the wreck, and action by the coastal State to locate the ship or wreck.[193]
- criteria for determining the hazard posed by wrecks, including depth of water above the wreck, proximity, of shipping route traffic density and frequency, type of traffic and vulnerability of port facilities. Environmental criteria such as damage likely to result from the release into the marine environment of cargo or oil are also included;[194]
- measures to facilitate the removal of wrecks, includes rights and obligations to remove hazardous ships and wrecks which set out when the shipowner is responsible for removing the wreck and when a State may intervene;[195]
- liability of the owner for the costs of locating, marking and removing ships and wrecks- the registered shipowner is required to maintain compulsory insurance or other financial security to cover liability under the convention and,
- settlement of disputes[196]

The Wreck Removal Convention also provides that with respect to ship registered in a State Party; such certificate shall be issued or certified by the appropriate authority of the State of the ships registry, providing that State is party to the convention. Ships registry, providing that is not parties will need to obtain a certificate from a relevant authority in a State Party.

The convention can, therefore, be said to fill a gap in the existing international legal framework by providing the first set of uniform international rules aimed at ensuring the prompt and effective removal wrecks located beyond the territorial sea.

Although there are several other important conventions that help to prevent marine pollution in one way or other, for instance, MARPOL, OPRC, CLC, FUND etc, each

[192] Ibid, The WRECK Convention, Article 12 (10)
[193] Ibid, Article 5
[194] Ibid, Article 6
[195] Ibid, The WRECK Convention Article 9
[196] Ibid, , Article 15

of these convention unlike UNCLOS, addresses only one particular aspect of marine pollution regulation, whereas UNCLOS targets the prevention of all varieties of marine environment.

Nevertheless, all these convention complement each other and contribute to improving international efforts for protecting and preserving the marine environment. The effective implementations of UNCLOS and the other conventions governing the marine environment will enable nations to solve the problem of marine pollution both at national and international levels. Every State should therefore, enact and enforce laws as provided in the international conventions in order to prevent pollution of the marine environment.

Part Two

Causes and Prevention of Marine Pollution in Myanmar

Our marine environment is subject to many varied pressures driven by increasing use of deep-water resources, shipping and human-driven environmental change. Common sources of marine pollution are oil, damping and agriculture runoff, and the most common source of marine pollution is oil spills, which is common as oil exploration ventures out into our oceans. Several pressures that have had substantial impacts on the marine environment, such as commercial fishing, and oil and gas exploration, are now decreasing because of economic pressures and management frameworks put in place to ensure future sustainability and environmental protection. Management frameworks for the traditional use of marine resources and recreational fishing are also improving, but from a lower base. Several pressures, such as those associated with climate change and marine debris, continue to increase, largely in association with limited management.[197]

The protection of the marine environment and the management of its natural resources constitute one of the major issues for Myanmar country. Myanmar's marine habitats are extremely limited, as are effective conservation measures. Threats facing the

[197] Environmental and Social Management Plan and Monitoring (ESMPM) Report, TOTAL EP MYANMAR

marine areas include overfishing, coastal development, illegal oil dumping and the use of destructive fishing practices such as dynamite and cyanide. Despite the country's long coastline, there are only four marine protected areas and there is little capacity to conserve and manage resources. The Myanmar Government has expressed its commitment, though international convention, to put 10% of its marine areas under protection by 2020; however a range of factor including the lack of biological and socio-economic data and a lack of financial and technical resources severely constrain the ability of the Government and other actors to meet this target. Overfishing, including by foreign vessels, is contributing to the declining livelihoods of fishing villages.[198]

Chapter 1

Causes of Marine Pollution

Marine pollution causes serious threat for developing country of Myanmar. The marine pollution in Myanmar caused by industry or agriculture has been minimal at present due to low level of industrialization, relatively small amount of chemical used in agriculture. Major marine sources of pollution include land based sources, and sea based source.

Section A. Land based Sources

Land based activities, which contribute to the degradation of the marine environment, can be conveniently categorized as household activities, industrial activities, agricultural activities and urban development of land. Myanmar is encouraging Investments for Industrial and other sectors by inviting domestic and international investors. Considerable Challenges on Environment due to increasing investments. Water is essential to life on our planet. It is necessary for ensuring uncontaminated stream, rivers, and lakes as a prerequisite of sustainable development. Marine pollution is one of the concerns for development as well as Environmental Conservation and Management.

Most municipalities, industries and agriculture in Myanmar discharge waste into nearby creeks or rivers and waterways and usually not directly into sea. Land based pollutants are generated from municipal, agricultural and industrial activities.

[198]Capt Kyaw Zeya, Enforcement of Environment Protection requirement in Myanmar, 2015.

Urbanization, industrialization and agricultural intensification are all contributing to increased levels of pollution in Myanmar. Commonly, major land based sources of pollution *inter-alia* contribute to domestic sewage, solid wastes, agricultural effluents, and industrial wastes, soil erosion, river pollution, land and road run off, direct effluents from plants, cities sewage, etc. [199]

Paragraph 1. Industry

Industrial activities in coastal areas have been identified as another significant source of land based source of marine pollution. Myanmar had been developed 18 industrial zones, 34 sub-industrial zones and 10 industrial parks throughout the country to manage inadequate infrastructure, environmental pollution and many other problems due to number of industries increasing. Mostly those constructed industrial zones are general industrial zones and some zones particularly for export manufacturing. Due to rapid growing industries, most of industrial zones would not have time to complete proper landscaping, road, electrical power and drainage before handed over to industries' owners. According to the conducted census found that 9% of industries are owned by private and most are small scale industries in these industrial zones. Large-scale industries are government industries and some other industries which associated or partnership with foreign investors which are only about 5% of overall industries in Myanmar.[200]

In Myanmar, most of the industrial estates are located near the rivers due to the reasons of accessibility for both motor vehicles and cargo ships, which became to increase the potential of environmental degradation. Beyond this, some factories discharged untreated wastewater, waste materials into the nearby drainage, lands and rivers illegally which had been aroused significantly environmental pollution pertain to air, water and soil. Improper management of industrial waste could cause not only pollution but also health risks to industrial workers and those residents lived near the industrial estates.

In Myanmar, it is almost a custom to discharge all kinds of waste into the rivers. Besides, the gradual growth of industries, increased use of fertilizers and pesticides,

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[199] Dr. Kyaw Naing, Member of National Task Force, Coastal Pollution Working Group (Myanmar),BOBLME Project, National Report of Myanmar on the Coastal Pollution Loading and Water Quality Criteria (Land Based Sources of Marine Pollution), pp. 4-5.

[200] ASSESSING CLIMATE RISK IN MYANMAR, A contribution to planning and decision-making in Myanmar TECHNICAL REPORT March, 2017.

urbanization and discharge of municipal waste are continuously polluting the river system. Moreover, the numerous rivers and their tributaries that crisscross the country carry pollutants of the whole catchment area including upstream areas. The Ayeyarwaddy River is one vital artery waterway of Myanmar and is navigable throughout the year. Many industrial zones are known to be situated along the banks of the Ayeyarwaddy River. Among these industries, some industrial plants in one way or other directly discharge their industrial effluents without any waste treatment into the Ayeyarwaddy River. It is obvious that the quality of this waterway will eventually become affected due to the extended discharge. Yangon with a population of about 5-millions discharge its sewage and industrial waste into the Yangon River, which is a tributary of the Ayeyarwaddy. A similar condition can be found in the river mouth of Thanlwin, which is about 50 miles south of Mawlamyaing, the third largest city with population of 700,000. The city of Pathein, which is the fourth largest city also discharge its waste into the Nga-Wun River, a tributary of Ayeyarwaddy.[201]

Current industrial waste management practices in Myanmar are Reduce, Reuse and Recycle (3 Rs) by providing waste collection services, implementation of employer, employee awareness on hazardous waste handling and other waste management activities by city development committee and Myanmar Industrial Development Committee (MIDC). Industrial waste reduction focused on two areas; demand and supply side to minimize generations of waste from initial waste generators.[202] Recycling is the most famous method of industrial waste management practice in Myanmar, which required collecting, sorting and reprocessing. Widespread of waste collectors, waste dealers and waste merchants are forming business with many recycling industries along with national industrial waste recycling scheme. Therefore, Myanmar is applying three Rs management practices on municipal waste and industrial waste in order to control pollution, environmental hazard. But still need to improve for compositing, incineration and landfill method of disposing industrial waste and also implementing waste management system on hazardous industrial waste and toxic chemicals handling, transportation and storage according to national

[201]Dr. Kyaw Naing, National Report of Myanmar on the Coastal Pollution Loading and Water Quality Criteria, p. 6.
[202]http://www.myanmarthilawa.gov.mm

and international regulations. Pollution assessment and measurement should be therefore started as soon as possible.[203]

Paragraph 2. Agriculture and Municipal

Agriculture activities are another important source of marine pollution. This category includes surface run-off into rivers, water drainage by canals from land used for farming activities and the movement of air distributing chemicals and soils.

The most common fertilizer currently utilized are Urea, triple Super Phosphate, Muriate of Potash and compound fertilizer for paddy in a small extent. However, the use of gypsum about 2,800 MT is only common in Mon State. In total, about 53,000 tons of Urea, 15,000 tons of TSP, 6,700 tons of Potash, and 8,500 tons of compound fertilizers were used in the coastal States and division.[204]

In comparison with the sown area of crops, the use of pesticides is rather low to lack of availability and partly due to low level of incidences of pest and disease in the coastal region. Pesticides are mainly used in Ayeyarwaddy Division, Yangon Division and Mon State, as there are larger and more intensive cropping area than Rakhine State and Tanintharyi Division.

As the overall utilization of agrochemical in the coastal zones of Myanmar, Particularly in the Rakhine State and Tanintharyi Division is minimal, there are no immediate threats to the fragile ecological conditions of these areas. However, as agricultural production expends, the uses of agrochemical are bound to increase in the near future. The increased utilization of agrochemicals could adversely affect land and water resources, environment and biodiversity, and merit serious consideration in use and methods of application. As such, Integrated Pest Management practices should be applied to the most possible extent in order to reduce number of applications and scale of chemical usage.[205]

Myanmar's municipal system have in Yangon and Mandalay cities that are organized differently than the rest of the country and are managed by the Yangon City Development Committee (YCDC) and the Mandalay City Development Committee (MCDC). The Yangon City Development Committee and Yangon City Development

[203]Myint Pe, "NATIONAL REPORT OF MYANMAR" on the Sustainable Management of the Bay of Bengal Large Marine Ecosystem (BOBLME), GCP/RAS/179/WBG, 2011.
[204] Myint Pe, "NATIONAL REPORT OF MYANMAR, p.42.
[205] Ibid, p.41

Committee have delegated administrative functions under the authority of the Yangon Region and Mandalay Region governments and have other regional municipal organizations under regional government. They are responsible for municipal service delivery and public works (waste management, water supply, roads and bridges, parks and sports grounds, street lighting, funeral services, firefighting, etc.), city planning, urban land administration, tax collection (including business licensing and registration), public health, and urban development. Both the YCDC and MCDC are now managed by committees, chaired by the ministers of the Yangon and Mandalay Region governments that are partly elected by the public. These governing bodies are unique in that they allow for consolidated management of townships thirty-three for Yangon and seven for Mandalay.[206]

Among of Municipal organizations, Yangon City Development Committee has responsibilities on transportation, equipment, personnel and disposal of waste disposal and cleanup operation and permission for disposal of waste in oil spill response. In case of oil spill response, Yangon City Development Committee shall control for waste management, which will currently provide the man power, equipment and services to facilitate the ongoing shoreline cleanup effort. Specifically, Waste Management is transporting and disposing of materials collected by the various shoreline cleanup teams, and is responsible for a service area along the Yangon River, which is just south of Myanmar, Yangon region.[207]

Section B. Sea Based Sources

Whenever sea based sources of marine pollution are discussed the focus is on the oil that enters the world's oceans from shipping activities. A major oil spill anywhere in the world will attract a great deal of media coverage, with viewers and listeners often given the impression that oil spills occur with more frequency than is supported by the facts. Nevertheless, oil spills are rightly of major concern to all those connected with the sea and with the protection of the marine environment.

In Myanmar, some effects of pollution from sea activities particularly oil spills are highly visible - oil covered wildlife, an oily coastline etc. However, there are also human costs such as the loss of income and livelihood, which should also be highlighted. In addition, tropical ecosystems such as coral reefs and mangroves are

[206]Municipal Government of Myanmar, 2015
[207]Ibid.

also highly vulnerable to pollution. Increasingly, we are also being made aware of other effects of marine pollution the introduction of alien species through ballast water discharges. Sources of sea based marine pollution in Myanmar include vessels, oil platforms, fishing boats, ballast water. The primary causes of sea based marine pollution include accidents, operational or intentional discharge and dumping at sea of wastes from land. Most of pollution incidents are caused by human error which led to accidents. Myanmar has a major responsibility to marine pollution from sea based activities but still need to make national law of enforcement concerning with marine environmental law such as MARPOL convention and OPRC.[208]

Paragraph 1. Oil Pollution

Myanmar currently has nine ports along the western and southeastern coast of the country, namely: Yangon, Sittwe, Kyaukphyu, Thandwe, Dawei, Myeik and Kawthaung. In addition, Myanmar International Terminals Thilawa is a private multi-purpose container terminal owned and operated by Hutchinson Port Holdings. Port and shipping operations are inherently hazardous to the marine environment. There has been no significant pollution incident recorded at the major ports.[209]

The main sources of oil pollution are petroleum or its fractions originating from transportation, offshore production and natural sources such as marine seeps and erosion of sediments. Additionally, oil gets deposited from incomplete combustion process and refineries. The estimate for oil entering the world's marine environment is about 2.4 million tons year, with yearly variations depending on the frequency of oil spills. Sources of oil pollution include natural seeps and anthropogenic sources such as discharges from storage facilities and refineries, discharges and deballasting activities from tankers and other vessels, accidental oil spills and pipeline ruptures.[210]

Today, it has been completed the construction of China Oil terminal in Made Island, Kyaukphyu, Rakhine region since 2013. This tanker port was built up by joint venture between China National Petroleum Corporation and the Ministry of Energy. The port is designed to accommodate oil tankers of 300,000-deadweight tonnage. Sooner or later, ships coming into Kyaukpyu along Rakhine coast will be Very Large Crude Oil

[208]Yangon River Oil Spill Contingency Plan, Department of Marine Administration of Myanmar, 2017.
[209]Dr. Kyaw Naing, National Report of Myanmar on the Coastal Pollution Loading and Water Quality Criteria, p 6.
[210]Department of Marine Administration of Myanmar

Carriers and Ultra Large Carriers Oil Carriers. Hundred thousand of persisted oil will be carried on board. Shipping casualty can happen at any time due to collision, grounding, fire or explosion, mechanical or hull failure, influenced by weather phenomenon as well as by posting maritime security threats. It is foreseeable that not only seaports but also special economic zones would also bring multifaceted environmental problems that have to be borne by Myanmar people especially living around the coast.[211]

In connection with this port, there are two pipelines laid down from Myanmar to China; one is for gas and already in operation, another parallel oil pipeline in order for transporting to China. Myanmar- China oil pipelines is planned to carry 22 million tons of oil annually, according to China National Petroleum Corporation, which means that almost 2 million tons of persistent oil will be discharged at the port monthly and then it will be transported through the parallel pipeline. Early in 2015, at the end of February, the very first Very Large Crude Oil Carriers tanker carrying about 130,000 tons of crude oil has successfully berthed at the port and unloaded the cargo. In such a way that, 2015 onwards, Myanmar become as an Oil Receiver country in million tons per annum so as oil pollution risk is likely to be significant. The obvious and problematic issue is how to contend with if there were oil pollution occurrence in Myanmar. Ship-source pollution is a contemporary issue on an urgency call.[212]

In Myanmar, Tendency of pollution by shipping transport and ship-port interface operations is inherently risky to the marine environment. Despite the fact, fortunately, there has been no major disastrous pollution incident recorded yet in any port of Myanmar other than that some minor incidents had already happened in Yangon river and off coast of Myanmar as illustrated in Fig.(1). [213]

[211]Ko KoNaing, "Legal Framework for Marine Pollution Prevention in Myanmar", 2016, p. 5.
[212] Ibid.
[213]Department of Marine Administration of Myanmar

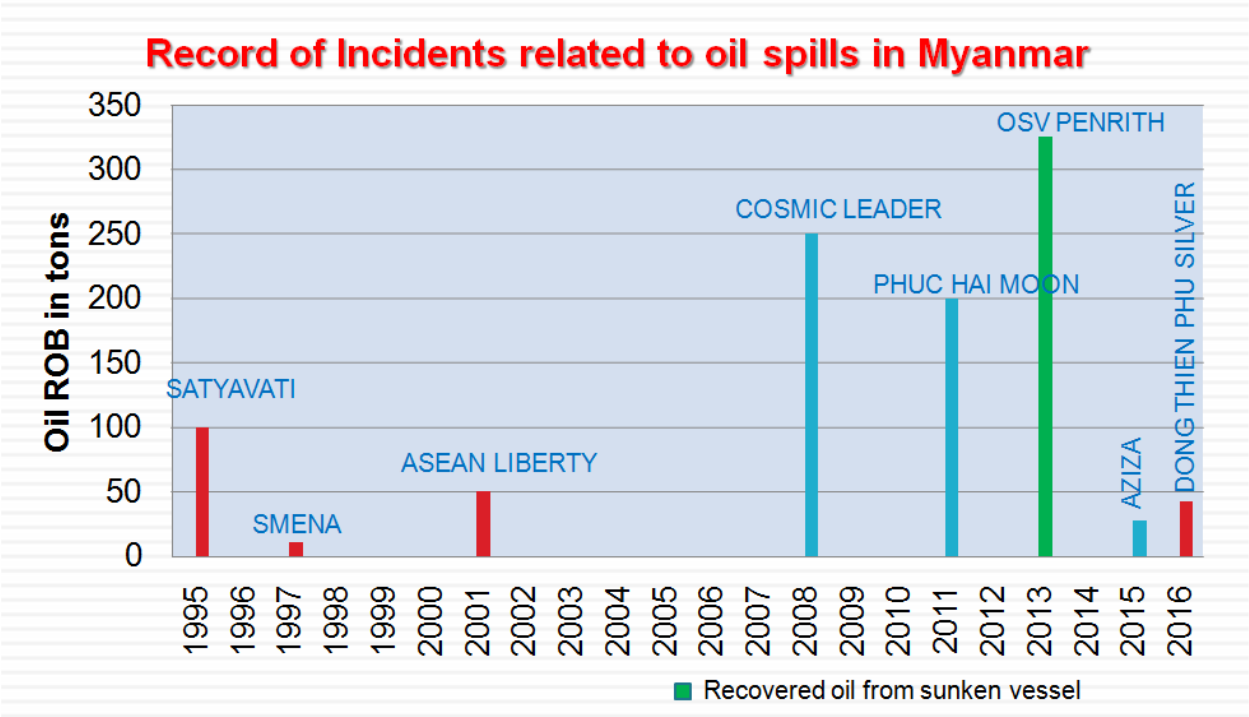

Fig. (1): Record of oil spill incidents occurred in Myanmar waters[214]

Source: Department of Marine Administration

Where regulations on pollution control are difficult to implement on small boats, undoubtedly, oil pollutions from fuel/lubrication oil and bilge water have to be believed as dumping into sea somewhere in Myanmar water. It was reported that off the record over twenty thousands of small sized fishing boats either self-propelled or without engine in various sizes operating in Myanmar coastal waters despite majority is not officially registered due to various reasons.[215] It reflects the considerable obstacles existing in the ship registration system and law enforcement as well as lack of monitoring mechanism. Another issues rebounding from the public were avoiding from annual taxation during the registration procedure that includes a mandatory requirement to produce a Tax Clearance Certificate usually arising in the context of a person applying for fishing vessel license.[216]

Even though very few oil spill accidents had happened in the Yangon River and Myanmar waters nothing about monetary compensation for any single case has ever been recorded.

[214] Record of oil spill accidents in the Fig. (1) was estimated amount based on the remaining bunker fuel on board at the time of incident that magnitude is, by no means, assumed as actually come out from the consequences of sunken or stranded vessels.
[215] Myint Pe, "NATIONAL REPORT OF MYANMAR"
[216] Ko Ko Naing, "Legal Framework for Marine Pollution Prevention in Myanmar", p.53.

There is no evidence left in the history that either a legal action has ever been taken against any polluters or a claimant has been attempted or rewarded from the myth that the polluter pays.[217] Record of oil spill accidents within Yangon area and the off the coast of Myanmar is summarized in Fig. (2).

No.	Date	Vessel	Location	Pollution	Factual
1.	1995 May		Near Yangon pilot station	Estimated 100 tons of heavy fuel oil had been submerged together with the sunken vessel.	1974 built M.V Satyavati collided with M.V Bonanza and capsized quickly in the vicinity of Lanthaya light while approaching to Yangon river.
1.	1995 May	Satyavati	Near Yangon pilot station	Estimated 100 tons of heavy fuel oil had been submerged together with the sunken vessel.	1974 built M.V Satyavati collided with M.V Bonanza and capsized quickly in the vicinity of Lanthaya light while approaching to Yangon river.
2.	1997 November	Smena	Near Yangon pilot station	Estimated 10 tons of heavy fuel oil had been submerged together with the sunken vessel.	The cement carrier M.V Smena sunk near the outer pilot station to the Yangon river. The ship was carrying bagged cement and sailing when it collided with and sank the Ukrainian vessel SMENA off Yangon, Myanmar.
3.	2001 December	Asian Liberty	Yangon river	About 50 tons of heavy fuel oil spilt over the river. The salvage team HNN nominated by the North of England P&I Club had deployed oil booms and spill dispersant about 3,000 litres spread into river.[218]	M.V Asian Liberty sank in Yangon river near Thilawa in December 2011. Nearly 5000 logs carried on board when it went aground on December 29 and hull failure due to stranding after dragging anchor.
4.	2008 May	Cosmic	Thameehla Island,	Estimated amount of 250 tons of heavy fuel oil	MV Cosmic Leader, Panaman-ian flag,

[217] Department of Marine Administration of Myanmar

[218] MyoLwin, (2001), "Salvage team starts work to set the Liberty free", Myanmar Times journal issued on 2-8 July 2001.

		Leader	Hainggyi	spilled into the sea. It was refloated and taken over by Myanma Five Star Line together with the said ship, liability was unquestionably diminished.	Japanese owners, grounded on the reef near Diamond island of Hainggyi region during Cyclone Nargis hit in Myanmar cyclone. It was abandoned by its owner, the Japan-based Eastern Car Liner company and handed over to Myanma Five Star Shipping Line and turned out to be M.V ThameeHla, later.
5.	October 2011	Phuc Hai Moon[219]	Lat. 19˚ 53.6′ N Long. 93˚26.6′E Singaung TaungRakhine coast	Estimated 200 metric tons of heavy fuel oil spilt into the sea.	The bulk carrier, Phuc Hai Moon (IMO 7527198) ran aground off the coast of Rakhine due to rough weather encountered by the effect of
6.	January 2013	OSV Penrith	Lat. 14˚ 29′ N Long. 97˚ 46′ E (Heinze` Bok)	Inevitable some amount of diesel oil might have been released during recovery operation by hot tapping method for about 325 tons from underwater sunken vessel.[220]	Offshore supply vessel (OSV) Penrith, flag of Marshall Islands, owner HALLIN PENRITH LTD., Singapore. The vessel was engaged in Zawtika gas field project works, attending to a project's pipeline at the time of the sinking after hitting a reef, off the west coast of Tanintharyi, Myanmar.
7.	April 2013	M.T Myan Aung	Yangon river (near Thilawa)	It was believed that not more than 5 tons of diesel oil might have been carried on board the capsized vessel.	Myanmar coastal tanker Myan Aung. While the coaster was on the way back to Yangon with ballast condition collided with an out-bound PCC Malacca Highway in

[219] Thaw Ka& Donald Aung, (2010), "Report on the Investigation of the grounded vessel M.V. Phuc Hai Moon", Department of Marine Administration, 22 November 2010.

[220] Htay Win, HtayLwinOo&KoKoNaing, (2013), "Incident Report on OSV Penrith", from the Investigation Report on the sunken vessel OSV Penrith (unpublished).

					Yangon river near Thilawa port. The coaster tanker capsized and drifted to river side and finally sank.
8.	August 2015	Aziza	Mun Aung Island[221]	27 tons of heavy fuel oil and 15 tons Diesel oil remaining on board after the ship was abandoned on the reef by its crew.	Bulker AZIZA, flag of St. Kitts and Nevis, stranded in the west coast of Myanmar. She bound Bangladesh and encountered engine trouble then stranded, on the reef of Mun Aung island.
9.	January 2016	Dong ThienPhu Silver	Near Yangon pilot station	Sunken with 42 tons of Marine Gas Oil (MGO) remaining on board	Vietnamese flagged cement carrier M.V Dong Thien Phu Silver, collided with M.T Ocean Osprey of Jamaican flag, sank near Yangon outer pilot station due to anchor dragging whilst both at anchor.

According our country records, most of oil pollution incidents were caused 61 percent spilled oil by heavy fuel, 35 percent by Diesel and 4 percent by marine gas oil as show in pie chart. Among them, 61 percent of spilled heavy fuel oil is just 0.8 percent of import crude oil transportation.

[221]Thet Htay & Thaw Ka, (2015), "Draft Report on the Investigation of M.V AZIZA Grounding", the Department of Marine Administration, September 2015.

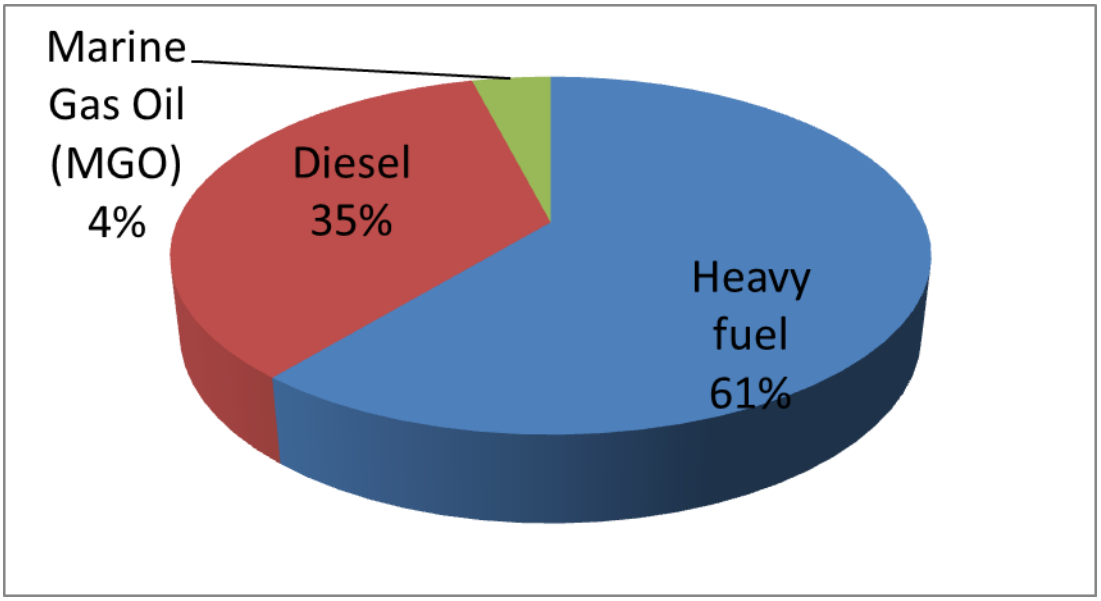

Fig (3) Types of oil spilled in Myanmar

Paragraph 2. Vessel Sources

Marine pollution in Myanmar, which can simply be defined as contamination of the marine with harmful or foreign materials, is categorized under water pollution because it constitutes the largest and the most crucial water body in all region of Myanmar. In case of marine transport in Myanmar, there might not be a clear-cut road, but problems in the form of pollution exist and persist. A substantial development of the Myanmar shipping industry can be expected, the steady increase of international trade in terms of value and volume. The development of ports, terminals and inland waterways, an improved information and communication infrastructure and the improved banking system will all add to this development. The newly formed Shipowners' Associations can help the professionalization process. The number of vessels calling to Yangon Ports is more than 2500 per year and the amount of general cargo trade has developed more than double. Today container throughput has reached over 400 per cent which compared to that of 2006-2016. The international port facilities in Yangon are now up to 18. The rapid economic development will increase trade flows and waterborne transport, growth of international trade, development of infrastructure, growing manufacturing economy and abundance in natural resources. [222]

[222] Department of Myanmar Port Authority of Myanmar

On the other side, Myanmar has been faced the marine environmental impact by ship, but no record to collect data because of there is no sufficient research to make survey these issues and to collect data of marine pollution. But the extent and the ways in which marine pollution by vessel in Myanmar is caused can be explained in-depth in following eight ways that are Ballast Water Pollution, Air Pollution, Noise pollution, Grey Water Pollution, Black water/ Sewage Pollution, Chemical Pollution, Solid Waste Pollution and Oil Pollution/ Bilge Oil Pollution.

In the 2006-07 fiscal years, the number of international trade vessels calling to Myanmar was 1153 whereas that of in 2015-16 reached to 3540. The figures in each fiscal year gradually increased to double the number in the last ten years from 2006 to 2016. Those statistics do not include the quantity of domestic vessels nor fishing vessels.[223]

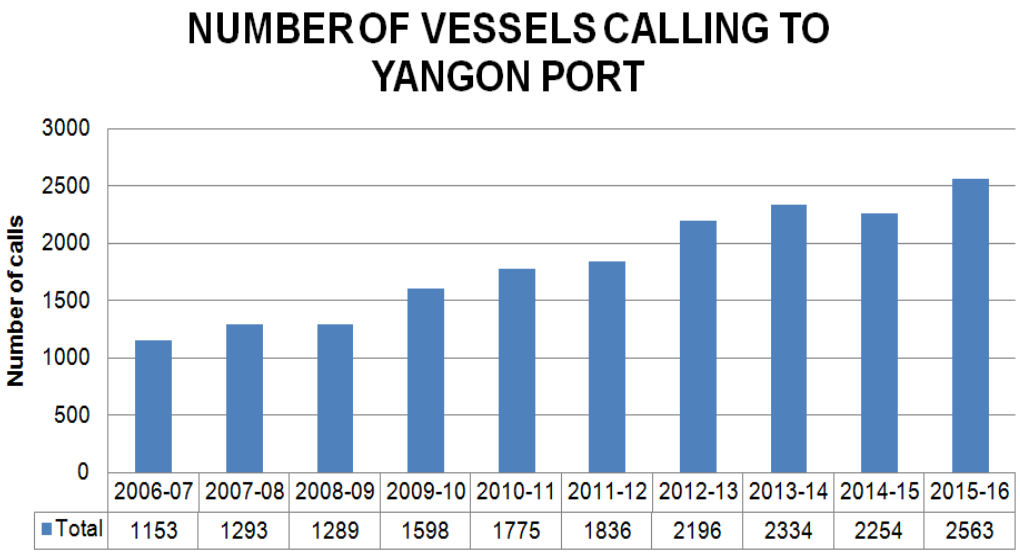

Fig 4: Statistics on number of vessels calling to Yangon port within 2006 and 2016

Source: Myanmar Port Authority

Chapter2

National Legal Framework and Implementation Process for the Protection against Marine Pollution

[223] Ibid.

It is important for Myanmar, like all coastal and port States, to preserve her environment (inclusive of her marine environment) and, in fact, the Constitutional of the Republic of the Union of Myanmar,[224] specifically provides that the Union shall protect and conserve the natural environment, and the Pyidaungsu Hluttaw (Union Parliament) shall have the right to enact laws for the entire or part of the Union related to the minerals, mines, safety of mineworkers, and environmental conservation and restoration.[225] On the other hand, implementation of these laws is the responsibilities of the various ministries.

In addition, in its capacity as a State party to the relevant international conventions, Myanmar is obliged to give full effect to them by ensuring that all legislative and other measures are developed for the protection of her marine environment.

Section A. National and International Legislation

As previous mentioned, Myanmar is a party to a number of international instruments which aim at preserving the marine environment by promoting maritime safety and security and by protecting it from pollution. Recognizing that as a party to these conventions it must fully meet its responsibilities and discharge its obligations under the conventions by putting in place an adequate and effective national legal framework and implementation process for the protection of the marine environment, the Government has introduced policies that clearly emphasize the fact that there is a need for a comprehensive legal and institutional framework for implementing and enforcing these international instruments fully and effectively.

Accordingly, although progress has been to a large extent slow, the Government is in the process of enacting new laws and updating old ones to ensure that it achieves a legal framework that gives full and complete effect to the international conventions to which it is a party.

Paragraph 1. Existing National Legislation

In general, many of Myanmar national maritime laws were promulgated before the World War and as such, have been amended to bring them more in line with modern international maritime laws, since they originally related primarily to merchant

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[224]Constitution of the Republic of the Union of Myanmar 2008, published in September 2008.

[225] Ibid

shipping legislation and focused on safety issues only rather than on maritime pollution.

Except for the Territorial Sea and Maritime Zone Law, which directly addresses the issue of preserving and protecting the marine environment, other existing laws are environmentally related and address the prevention of pollution by industry, agriculture and other sources, but do not directly address the issue of marine pollution.

The Territorial Sea and Maritime Zone Law 2017

The Territorial Sea and Maritime Zone Law 2017[226] provides measures for protection of marine environment, prevention and control of marine pollution. It also endorses conducting scientific research and management of the marine environment.

According to the Territorial Sea and Maritime Zone Law 2017, Myanmar has exclusive jurisdiction to preserve and protect the marine environment and to prevent and control marine pollution in the continental shelf and the exclusive economic zone.

Merchant Shipping Legislation

As far as shipping regulations are concerned there are two main Acts existing in Myanmar. Safety of seagoing vessels falls under the **Merchant Shipping Act**[227] and river crafts under the **Inland Steamed Vessels Law**[228]. In general, many of the Myanmar National Maritime Laws were promulgated before the World Wars and outdated.

Myanmar Merchant Shipping Act

Myanmar Merchant Shipping Act (MSA) is based upon the British Merchant Shipping Act of 1894. The existing Myanmar Merchant Shipping Act has been amended many times as indicated in the list below, which reflects the existing conditions. Hitherto, Myanmar Merchant Shipping Law is extensively revised in line with the provisions of the international maritime instruments, such as SOLAS and its Protocol, and other Safety Conventions. The task has been quite a long time as it was started since 2009 so as it seems to be rather unusual. For the most part there were several amendments made and submitted to the Attorney General's Office during 2012 but the initial attempts failed and bounced back with remarks suggested that it

[226] The Territorial Sea and Maritime Zone Law, 2017
[227] The Burma Merchant Shipping Act, 1923, The Burma Code, vol. VII, pp. 233-360.
[228] The Inland Steamed Vessels Law, 2015

should be rewritten the whole contents of the Act into a new law instead of several amendments being composed. Sighting from the legal framework for the protection of marine environment, nothing in the existing Merchant Shipping Law covers marine pollution essence but just focus on safety issues. The existing Merchant Shipping Law some have been revised and some still seriously need to be amended or revised. For that reason, the legislation process delay offers a room to hesitation issue whether marine pollution law should be added in Merchant Shipping Law or a new Marine Pollution Law should be separately promulgated. The majority of maritime nations prefer the latter pattern around the world.

The Inland Vessels Law

The Inland Steam Vessels Act was wholly revised and abrogated by the new Inland Vessels Law (IVL) which has been promulgated recently in the month of April, 2015. It can be observed that in the Chapter 6 of new IVL, the provisions for the protection of marine environment have been inserted in sections 33, 34 and 35. It is also notable that, in any case, inland water" means only river, canal, lake or other navigable water within the country but it neither goes beyond this limit to coastal water nor extends to sea.[229]Understandably, the new Inland Vessels Law would not cover in case of marine pollution if it happens in Myanmar territorial water, EEZ or continental shelf.

The Myanmar Port Authority Law

The Ports Act, 1908, the Yangon Port Act, 1905 and the Out-ports Act were merged into a single volume after a major modification and renamed as Myanmar Port Authority Law. The Myanmar Port Authority Law has been promulgated since 9 April 2015 and in the meantime the Yangon Port Act and the Out ports Act were revoked. Moreover, the Myanmar Port Authority Law, section 23(b) assigns the authority to carry out the distribution of information and technology, taking precautionary measures not to cause oil spills from vessels, which carry petroleum, oil, chemical plying within the port boundary, or from oil test wells, oil wells and oil pipelines, or from collision and grounding of vessels. If an oil and chemical spill occurs, such authority shall arrange and carry out, in coordination with the experts, for not causing water pollution, learing and sanitation. In doing so, the cost may be claimed from the responsible person in accord with the stipulations. [230]

[229] The Inland Vessels Law, Section 2 (c)
[230] The Myanmar Port Authority Law, Section 23 (c)

From the vantage point of offences and penalties, section 88 stipulates to sentence whomever if convicted under section 80, which is indicative having done to cause water pollution or destruction and loss of resources of the natural environment with two years' imprisonment and/or 20 million kyats. Even a maximum amount of this punishment with less than twenty thousand US$ is that would merit merely to clean up cost for 1 ton of oil spill. On the other hand, notably, there is no provision in the Myanmar Port Authority (MPA) Law that addresses the issue of contravention of the marine pollution regulations. In this regard, it would appear that the drafters did not have in contemplation to detect violations or any contravention of the operational discharge standards. This key point seems to be intentionally left a room for another legislature to fill the loophole.

Environmental related Laws in Myanmar

The environmental management pattern in Myanmar is, largely, sectoral with existing laws relating to environmental management being formulated and administered by the sectoral ministries and departments concerned. There are totalling over 60 laws, rules and regulations relating to environmental matters.[231]

There have been a number of sectoral laws established that have environmental provisions in relation to the prevention of marine pollution and the protection and conservation of natural resources launched as listed in Fig.(5).

Legal Instrument	Objectives
The Water Power Act 1927	To prohibit pollution of public waters for obtaining energy and mining purpose
The Factories Act 1951	To control factories that involve with chemicals, particularly hazardous or toxic chemicals
The Public Health Law 1972	To carry out measures relating to environmental health, such as garbage disposal, use of water for

[231] Finnish Environment Institute (SYKE) & UNDP Myanmar, (2015), "Draft Report on Needs Assessment for Effective Implementation of the Environmental Conservation Law in Myanmar", p.30.

	drinking and other purposes, radioactivity, protection of air from pollution, and food and drug safety.
The Territorial Sea and Maritime Zone Law 1977	To define and determine Myanmar territorial sea and maritime zones, contiguous zone, exclusive economic zone and continental shelf in respect of preservation and protection of marine environment, its resources and prevention of marine pollution.
The Law Relating to Aquaculture 1989; The Law Relating to the Fishing Rights of Foreign Fishing Vessels 1989; The Myanmar Marine Fisheries Law 1990; and The Freshwater Fisheries Law 1991	To provide for further development of fisheries, preventing over fishing, safeguarding and protection of fishing grounds and management of fisheries. These laws prohibit fishing without license, causing water pollution, use of destructive fishing practices and promotion of sustainable use of fishery resources.
Private Industrial Enterprise Law 10/1990	To cause avoidance of or reduction of the use of technical know-how which cause environmental pollution.
The Pesticide Law 1990	To monitor and control the selection, storage, transportation and use of pesticides
The Forest Law 1992	To declare all mangrove forests as protected areas. Fishing within three hundred yards around mangrove area is strictly prohibited.
The Myanmar Pearl Law 1993	To protect and conserve water areas of pearl oyster fishing ground from destruction and oysters from over-fishing
The Myanmar Mines Law 1994	To protect the environmental conservation works that may have detrimental effects due to mining operation. To control safe disposal of waste, tailing and fumes
The Myanmar Investment Commission Notification, 1994	All permitted enterprises shall compulsorily install sewage treatment plant, industrial waste water treatment plant and other pollution control procedures and abide with existing sanitary and health regulations set by the State.

The Ministry of Industry (1) Standing order, 1995	For prevention of pollution and damage to the environment on water and air pollution by waste discharged by factories.
The Fertilizer Law 2002	To support the conservation of soil and environment by utilizing suitable fertilizer
The Conservation of Water Resources and Rivers Law 2006	To conserve and protect the water resources and rivers system for beneficial utilization by the public. It just covers within rivers.
Prevention of Hazard from Chemical and Related Substances Law, 2013	To protect from being damaged the natural environment resources and being hazardous any living beings by chemical and related substances

Fig. (5): Myanmar laws relating to protection of marine environment & conservation of natural resources

National Environmental Policy

The National Environment Policy of Myanmar was proclaimed on 5 December 1994. The government of Myanmar adopted the "National Environment Policy" which resulted from working with United Nations on a national action plan for the environment called "Myanmar Agenda 21".[232] The National Environment Policy adopted by the Government of the Union of Myanmar is as follows:

"The Wealth of a nation is its people, its cultural heritage, its environment and its natural resources. The objective of Myanmar's environment policy is aimed at achieving harmony and balance between these through the integration of environmental considerations into the development process to enhance the quality of the life of all its citizens".

"Every nation has a sovereign right to utilize its natural resources in accordance with its environmental policies, but great care must be taken not to exceed its jurisdiction or infringe upon the interests of other nations. It is the responsibility of the State and every citizen to preserve its natural resources in the interest of present

[232]NCEA, (2009), "Myanmar Agenda 21", National Sustainable Development Strategy for Myanmar (NSDS), National Commission for Environmental Affairs, Ministry of Forestry, 1997. NB: Ministry of Forestry was renamed as Ministry of Natural Resources and Environmental Conservation in 2016.

and future generations. Environmental protection should always be the primary objective in seeking the development."[233]

The formulating of Myanmar Agenda 21 was undertaken by the NCEA and completed in 1997. The main purpose of formulating the agenda is to provide a framework of programmes and action for achieving sustainable development in the country.[234] Building on the National Environment Policy of Myanmar, the Myanmar Agenda 21 takes into account principles contained in the global Agenda 21.

Myanmar Agenda 21 also aims at strengthening and promoting systematic environmental management in the country. The programme areas relating to Myanmar Agenda 21 is the integration of environment and development in decision making; integration of sustainable development concerns into national economic planning and development process; institutionalization of EIA systems and procedures; strengthening of sustainable development information system; strengthening of institutions for environmental management and sustainable development and strengthening of legislation for promoting environmental management and sustainable development. The detailed programmes and activities in Myanmar Agenda 21 have been drawn by the NCEA in collaboration with the government ministries and departments concerned.[235]

Environmental Conservation Law 2012

The Government of the Republic of the Union of Myanmar developed the Environmental Conservation Law using examples of the Environmental Laws of ASEAN countries such as Cambodia, Lao, Malaysia, Thailand and Vietnam. Myanmar Environmental Conservation Law is mostly similar to the Environmental Law (1992) of Thailand. The Environmental Conservation Law was promulgated by Pyidaungsu Hluttaw No. 9/2012 on 30th March 2012. Myanmar Environmental Conservation Law includes 14 Chapters and 42 Articles. Environmental Conservation Law, Section 2(p) defines that Environmental Emergency means "the situation which may affect the safety and health of the public or the environment and ecosystem if natural or man-made disaster or pollution is not taken action immediately".

[233]NCEA (1997), Environmental Stakes Myanmar and Agenda 21, p.13
[234]Ibid, NCEA (1997), p.2
[235]Ibid, NCEA (1997), p.2

According to the definition, "Ministry means the Union Ministry assigned by the Union Government to perform the matters of environment", thus at the outset the Union Government must have assigned a designated Ministry to execute the environmental law, and only after such authorization, the named Ministry would be able to become entitled to do so. [236]

The Union Government shall from the Environmental Conservation Committee with the Union Minister for the Union Ministry assigned by the Union Government as the Chairman and with suitable members to conserve the environment of the Republic of the Union of Myanmar.[237]

The provision relating to the powers of the Committee could be found in Section 6 (a), (c), (f), (g) of the Environmental Conservation Law as follows:

(a) carrying out organization education and activities relating to environmental conservation;

(c) accepting donations, grants, materials and technological aids from local and foreign and managing and using such money, materials and technologies as may be necessary in environmental conservation works;

(f) prohibiting the relevant Government departments and organizations if the environmental damages arises or situations for damage arise and , if necessary, asking policy to the Union Government;

(g) laying down and carrying out the Myanmar national environmental policies and other environmental policies for conservation and enhancement of environment with the approval of the Union Government.

The duties and powers relating to the environmental conservation of the Ministry are as follows:

(a) implementing the environmental conservation policies;
(b) planning and laying down national or regional work plans relating to environmental management;
(c) laying down, carrying out and monitoring programmes for conservation and enhancement of the environment, and for conservation, control and abatement not to cause environmental pollution;

[236]The National Environmental Conservation Law, Section 2(r)
[237] Ibid, Section 4 (a)

(d) prescribing environmental quality standards including standards on emissions, effluents, solid wastes, production procedures, processes and products for conservation and enhancement of environmental quality;

(e) submitting proposals to the Committee for economic incentive mechanisms and terms and conditions which may not affect the environment or cause least environmental affects for sustainable development in addition to legal affairs and guidelines relating to environment;

(f) facilitating for the settlement of environmental disputes and , if necessary, forming bodies to negotiate such disputes;

(g) specifying categories and classes of hazardous wastes generated from the production and use of chemicals or other hazardous substances in carrying out industry, agriculture, mineral production, sanitation and other activities,

(h) prescribing categories of hazardous substances that may affect significantly at present or in the long run on the environment;

(i) promoting and carrying out the establishment of necessary factories and stations for the treatment of solid wastes, effluents and emissions which contain toxic and hazardous substances;

(j) prescribing the terms and conditions relating to effluent treatment in industrial estates and other necessary places and buildings and emissions of machines, vehicles and mechanisms,

(k) negotiating cooperating and implementing in respect of international, regional and bilateral agreements, instruments and programmes relating to matters of environment;

(l) implementing the international, regional and bilateral agreements accepted by Myanmar for environmental conservation and enhancement of environmental quality in accord with the guidance adopted by the Union Government or the Committee,

(m) causing to lay down and carry out a system of environmental impact assessment and social impact assessment as to whether or not a project or activity to be undertaken by any Government department, organization or person may cause a significant impact on the environment;

(n) laying down guidance relation to the management, conservation and enhancement of environment for the matters of protection of ozone layer, conservation of biological diversity, conservation of coastal environment,

mitigation and adaptation of global warming and climate change, combating desertification and management of non-depleting substances and management of other environmental matters;

(o) managing to cause the polluter to compensate for environmental impact, cause to contribute fund by the organizations which obtain benefit from;

(p) the natural environmental service system, cause to contribute a part of the benefit from the businesses which explore, trade and use the natural resources in environmental conservation works;

(q) carrying out other functions and duties assigned by the Union Government relating to environmental conservation.[238]

Section 9 (b) requires that an event of environmental emergency the concerned department shall carry out necessary measures relating to the environmental emergency.

The Ministry may, with the approval of the Union Government and the Committee, stipulate the environmental quality standards such as suitable surface water quality standards in the usage in rivers, streams, canals, springs, marshes, swamps, lakes, reservoirs and other inland water sources of the public; water quality standards for coastal and estuarine areas; underground water quality standards; emissions standards; effluent standards; solid wastes standards; other environmental quality standards stipulated by the Union Government.[239]

The Ministry shall, under the guidance of the Committee, maintain a comprehensive monitoring system and implement by itself or in co-ordination with relevant Government departments and organizations in the following matters:

(a) the use of agro-chemicals which cause to impact on the environmental significantly;

(b) transport, storage, use, treatment and disposal of pollutants and hazardous substances in industries;

(c) disposal of wastes come out from exploration, production and treatment of minerals, industrial mineral raw materials and gems;

(d) carrying out waste disposal and sanitation works;

(e) carrying out development and constructions;

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[238]The Environmental Conservation Law, Article 7

[239] Ibid, Section 10

(f) carrying out other necessary matters relating to environmental pollution.[240]

Section 14 of the Environmental Conservation Law provided that, a person causing a point source of pollution shall treat, emit, discharge and deposit the substances which cause pollution in the environment in accord with stipulated environmental quality standards.

The owner or occupier of any business, material or place which causes a point source of pollution shall install or use an onsite facility or controlling equipment in order to monitor, control, manage, reduce or eliminate environmental pollution. If it is impracticable, it shall be arranged to dispose the wastes in accord with environmentally sound methods.[241]

The Ministry may, with the approval of the Union Government, stipulate the categories of business; work-site or factory, workshop which may cause impact on the environmental quality that requires obtaining the prior permission.[242] The holder of the prior permission shall effect insurance according to the category of his business, work-site or factory, workshop for any accident that may cause impact on the environment, in accord with the existing law.[243]

In the context of offences and penalties under chapter XIII, section 32[244] of the Environmental Conservation Law stipulates that "whoever violates any prohibition contained in the rules, notifications, orders, directives and procedures issued under this Law shall, on conviction, be punished with imprisonment for a term not exceeding one year, or with fine, or with both", thereby violation means any infringement to the subsidiary instruments, such as, rules, notifications or procedures which would have been issued under the Law. Thus far, majority of those secondary legislations have yet to come out. As long as such orders or directives do not appear to public by gazette, any act so as to cause any pollution to marine environment may not be catalogued as a conviction to be punishable with imprisonment or fine.

Myanmar provided Mother Law that is the State Constitution 2008 contained provisions relating to the environmental affairs. Besides, the Environmental Conservation Law was provided by the Pyidaungsu Hluttaw Law No. 9/2012 on 30th

[240] The Environmental Conservation Law, Section 13
[241] Ibid, Section 15
[242] Ibid, Section 21
[243] Ibid, Section 26
[244] The Environmental Conservation Law, Section 32

March 2012. In addition, Environmental Conservation Rule was regulated 0n 5 June 2014 to determine environmental quality standard for any area or urban or rural area, river, stream, lake or any point of them; to carry out waste treatment by establishment of own facility or center or collective facility; to determine the period to establish waste treatment facilities or plants which are responsible to establish their own or collective waste treatment facility or plant. Those laws and regulations need to consistent with the international conventions and agreements to which Myanmar is a party.

Natural Disaster Management Law, 2013

Addressing the preparedness for emergency management, under National Natural Disaster Management Law 2013, section 2(b) states that "Natural disaster means the destructions to the life and property, livelihood, infrastructures, safety education and health of the public or to the environment due to natural or man-made accidents or dangers caused by industrial, chemical or nuclear accidents, oil spills or leakage of natural gas".

Furthermore, according to Section 15(a) of the National Natural Disaster Management Law, 2013, preparatory measures must be organized before natural disaster in the area where is likely to strike natural disaster must include to identifying the area where is likely to strike natural disaster and preparing the natural disaster risk assessment and planning emergency management.

Yangon City Development Law

The Waste Management Organizations are the City Development Committees of Naypyitaw, Yangon and Mandalay, and in other parts of the country in Myanmar. The objectives of the Waste Management Organizations are to reduce the amount of waste ends up in land fill, to reduce the burden of the waste deposal, to provide natural fertilizer for farmers with low cost, to reduce the impact of Chemical Fertilizer.[245]

One of the most prominent landmarks in Naypitaw is the City Hall with the same name, in which the Naypyitaw Development Committee has its headquarters. The committee undertakes tasks for the development of Naypitaw. During important state occasions, the National Anthem of Myanmar is played by the State Orchestra in the

[245] http://www.uncrd.or.jp/content/documents/RT/Myanmar.

Naypitaw City Hall. That is indicative of the status of Naypitaw as the administrative City of the Union of Myanmar.[246]

Yangon City Development Committee (YCDC) is the administrative body of Yangon, the largest city and former capital of Myanmar. It consists of 20 departments, with headquarters in the Yangon City Hall.[247]

The Yangon City Development Law was adopted on 8 October 2013 by Yangon Region Hluttaw, Law No. 6/2013. With regard to functions of the Committee, Section 11 sub-section (i) and (k) of the 2013 Yangon City Development Law provides that the Committee shall lay down the policy, give directions, supervise and carry out in respect of the following functions and duties:

(i) conservation of environment and management of rubbish;

(k) carrying out and directing the standard, specification and qualification of environment, including standard and specification of process and product, manufacturing methods of product, emission, effluent and solid waste for maintaining and promoting the environmental qualification of Yangon City.

Section 19 sub-section (d) and (e) of the 2013 Yangon City Development Law prescribes that the Committee shall perform the following duties in respect of construction of buildings, drains and roads within the city boundary:

(g) order to construct or repair the gutter, drain pipe, drain not to ruin the public roads and other places because of the drainage water come from factories, work places, buildings and above ground and to make good current;

(h) the Committee may has the right to dispose of all or part of drainage water from its owned drain into the Yangon river, Hlaing river, Bago river and Nga MoeYake stream and may dispose of such drainage water at any in or outside of the City boundary.

The committee shall perform the permit to carry out with stipulation after coordinating with the relevant departments and organizations to collect the rubbish,

[246] http://www.myanmarecotours.com/the -city-hall-naypitaw.
[247] http://www.ycdc.gov.mm.

discarded materials, dirty and loathe things in respect of conservation of environment and sanitation within the City boundary.[248]

Relating to distribution of water and cleaning of cesspit, Section 25 sub-section (g), (h) and (i) of the 2013, Yangon City Development Law provides that the Committee shall perform the following functions and duties:

(g) managing the business of cesspit and purifying the polluted water;

(h) order to keep flush toilet, flow toilet, cesspit pipe and cesspit tank in the factory, workshop, building and land;

(i) order to close or destroy or renovate flush toilet, flow toilet, cesspit pipe and cesspit tank which have not permission or are not conformity with the stipulation included in the permission.

No one shall dispose of or cause to flow the water from factory, workshop, and economic business into drains and rivers and streams without purifying in accord with the specific standard by the committee.[249]

Whoever violates or fail to oblige the provision contained in this law, shall, on conviction be punished with imprisonment for a term which may extend to 1 year or be punished with a fine from a minimum of Kyats 10,000 to maximum of kyats 500,000 or with both.[250]

Whoever has, on conviction, been punished under sections 68 continue to violate or fail to oblige such provision of this law, he shall be punished for each day with fine from a minimum of Kyats 10,000 to a maximum of Kyats 500,000 or with imprisonment for a term which may extend to 1 year.[251]

Whoever violates or fail to oblige the prohibitions included in rules issued under this law, shall. on conviction be punished with imprisonment for a term which may extend to 6 months or be punished with a fine from a minimum of Kyats 10,000m to a maximum of Kyats 400,000 or with both.[252]

Whoever has, on conviction, been punished under sections 70 continue to violate or fail to oblige prohibitions included in rules issued under this law, he shall be punished

[248] The Yangon City Development Law, Section 22 sub-section (e)
[249] Ibid, Section 62 sub-section (f)
[250] The Yangon City Development Law, Section 68
[251] Ibid, Section 69
[252] Ibid, Section 70

for each day with fine from a minimum of Kyats 10,000 to a maximum of Kyats 500,000 or with imprisonment for a term which may extend to 6 months.[253]

Whoever violates or fail to oblige the prohibitions included in orders issued by the committee under this law, shall, on conviction be punished with imprisonment for a term which may extend to 3 months or be punished with a fine from a minimum of Kyats 10,000 to a maximum of Kyats 300,000 or with both.[254]

Whoever has, on conviction, been punished under sections 70 continue toviolate or fail to oblige prohibitions included in orders issued by the committee under this law, he shall be punished for each day with fine from a minimum of Kyats 10,000to a maximum of Kyats 50,000 or with imprisonment for a term which may extend to 3 months.[255]

The Mandalay City Development Committee undertaking the various city development activities is constituted of seven members. Projects are being carried out in all sectors with the three objectives namely:

(l) to make the city clean;

(2) to keep the city beautiful;

(3) to enable the city dwellers.

In the studying of the recycling and composting in Yangon City, some materials such as paper, plastic, glass etc., are collected separately from municipal waste and recycled. Besides, many small sized paper mills, glass factories, plastic industries and so on are, producing recycled products.

It is highly encountered that the issues and problems are at present recycling of municipal solid waste is not fully and systematically developed; the budget allocation covers only for routine works; additional financial supports are needed to fulfill advanced and sufficient facilities in fact, City Development Committees and Township Development Committees are struggling against damping waste disposal amongst constraints of inadequate vehicles, workers and scarce funds.

In the studying of local news of Myanmar, only 20 percent of the factories in Myanmar are adhering to the water treatment standards. Wastewater can have harmful

[253] Ibid, Section 71
[254] Ibid, Section 72
[255] Ibid, Section 73

health effects. The State Government is conducting surveys with the help of WHO to find out how to treat the wastewater properly. The seventeen countries including Myanmar have reported about their own wastewater treatment systems and standards to WHO and UNICEF (United Nations Children's Fund) in late 2013. Breweries are the major violators of the regulations. The chair of Hlaing Tharyar Industrial Zone management committee, said that although they are routinely conducting inspections on water treatment, bad smells caused by wastewater are still prevalent and that the factories in the zone need systematic treatment technologies. Yangon City a Development Committee (YCDC) conducted the last citywide inspection on water treatment standards in 2012 in which only 39 factories were reported to have meet all the criteria. A total of 167 factories were found to be disposing wastewater in the designated area but failing to comply with all the rules and 3,054 factories were found to be disposing wastewater irresponsibly. The committee is also getting help from water experts and water treatment focused international companies to upgrade the water treatment technologies and practices of industries.

Paragraph 2. Ratified International Convention

The International Maritime Organization (IMO) which is the international regulatory body for marine matters in regard to the protection of the marine environment was formed in 1948 in Geneva and first met in 1959. The IMO's main task has been to develop and maintain a comprehensive regulatory framework for shipping and its remit includes safety, environmental concerns, legal matters, technical co-operation, maritime security and the efficiency of shipping. The IMO has adopted various marine pollution conventions, which provide maritime nations which the necessary guidelines to promote their maritime activities at internationally acceptable standards. The Union of Myanmar as a maritime nation, has adopted, the following conventions:

- The United Nations Convention on the Law of the Sea (UNCLOS 1982)
- The International Convention for the Prevention of Pollution from Ships, 1973 as modified by the protocol of 1978 (MARPOL 73/78) (Annex I, II, III, IV, V,)
- The International Convention on Oil Pollution Preparedness, Response and Co-operation 1990
- The International Convention on Civil Liability for Oil Pollution Damage (CLC 1969)

Myanmar became a Contracting Party to UNCLOS on 20thJune 1996, following its formal lodgement of the instrument of ratification with the Secretary General of the United Nations after its signature on 10th December 1982.

Myanmar has also ratified the International Convention for the Prevention of Pollution from Ships, (MARPOL 73/78) (Annex I & II**)** on 4th August 1988 and Annex III, IV & V on 5th July 2016respectively.

The International Convention on Oil Pollution Preparedness, Response and Co-operation (1990) has been enforced in Myanmar since 15 March 2017 and the International Convention on Civil Liability for Oil Pollution Damage (CLC 1969) on 12 July 2017.

Section B. Implementation Process and Response for Protection of Marine Pollution after Ratifying the International Conventions

Regional initiatives play a crucial role in ocean governance and hence UNCLOS 1982 has put considerable importance on regional initiatives for the prevention, reduction and control of marine pollution.[256]

The national legal framework of Myanmar which provides for the prevention and preservation of marine environment is manifestly poor. Although Myanmar has ratified several international conventions related to the prevention of marine pollution, so far there is no comprehensive domestic legislation that deals with marine pollution.

Paragraph 1. Implementation Process

Myanmar has ratified many of the International Conventions relating to the protection of the environment and in particular relating to the marine environment. In this regard, as mentioned above, Myanmar has signed the United Nations Convention on the Law of the Sea in 1982.With regard to the marine pollution prevention instruments of IMO, Myanmar is a party to several IMO conventions and among others, these include, MARPOL with Annex I, II, III, IV and V and OPRC and CLC. However, Myanmar has not enacted any enabling legislation to give effect to any of these Conventions this is because under the legislative system in Myanmar, after the adoption of a convention, it does not become law, automatically. The responsible department has to translate such a convention into domestic legislation of Myanmar in

[256] Ibid, UNCLOS, Article 192

order for it to come into force. With regard to maritime conventions, in particular the MARPOL Convention, the Department of Marine Administration is the responsible authority, which has to deal which incorporating MARPOL into Myanmar's domestic legislation.

In order to enact domestic legislation, the following procedures need to be followed by the Department of Marine Administration:

1. The Administration will discuss the MARPOL Convention and sent it to the Ministry of Transport and Communications.
2. The representatives of both the Administration and the Ministry will form a working group and discuss MARPOL 73/78.
3. The working group will draft a Bill and send it to the Attorney General.
4. After the Attorney General has perused the draft Bill he will send it back to the working group.
5. The working group will incorporate the relevant comments and send the reviewed draft Bill back to the Attorney General.
6. The working group will also send the reviewed draft Bill to the President's office.
7. The working group will send the draft Bill to the Union of Government if it is approved by the President's office.
8. If the Bill is approved by the Union Government then it will be signed the Bill.
9. Once the Bill is signed it comes into force on the date specified by the Government of the Union of Myanmar and is published in the official gazette.

The under mentioned is the draft Bill for the prevention of pollution from ships, based on MARPOL 73/78 which has been ratified by Myanmar.

THE REPUBLIC OF THE UNION OF MYANMAR

PREVENTION OF POLLUTION FROM SHIPS LAW ( )

Pyidaungsu Hluttaw Law No. /2017

The Day of ----------, 1379 ME

(----------, 2017)

CHAPTER - I

Title and Definition

1. This Law shall be called the Prevention of Pollution from Ships Law.

2. The following expressions contained in this law shall have the meanings given hereunder:

(a) **Union** means the Republic of the Union of Myanmar.

(b) **Government** means Union Government of the Republic of the Union of Myanmar.

(c) **The Ministry** means Ministry of Transport and Communications of the Union of Myanmar.

(d) **Department** means Department of Marine Administration.

(e) **"Convention"** means the International Convention for the Prevention of Pollution from Ships, 1973, as amended by the Protocol of 1978 adopted by the Inter-Governmental Maritime Consultative Organization ("IMCO") in London on 17 February 1978, and set out in the Schedule;

(f) "**Protocol of 1978"** means the Protocol relating to the Convention of 1973 which constitutes attachment 2 to the final act of the International Conference on Tanker Safety and Pollution Prevention signed in London on 17th February 1978;

(g) "**Exclusive economic zone**" means the exclusive economic zone referred to in section 7 of the Maritime Zones Act, 1994 (Act No. 15 of 1994);

(h) "**Territorial waters**" means the territorial waters referred to in section 4 of the Maritime Zones Act, 1994 (Act No. 15 of 1994);

(i) "**In packaged form**" means in an individual package or receptacle including a freight container or a portable tank or tank container or tank vehicle or ship borne barge or other cargo unit containing harmful substances for shipment

(j) "**Marine pollutant**" means a substance which is identified as a marine pollutant in the International Maritime Dangerous Goods Code

published by the International Maritime Organization, as amended from time to time;

CHAPTER – II

Objectives

3. The objectives of this law are as follows:

(b) For the purpose of any provision of this Act relating to the discharge of oil, oily mixture, refuse, garbage, waste matter, plastics, marine pollutant in packaged form, noxious liquid substance or trade effluent from a ship, any floating craft other than a ship which is attached to a ship shall be treated under the Prevention of Pollution of the Sea Act as part of the ship.

CHAPTER – III

Application

4. (a) Application and interpretation of Convention.

(1) Subject to the provisions of this Act, the Convention shall have effect in relation to-

(a) any Myanmar Ship, wherever it may be, and

(b) any other ship while it is in the Republic or its territorial waters or exclusive economic zone

(b) Unless the context indicates otherwise, a reference in the Convention-

(1) to a State Party shall be construed as, or as including, a reference to the Union, and any reference to a Party shall be construed accordingly;

(2) to the Administration Government or Department shall, in relation to a Myanmar ship, be construed as, or as including, a reference to the Department or any person acting on its authority.

CHAPTER – IV

Force of Law of Convention and Protocol

5. According to the notification contained in Section 6 which conforms to the Convention or Protocol established by the Ministry with the confirmation of the Government, the following provisions shall, as parts of this Act, have the force of law; the provisions contained in the Convention in Table 1, in the Protocol in Table 2, in Annex I in Tables 3, in Annex II in Tables 4, in Annex III in Tables 5, in Annex IV in Tables 6 and in Annex V in Tables 7.

CHAPTER - V

Obligations

6. The Parties to the present Protocol undertake to give effect to the provisions of:

(a) the present Protocol and the Annex hereto which shall constitute an integral part of the present Protocol; and the International Convention for the Prevention of Pollution from Ships, 1973 (hereinafter referred to as "the Convention") subject to the modifications and additions set out in the present Protocol.

7. (a) The Minister may make regulations-

(1) relating to the carrying out of, and giving effect to, the provisions of the Convention;

(2) whereby exemption is granted, with or without conditions, in respect of particular ships or ships of a particular class or type, from all or any of the provisions of the Convention;

(3) applying, subject to such exemptions, restrictions and modifications as may be desirable, any provision of the Convention to ships to which and in circumstances in which the Convention does not apply;

(4) prescribing fees, and providing for the recovery of expenditure incurred, in connection with the application of the Convention, and

(5) prescribe, for any contravention thereof failure to comply therewith, penalties ranging from fines of a minimum of kyats 500,000 to a maximum of kyats 500,000, imprisonment ranging from a minimum of (2) years to a maximum of (5) years or both fines and imprisonment.

Chapter (VI)

Offences and Penalties

8. (a) Offences and penalties.—

(1) Any person who contravenes any provision of this Act or the Convention or who fails to comply with any provision, thereof with which it is his or her duty to comply, shall be guilty of an offence.

(2) The failure to carry an oil record book or cargo record book on board a ship shall be construed as an offence and the person at fault shall be liable on conviction to a fine not exceeding kyats 500,000.

(3) Any person who fails to comply with any of the regulations regarding entries to be made in any oil record book or cargo record shall be guilty of an offence and shall be liable on conviction to a fine not exceeding kyats 500,000.

(4) Any person who makes an entry in any oil record book or cargo record book carried or any record which is to his knowledge false or misleading in any material particular shall be guilty of an offence and shall be liable on conviction to a fine not exceeding kyats 1,000,000 or to imprisonment for a term not exceeding 1 years or to both.

(5) Failure to comply with any provisions of this Act regarding the holding during transit of a ship, of an international certificate relating to the prevention of marine pollution shall be construed as an offence, and the person guilty of the offence shall be liable to a fine of kyats 500,000 or to imprisonment not exceeding 2 years or to both.

(6) If any ship is detained and the ship proceeds to sea before it is released by the Department any person who sends the ship to sea shall be guilty of an offence and shall be liable on conviction to a fine not exceeding kyats 1,000,000 or to imprisonment for a term not exceeding 2 years or to both.

(7) Any discharge of oil or oil mixture into Myanmar water from the ship or from land without permission shall be construed as an offence and the person guilty of the offence shall be liable to a fine not exceeding kyats 2,000,000 to imprisonment not exceeding 2 years or to both.

(8) Any discharge of oil or oil mixture from any ship into the sea or into Myanmar water shall be construed as an offence and the person guilty of the offence shall be liable for each offence to a fine nor exceeding kyats 2,000,000 or to imprisonment not exceeding 2 years or to both.

(9) Any discharge into Myanmar waters of noxious liquid substances transported by a cargo ship shall be construed as an offence and the person guilty of the offence shall be liable for each offence to a fine not exceeding kyats 2,000,000 or to imprisonment not exceeding 2 years or to both.

(10) Any discharge into Myanmar waters of waste matter, refuse, seepage from waste matter, plastics on other packing material likely to pollute the sea, being transported by any ship shall be construed as an offence and the person guilty of the offence shall be liable for each offence to a fine not exceeding kyats 1,000,000 or to imprisonment not exceeding1 year or to both.

(11) Any discharge into Myanmar waters of hazardous chemical packaging material liable to cause maritime pollution, being transported by any ship shall be construed as an offence and the person guilty of the offence shall be liable for each offence to a fine not exceeding kyats1, 000,000 or to imprisonment not exceeding 1 year or to both.

(12) Failure of any person to abide by the regulations regarding reception facilities for ships for the disposal of waste material prescribed in this Act, is an offence and such person shall be liable for each offence to a fine of 1,000,000 or to imprisonment not exceeding 1 year or to both.

(13) In order to ensure the smooth performance of inspections carried out under this Act by the Department or any authorized person, the required assistance, supporting item sand relevant data of the ship must be provided. If the failure to do so should be construed as an offence, the person guilty of the offence shall be liable to a fine not exceeding kyats 1,000,000 or to imprisonment not exceeding 1 year or to both.

(b) In instituting legal proceedings under section 8 sub-sections (a), there must be firm, irrefutable evidence that an offence of discharge has taken place. If it can be shown that the said discharge is as described in the provisions of this Act, defence proceedings may be instituted.

(c) If evidence can distinctly show that the provisions of this Act have been complied with, it shall not be construed as an offence under Section 8, sub-section (a).

(d) If any person admits to the Department that he has contravened or failed to comply with any prevision of this Act and agrees to abide by the decision of the Department, the Department may, after such enquiry as it deems necessary, determine the matter summarily and may, without legal proceeding, order him to pay to the Department by way of penalty the whole or any part of the fine.

(e) If there is any dissatisfaction with an order of the Department on appeal may be submitted to the Ministry within three months from the date of issue of the order.

(f) In accordance with section 8, sub-section (d), if upon taking action and investigating, it is found that an offence has not been committed it shall be deemed not to be an offence and no further prosecution may be instituted.

Part VII
Jurisdiction

9 (a) Any offence contemplated in section 8 sub-section (a) shall, for purposes in relation to jurisdiction of a court to try the offence be deemed to have been committed within the area of jurisdiction of the court in which the prosecution is instituted.

(b) Notwithstanding anything to the contrary contained in any law, a magistrate's court shall have jurisdiction to impose any penalty prescribed by this Act.

Part VIII
Miscellaneous

10. In the event that anything in this Act which is written in the Myanmar language is in contravention to a provision written in the English Language contain that in an Annex to the Act, the English version shall prevail.

11. Notwithstanding any provision contained in existing Laws, all matters related to the provisions of the Convention, Protocol and Annexes, contained in Tables (1) to (7) must be duly implemented in accordance with this Act.

12. Not withstanding that a provision is contained in any existing law, if the said provision is in contravention to or differs from any such provision contained in this Act, the provision contained in this Act shall prevail.

13. If a provision in the by-laws enacted under this Act, deal with a matter similar to that contained in a provision of the Convention, only the provisions contained in the bylaws shall be implemented.

14. In implementing the provisions under this Law:

(a) The Ministry, with the approval of the Union government, can promulgate necessary by-laws, and rules and regulations.

(b) The Ministry can promulgate necessary orders, rules and regulations; notices; and directives. The Department can post orders and directives.

Htin Kyaw
President
Republic of the Union of Myanmar

There are always problems with the reduced number of ratifications of international conventions by States. The effectiveness of international legal framework depends on the number of States that implement the framework in it national laws. It requires cooperation amongst the Member States. Certainly, conventions such as MARPOL require technical equipment and established facilities, as well as the implementation of specific standards during ship construction. Developing States would require economic as well as technical assistance and expertise to put in place the required system and for its effective functioning.

The Myanmar legal framework for marine pollution prevention falls short, and lacks comprehensiveness. Myanmar is a party to MARPOL but it has not yet incorporated these conventions into domestic law in a comprehensive manner. The general obligations are provided in different pieces of legislations, but they do not address all the international obligations. A reason for these shortcomings may be lack of priority for maritime issues in the country. Furthermore, there is inadequate capacity and resources for updating the existing legislations and for establishing expensive technical standards such as reception facilities required by Conventions.

Paragraph 2. Preparing and Response for Protection of Marine Pollution

Regional Cooperation and development of the ASEAN OSRAP MOU

The International Maritime Organization (IMO) is the body responsible for handling all aspects of safe shipping on a worldwide scale, including protection of seas from oil pollution. The Global Initiative (GI) programme is a partnership between the IMO and the International Petroleum Industry Environment Conservation Association (IPIECA) to strengthen global oil spill preparedness and response capability and to promote ratification and implementation of the relevant international conventions. The Global Initiative for South East Asia (GISEA) was launched in March 2013 with the aim of assisting in the development of the national, sub regional and regional capabilities in oil spill preparedness and response in the ASEAN (Association of Southeast Asian Nations) region. The establishment of a Regional Cooperative Mechanism for Oil Spill Preparedness and Response in the Southeast Asian region is close to realization. The final text of the MOU was finally agreed at the 28th Association of Southeast Asian Nations Maritime Transport Working Group (ASEAN MTWG) meeting in Siem Reap, Cambodia. It was signed during the 20th ASEAN Transport Ministers (ATM) Meeting on the 28th of November 2014, Myanmar. The

MOU is based on the International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC 1990), particularly articles 5, 6, 7, and 10.[257]

The development of a Regional Oil Spill Contingency Plan (ROSCP) is an integral commitment of the ASEAN member countries in the MOU. There are also a number of sub regional and bilateral agreements in place among the ASEAN member countries. Some of these have been in place for a number of years but rarely updated and their status remain unclear. Now that the ASEAN OSRAP MOU is in force, these agreements need to be revisited so it integrates with the ROSCP.

Memorandum of Understanding on Port State Control in the Indian Ocean

Myanmar is also a party to the Memorandum of Understanding on Port State Control in the Indian Ocean Region. However there is no law to implement Indian Ocean Memorandum of Understanding requirements in Myanmar yet. Hence, there are no standards within Myanmar to conduct port State inspections required by the Indian Ocean Memorandum of Understanding.

In Myanmar, the Department of Marine Administration is the specialized executive body of the Government responsible for the implementation and enforcement of the regulatory functions embodied in the National Maritime Legislation because of its experts. The Department of Marine Administration which is authorized to inspect foreign ships, gives effect to the provisions on inspections which are similar to international procedures under the guidelines of the International Maritime Organization for the control of ships.

The Department has the power to inspect the certificates of the ships and the physical conditions of foreign ships in assure the safety of ships, the safety of life on-board the vessel and environmental protection. Section 224 of the Myanmar Merchant Shipping Act stipulates that “Inspection of ships not registered in the Union of Myanmar” is the responsibility of the port State control of Myanmar. The function of the port State control has been exercised in Myanmar for many years. In addition, Myanmar has established particular requirements for the prevention, reduction and control of pollution of the marine environment as a condition for the entry of foreign vessels into Myanmar ports or internal waters.

However, the mechanism to control the entry of ports when there is non-compliance with the International requirements is not clear in the Laws. The Laws are silent on powers of the Myanmar authorities in this regard.

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[257]Ministry of Transport and Communications of Myanmar

Regional and National Oil Spill Contingency Plan for Marine Pollution in Myanmar

Myanmar has signed the International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 in December 2016 and therefore the Department of Marine Administration envisages that would encourage national organizations and maritime stakeholders including oil and gas industries to implement effectively and fulfill the requirements of the Convention with strong commitment.

Under the OPRC Convention, ships are required to carry a shipboard oil pollution emergency plan and to report incidents of pollution to coastal authorities. The OPRC Convention, 1990 facilitates international co-operation and mutual assistance in preparing for and responding to a major oil pollution incident and further encourages States to develop and maintain an adequate capability to deal with oil pollution emergencies.

The Department of Marine Administration has already finalized the Yangon River Oil Spill Contingency Plan, and the Myanmar Port Authority (MPA) will implement the plan area along the Yangon River, the Myanmar Port Authority is ultimately responsible for government port facility operations and to develop and maintain an oil spill contingency plan covering all port facilities along the Yangon river.[258]

Myanmar Port Authority has an obligation to plan, maintain and initiate oil spill response action up to Tier 2 spill that occur within Port limits, or that occur outside Port limits but which may impact on port operations. Myanmar Port Authority also has an obligation to have in place arrangements for the combating of a spill that may exceed Tier 1 response or will affect areas outside the Port limits.[259]

The Yangon Oil Spill Contingency Plan has been prepared as required by the Government, to be consistent with the National Oil Spill Contingency Plan (NOSCP), is the State plan for the response to an oil spill of any size. Whilst the Yangon Oil Spill Contingency Plan has been prepared for a response to a Tier 1 and Tier 2 oil spill the National Oil Spill Contingency Plan may be activated if the size of the spill is assessed at greater than that of Tier 1 and 2 or the spill is outside the Port limits.[260]

[258]Department of Marine Administration of Myanmar
[259]The Yangon Oil Spill Contingency Plan
[260]Department of Marine Administration of Myanmar

Activation of the National Oil Spill Contingency Plan, and hence mobilization of the associated resource, will be initiated by the National Incident Commander (NIC) hence the need for the Yangon Port Incident Commander to ensure that the NIC is informed of any incident and regularly updated on the incident response progression.[261]

Myanmar Port Authority is responsible for overall management of all emergency situations within Yangon Port Limits, including oil spills. Myanmar Port Authority shall designate a Yangon Ports Incident Commander (YPIC) for spill responses, area coordinator for liaising with Emergency Response Teams, and corresponding governmental organizations where necessary, during an oil spill.[262]

Myanmar Port Authority shall appoint a person who is leading as On Scene Commander (OSC) for Emergency Response Team (ERT) in order for combating oil spills; he could be a pilot or a tug master depending upon the nature of the oil spill, its type and extent.

Upon receipt of a report of actual or threatened acute pollution, the Myanmar Port Authority or Yangon Port Incident Commander shall notify the Department of Marine Administration or National Incident Commander and the Myanmar Maritime Police immediately.[263]

Yangon Ports Incident Commander (YPIC) is the person in charge of all field operations undertaken in respect of a marine oil spills within Yangon Ports. Myanmar Port Authority shall determine strategies and equipment's to be used and may direct all staffs and contractors involved in field operations. [264]

Myanmar Port Authority is also responsible for the collection and interpretation of required data such as weather, tides, currents, topography, shoreline character, environmental sensitivity data, spilled oil data, community issues and the actions need to be taken. Myanmar Port Authority shall be concerned in determining the level of

[261]Ibid
[262]The Yangon Oil Spill Contingency Plan
[263]Ibid.
[264]Ibid.

response and staffing requirements in co-operation with Department of Marine Administration and response teams.[265]

Myanmar Port Authority shall ensure that the objectives and strategies outlined in the Action Plan are carried out effectively. Myanmar Port Authority is responsible for maintenance of safe working practices on site and a complete record of operations during Tiered responses. Department of Marine Administration would also ensure that the Response Team receives required information for spill response.[266]

In the event of identified or suspected pollution from a ship, Myanmar Port Authority can take samples from its cargo, lubricating oil and bunker tanks. Myanmar Port Authority will compile contracts, as required, for provision of equipment and labour from Ports sources and also responsible for receiving claims for compensation or other claims resulting from an oil spill or response. Myanmar Port Authority may require identifying and mobilizing additional staff or external sources for field response teams during prolonged or major spill response activities.[267]

Myanmar Port Authority is responsible for response termination and shall provide onsite advice and assistance to Responder Teams in the handling and storage of recovered wastes. Myanmar Port Authority shall maintain a complete record of operation during responses and is responsible for reviews, assessments and evaluations upon oil spill response operations.[268]

After the Yangon Oil Spill Contingency plan, a dedicated National Task Force (NTF) will be formed so as to develop the National Oil Spill Contingency (NOSCP) according to the roadmap and timeframe. In the long run for implementation of the NOSCP there would be a funding mechanism by the contributions of the stakeholders as well as by the Government. The development process should be within the time duration which is estimated as two years.[269]

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[265]The Yangon Oil Spill Contingency Plan
[266]Ibid
[267]Ibid
[268]Ibid.

[269]Department of Marine Administration of Myanmar

2017	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
					1st Meeting (Allocate Resource Person)	Data Collecting of Calling Vessel and Import Cargo from Ports	Data Collecting from offshore exploration	2nd Meeting (Frame-work for NOSCP) 24 - Aug	SCOPE Field Exercise 24-29 Sep	3rd Meeting (Risk Assessment) 3 October		4th Meeting (Responsibilities & IMS)
							Risk Assessment & Equipment Analysis					
2018	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
		5th Meeting (Tier & Action Plan)	National Seminar	6th (Response Procedure & Communications)		7th Meeting (Shore Line Response, Finance & Claims)		8th Meeting (Waste Management Strategy & Dispersant Policy)		9th Meeting (Legal Scrubbing from Union Attorney General's Office)		10th Meeting (Approval)
										Stakeholders Consultation		
2019	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
	Stockpiles establishment and joint inspection											
2020	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
	Implementation NOSCP											
2020	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
	Implementation NOSCP											

Table 1. Nation Oil Spill Contingency Plan Timeline

Sources: Department of Marine Administration

The purpose of this Contingency Plan is to better prepare the States to respond immediately and effectively in an event of oil spill pollution. Since the plan has yet to come into force, it will be premature to comment on the success of the plan.

Conclusion

4.1 Summary

Marine pollution is a serious problem in all areas of the world. Every State is obliged to prevent, control, and reduce pollution of the environment. According to the UNCLOS III 1982, States must establish international rules and standards to prevent reduce and control pollution of the marine environment. They must also adopt

national laws for marine pollution which at least have the same effects as that of generally accepted international rules and standards. This commitment causes all States to ensuring that their national law complies with standards generally accepted under international law. Thus, there are always problems when there is a reduced number of ratifications of international conventions by States, since the effectiveness of the international legal framework depend on the number of States that implement the framework in it national laws.

States should promote the effective exchange of information and, where appropriate, the building of institutional relation between regional institutions concerning with environment and development of the ocean. This requires cooperation amongst the Member States. They should ensure the effective operation of coordinating systems and reporting arrangements for the components of the United Nations System dealing with environment and development in marine and coastal areas, and enhance their links with other concerned international organizations, including donor and assistance agencies. General marine issues, including their environmental and developmental aspect, should enjoy regular consideration within the United Nations System at the intergovernmental level. States should also strengthen existing intergovernmental regional cooperation and coordination among all relevant organizations and bodies, development assistance and donor agencies, and the private sectors.

Most countries have provided environmental conservation laws, which provided environmental conservation laws, which include management, assessment and monitoring systems to protect the marine environment. In order to properly implement these systems stipulated under the law, States need the establishment of financial resources in their territories. It is therefore, required that National governments, when necessary, should be assisted in implementing the principles of relevant international agreements, reflected in the United Nations Convention on the Law of the Sea. For instance, conventions such as MARPOL require technical equipment and established facilities, as well as the implementation of specific standards during ship construction. Developing States would require economic as well as technical assistance and expertise to put in place the required system and for its effective functioning. This being so, developed countries shall support the developing countries in financial, scientific and technical matters in accordance with the provisions of the United Nations Conventions on the Law of the Sea, 1982. However, the implementation of such provisions is weak at present. Moreover, States governments have laid down

laws, regulations, rules and standards to control the marine water quality. These laws, regulations, rules and standards must be imposed on all people and enforced throughout the State. However, some State governments, as in Myanmar, have not yet effectively taken action on the persons or organizations carrying out activities that are causing marine pollution in violation of these laws.

In other words, when a Government accepts on IMO convention, it agrees to make it part of its own national law, to reflect the requirements of the convention and to enforce it with respect to promulgation rules and regulations and implementation; effective control and monitoring mechanism; with enforcement action to be taken for any contravention. Regardless of its status, whether the State is a member of a convention, as long as the convention does not become part of its national law by the legal process applicable in its jurisdiction, that is, it fails to implement the convention, it is not possible to take action against any violator. Without the effective implementation of an international convention the State cannot benefit from the application of that law within its jurisdiction. It is an indispensable premise that domestic law governs the application and enforcement of law within the domestic legal order.

The regulations of marine pollution highlight the relation between political, economic and social development and the environmental protection process in international law. On the one hand, conventions improve principles and legal techniques in marine pollution control. On the other hand, the application of those principles and legal techniques must be coordinated among political, economic and social sectors of each State. Therefore, for the effectiveness of a legal framework in this field it is important to strike a balance between environmental protection and the economic, social and political development of each State.

It is regrettable that Myanmar who is one of the member States of the United Nations Convention on the Law of the Sea (UNCLOS) and the MARPOL Convention has several short falls to implement in full and complete effect and enforcement as prescribed in the relevant provisions of those conventions. The member States of a convention must, with due regard to their national laws, in their respective national jurisdictions, provide for violations and sanctions through provisions such as a clause requiring punishments of adequate severity to deter potential violators. The provisions for any violation stipulated in the conventions must be converted into offences in the

national legislation. Only then, law enforcement would be able to become tangible and effective implementation of the relevant convention would be achieved.

To balance economic development and preservation of the environment is a lasting issue that society must consider so as to attain long term development. As far as the marine environment is concerned, because we depend largely on the oceans, it is necessary to take adequate measures to protect the marine environment. Marine pollution as one of the major threats to the ocean is adequately regulated by a legal framework created by international law. In the regulatory law regime, IMO conventions undoubtedly play a vital role. MARPOL 73/78, which is entirely preventive law in scope, is by far the most important one among all the marine pollution conventions. As mentioned above, the degree of effectiveness of international instruments depends on enforcement. More specifically, it relies on national legislation and enforcement practices of the contracting states.

Oil pollution from maritime transport is a continuous and unpredictable threat to the quality of the marine environment. Many initiatives have been taken and even more regulations have been implemented aiming at the IMO Proclamation for Clean Seas. As result, there has been a significant reduction in oil spillage generated by ships and relative "sources". However, certain vessel types (e.g., tankers) are still important pollution players and a challenge to the marine environment mainly due to their potential for massive and catastrophic spills.

Thus it can be said that major challenges are waiting ahead for Myanmar on port development projects, which have already started. In view of the fact that Marine Pollution Law is crucially important for a littoral State, Myanmar should be aware that idling with the *status quo*, rather than taking initiatives to preserve the marine environment and prevent pollution, given the absence of mechanism to monitor and control the marine environment, may lead to detrimental consequences. In combating oil pollution Myanmar must carry out an effective response. In order to have an effective response for oil spill pollution at sea, Myanmar should provide knowledge on oil pollution to all stakes-holders concerned, put into force contingency plans, establish the mechanism for oil spill response, develop a national maritime law and create an agreement between neighbouring countries and also for the region. Furthermore, the oil-combating unit needs highly skilled human resources and effective equipment for combating operations as well as technical support. A wide range of knowledge covering different educational and technical backgrounds such as

engineers, maritime experienced specialists in ship operation, offshore specialists, biologists and lawyers' etc. plays an important factor in combating oil pollution. For this reason, training, exercises, holding seminars and workshops on oil spill control are necessary for the successful combating of oil spill pollution. In addition, the effectiveness of the combating equipment also plays an important role for successful operation. Thus, purchasing of good quality equipment such as booms, skimmers, sorbet materials, vessels and barge equipment, vacuum trucks and pumps is necessary.

Besides, if there is no comprehensive overseeing of how the entire structure of environmental protection instruments cover land and Myanmar waters including the offshore areas, the legislatures may not be able to be fully aware of the threats of real potential impacts of oil and gas exploration and the production industry as well as the correspondent environmental protection measures that need to be established. In recognition of the foregoing and realizing that it is incumbent upon Myanmar in the present context to select one of the two viable options: one is to be incorporated under the Environmental Conservation Law as subsidiary legislation or other preference to be enacted as a separate law so as to embrace holistic managements in the context of Marine Pollution, the authorities have chosen the latter preference and have drafted a separate law, namely the Prevention of Pollution from Ships Law. To be able to make this law effective and active accurate and effective measures should be taken on any act in violation of the provisions set out in the law.

In the regard, although the necessary standards for discharging of pollutants into the oceans should be enforced in Myanmar, local and foreign business and the people are weak in complying with such standards. This respect should have special attention because prevalence of law and order is not yet fully established in Myanmar society and offenders tend to enable the law until and unless legal control is made strict and strong.

Finally, Myanmar, it is high time to act to protect and preserve the marine environment, for the betterment of future generations where the ocean plays an important role in the daily lives of its people, and for the economy of the country.

4.2 Evaluation and Recommendation

- Myanmar’s legal framework for marine pollution prevention falls short of the international requirements.

- Existing legislation needs to be development and implementation promulgates to implement comprehensively the international conventions it is party to.
- Myanmar's capacity in the development and implementation of legal documents on marine management needs to be strengthened.
- Training and international cooperation in this regard needs to be undertaken in order to create high quality human resources in this field.
- Multiple authorities deal with one or more aspect of pollution prevention, making the system more complex.
- A centralized authority with clearly defined responsibilities needs to be established.
- The institutional framework for preventive monitoring and enforcement is weak.
- Strict and effective measures need to be imposed on any act in violation of the law.
- The National Oil Spill Contingency Plan has been prepared but is not yet in force.
- The Plan needs to be finalized and put into force, without undue delay.
- Resources for establishing facilities, and acquiring technical equipment required by the conventions is inadequate.
- International cooperation should be sought for economic as well as technical assistance to put such a system in place.
- Port State control inspection needs to be improved as the Department of Marine Administration lacks trained and experienced personnel.
- Human resources improvement through awareness programmes, education and training with international cooperation should be undertaken.

It is hoped that the above evaluations and recommendations will be taken into consideration in order to assist Myanmar to establish the legal and institutional framework required under the conventions.

Furthermore, since the mere promulgation of law without enforcement power is not sufficient to achieve the intended purposes of taking control over marine pollution, strict enforcement of the law is necessary. That is, immediate and effective action must be taken against any violations of the law.

Finally, Myanmar should consider ratifying other conventions to protect against marine pollution.

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