A STUDY ON LEGAL FRAMEWORK OF OCEAN ENVIRONMENT RELATING TO OIL POLLUTION

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ABSTRACT

Oil pollution in marine environments is one of the most significant environmental challenges facing the global community. Oil spills can have devastating impacts on marine life, coastal ecosystems, and local economies. To address these challenges, a range of international, regional, and national legal frameworks have been established to regulate and manage oil pollution in the ocean. This study aims to provide an overview of the causes for oil spill in ocean its effect on the ocen environment, further as study on the legal framework that governs oil pollution in the marine environment, examining both the existing conventions and national laws, as well as the role of international organizations in combating oil pollution with a case study method.

Keywords: Oil spills, oil pollution, legal framework

Introduction:

Right through genesis, the ocean served mankind as a channel for communication, trade, livelihood, and its development. We live on a blue planet, with oceans and seas covering more than 70 per cent of the Earth's surface. We dwell in a planet, where the surface is covered with 70% of water and 30% with land. Oceans feed us, regulate our climate, and generate most of the oxygen we breathe. However growing threats such as marine pollution, sea-level rising and over-fishing damage these aspects of our lives and infringe on the human rights attached to them. UNESCO[1] predicts more than 50 per cent of the world's marine species may face extinction by 2100[2]. One-third of the total human population, nearly 2.4 billion people, live within 100 km (60 miles) of an oceanic coast - and all human life is dependent upon the oxygen and freshwater it creates.

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. Regarding 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. This paper addresses the issue of ocean pollution due to oil spill and explores the evolution of international law on oil pollution, highlighting key conventions, regulations, and recent developments shaping the legal landscape.

Wherever the oil is unearthed, shipped, or kept has the potential to experience oil spills. Various variables, such as the type and quantity of oil spilled, the location where the spill occurs, the time of year, the weather, and the efforts made to clean it up, affect how much damage a spill does to the ocean environment and ecosystem. The impact of oil spill often cause harm to Both exterior and internal exposure from consuming or breathing in oil can affect the animals. Since most oils float, animals who inhabit shoreline habitats or the area near the sea's surface are frequently the ones most impacted by oil. If oil seeps below the surface or becomes mixed with the water column, fish and shellfish may suffer consequences. Crude oil

[1] United Nations Department of Economic and Social Affairs, *available at* : https://www.un.org/en/desa/5-reasons-you-should-care-about-our-ocean (last visited on May 25, 2024).
[2] Boyce, D.G,Tittensor, D.P, Garilao, C,*et al., A climate risk index for marine life* 854–862 (*Nat,Clim,Chang,*2022)

is a fossil fuel that is used to create a variety of fuels and products. It is the liquid left overs of extinct plants and animals[3].

Causes for Oil Spill in Ocean:

Tanker accidents and routine tanker operations, such as tank cleaning, de-ballasting, and other operational reasons for occasionally dumping oil overboard, are the two main causes of oil pollution from tankers. From statistics gathered on global operations, it has been estimated how much oil has leaked into the water from ships of all sizes. About 200,000 tons of oil are spilled annually by tanker accidents, compared to approximately 1,000,000 tons that are dumped annually during routine operations. Additionally, the annual increase in oil pollution linked to tanker drydocking activities is 250,000 tons. The global reliance on oil as a primary energy source has brought with it the persistent threat of oil pollution in marine environments. Recognizing the transboundary nature of this issue, nations have come together to establish a framework of international laws aimed at preventing, mitigating, and addressing oil pollution incidents. This article explores the evolution of international law on oil pollution, highlighting key conventions, regulations, and recent developments shaping the legal landscape.

Impact Of Oil Pollution in Ocean:

Every year, 2.7 million liters of oil leak into the ocean[4], poisoning the water, destroying marine life, and harming economies and ecosystems for a long time. A tiny amount of oil is continuously leaking into the water and becoming integrated into the ecosystem. Although the effects of oil pollution make up a very minor portion of the overall damage to the maritime environment, the marine ecosystem and its inhabitants suffer greatly as a result of oil spills and wastes. In addition to directly harming fisheries, plants, animals, and corals, an oil spill also has an impact on human activities in the fishing industry by destroying fishing boats, fishing gear, and floating fishing equipment. The coastline region is particularly susceptible to possible

[3] National Oceanic Atmospheric Administration, U.S. Department of Commerce *available at*: https://www.noaa.gov/education/resource-collections/ocean-coasts/oil-spills#:~:text=Crude%20oil%2C%20the%20liquid%20remains,or%20holes%20in%20the%20rock, (last visited on May 29, 2024).

[4]Airplanet.org/story/how-oil-spill-affect-humans-and-the-evironment/#:~:text=Annually%2C%202.7%20million%20litres%20of,on%20and%20regulate%20our%20climtes , (last visited on May 29, 2024).

harm. The extent of the oil spill has no bearing on the harm that is inflicted, and it is unpredictable. It primarily relies on how vulnerable the area is and how close it is to the shore.

For instance, in 1957, a 9,000-ton diesel fuel spill from the "Tampico Maru" in Baja California caused damage to more than 10 kilometers of shoreline. However, the 10,000 tons of crude oil that the "Area Prima" spilled in 1962 in Puerto Rico did not really cause any harm. The Ixtoc I[5] oil platform disaster in the Gulf of Mexico resulted in a 476 000 tons of crude oil spill, however the damage was not that great. A 50,000-ton oil spill and the 1976 grounding of the "Argo Merchant" caused extremely significant damage[6]. An ecological catastrophe and extensive and expensive cleanup efforts followed the VLCC "Exxon Valdez's" 40 000 tons of oil spill in 1989 in a particularly vulnerable portion of Alaska's Prince William Sound[7]. Although the "Atlantic Empress" oil leak in 1978 resulted in the loss of about 300,000 tons of crude oil in the Atlantic Ocean[8], it had a major negative effect on the offshore ecology near the accident site.

International Legal Framework

The international legal framework for preventing and responding to oil pollution is primarily based on several key conventions established under the auspices of the International Maritime Organization (IMO) and other international bodies. In Washington, the International Maritime Conference adopted the first international convention on oil pollution in 1926. Unfortunately, this document was not approved. Since 1945, the issue of oil pollution has become increasingly pressing and relevant due to the massive contamination, particularly in the Atlantic Ocean, caused by military activities using submarines and torpedoes during World War II. Under no specific international environmental treaty is marine pollution, especially oil-related contamination, expressly regulated. The roots of international law on oil pollution can be traced back to the mid-20th century with the adoption of the International Convention for

[5] Anyanova E, Oil Pollution and International Marine Environmental Law. Sustainable Development - Authoritative and Leading Edge Content for Environmental Management (2012). InTech. *available at*: http://dx.doi.org/10.5772/37399.
[6] https://www.govinfo.gov/content/pkg/CZIC-gc1212-m4-a73-1977/html/CZIC-gc1212-m4-a73-1977.htm (last visited on May 23, 2024).
[7] Martinelli, Massimo & Luise, Anna & Tromellini, Elisabetta & Sauer, Theodor & Neff, Jerry & Douglas, Gregory, The M/C Haven oil spill: Environmental assessment of exposure pathways and resource injury. International Oil Spill Conference Proceedings, (1995) 679-685.
[8] Gertler, C., Yakimov, M.M., Malpass, M.C., Golyshin, P.N. (2010). Shipping-Related Accidental and Deliberate Release into the Environment. In: Timmis, K.N. (eds) Handbook of Hydrocarbon and Lipid Microbiology. Springer, Berlin, (2010).

the Prevention of Pollution of the Sea by Oil (OILPOL) in 1954. This convention laid the groundwork for subsequent legal instruments targeting oil pollution.

Regulatory Milestones:

The 1969 International Convention on Civil Liability for Oil Pollution Damage (CLC) established a liability and compensation regime for oil pollution incidents caused by tankers, introducing the principle of strict liability for shipowners.

The 1973 International Convention for the Prevention of Pollution from Ships (MARPOL) broadened the scope of regulation to encompass various forms of marine pollution, including oil pollution, and set standards for pollution prevention from ships. The MARPOL Convention, adopted in 1973 and modified by the Protocol of 1978 (MARPOL 73/78), is the principal international treaty aimed at preventing marine pollution by ships. It includes six annexes, each addressing different sources of pollution[9]:

Annex I: Prevention of pollution by oil.

Annex II: Control of pollution by noxious liquid substances in bulk.

Annex III: Prevention of pollution by harmful substances carried by sea in packaged form.

Annex IV: Prevention of pollution by sewage from ships.

Annex V: Prevention of pollution by garbage from ships.

Annex VI: Prevention of air pollution from ships.

MARPOL Technical Annexes I and II, which cover 98.89% of the world fleet, are required for all Contracting States to adhere to. They handle pollution by oil and hazardous liquid substances in bulk. Annex I, in particular, contains detailed regulations for the prevention of oil pollution, including requirements for ship design, equipment, and operation, as well as

[9] IMO status of conventions, ratifications by state, *available at*: https://www.imo.org/en/Home/ErrorPageNotFound?aspxerrorpath=/en/About/Conventions%20/Pages/International-Convention-for-the-Safety-of-Life-at-Sea-(SOLAS),1974, (last visited on May 28, 2024).

procedures for oil spill reporting and response[10]. A greater interest in the preservation of the marine environment, particularly with regard to the principle of liability for pollution, was sparked by the early 1970s catastrophic maritime accidents, such as those involving the supertankers Torrey Canyon[11] (1967) and Amoco Cadiz (1978)[12]. Due to this increasing focus, international treaties in the area of state responsibility—also referred to as "second generation" agreements—were signed[13].

The 1992 International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC) focused on enhancing international cooperation and coordination in responding to oil pollution emergencies, requiring states to develop national contingency plans.

The 1982 United Nations Convention on the Law of the Sea (UNCLOS) established a comprehensive legal framework governing the activities in the world's oceans, including provisions related to marine pollution prevention and control. Globally, the marine protection regulations of the UNCLOS are essential. They are contained in Conventional Provision XII. The scope of these regulations is wide. Governments are generally obliged under Article 192 of the treaty to protect the marine and coastal environment and its resources. According to Art. 193, states are free to utilize their natural resources as long as their natural environmental policies are taken into consideration. Article 193 further emphasizes governments' obligations to protect and preserve the maritime environment. The general guidelines in the Articles 192 and 194 about actions taken to stop, lessen, and manage pollution of the maritime environment are regarded as international customary law.

National Legislations:

National legislations, such as the 1990 Oil Pollution Act (OPA) in the United States, complement international conventions by strengthening regulations within specific jurisdictions. The Deepwater Horizon oil spill in 2010 served as a catalyst for reassessing oil

[10] OMI, index of MEPC resolution and guidelines related to MARPOLE, *available at*: https://www.imo.org/en/Home/ErrorPageNotFound?aspxerrorpath=/en/OurWork/%20Environment/Pages/Index-of-MEPC-Resolutions-and-Guidelines-related-to-MARPOL-Annex-VI, (Last visited on May 24, 2024).

[11] Peter Geoffrey Wells, "The iconic Torrey Canyon oil spill of 1967- Marking its legacy" 2, ResearchGate 115, (2017)

[12] Amoco Cadiz oil spill: The largest loss of marine life ever, *available at*: https://safety4sea.com/cm-amoco-cadiz-oil-spill-the-largest-loss-of-marine-life-ever/ , (last visited on May 20, 2024)

[13]International Convention for the prevention of pollution of the sea, *available at*: https://www.imo.org/en//about/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx/ (last visited on May 26, 2024)

pollution regulations, leading to increased scrutiny of offshore drilling practices and calls for stricter oversight and enforcement mechanisms. Amendments and updates to existing conventions, such as the 2004 BUNKER Convention, reflect ongoing efforts to adapt to emerging challenges and technological advancements in oil pollution prevention and response.

Flag State Responsibilities on Oil Spill in the Ocean

Flag states, which are countries where ships are registered, have crucial responsibilities in preventing and managing oil spills in the ocean. These responsibilities are derived from various international conventions, national laws, and guidelines. The effectiveness of a flag state's regulatory regime significantly impacts the prevention, mitigation, and response to oil pollution incidents.

Flag states are primarily guided by international conventions, many of which are under the auspices of the International Maritime Organization (IMO). These conventions outline specific obligations for flag states in preventing and responding to oil spills.

a. International Convention for the Prevention of Pollution from Ships (MARPOL)[14]

Under MARPOL, flag states are required to ensure that ships flying their flag comply with international standards aimed at preventing pollution from ships. Key responsibilities include, Certification and Inspection. Flag states must issue certificates to ships verifying their compliance with MARPOL's technical standards. Regular inspections must be conducted to ensure ongoing compliance.

Surveys and Documentation: Ships must undergo initial and periodic surveys to ensure their equipment and systems meet MARPOL requirements. Proper documentation, such as the International Oil Pollution Prevention Certificate, must be maintained and available for inspection.

Implementation of Operational Standards: Flag states must ensure that ships adhere to operational standards, including proper handling of oil residues and adherence to procedures

[14]https://www.imo.org/en/about/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx,(last visited on May 26, 2024)

for oil discharge and ballast water management.

b. International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC)[15]

The OPRC Convention outlines flag state responsibilities in preparedness and response to oil pollution incidents such as Contingency Planning which ensure that ships have onboard oil pollution emergency plans. These plans should outline the steps to be taken in the event of an oil spill, including notification procedures and response actions. Ships must conduct regular drills and exercises to test the effectiveness of their emergency plans. Flag states are responsible for overseeing and verifying these activities. Further it mandates that Flag states must establish procedures for the prompt reporting of oil pollution incidents. Ships are required to report any discharge of oil into the marine environment to the appropriate authorities.

c. United Nations Convention on the Law of the Sea (UNCLOS)

UNCLOS provides a comprehensive legal framework for the protection and preservation of the marine environment. Flag state responsibilities under UNCLOS include Jurisdiction and Control such as the Flag states have jurisdiction over their registered ships, regardless of where the ship operates. They must ensure that their ships do not cause pollution in the marine environment and Legislative and Enforcement Measures where the Flag states must adopt laws and regulations to prevent, reduce, and control pollution from ships. These measures should align with international standards and must be enforced effectively. Further Liability and Compensation is provided. UNCLOS requires flag states to ensure that their ships have adequate insurance or financial security to cover liability for oil pollution damage. While the legal framework for flag state responsibilities is robust, several challenges affect its effectiveness such as compliance with international and national regulations can be challenging. Factors such as limited resources, lack of capacity, and varying levels of commitment among flag states can hinder enforcement efforts. Strengthening inspection regimes, enhancing cooperation among enforcement agencies, and providing technical assistance to developing countries can improve compliance.

[15] https://treaties.un.org/doc/publication/unts/volume%201891/volume-1891-i-32194-english.pdf, (last visited on May 26, 2024)

Port State Control of Oil Spills in the Ocean

Port State Control (PSC) plays a vital role in enforcing international maritime standards aimed at preventing and managing oil spills in the ocean. PSC involves the inspection of foreign-flagged ships to ensure they comply with international conventions and national regulations designed to protect the marine environment from oil pollution. This article explores the legal framework governing PSC, the procedures involved, the role of PSC in preventing oil pollution, and the challenges and effectiveness of PSC in addressing oil spills.

1. Legal Framework for Port State Control

The legal framework for PSC is established by several key international conventions and regional agreements, providing the basis for inspecting and enforcing compliance on foreign ships.

a. International Convention for the Prevention of Pollution from Ships (MARPOL)

MARPOL is the cornerstone international treaty aimed at preventing marine pollution by ships, including oil pollution. Under MARPOL, port states have the authority to inspect ships to verify compliance with the convention's provisions, especially those related to oil discharge monitoring, pollution prevention equipment, and proper documentation.

b. United Nations Convention on the Law of the Sea (UNCLOS)

UNCLOS, often referred to as the "constitution of the oceans," provides a comprehensive legal framework for the protection and preservation of the marine environment. It grants port states the authority to enforce international standards related to marine pollution within their ports and maritime zones.

c. Memoranda of Understanding (MOUs) on Port State Control

Regional MOUs, such as the Paris MOU, Tokyo MOU, and others, create cooperative frameworks for conducting inspections and sharing information among member states. These MOUs standardize inspection procedures and criteria, enhancing the overall effectiveness of PSC regimes.

If serious deficiencies are identified in the ship, PSC authorities have the power to detain the ship until the issues are rectified. Detentions serve as a strong deterrent against non-compliance, ensuring that only ships meeting international standards can continue their voyages.

2.PSC plays a critical role in preventing oil pollution through various mechanisms:

a. Enforcement of Standards

By inspecting foreign-flagged ships and verifying compliance with international standards, PSC authorities enforce regulations designed to prevent oil pollution. This includes ensuring that ships have the necessary equipment, documentation, and operational procedures to manage oil discharge and prevent spills.

b. Deterrence of Non-Compliance

The risk of detention and penalties provides a strong incentive for shipowners and operators to comply with international regulations. Regular PSC inspections create a culture of compliance, reducing the likelihood of oil pollution incidents.

c. Detection and Reporting of Violations

PSC inspections help detect violations and deficiencies that could lead to oil spills. By identifying and addressing these issues promptly, PSC authorities prevent potential pollution incidents. Additionally, PSC authorities report violations to flag states and relevant international organizations, facilitating broader enforcement efforts.

d. Capacity Building and Cooperation

Regional PSC MOUs promote cooperation and capacity building among member states. Training programs, information exchange, and joint inspections enhance the capabilities of PSC authorities, improving the overall effectiveness of PSC regimes in preventing oil pollution.

3. Challenges and Effectiveness

While PSC is a powerful tool for preventing oil pollution, it faces several challenges

that can affect its effectiveness:

a. Resource Constraints

PSC authorities often operate with limited resources, including personnel, funding, and inspection equipment. These constraints can limit the number of inspections conducted and the thoroughness of inspections, reducing the overall effectiveness of PSC regimes.

b. Varying Levels of Enforcement

The effectiveness of PSC can vary significantly between regions and countries, depending on the commitment and capacity of individual PSC authorities. Inconsistent enforcement can create gaps in the regulatory framework, allowing non-compliant ships to avoid detection.

c. Evasion by Substandard Ships

Some shipowners may attempt to evade PSC by avoiding ports with rigorous inspection regimes or by re-flagging their vessels under flags of convenience with less stringent enforcement. Strengthening international cooperation and harmonizing standards can help address this issue.

d. Technological and Operational Challenges

Advancements in ship technology and operational practices can pose challenges for PSC authorities. Keeping up with these changes requires continuous training and adaptation of inspection procedures to ensure effective enforcement.

The Exxon Valdez oil spill case study:

The Exxon Valdez oil spill, which occurred on March 24, 1989, is one of the most infamous environmental disasters in history. The spill happened when the Exxon Valdez, an oil tanker owned by the Exxon Shipping Company, struck Bligh Reef in Prince William Sound, Alaska. This accident resulted in the release of approximately 11 million gallons of crude oil into the pristine marine environment, causing extensive environmental, economic, and social damage. This case study examines the causes, impacts, and aftermath of the Exxon Valdez oil

spill, as well as the legal and regulatory responses that followed.

a. Causes of the Oil Spill and Legal Actions

Several factors contributed to the Exxon Valdez oil spill, including human error, inadequate safety measures, and regulatory failures. The Exxon Valdez oil spill prompted significant changes in environmental policy and regulation. Exxon faced numerous lawsuits from federal and state governments, as well as private parties. In 1994, a federal jury awarded $5 billion in punitive damages to the plaintiffs, although this amount was later reduced to $507.5 million by the U.S. Supreme Court in 2008. Exxon agreed to pay $900 million in a civil settlement with the U.S. and Alaskan governments to cover the costs of environmental restoration and cleanup.

b. Regulatory Reforms due to Exxon Valdez Oil Spill

Oil Pollution Act (OPA) 1990: In response to the spill, the U.S. Congress enacted the Oil Pollution Act of 1990. This comprehensive legislation strengthened regulations on oil spill prevention and response. Key provisions included- Double-Hull Requirement. The OPA mandated that all new oil tankers operating in U.S. waters be constructed with double hulls, providing an additional layer of protection against spills. Further Spill Response Plans were made. The act required oil companies to develop and maintain detailed spill response plans, including resources and strategies for immediate action in the event of a spill. The OPA established a liability framework for oil spill damages, holding responsible parties financially accountable for cleanup costs and damages. It also created the Oil Spill Liability Trust Fund to provide compensation for victims and cover response costs.

Holding responsible parties accountable for environmental damage is essential for ensuring compliance with regulations and fostering a culture of safety within the industry. The legal and financial repercussions faced by Exxon served as a powerful deterrent for other companies.

Case of the Erika oil spill

The Erika oil spill[16] is one of the most significant environmental disasters in European maritime

[16] *EuropeanCourtReports2008I-04501.<https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A62007CJ0188 (last visited on 23 may 2024).*

history. It occurred on December 12, 1999, when the Maltese-flagged oil tanker Erika, carrying 31,000 tons of heavy fuel oil, broke in two during a severe storm in the Bay of Biscay off the coast of France. This catastrophe resulted in a massive oil spill, causing extensive environmental damage and prompting substantial legal and regulatory changes in maritime safety and pollution prevention. This case study examines aftermath of the Erika oil spill, along with the legal and regulatory responses. The Erika oil spill was the result of a combination of factors, including structural failures, inadequate maintenance, and regulatory shortcomings. he Erika oil spill had devastating environmental consequences, particularly for the coastal regions of Brittany and Pays de la Loire in France

a. Immediate Impact

The spill caused the death of an estimated 150,000 to 300,000 seabirds, making it one of the most significant wildlife disasters in Europe. Marine mammals, including dolphins and seals, were also affected, along with fish and shellfish populations. Approximately 400 kilometers (250 miles) of coastline were polluted with heavy fuel oil, contaminating beaches, rocky shores, and estuaries. The thick, sticky nature of the oil made cleanup efforts particularly challenging.The spill disrupted the local marine and coastal ecosystems, leading to long-term damage to habitats and biodiversity. The contamination of sediments and water bodies affected the reproductive health and survival rates of various species. The spill severely impacted local economies, particularly the fishing and tourism industries. Contaminated waters and beaches led to the closure of fisheries and a significant drop in tourism, causing economic hardship for local communities.

b. Legal and Regulatory Responses

The Erika oil spill prompted significant legal and regulatory reforms aimed at enhancing maritime safety and preventing future oil spills. The spill led to extensive litigation involving multiple parties, including the shipowner, the charterer (Total S.A.), the classification society (RINA), and the ship's manager. In 2008, a French court held Total, RINA, and others responsible for the spill, imposing fines and damages totaling over €200 million. Total S.A. agreed to pay substantial compensation to the French government and affected parties for environmental damage and economic losses. The International Oil Pollution Compensation Funds (IOPC Funds) also provided additional compensation to victims of the spill.

c. Regulatory Reforms

European Union Legislation: In response to the Erika disaster, the European Union introduced several legislative measures to enhance maritime safety and pollution prevention such as Erika I Package (2001). This package of measures included stricter controls on classification societies, enhanced port state control inspections, and the phasing out of single-hulled tankers within European waters. Erika II Package (2002): This package established the European Maritime Safety Agency (EMSA) to provide technical assistance and support to member states, enhance pollution response capabilities, and improve the monitoring of maritime traffic. Erika III Package (2009): Further measures were introduced to improve ship inspections, enhance flag state responsibilities, and create a framework for the liability of shipowners and compensation for pollution damage.

The MV Wakashio oil spill

The MV Wakashio oil spill[17] is a recent maritime disaster that occurred on July 25, 2020, when the Japanese bulk carrier MV Wakashio ran aground on a coral reef off the coast of Mauritius. This incident resulted in a significant oil spill that caused extensive environmental, economic, and social damage. The MV Wakashio spill highlights ongoing challenges in maritime safety and pollution prevention, emphasizing the need for effective response mechanisms and regulatory oversight.

The MV Wakashio oil spill had severe environmental consequences for Mauritius's coastal ecosystems and marine life. Approximately 1,000 tons of fuel oil leaked into the Indian Ocean, contaminating the coastal waters and the surrounding marine environment. The spill occurred in an area rich in biodiversity, including coral reefs, seagrass beds, and mangroves. The oil spill resulted in the death of numerous marine species, including fish, crabs, and seabirds. The oil's toxicity and smothering effect caused immediate harm to wildlife, disrupting feeding and breeding behaviors. Further the spill damaged critical habitats, such as coral reefs and mangroves, which are essential for the survival of many marine species. The long-term recovery of these ecosystems is uncertain and may take decades. The oil's persistent nature

[17] https://appliedsciences.nasa.gov/what-we-do/disasters/disasters-activations/mauritius-oil-spill-2020, (last visited on May 29, 2024).

means that it can bioaccumulate in the food chain, affecting various species over an extended period. This can lead to chronic health issues and population declines in affected species.

MV Wakashio oil spill had significant economic and social repercussions for Mauritius. The spill contaminated fishing grounds, leading to a suspension of fishing activities. This had a direct impact on the livelihoods of local fishermen and the broader fishing industry. Mauritius is heavily reliant on tourism, which was severely affected by the spill. The images of oil-soaked beaches and dead marine life discouraged tourists, leading to cancellations and a decline in tourist arrivals. Subsequently it resulted in community Displacement- Local communities, particularly those dependent on fishing and tourism, faced economic hardship and displacement. The loss of income and disruption of daily life had profound social consequences. Exposure to the oil and involvement in cleanup operations posed health risks to local residents and volunteers. Respiratory issues, skin conditions, and other health problems were reported among those involved in the response efforts.

a. Legal and Regulatory Responses

The MV Wakashio oil spill prompted legal actions and regulatory scrutiny, highlighting the need for robust frameworks to prevent and respond to such disasters. The Mauritian government and affected parties sought compensation from the ship's owner, Nagashiki Shipping, and the insurer, Japan P&I Club. Claims covered environmental damage, economic losses, and cleanup costs. The incident led to investigations into the actions of the crew, the shipping company, and regulatory authorities. Legal proceedings aimed to hold responsible parties accountable for negligence and regulatory violations.

The spill underscored the need for stricter navigation protocols and monitoring to prevent vessels from deviating dangerously close to sensitive coastal areas. The spill highlighted the necessity for international cooperation in maritime safety and pollution response. Mauritius received support from various countries and international organizations in the form of equipment, expertise, and financial aid.

Conclusion:

The evolution of international law on oil pollution reflects a concerted effort by the international community to address a pressing environmental concern with far-reaching

consequences. While significant strides have been made in establishing regulatory frameworks and mechanisms for addressing oil pollution incidents, continued vigilance, cooperation, and adaptation to evolving threats are essential to safeguarding marine ecosystems and coastal communities against the detrimental impacts of oil pollution. Its need of an hour to Strengthening monitoring and enforcement to ensure compliance with existing legal frameworks. Continued international cooperation, the development of new technologies, and strengthened legal frameworks are essential to ensuring the protection of the ocean environment from the adverse effects of oil pollution. Governments, industries, and international bodies must work together to address these challenges and minimize the impact of oil pollution on marine ecosystems and coastal communities.