

MARITIME ADVERSITIES AROUND SRI LANKA (1994-2021)

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THE PEARL PROTECTORS



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An Initiative of The Pearl Protectors

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THE PEARL PROTECTORS

The Pearl Protectors is a volunteer-based and non-profit marine conservation organization in Sri Lanka. Established in 2018, The Pearl Protectors seek to mitigate the impacts of anthropogenic activities on the marine environment, reduce plastic pollution and promote sustainable practices through youth engagement, volunteerism, awareness and advocacy. Projects undertaken by The Pearl Protectors over the years entail the launching of the 'Pearl Protector Approved' Accredited Standardization Certificate to promote a plastic-free dining culture; the annual construction of a Christmas tree out of discarded plastic bottles to highlight single-use plastic pollution; school education programs; eco brick workshops; coastal cleanups; and social media campaigns to inspire action towards protecting the marine environment

The purpose of this advocacy initiative is to emphasize the need for effective policy and availability of adequate resources to prevent and mitigate maritime accidents thereby conserving the marine environment. The author and contributors are volunteer researchers.

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1. ABBREVIATIONS

BRI– Belt and Road Initiative

CCD – Coast Conservation Department

CPC- Ceylon Petroleum Corporation

CPSTL – Ceylon Petroleum Storage Terminals Limited

DMC – Disaster Management Centre

DWT – Deadweight tonnage

EEZ – Exclusive Economic Zone

GDP – Gross Domestic Product

ICG – Indian Coast Guard

IN – Indian Navy

INS – Indian naval ship

MEPA – Marine Environment Protection Authority

MOC – Maritime oil chokepoint

MPPA – Marine Pollution Prevention Authority

MRCC – Maritime Rescue Coordination Centre

MSC – Mediterranean Shipping Company

MSR– Maritime Silk Route

MT – Metric ton

NARA – National Aquatic Resource Research Agency

NM – Nautical miles

NOSCOP – National Oil Spill Contingency Plan

SLA – Sri Lanka Army

SLAERC – Sri Lanka Atomic Energy Regulatory Council

SLAF – Sri Lanka Air force

SLCG – Sri Lanka Coast Guard

SLCGS – Sri Lanka coast guard ship

SLN – Sri Lanka Navy

SLPA – Sri Lanka Ports Authority

SPBM – Single point buoy mooring

TEU – Twenty-foot equivalent

UNCLOS – United Nations Conference on Law of the Sea

VLCC- Very large crude carrier

2. ABSTRACT & OBJECTIVES

International maritime trade has been increasing over the recent years and with it, maritime traffic and adversities. Sri Lanka's location in the Indian Ocean places it in the middle of the global trade network. With rates of maritime trade expected to rise higher in the coming years it becomes important to preserve the marine and coastal resources of Sri Lanka that sustain millions of livelihoods and numerous industries. This report focuses on the maritime adversities that have occurred from 1994 to 2021 in regional and Sri Lankan waters and the primary objective of the study is to,

- Highlight the importance of preventing and resolving maritime adversities in Sri Lankan waters through effective policy, monitoring and the availability of adequate resources.

3. INTRODUCTION

3.1. The strategic location of Sri Lanka with regards to the maritime industry

Throughout history, the location of Sri Lanka at the centre of the Indian Ocean has been recognized as being of strategic importance. This locational advantage and the presence of several natural ports on the island such as Manthai (northwest), Godawaya (south), and Gokanna (east), gave rise to its status as an important trade hub in ancient times. Sri Lanka has had international trade relations since the 8th century BCE (Ministry of Foreign Affairs, 2016).

Presently, Sri Lanka's location is significant than ever before. The East-West shipping route connecting major trade hubs such as the Suez Canal and the Strait of Malacca passes in close proximity to the southern coast and the port of Hambanthota (Figure 1) (Ministry of Foreign Affairs, 2016). The number of ships that ply these international routes amounts to a vast 100,000 ships annually.

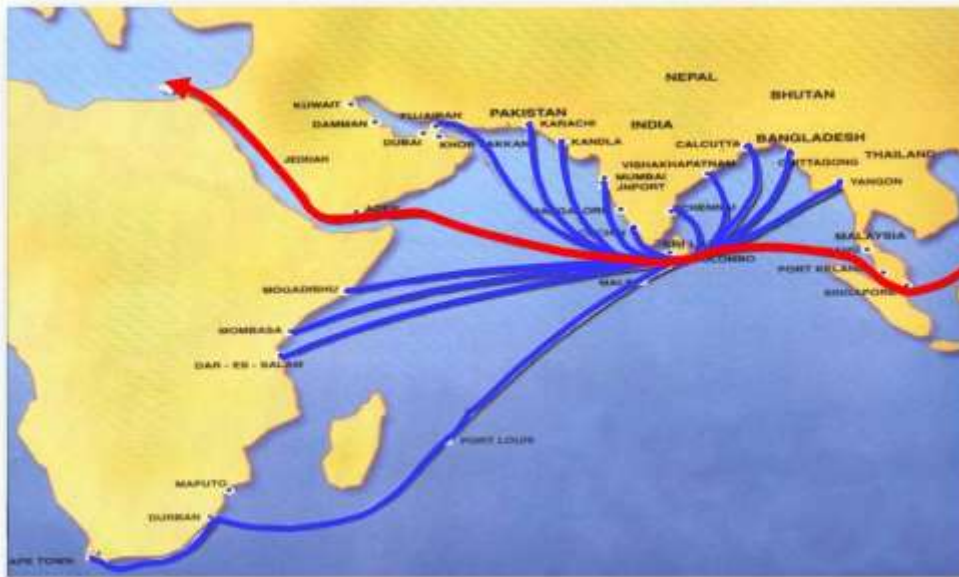


FIGURE 1: SHIPPING LANES AROUND SRI LANKA (SOURCE: SRI LANKA PORTS AUTHORITY)

3.2. Sri Lanka as a regional maritime hub

Many factors allow Sri Lanka to emerge as a prime maritime hub in the Indian ocean in terms of location, connectivity, changing global trends in shipping and trade and preferential trade access (Ministry of Foreign Affairs, 2016). In the recent past, there has also been an increase in investment in port and logistics infrastructure that further strengthens this cause. Some of the developments include,

- i. The ongoing Colombo Port Expansion Project which once completed will allow the port to handle 11.7 million TEU's per year. Out of the three terminals to be constructed under this project, the South terminal has already been completed in 2013 (SLPA, 2020).
- ii. The development of the Colombo Port City, the largest foreign direct investment project in the country ("Colombo Port City to Serve as BRI Template," 2019).
- iii. The development of the Hambantota port, which is a unique resource due to its deep-water coastline and closeness to the East-West shipping route (Nizar & Fernando, 2020).
- iv. A Colombo North Port proposed by SLPA to expand container holding capacity ("SLPA to Conduct Feasibility Study for Colombo North Port Project," 2020).

3.3. The increase of seaborne trade across Sri Lanka

A study carried out by Tournadre, 2014 indicated a fourfold increase in global shipping traffic from 1992 to 2012, with the greatest increase in the Indian Ocean and Western Pacific Ocean. Global maritime traffic is further expected to increase by 240–1,209% by 2050 (Sardain et al., 2019).

Sri Lanka is also incorporated into the Belt and Road Initiative of China that comprises of a land-based network of infrastructure development and trade links, the 'Silk Road Economic Belt' and a similar oceanic route, the '21st Century Maritime Silk Road' (MSR) (Griffiths, 2017). Proposed in 2013, the \$1 trillion

investment involves more than 130 countries up to date and is estimated to be one of the largest infrastructure and investment projects in history (Griffiths, 2017).



FIGURE 2: OVERVIEW OF THE BELT AND ROAD INITIATIVE OF CHINA (SOURCE: DAILY FT)

With the port of Hambantota being a key component in the MSR, the Sri Lankan economy, especially the maritime industry is set to greatly benefit from this, due to the expected increase in maritime traffic (Nizar & Fernando, 2020).

3.4. Legal waters

Sri Lanka is a party to the United Nations Convention on Law of the Sea (UNCLOS) of 1982. Accordingly, Sri Lanka has jurisdiction over several zones in the surrounding seas (DOALOS, 2001);

- i. Territorial waters: Extend up to 12 NM from the baseline to the sea and include the air space, water column, sea bed and subsoil. Innocent passage of ships can occur within the territorial sea as long as it does not harm the peace, good order or security of the country [Article 3]

- ii. Contiguous zone: Extends a 12 NM further from the territorial sea boundary. [Article 33]
- iii. Exclusive Economic Zone (EEZ): Extends up to a total of 200 NM from the baseline. Sri Lanka has rights to both living and non-living resources in the sea bed, water column and subsoil in the EEZ [Article 57]
- iv. Continental shelf: A coastal state can extend its limits beyond the EEZ, into the continental shelf according to UNCLOS [Article 76]. Sri Lanka has made a submission to the United Nations on this matter (Martenstyn, 2019).

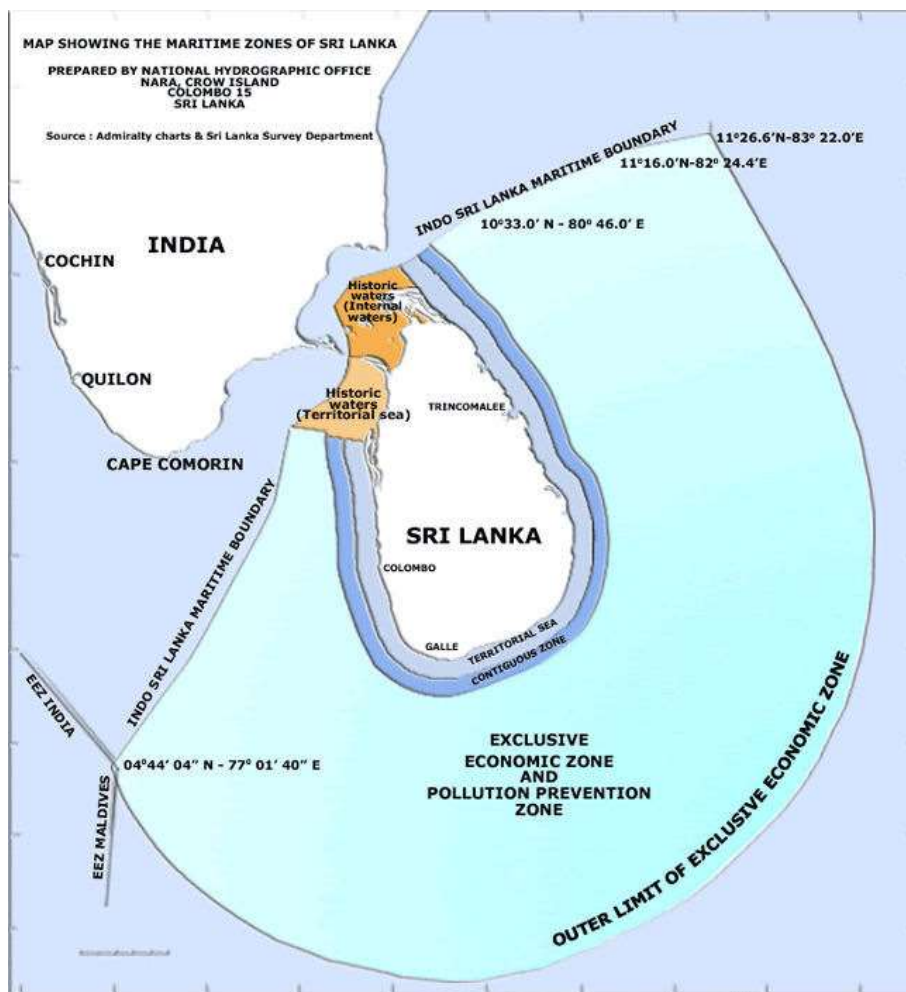


FIGURE 3: MARITIME ZONES OF SRI LANKA (SOURCE: GLOBALSECURITY.ORG)

3.5. Marine and Coastal Ecosystem of Sri Lanka

The island of Sri Lanka is bestowed with a rich marine and coastal environment. The coastal and marine ecosystem ranges for a distance of 1680 km (Coast Conservation & Coastal Resource Management Department, 2021) along the coast and extends from the coast up to the Exclusive Economic Zone (EEZ).

It includes “estuaries and lagoons (214,522 ha), mangroves (11656ha), seagrass beds (37137ha) salt marshes (27520 ha), coral reefs (not determined), and large extents of beaches including barrier beaches, spits (5731ha), and sand dunes (10363 ha)” (Coast Conservation & Coastal Resource Management Department, 2018, p. 31A). Each of these ecosystems is incredibly diverse and provides a range of vital ecosystem services.

According to the Coast Conservation & Coastal Resource Management Department, 2018, there are more than 1,800 pelagic fish species, five species of turtles, and 38 species of endangered and rare marine mammals in Sri Lankan waters. An important fact for this study is the Northern Indian population of pygmy blue whales found in Sri Lankan waters year round, whose individuals have been recognized as a subspecies of the pygmy blue whale; *Balaenoptera musculus indica* (de Vos et al., 2016)

3.6. Socioeconomic importance of Sri Lanka’s coast

The coastal belt of Sri Lanka is not only of ecological importance but also of socio-economic importance to the nation. The communities living in the coastal zone comprise around 25% of the entire population, belong to 74 divisional secretariat divisions and depend on coastal and marine resources for their livelihoods (Koralagama, 2008).

The coastal region is also the hub of industry in the country and contains 62% of all industrial units that contribute to the national GDP. There are over 30 coastal

divisional secretariat divisions with industrial units with most of them clustered in the Western and Southern provinces (Koralagama, 2008)

3.7. Implications of a developing maritime industry for Sri Lanka

With Sri Lanka on the path to becoming a maritime hub in the region, the amount of marine traffic in our waters is expected to increase. With increasing maritime traffic is the danger of probable maritime adversities such as oil spills and ship strikes that can bring about immense socio-economical losses and biodiversity threats.

4. CASE STUDIES

4.1. SINKINGS

4.1.1. MV MELIKSAH

MV Meliksah was a Turkish general cargo ship that ran into difficulty when it was around 17 NM off the coast of southern Sri Lanka on 23rd August 1999 (Prasad, 1999). After a distress signal was sent, the crew members were rescued. The ship was abandoned and left to sink while drifting further into deeper waters.

Two days later on the 25th of September, the Sri Lankan salvaging company, Sri Lanka Shipping Limited got involved when the ship was 40 NM away from the point of abandonment. One of their salvage tugs, 'Mahanuwara' was used to tow the vessel towards the coast of Hambanthota (Eliatamby, 1999).

However, at a distance of 800 m from the coast of Bundala, the ship ran aground and broke into two parts. This released 16,500 MT of fertilizer and 200 MT of heavy fuel oil into the surrounding waters and led to the pollution of several square kilometres of the sea surrounding the ship. The waters around the sensitive coral reef, Great Basses were also covered with oil and some of the oil was seen several feet above the shoreline due to the tide (Prasad, 1999).

The spill had adverse consequences for fisheries in the area, as according to Prasad (1999), fishing boats could not leave the Hambanthota harbour for over a week since the incident. Oil from the spill was even found 100 m upstream of the Kirindi Oya, having entered the Kirindi Oya estuary. Due to this, the livelihoods of farmers in the area were affected. W. Iranganie, a farmer who lived on the banks of the Kirindi Oya was quoted as saying, "We depend on the Kirindi Oya for water. Our fields will be parched now. Our livelihood is ruined. Who will help us or pay for this? We know nobody will" (Eliatamby, 1999). The oil upstream of the Kirindi Oya had a concentration of 4.2 mg/l, even 1 month after the spill (BOBLME, 2013).

The MPPA officials claimed that the private salvaging firm acted on its own accord, against instructions not to do so, in bringing the sinking ship with its hazardous cargo so close to shore. However, the Chairman of Sri Lanka Shipping Limited, Lester Outsmann claimed "We feel that the MPPA is taking the wrong stand, we are not responsible for the accident. We were just towing the ship to the harbour" (Eliatamby, 1999; Prasad, 1999).

Furthermore, Prasad (1999) reports that the owners of the ship had not attempted to make contact with the MPPA or Sri Lanka Shipping Limited following the incident.

4.1.2. MV AMANAT SHAH

MV Amanat Shah was a Bangladesh cargo ship that sank 11 km off the southern coast following a hull failure while it was transporting teak logs from Rangoon in Myanmar to Bombay in India on 7th September 2007 (MEPA, 2020; Wijayapala, 2015). When it sank, the 25 MT of heavy fuel oil contained in the ship leaked, polluting the nearby marine environment. It affected 13 km of the south coast including areas such as Koggala, Habaraduwa, and Ahangama (Kulatilaka, 2018; MEPA, 2020)

A cleaning process was conducted with the collective efforts of the MEPA, DMC, SLN, SLAF, CCD, SLA, ICG, private companies and NGOs, lasting 12 days. Oil dispersant was used by the ICG to combat the pollution caused. The collected debris and oil were transported to the Holcim Factory, Puttalam for incineration. Though legal action was taken against the ship as per the Marine Pollution Prevention Act, the results are still pending (MEPA, 2020).



FIGURE 4: OILY LOGS WASHED ASHORE (SOURCE: MEPA)

4.1.3. MT GRANBA

MT Granba was a Turkish chemical products tanker that sank in Sri Lankan waters off the eastern coast on 06th April 2009. It was travelling from Tuticorin harbour, near India's south-eastern tip to Kakinada on India's north-eastern coast carrying 6250 MT of sulphuric acid and was reportedly overloaded (Kelley, 2009b). An acid leak from the cargo into the ballast tanks led to the listing of the ship (Kelley, 2009b).

A distress call from the crew of the ship was received by the Sri Lankan authorities and the Sri Lanka Navy responded, rescuing the crew of 19 members (Kelley, 2009a, 2009b). The ship was then towed away to deeper seas by the Navy to minimize environmental pollution. The ship sank at 90 NM off the Trincomalee coast in waters of depth, 3000 m (Kelley, 2009a).

Then Chairman of MEPA, Ranjith Kularatne was reported as saying that legal action would be taken against the ship owners due to the pollution caused (Kelley, 2009b).

However, it was reported that the ship owners had denied that the ship was overloaded with sulphuric acid (Kelley, 2009b).

4.1.4. THERMOPYLAE SIERRA

The Cypriot owned vessel, Thermopylae Sierra has been detained in the Colombo outer anchorage (about four km west of Mount Lavinia) since 2009, following a court order (Jayawardena, 2014). The ship was deteriorating due to lack of maintenance as the crew had abandoned it because they were not given access to basic facilities. Engineers with the ship had already warned that some of the cargo on-board the ship could harm marine life in the area if it sank. And on the 23rd of August 2012, the ship finally sank due to water flowing into the ship, causing a spill of about 70 MT (Marine Environment Protection Authority, 2021c; Ship & Bunker, 2012).



FIGURE 5: DETERIORATED STATE OF SHIP BEFORE SINKING (SOURCE: OFFICER OF THE WATCH)

Jagath Gunasekera of the MEPA was quoted as saying, “There were some 350 tonnes of oil on the ship but most of it was removed and now there are less than 75 tonnes on board. A contingency plan is now underway to face whatever environmental impact even that little oil may cause once it begins to surface” (Ship & Bunker, 2012).

4.1.5. MUTHA PIONEER

The Indian owned general cargo ship Mutha Pioneer experienced a heavy port side list off the shores of Colombo on 26th June 2018 due to the captain losing control of the ship (Offshore Energy, 2018). The incident took place around 11.6 NM off the Colombo port during its journey from Colombo to the Maldives that started on 25th June (“SLN Rescues Crew of ‘Mutha Pioneer,’” 2018; “Sri Lankan Navy Rescues Crew of Listing Freighter,” 2018)

Its crew of 11 was rescued by the Western naval command, Colombo by deploying two Fast Attack Craft (“SLN Rescues Crew of ‘Mutha Pioneer,’” 2018). The ship was salvaged and towed to the port by the Master Divers private company in August (Aravinda, 2018). No pollution was reported due to the incident (Offshore Energy, 2018; “Sri Lankan Navy Rescues Crew of Listing Freighter,” 2018).



FIGURE 6: CREW BEING RESCUED BY SRI LANKA AUTHORITIES (SOURCE: SRI LANKA MIRROR)

Mutha Pioneer was a yard-and-stay geared freighter of 2357 DWT and was registered under a Dominican flag (“Sri Lankan Navy Rescues Crew of Listing Freighter,” 2018). Prior to this incident, on 9th December 2014, it ran aground on Thilafushi reef, Maldives and but was re-floated the next day (Voytenko, 2014). Maritime Executive, 2018 reported that “Her last port state control inspection was in 2015, and it found deficiencies related to her hatch covers and lifeboats, among other issues.”



FIGURE 7: MUTHA PIONEER EXPERIENCING HEAVY PORT SIDE LIST (SOURCE : SRI LANKA MIRROR)

4.1.6. SAIGON QUEEN

Saigon Queen was a Vietnamese cargo ship that sank off Sri Lanka on 30th October 2012. It was carrying wood cargo from Myanmar to India (“4 Missing After Vietnamese Cargo Ship Sinks Off Sri Lanka,” 2012).

The cause for the incident was determined as shifting cargo likely due to adverse weather conditions. A Cyprus flagged ship, Pacific Skipper rescued 18 of the 22 crew members while four members including the captain were reported missing (“4 Missing After Vietnamese Cargo Ship Sinks Off Sri Lanka,” 2012).



FIGURE 8: SAIGON QUEEN PRIOR TO SINKING (SOURCE: SEA NEWS)

4.2. GROUNDINGS

4.2.1. M/V KOMSOMOLETS AZERBAYDZHANA

M/V Komsomolets Azerbaydzhana reportedly grounded outside the Galle harbour in 1994 and caused an oil spill of 100 MT of fuel oil. However, no oil was reported to have reached the coast line (Bay of Bengal Large Marine Ecosystem Project, 2003).

4.2.2. MV WAKASHIO

MV Wakashio was a Japanese owned, Panama flagged, bulk carrier that was on its way from China to Brazil when it unexpectedly changed course, heading on a direct collision course with Mauritius and eventually running aground in waters off the south-eastern coast of Mauritius near Pointe d'Esny on 25th July 2020 (Bearak, 2020a; Mongabay, 2020). The bulk freighter was devoid of cargo at the time but contained its engine fuel supply of an estimated 4000 MT (Bearak, 2020b).

However, even 12 days after the grounding, on 6th August, the vessel remained in the same location. It then started leaking its oil supply due to a rupture in the hull and an amount close to 1000 MT leaked out into the surrounding waters (Bearak, 2020a). By 11th August, the oil had spread up to an area encompassing 27 square kilometres (BBC, 2020a). Greenpeace Africa warned that "thousands of animal species were at risk of drowning in a sea of pollution, with dire consequences for Mauritius's economy, food security and health" as the island nation's economy depends largely on tourism and fishing (BBC, 2020b).

Near the location of the incident were areas of high ecological significance; wetlands of international importance, a coral atoll and marine protected areas, with unique and rare biodiversity (Vyawahare, 2020a). A state of environmental emergency was declared by the Prime Minister on 7th August (Mongabay, 2020).

Due to prevailing rough seas, the wrecked ship broke into two, on 15th August. However, because around 3000 MT of fuel oil were removed from the ship before

it split in two, a crisis of magnitude three times than that of this was prevented. Around 90 MT remained in the ship at the time of splitting (BBC, 2020a).

The government then decided to scuttle the bow of the ship at a depth of 2000 meters amidst much controversy from environmental groups such as Greenpeace (Vyawahare, 2020b). This decision along with the inaction of the government for days after the grounding sparked unrest among citizens that eventually culminated in protests on the 29th (Vyawahare, 2020a)

Reports of 39 strandings of dead marine mammals that mainly included Melon-headed whales (*Peponocephala electra*) were recorded shortly afterwards. While preliminary investigations revealed an absence of hydrocarbons, there are speculations that the sinking of the bow may have been a cause (Vyawahare, 2020a).



FIGURE 10: STRANDED MELON-HEADED WHALE (SOURCE: GREENPEACE AFRICA)

Early investigations by Panama Maritime Authority revealed that a birthday celebration of one of the crewmembers may be the reason the ship veered off course (Mongabay, 2020). Investigations into the incident by Mitsui O.S.K. Lines (MOL), list probable causes as “lack of safety awareness” and “crewmembers lacked awareness of guidelines on performing navigation in a safe manner and their efforts to conform were insufficient, because they did not prepare an appropriate passage plan that would have ensured appropriate performance, did not own and use the correct nautical map, and neglected visual and radar watch keeping” (MOL, 2020).

The incident was deemed the country's worst ecological disaster by scientists and it was evident with many dead marine life such as eels, sea birds and starfish washing up onshore ("Explainer: Who Pays for Mauritius Oil Spill and How Much?," 2020; "Sea Life around Mauritius Dying as Japanese Ship Oil Spill Spreads," 2020).

The captain of the ship was arrested on 18 August for "endangering safe navigation" as the ship did not respond to several calls made by Mauritian Coast Guard (Mongabay, 2020).



FIGURE 9: OIL SPILL FROM MV WAKASHIO (SOURCE: GREENPEACE AFRICA)

4.2.3. SRI LANKA GLORY

Sri Lanka Glory was a general cargo ship owned by Sri Lanka. On the 18th July 2019, it ran aground near the coast of Rummassala due to heavy winds and extreme weather conditions that led to the anchor being let loose (“Sri Lankan Glory: Fuel Removed,” 2019).

It posed an enormous threat to the nearby Bona Vista coral reef as it was carrying 15 MT of fuel oil (“Bonavista Coral Reef at Risk Due to ‘Sri Lanka Glory,’” 2019). However, the fuel was successfully removed from the ship by MEPA (“Sri Lankan Glory: Fuel Removed,” 2019).



FIGURE 10: SRI LANKA GLORY STRANDED OFF RUMMASSALA (SOURCE: NEWS FIRST)

4.2.4. DREDGER GROUNDING

A dredger grounded at the Port of Colombo on 22nd May 2009. It sank and caused an oil spill of 180 MT (Marine Environment Protection Authority, 2021c).

4.2.5. MV EUROSUN

MV Eurosun was a bulk carrier sailing under the Liberian flag, from the Abu Dhabi port of United Arab Emirates to Trincomalee when it ran aground at the Little Basses coral reef located 5.5 NM off the south-eastern coast on the 23rd January 2021. It had 33 000 MT of clinker and 7200 MT of bunker fuel on board (Sri Lanka Navy, 2021a).

Upon receiving a distress call, the MRCC dispatched an aircraft and ship with navy divers to the location from the ports of Galle and Hambanthota. Preliminary investigations revealed no damage to the hull, oil spill, or water intrusion into the ship (Sri Lanka Navy, 2021a).

On the 24th, a scan of the underwater profile of the ship conducted by navy divers confirmed the hull was intact and that 70m of the keel of the ship was resting on the sandy, rocky bottom. Meanwhile, SLCGS 'Samaraksha' with officials from MEPA and 'Samudraraksha' with oil spill mitigation equipment were sent to the location, on standby. The ship was then reported to have re-floated with the high tide in the evening and was safely anchored about 05 nautical miles southwest of the reef (Sri Lanka Navy, 2021b).

Another investigation carried out on the 25th revealed that there were minor damages to the keel of the ship. Ship surveyors were directed by the Director-General of Merchant Shipping to provide a report of the damages and the MRCC ordered the local agent to repair the ship after it is towed to the nearest port (Sri Lanka Navy, 2021c).



FIGURE 11: MV EUROSUN RUN AGROUND AT THE LITTLE BASSES REEF (SOURCE: SRI LANKA AIRFORCE)

4.3. COLLISIONS

4.3.1. MARINA SEDNA

Marina Sedna was a Singapore flagged barge, that met with an accident near the Galle harbour on the 3rd August 2007, while transporting a Dragger Scorpio. When it was being dragged by a tug, the tow rope broke, causing the barge to hit on the breakwater and break into two parts (MEPA, 2020).

There was a threat of an oil spill due to the 90,000 litres of oil supply contained in the Dragger Scorpio but actions were taken by MEPA to prevent a major spill and only about 2 MT were leaked (Marine Environment Protection Authority, 2021c). Operations concluded on the 10th of August 2007 and the expenses were charged from the ship-owner (MEPA, 2020).

4.4. FIRES

4.4.1. MSC DANIELA

MSC Daniela was a very large container ship belonging to the Mediterranean Shipping Company (MSC) carrying AIS Status-Hazard A (Major) type cargo when it caught on fire on 4th April 2017, approximately 120 NM off the Colombo port en route to the Suez Canal from Singapore (Gamage, 2019).

It was reported that the fire started in the containers on the main deck in the aft part of the ship. The crew was unable to extinguish the fire themselves and the ship sailed to Colombo, sending a distress signal that was received by the MRCC (Gamage, 2019).



FIGURE 12: FIRE ABOARD MSC DANIELA (SOURCE: SRI LANKA NAVY)

Two tugs; Rawana and Maha Wewa from the SLPA, the vessel Sagara and two Fast Attack Craft ; P 436 and P 412 from the SLN were deployed to combat the fire. The SLAF Bell 212 helicopter assisted the firefighting aerially. The ICG also dispatched the ICG ship Shoor along with INS Garriel and INS Darshak and the helicopter

'Chetak' when assistance was requested by SLN. Both, 'Shoor' and 'Sagara' were equipped with resources for firefighting (Gamage, 2019).



FIGURE 13: FIREFIGHTING NEAR MSC DANIELLA (SOURCE: SRI LANKA NAVY)

The firefighting continued for over 10 days and with collective efforts from the SLN, SLAF, SLPA, IN, ICG and other stakeholder agencies, the fire was doused and brought under control (Gamage, 2019; "Misdeclaring of Hazardous Cargo Might Be Root Cause of Fire on MSC Daniela," 2017).

The ship was brought in to and berthed in the Colombo port afterwards and the damaged cargo was unloaded. The MSC announced that the misdeclaration of hazardous cargo was the most likely the reason for the fire (Gamage, 2019).

4.4.2. MOL CHARISMA

MOL Charisma was a Bahamas flagged box ship deployed in Hapag-Lloyd's Pacific South 3 (PS3) service ("Fire Aboard Container Ship MOL Charisma Off Sri Lanka," 2020; Schuler, 2020). On September 1st, 2020, while approximately 250 miles east from Colombo, its no.5 cargo hold experienced a fire. It was on the way from Port Kelang, Malaysia to Nhava Sheva, Mumbai, India (Schuler, 2020).

Although the fire was extinguished by the crew using CO₂, the ship reduced speed and sailed to Colombo, Sri Lanka. It arrived early September 3rd and was anchored off Colombo awaiting inspection ("Fire Aboard Container Ship MOL Charisma Off Sri Lanka," 2020). The latest news reported that AIS ship tracking data showed that the ship was 'Underway Using Engine' heading for Singapore (Schuler, 2020).

4.4.3. MT NEW DIAMOND

The MT New Diamond was a Panama flagged VLCC that caught fire, 38 NM off Sangaman Kanda point on the east coast of Sri Lanka. It was transporting 270,000 MT of crude oil along with its 1700 MT of diesel supply, from the port of Mina Al Ahmadi, Kuwait to the Port of Paradip, India when the fire started due to an explosion in the engine room (Farzan, 2020a; “Fire on MT New Diamond Brought under Control,” 2020)

It sent out a distress signal in the early morning hours of September 3rd and the Sri Lankan authorities responded quickly (Farzan, 2020a). The crew and the captain were evacuated except for one, who was later reported as dead. Firefighting started immediately and continued till 6th September when the flames were finally doused (“Fire on MT New Diamond Brought under Control,” 2020). Towing of the ship to deeper waters away from Sri Lanka began on the same day. The operations were a collective effort by Sri Lankan and Indian firefighting teams that included ships, tugs, equipment and personnel from the SLN, SLAF, SLCG, IN, ICG, Hambanthota International Port Group and other stakeholders (Farzan, 2020b).



FIGURE 14: FIREFIGHTING ABOARD MT NEW DIAMOND (SOURCE: ECONOMY NEXT)

Nevertheless, on September 7th, the fire reignited due to strong winds caused by prevailing rough weather conditions. Firefighting recommenced and operations

persisted for another three days till the fire was finally brought under control on the 9th (Farzan, 2020e). Meanwhile, a research team comprising of officials from MEPA, NARA and the University of Ruhuna also arrived on-site and collected samples for analysis of the environmental impact of the fire on the 8th (Farzan, 2020c).

A narrow diesel oil patch of about 1km was observed trailing behind the ship on 8th September and consequently an Indian Dornier aircraft was flown to the location to airdrop diesel dispersant to minimize marine pollution (Farzan, 2020c). Another oil patch was observed on the 9th morning and after preliminary investigations, it was proved to have resulted from a leak in the fuel supply of the ship and not the crude oil (Farzan, 2020d). Sri Lankan military divers were able to fix the fuel leak by the 11th (“Navy Plugs Fuel Leak on MT New Diamond,” 2020).



FIGURE 15: OIL SLICK TRAILING BEHIND THE OIL TANKER (SOURCE: SRI LANKA AIR FORCE)

Moreover, on the 9th, experts from SMIT Singapore Pte Ltd, an international Singapore-based company, appointed by the ship’s commercial owners as its salvage company, boarded the ship for their investigations (Farzan, 2020d). They confirmed that the crude oil cargo was intact (“Navy Plugs Fuel Leak on MT New Diamond,” 2020).

NARA has confirmed negative effects to the marine environment due to the oil spill following observations of changes in behavioural pattern in turtles in the area but

a complete impact assessment would need a period of 8 months to a year as periodical analysis of seawater and marine life needs to be done (Farzan, 2020g; A. Fernando, 2020)

An interim claim of Rs. 300 million was submitted by the Attorney General Dappula de Livera on September 16th, representing the costs incurred by the government and relevant authorities in controlling the fire on the ship. On the 24th, the AG submitted a further claim of Rs. 100 million to the interim claim (Farzan, 2020f). News media reported that the owners of MT New Diamond settled the complete payment. However, it is to be highlighted that this payment did not include compensation for the marine pollution caused due to the incident (A. Fernando, 2020).

The captain of the MT New Diamond, Ilias Sterio, was indicted under two charges for violation of the Marine Pollution Prevention Act. No 35 of 2008. He pleaded guilty and was fined a penalty amounting to Rs. 20 million (Marine Insight, 2020).

On the 2nd of October, MEPA stated that they had informed relevant authorities that the MT New Diamond was to be allowed to leave Sri Lankan waters only after all negotiations concerning marine pollution were settled. However, MRCC granted permission for the vessel to be towed away from Sri Lanka, on the same day (Farzan, 2020h).

The tanker was reported to have been towed across the Indian Ocean to the United Arab Emirates where it arrived on November 8th (Farzan, 2020i). Negotiations with the ship owners over compensation for the oil pollution are still underway.

4.5. OTHER TYPES

4.5.1. SHIP STRIKES

The shipping lanes off the Southern coast of Sri Lanka are one of the busiest in the world, yet they also overlap with high concentrations of whales and other cetaceans (Nanayakkara & Herath, 2017). Moreover, the unique population of *Balaenoptera musculus indica* found in these waters seem to be especially vulnerable to ship strikes, due to their localized presence in the Northern Indian Ocean (de Vos, 2018).

A study (Nanayakkara & Herath, 2017) conducted from 2010 to 2014 found 14 records of ship strikes between whales and vessels from all the strandings reported in Sri Lanka during that time period. The highest number of strandings was recorded from the south of the island and the victims mainly included blue whales (64%), great sperm whales (14%), Cuvier's beaked whales (7%), and Bryde's whales (7%). The study also observed two live blue whales in southern waters with propeller marks on their bodies.



FIGURE 15: CARCASS FOUND ON BOW OF A CONTAINER SHIP (SOURCE: DE VOS ET AL., 2015)

4.5.2. THALDIYAWATTE LAGOON OIL SPILL

Leakage of a pipeline carrying oil to the Muthurajawela Oil Refinery Complex and owned by Ceylon Petroleum Storage Terminals Ltd (CPSTL) led to an oil spill in a lagoon in Thaldiyawatta, Dikovita on 31st December 2015. The spill was reported to have occurred during the cleaning of the pipeline and involved more than 22 tons of Kerosene oil (Jet A-1) (Fernando, 2018; Marine Environment Protection Authority, 2021c). Apart from the slick on the surface, the oil and grease in the water column had a concentration of 285.9 mg/l just after the spill (Amarathunga et al., 2017). Although the SLN was able to restore the pipeline, the damage was already done (“Navy Assists to Arrest Muthurajawela Oil Spill,” 2016).

According to a study on the spill (Amarathunga et al., 2017), the environmental impact was very high although the affected area was less. The study found that 30% of the mangroves had died due to suffocation and the area where plants had died amounted to an estimated 6325 m² of land. Dead animals encountered were identified to be from 12 fish species, three crab species and 9 gastropod species. Behavioural changes and severe stress were also seen in mangrove associated animals like *Metopograpsus messor*, *Telescopium telescopium* and *Sesarma* sp.

The study also found that the livelihoods of the fisheries community were affected as 22 fishing vessels had been impacted and commercially important species were badly affected by the oil.



FIGURE 16: CLEANUP EFFORTS AT THALDIYAWATTE LAGOON
(SOURCE: NAVY.LK)

4.5.3. MUTHURAJAWELA OIL SPILL

On the 8th of September 2017, an oil spill of around 25 MT occurred on the West coast of Sri Lanka due to the bursting of a pipeline carrying oil belonging to CPSTL. The pipeline connected a mooring facility around 10 km offshore to the Muthurajawela Oil Refinery Complex (Fernando, 2018; Mudugamuwa, 2018). The cause was reported as the old and low-quality condition of the pipeline (Mudugamuwa, 2018).

Leaked oil was mainly observed along a two and a half kilometre coastal stretch to the north of the point of spillage, namely in the areas Dikovita and Wattala. Cleaning operations were conducted with combined efforts of the SLCG, CPSTL, CPC, SLA, SLN, MEPA, CCD and civilians. Methods used included collecting oil mixed sand, pumping floating oil slicks into bowsers and soaking up oil using oil skimmers. Two ships of the SLCG, SLCGS Samaraksha and SLCGS Samudra Raksha were also deployed for cleaning up the surrounding sea using oil dispersals. Oil dispersants were, however, used with caution due to them being strong chemicals (Fernando, 2018).



**FIGURE 17: CLEAN-UP OPERATIONS UNDERWAY DURING OIL SPILL OF MUTHURAJAWELA
(SOURCE: SUNDAY OBSERVER)**

Around 70% of the oil spill was cleaned up and the rest was left for the environment to slowly dispose of. Residents were warned to avoid the coast and sea for around

three weeks. However, the marine and coastal ecosystem in the area was reported to be greatly affected. A complaint was lodged at the Pamunugama police station by MEPA regarding the oil spill (Fernando, 2018).

Later, a report on the environmental damage caused by the spill was submitted by NARA to the Ministry of Petroleum Resources Development (Pabasara, 2018).



FIGURE 18: CLEANUP EFFORTS UNDERWAY (SOURCE: THE MORNING)

4.5.4. THALDIYAWATTE OIL SPILL

On 24th March 2018, a leakage from a pipeline transferring furnace oil caused an oil spill of 39 MT in Thaldiyawatta (Marine Environment Protection Authority, 2021c).

4.5.5. SPBM LEAKAGE AT THALDIYAWATTE

Rupture of an underwater buoy pipeline in a SPBM at Thaldiyawatta, Uswetakeiyawa led to an oil spill of 50 MT of furnace oil on 8th September 2018 (Marine Environment Protection Authority, 2021c)

4.5.6. WELLAWATTE OIL SPILL

A minor oil spill was seen affecting a 1 km radius of the coast from Mt Lavinia to Wellawatte on 2nd June 2019. The cause of this incident was reported to be oil released from a ship. However, available satellite systems could not determine which ship was responsible for the spill. The oil spill was suspected to have occurred late at night on 1st June but the spill was only detected early morning on the 2nd (Silva, 2019).

The public was warned to avoid the beach and the fishermen in the area were advised to avoid fishing, by MEPA, due to the risk of sludge oil adhering to the boats which would be expensive to get rid of.

Marine life in the area was reported to be at risk and marine biologist, Asha de Vos had expressed concern for turtle nesting in the area as they have been observed in the area onwards from Mt Lavinia. The Department of Fisheries and Aquatic Resources was working with MEPA, conducting research to analyse the environmental effects (Silva, 2019).

80 - 90% of the oil spill was cleaned up by MEPA with assistance from the SLCG and SLN. The other 10% was mixed and ingrained into the sand and there was no technology available to remove it (Silva, 2019).



FIGURE 19: OIL WASHED ASHORE

4.5.7. MV BBC NAPLES

MV BBC Naples was a ship sailing under the flag of Antigua and Barbuda, from Rotterdam, the Netherlands to China when it made an emergency call at the Hambantota port on the 20th April 2021 (Senadhira, 2021).

While Sri Lankan authorities had approved the documentation shown by the local agents of the ship, Ms. Barwil Meridian Navigation, it was later revealed that they had not declared that the ship was carrying radioactive cargo consisting of Uranium hexafluoride. Investigations were carried out by the SLN and SLPA (Senadhira, 2021).

H.L. Anil Ranjith, Director General of SLAERC was reported saying “Uranium hexafluoride is nuclear material that is commonly transported from one country to another. But as per Sri Lankan law, we need any vessel carrying radioactive material to obtain prior permission before berthing at any of our ports. This vessel had not obtained that clearance.” These actions violated Sri Lanka’s Atomic Energy Act No. 40 of 2014 and after consultation with the Ministry of Defence, the ship was ordered to leave immediately (Senadhira, 2021; Srinivasan, 2021).

Once the ship was found to be carrying dangerous cargo, it was immediately moved to the outer port and instructed not to unload its cargo at the port. Sri Lanka Customs and the SLN were reported to be present at all times ensuring the ship did not unload its cargo (Senadhira, 2021).

Legal action is to be taken against the local agents of the ship.



FIGURE 20: MV BBC NAPLES (SOURCE: HELD SHIPPING)

4.6. OTHER MARITIME INCIDENTS

TABLE 1: OTHER SELECTED MARITIME INCIDENTS RELATED TO OIL SPILLS IN SRI LANKAN WATERS IN RECENT TIMES (SOURCE:MEPA)

Date	Source involved	Incident	Location	Amount of oil involved
14-Nov-2010	MT Charhat	Bunker oil spill	Port of Colombo	Less than 2 MT
17-Oct-2012	Ship of Weligovva	Oil leakage while repairing the ship	Kirinda Fisheries Harbour	20 barrels
14-Aug-2013	LPG Formentera	Oil leakage from barge	Galle Port	1 MT
14-Nov-2013	TF-77 (Fishing vessel)	Leakage from abandoned vessel	Mutwal Harbour	Less than 1 MT
23-Jan-2015	MT.CSC Progress	Risk of oil spill due to a grounding incident	Trincomalee Port	18 635.645 MT
31-May-2015	Colombo Dockyard PLC	Oil spill	Dolphin pier & Doc 1-Colombo Dockyard	Approx. 10 MT
16-Jan-2016	Tank leakage at Lanka fuel mart (a filling station)	Diesel oil spill	Akuressa	Approx. 12 MT
23-May-2016	Tank farm of Ceylon Petroleum Corporation-Orugodawatta	Waste oil spill	Kiththampahuwa canal, Orugodawatta	-
1-Jun-2017	SPBM Colombo (9.6 km offshore from Colombo Port)	-	-	5600L of crude oil
16-Jan-2018	Furnace oil transferring pipeline	Pipeline leak of furnace oil	Heen ala canal	150,000L of furnace oil

5. NATIONAL OIL SPILL CONTINGENCY PLAN

Sri Lanka is located between the two major MOC's in the Indian Ocean; the Strait of Hormuz and the Strait of Malacca. Thereby, the amount of oil transported in tankers across Sri Lanka is approximately 525 million tonnes per year within the EEZ and close outside this zone (Bay of Bengal Large Marine Ecosystem Project, 2003). This poses a huge threat of oil spill in these waters.

Oil transit chokepoints

About half of the world's oil production is moved by tankers on fixed maritime routes. The blockage of a chokepoint, even temporarily, can lead to substantial increases in total energy costs. Oil transit chokepoints are therefore a critical part of global energy security.

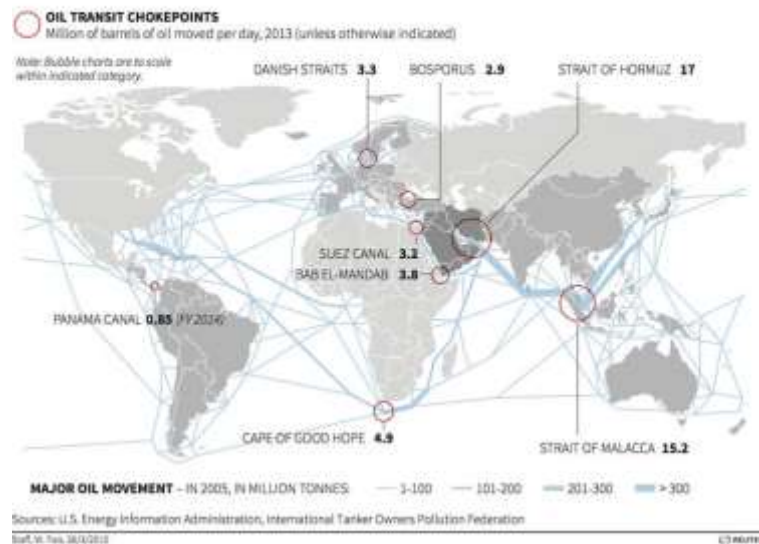


FIGURE 21: MAJOR OIL MOVEMENT AND CHOKEPOINTS IN THE WORLD (SOURCE: U.S. ENERGY INFORMATION ADMINISTRATION, INTERNATIONAL TANKER OWNERS POLLUTION FEDERATION)

The Marine Environment Protection Authority (MEPA) is the “Agency responsible for marine pollution prevention related activity” designated by the Marine Pollution Prevention Act No. 35 of 2008 (Marine Environment Protection Authority, n.d.).

Following this Act, the National Oil Spill Contingency Plan (NOSCOP) of Sri Lanka was formulated by MEPA in 1995 and it was last amended in 2012 (Marine Environment Protection Authority, n.d.; Ministry of Environment, 2012). NOSCOP

provides a framework for the prevention and mitigation of oil spills for different stakeholders to be followed in the event of a spill to prevent or minimize harm to the marine and coastal environment within the territorial sea, EEZ and even the high seas where a spill can potentially harm Sri Lanka (Marine Environment Protection Authority, n.d.).

Potential threats of oil spill in Sri Lankan waters identified by the NOSCOP are given below (as directly referred to the NOSCOP).

- The density of marine traffic in Sri Lanka's coastal waters. Sri Lanka borders the main East/West shipping Route used by ships trading to and from the industrial centers of the Far East and the West.
- The offshore single point buoys mooring off the port of Colombo. Crude oil imported to Sri Lanka is pumped to the Ceylon Petroleum Corporation's land-based storage tanks via an undersea pipeline from this offshore terminal. The terminal is operated throughout the year, even during the monsoon period and approximately two tankers carrying 120,000-tonne parcels of crude oil are transferred to the tanks ashore every month.
- Operations of Trincomalee Oil Tank Farm.
- Expansion and development of ports and new constructions of ports.
- Existing marine services industry, including the offshore supply of bunkers and ship repairing industry.
- Exploration of oil within the Exclusive Economic Zone (EEZ) of Sri Lanka (Marine Environment Protection Authority, n.d., p. 8)

The NOSCOP then categorizes oil spills according to the amount of oil spilt and the proximity to a response centre into three tiers. Each tier includes a response plan as shown below,

1. Tier I - Involves oil spills up to 50 tonnes which are relatively small spills. They require local responses taking in to use of local resources and capabilities according to the local oil pollution contingency plan. It is also required that all authorities involved in the handling of oil in the country are required to have their own

contingency plans that need to be activated in the event of a Tier I spill. Agencies involved are those such as CPC, Colombo Dockyard PLC, Lanka IOC, Hambanthota International Port, Tokyo Cement Company PLC, China harbour engineering company Ltd and Litro gas.

2. Tier II - Involves spills from 50 to 100 tonnes and includes implementation of NOS COP. They may involve resources from several sources, for instance, industrial and governmental resources.
3. Tier III - Involves spills greater than 100 tonnes and will require all oil spill response resources in a nation. International assistance will also be required.

The resource capacity of MEPA to combat oil spills is limited to a number of oil booms, oil spill dispersants, absorbents, a spray machine, a decontamination unit and chemical response kits along with equipment for human safety (Marine Environment Protection Authority, 2021b). Combined resources of other stakeholders involved include several other vital oil spill mitigation tools such as skimmer equipment, foam, pumps and temporary portable storage (Marine Environment Protection Authority, 2021a).

On the other hand, oil spills can be particularly harmful to marine life such as birds, turtles and marine mammals that live on the water surface as oil is usually present floating on the surface. Oil destroys the water repellency of birds and the insulation ability of mammals. In the event of a spill, oiled wildlife need to be found, stabilized, cleaned and rehabilitated properly before releasing back to the ocean, all of which require special training and equipment. Currently, Sri Lanka lacks an oil spill response and rehabilitation plan for wildlife. Some of the equipment essential for oiled marine life rescue and rehabilitation are included in Table 2.

TABLE 2: STANDARD EQUIPMENT USED FOR OILED MARINE LIFE REHABILITATION (SOURCE: (Oiledwildlife.eu, n.d.), (Welte & Frink, 1991))

Search and rescue	Stabilisation and husbandry	Medical	Wildlife cleaning	Rehabilitation:
<ul style="list-style-type: none"> -Nets -Boxes and/or cages -Navigational aids (compass, GPS, maps, charts) -Quad bikes or four-wheel drive vehicles (for access to remote areas) -Boats (water rescue) 	<ul style="list-style-type: none"> -Electrolyte solution -Catheter tip syringes -Feeding tubes -Measuring cups -Feeding tubs or bowls -Specialised cages/housing units (many bird species can be housed in small groups) -Disinfectant -Sponges, brushes -Refrigerators (for food) 	<ul style="list-style-type: none"> -Stethoscopes -Needles and syringes -Injectable and oral vitamins, antibiotics, anti-fungals and other drugs -Blood collection tubes -Centrifuge -Hazardous medical waste containers -Dedicated refrigerators and freezers -Dedicated post mortem examination instruments 	<ul style="list-style-type: none"> -Washing liquid for de-oiling birds such as Dawn -dishwashing detergent (Proctor & Gamble) -Washing tubs (simple plastic bowls or larger metal tubs/sinks) -Hoses with adjustable nozzles -Drying cages (purpose-built net bottom pens are often used) -Pet dryers and/or heat lamps 	<ul style="list-style-type: none"> -Purpose-built accommodation (appropriate for the species in care) -Bathing pools (usually of some depth)

6. DISCUSSION

In this report, a total of 20 major maritime adversities (excluding ship strikes) that have occurred in Sri Lanka within a period of 27 years, from 1994 to 2021, were studied (Table 3). More than 50% of the incidents have occurred in the last five years. This can be attributed to increasing maritime shipping trends.

Out of the 20 incidents studied, 12 of them involved an oil spillage of some sort. All the incidents listed in Table 1 had an amount of oil involved. This goes on to prove that Sri Lanka is highly vulnerable to oil spills.

However, the large number of oil tankers that move through Sri Lankan waters were not the cause of all these spills. 11 out of the 12 spills, resulted from other sources. 6 incidents occurred due to leakage of the fuel supply of ships carrying cargo other than oil when meeting with adversity. Even the MV Wakashio oil spill that led to the worst ecological crisis Mauritius has ever faced, resulted from a bulk carrier devoid of cargo.

Four incidents resulted from the leakage of oil-carrying pipelines belonging to CPC and CPSTL and were reported from the Thaldiyawatte, Dikovita area within the span of three years, 2015 to 2018. It is important that while this area has an offshore SPBM, it also hosts the Muthurajawela marshes which is an ecologically significant wetland, putting it at high risk. However, a cause for the pipeline leakage was reported from only one incident; the old and low quality of the pipelines. This may be due to improper maintenance and monitoring.

Of the 12 major incidents with spills, only 11 had information available on the amount or at least the source and nature of the spill. The anonymous case was the one that occurred in Wellawatte. Of these 11 spills, only two can be classified as Tier III spills. Even so, the risk of an oil spill cannot be taken lightly as the MT New Diamond would have caused a massive Tier III spill.

The need for an effective monitoring system of vessels entering and leaving Sri Lankan waters seems vital considering the large ship density and amount of maritime trade that passes through our waters. Easy access, by authorities, to the

general information of vessels passing through may be crucial to effectively mitigate possible shipping adversities using the appropriate measures. Such information can include cargo details such as cargo type, speed, amount of fuel, vessel dimensions and details of the crew. From the case studies, the Wellawatte incident highlights the need for better surveillance as the spill was detected many hours after it was released and the responsible ship could not be found. If such incidents occur further away in the EEZ, authorities may not even be aware of them without better monitoring systems, as the slick might not wash ashore.

In the year 2020, the MT New Diamond oil tanker leaked only a part of its fuel supply in the eastern seas. Had the tanker leaked its 270 000 MT of oil cargo, it would have led to a major ecological crisis for Sri Lanka's foreseeable future similar to the MV Wakashio catastrophe as the latter incident involved a similar amount of oil cargo, in a location of similar ecological sensitivity. If that had happened, magnified effects of those seen in the aftermath of the Thaldiyawatte lagoon spill of 2015, which involved only around 22 MT of fuel could have been seen.

The adverse consequences of an oil spill for a nation whose economy depends a lot on tourism, which in turn thrives on its rich marine and coastal resources will be evident in Mauritius with the MV Wakashio incident. And a similar crisis stemming from disrupted industries such as fisheries and tourism was only narrowly deflected by Sri Lanka with the MT New Diamond. Moreover, since a spill from the MT New Diamond would have affected quite a large area of the coast due to its 270 000 MT of cargo and the coastal area being the hub of industry in Sri Lanka along with the fact that this would have occurred during the COVID-19 period, there could have been severe economic consequences.

Furthermore, since the East-West shipping route passing close to Sri Lanka's shores involves a large portion of world trade, a spill such as the MT New Diamond could have affected this trade flow and have had dire consequences on both the regional and global scale.

On the other hand, it is to be highlighted that the resource capacity of Sri Lanka to handle oil spills could be improved as even in the case of a 25 MT, Tier I spill such as the MV Amanat Shah incident, assistance was required from the ICG. The fire

aboard the MSC Daniela and MT New Diamond also needed international firefighting assistance.

The need for a Chemical Contingency Plan for Sri Lanka is highlighted in the case of the MT Granba where monitoring of the environmental effects was not reported even though the ship with all of its chemical cargo was sunk within the EEZ. Other nations in the region such as Singapore which has a similar density of marine traffic, have a Chemical Contingency Plan. It was developed as a supplement to their Marine Emergency Action Procedure and includes that all chemical tankers coming to Singapore need to provide a report of the chemical cargo on-board beforehand (IIMS, 2014; ITOPF Limited, 2018).

Another point that would have been highlighted if the MT New Diamond caused a Tier III spill is the lack of a response plan for oiled marine life in Sri Lanka. With the high risk of an oil spill in Sri Lankan waters, such strategies being added to the NOSCOP will help Sri Lanka be prepared to minimize the environmental impact, should such a situation arise in the future.

With increasing maritime traffic, frequencies of ship strikes are also expected to increase, especially in the southern waters where the main shipping route passes through. This increases the threat to the unique population of blue whales in our waters as well as other cetaceans. Measures such as reduction of vessel speeds and noise in ecologically sensitive and protected areas can help minimize harm to this megafauna and marine life in general. Tools such as Whale Alert is currently being used in the United States for this purpose (Whale Alert, n.d.). Whale Alert offers a mobile application that is freely available to citizens and mariners. It designates alert zones with restrictions, recommended alternate routes and guides voluntary vessels through areas with high whale densities.

With the density of ships passing through our waters expected to increase further, if Sri Lanka develops proactive strategies for maritime adversities, in terms of resources, monitoring, and policy, rather than relying on reactive solutions, Sri Lanka would be able to successfully mitigate them-protecting our seas and sustaining the millions of livelihoods that depend upon them and ensuring a

sustainable maritime industry that will aid Sri Lanka to grow into a prime maritime hub and even extend our support and services to regional adversities.

TABLE 3: SUMMARY OF THE OIL SPILLS STUDIED

Ship/Source	Year	Location	Type of oil spilt	Amount of oil spilt	Tier
M/V Komsomolets Azerbaijani	1994	Outside Galle harbour	Fuel oil	100 MT	II
MV Meliksah	1999	Off the coast of Bundala	Heavy fuel oil	200 MT	III
MV Amanat Shah	2007	13 km of southern coast	Heavy fuel oil	25 MT	I
Marina Sedna	2007	Near Galle harbour		2 MT	I
Dredger	2009	Port of Colombo	-	180 MT	III
Thermopylae Sierra	2012	Colombo Outer Anchorage	-	70 MT	II
Pipeline	2017	Off the western coast near Muthurajawela Oil Refinery	-	25 MT	I
Pipeline	2018	Thaldiyawatte	Furnace oil	39 MT	I
SPBM underwater buoy pipeline	2018	Thaldiyawatta, Uswetakeiyawa	Furnace oil	50 MT	I
Unidentified ship	2019	1 km radius area from Mt Lavinia to Wellawatte	-	-	-
MT New Diamond	2020	Off the eastern coast	Diesel	-	-
Pipeline	2015	Lagoon in Thaldiyawatte	Kerosene oil spill (Jet A-1)	>22 MT	I

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