



## MARINE POLLUTION CONTROL: GOVERNANCE CHALLENGES

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### *Abstract*

Marine pollution is a challenging issue as it involves present and emerging areas (e.g. fisheries, shipping, ecosystems, and biodiversity) and are often transboundary in nature, making governance solutions complex. The continuing threat of pollution on coastal and marine environment and resources has been addressed using national, regional, and international governance mechanisms. Recent deliberations emphasise on the need for coordinated, adaptive and directed responses to the challenges and opportunities in accordance to the frameworks of the United Nations Convention on the Law of the Sea (UNCLOS), Sustainable Development Goals (SDGs), and other relevant environmental treaties. This paper focuses on the coastal and marine pollution management frameworks in Malaysia and the region. Existing management frameworks have been developed through regional projects and programmes supported by various international (e.g., UNEP) and regional institutions (e.g., ASEAN, COBSEA, PEMSEA, IORA, LMEs). Although these frameworks take a holistic and functional management approach, there is a general limitation in terms of legally binding regional policies on addressing marine pollution due to the varying geographical, political, social as well as economic settings of countries. Countries have been active in various projects and programmes in the region, though compliance to obligations of the international and regional conventions on coastal and marine pollution management had been limited in some areas. For instance, an analysis of the drivers and pressures on coastal and marine ecosystems as well as its current state show that pollutants persist despite efforts to manage their release from anthropogenic sources. This paper provides a case study focusing on marine plastic pollution as an emerging issue, with an emphasis on actions by Malaysia. On a broader level, the option for a region-wide and legal framework for effective management of coastal and marine pollution issues are further explored.

**Keywords:** Marine Pollution, Transboundary, Environmental Treaties, Region, Malaysia.

### **Introduction**

The Maritime Institute of Malaysia (MIMA) is a policy research institute set up by the Malaysian Government to look into matters relating to Malaysia's interest at sea, and to serve as a national focal point for research in the maritime sector. One key task of the Institute is to complement the efforts of the various government

agencies involved in the maritime sector by mobilising expertise to assist and support them in national maritime policy planning and implementation.

From the age of sail till modern era, humankind has consistently ventured and explored sea to ensure their better livelihood. In the contemporary context, as land resources are depleting in an unprecedented rate, ocean borne activities have flourished immensely. The United Nations has taken this into cognisance and highlighted these issues in Sustainable Development Goals (SDGs)<sup>1</sup> in Goal 14 i.e. Conserve and sustainably use the oceans, seas and marine resources for sustainable development<sup>2</sup>. The growing importance of oceans draws attention of all states and many non-state actors, which has created a multidimensional political landscape for addressing ocean-related issues.

Sea, being a global common, does not belong to any particular state. As such, actions and policies on sea affairs by different states as maritime authorities have made the sea governance complex. This creates a demand for improved understanding of the ocean and the use of modern and sophisticated technologies for maritime activities including exploration and utilisation of maritime resources. The best way of adopting rules of conduct at sea is therefore through international agreements and, in particular, through regional approaches. This would ensure the best use of sea resources in a sustainable manner, where parties involved in the decision-making are aware of each other's priorities and needs. Against this background, this paper was presented at the Bangladesh Institute of Maritime Research and Development (BIMRAD) at its maiden International Seminar in November 2018 themed Maritime Good Governance towards Sustainable Development. Some of the interconnected issues deliberated included the following areas i.e. broader concept of good governance leading towards sustainable development; role of good governance in the exploration and the utilisation of marine resources; maritime security and good governance in the Indian Ocean Region; governance challenges for pollution control, as well as the role of law enforcing agencies to ensure good governance at sea.

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<sup>1</sup> Malaysia began her journey towards sustainable development since the 1970s when the New Economic Policy (NEP) was introduced in 1970s. All the subsequent five-year Malaysia development plans have underscored the elements of sustainable development encompassing sustainable economic growth, as well as mainstreamed environmental conservation.

<sup>2</sup> Acknowledging the SDGs 2030 as the blueprint to achieve a better and more sustainable future, specific attention is placed here on SDG Goal 14 focusing for instance on Target 14.1 (marine pollution), 14.2 (sustainable management and protection of the coastal and marine ecosystems), 14.5 (marine protected areas), and others that are related to sustainable ocean governance measures.

Challenges faced in the governance of the sea revolve around a number of factors. For instance, the seas are increasingly being used both to provide the essentials of life and for commercial purposes. As a result, cases of overexploited fisheries, pollution by pesticides, fertilisers, chemicals and waste washed from land and the effects are increasingly witnessed. Additionally, in the modern era of unbounded use of plastic materials in different forms are also a major cause for marine pollution. In addition, the increasing effects of climate change are evident on ocean temperature, currents, food chains and in extreme events like severe natural disasters including flooding and storms. Biodiversity and marine life related to sea are also being affected due to oil spillage from different sources. Moreover, with the introduction of modern technology, over exploration and over exploitation of fishes and marine resources (minerals and petroleum resources) are also degrading the marine environment, which has an adversary effect on maritime governance.

As the UN member countries aim to achieve SDG goals at all levels, it is necessary to identify challenges and threats to achieving these goals. A large number of challenges are common to all countries, and they require joint global response. Likewise, the threats to climate and the health of the oceans can only be addressed through innovation and global cooperation. Measures against marine pollution or other threats to the marine environment are highly essential to ensure better livelihood of humankind, in connection to ensure sustainable development. Also, collaborative efforts among different nations and regional actors to control marine pollution should be a priority mechanism towards ensuring good maritime governance. With this as the backdrop, the presentation delivered at BIMRAD 2018 also highlighted the issues and challenges faced and existing international practices in the areas of policymaking and actions to deal with such challenges. It also highlights on states' obligations to protect from maritime pollution, governance challenges to control marine pollution and options for effective pollution control to ensure good governance for sustainable development.

### **Malaysia and the Indian Ocean Region**

The Indian Ocean Region consists of an important Large Marine Ecosystem (LME) area i.e. the Bay of Bengal Large Marine Ecosystem (BOBLME). The area involves cooperation fostered amongst eight countries which include Indonesia, Malaysia, Thailand, Myanmar, Bangladesh, India, Sri Lanka and the Maldives. The BOBLME area at large includes the Bay of Bengal itself, the Andaman Sea, the Straits of Malacca (SOM) and the Indian Ocean. More specifically, besides the high seas area, the area also comprises coastal ecosystems, islands, continental shelves, as well as coastal and marine waters of the northern part of the Island of

Sumatra in Indonesia (Provinces of Aceh, Riau, North Sumatra and West Sumatra), the West Coast of Peninsular Malaysia, the West Coast of Thailand, Myanmar and Bangladesh, the East Coast of India; the Andaman and Nicobar Islands of India, Sri Lanka, and the Maldives. The BOBLME covers an area of about 6.25 million square kilometres. Its boundaries are based on the delineation of the world's LMEs by the National Oceanic and Atmospheric Administration (NOAA), but have included also Maldives and northern Sumatra in Indonesia for the sole purpose of fostering cooperation in the BOBLME programme signed in 2009 (Figure 1).

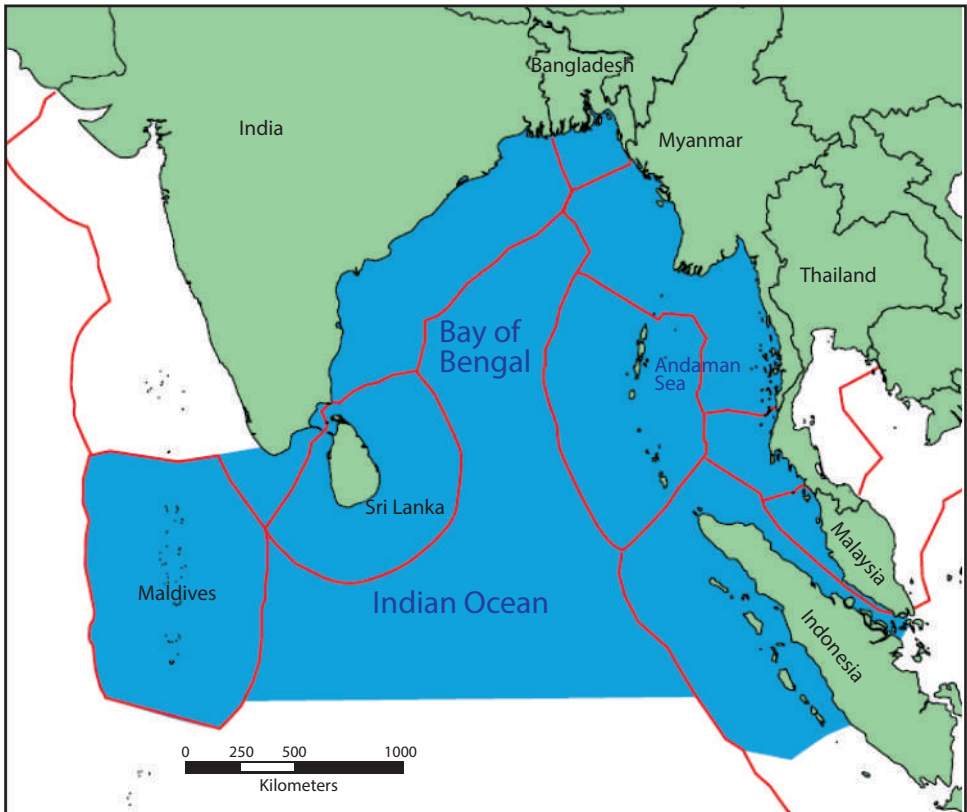


Figure 1. The BOBLME programme area in the Indian Ocean

Source: [www.boblme.org](http://www.boblme.org)

The BOBLME countries have a combined total population of about 1.8 billion people, which is equivalent to about 25 percent of the world's population (DESA, 2011). The area is generally rich in natural resources, which includes extensive minerals and energy resources, marine living resources especially fisheries, as well as forest and land resources. Fish production alone reaches about six million tonnes per year, which is in essence more than seven percent of the world's marine catch. This LME also supports a wide range of habitats, including extensive tracks of mangroves, coral reefs, and seagrass beds (Changsanget al., 1999; Chavanet al., 1992; Conservation International, 2008; Ellison, 1998; Ertemeijer& Lewis, 1999; Fonseca et al., 2000). It is an area of high biodiversity, with a large number of endangered and vulnerable species recorded to be found in the LME. Accordingly, the BOBLME and its natural resources is of considerable social and economic importance to the countries bordering the area. The specific aim of the programme hence revolves around improving lives of the coastal populations through improved management of the environment and its fisheries.

Activities such as fishing, marine farming, tourism and shipping contribute to not only ensuring food security for the people, but also provide employment opportunities and contribute to the national economies. For instance, there are some 400,000 fishing boats operating in the area with some 4.5 million people employed in the fisheries sector and associated activities. Rapid population growth, high dependence on aquatic resources for food, trade and livelihoods, and changing land use patterns are however imposing adverse impacts on the marine ecosystems on a whole.

Among the major issues that have been identified in the area include: (i) overexploitation of marine living resources, (ii) degradation of coastal habitats, and (iii) pollution and water quality degradation. Each of these issues is further accompanied by factors such e.g. elaborating further on the above mentioned factors: (i) a decline in the overall availability of fish resources, changes in the species composition of catches, a high proportion of juvenile fish in the catch, and changes in marine biodiversity, especially through the loss of vulnerable and endangered species; (ii) loss and degradation of mangrove habitats, degradation of coral reefs, as well as loss and damage to seagrasses; and under issue (iii) sewage-borne pathogens and organic load, solid waste and marine litter, increasing nutrient inputs, oil pollution, persistent organic pollutants and persistent toxic substances, sedimentation, and heavy metals. Under the BOBLME programme, the member countries have been cooperating in various means and ways towards developing regional and national responses on the issues that have been identified and their causes. As a member country, Malaysia has benefited on the areas

addressed under the BOBLME programme, including on general coastal and marine governance assessment and improvements. Malaysia envisages to continue to play an active role as well as in fulfilling commitments towards meeting the nation's international obligations related to environmental and resources sustainable use and management.

Additionally, an active participation is displayed by Malaysia through the Indian Ocean Rim Association (IORA). The platform is a dynamic intergovernmental organisation aimed at strengthening regional cooperation and sustainable development within the Indian Ocean Region through its 22 Member States and nine Dialogue Partner. The IORA Council of Ministers in 2007 identified six priority areas for the Association targeted from the medium to long term goals i.e. Maritime safety and security; Trade and investment facilitation; Fisheries management; Disaster risk management; Tourism and cultural exchange; Academic, Science and technology; blue economy; as well as Women's economic empowerment.

### **Trade in the Indian Ocean Region**

The IORA region is synonymous with commerce for centuries and is progressing further. Total half of the world's container ships and two thirds of the world's oil shipments pass through the Indian Ocean, including key transit points including the Bab el-Mandeb, Straits of Hormuz and the SOM. Emerging economies surrounding the seas in the area will ensure that the importance of the region to the global trade environment will only increase in importance and significance in the years to come, including the need to promoting sustained growth and balanced development in the countries bordering the region in line with the SDGs and other global commitments.

In addition, the Indian Ocean Rim Business Forum (IORBF), established in 1997, brings together the private sector and industry groups from across the region to formulate policy and project recommendations to the IORA governments. Furthermore, the IORA Working Group on Trade and Investment (WGTI) brings together government trade experts who work towards harmonising ways of doing business in the IORA region. Amongst others, recent focus areas under these two groups have been into research on how trade contributes to not only job creation and poverty alleviation, but also sustainable and balanced economic growth in the region; as well as harmonising efforts with related IORA priority areas and cross-cutting issues, particularly Blue Economy.

Closer at home, the Maritime Institute of Malaysia (MIMA) in cooperation with the IORA Regional Secretariat and Ministry of Foreign Affairs Malaysia will be spearheading a capacity building programme focusing on Sustainable Development

for Ports and Shipping in the Indian Ocean Region for Maritime Connectivity in April 2019 in Malaysia. The objectives include to enhance competencies in regulating and overseeing ports and shipping in countries in the IORA region, better manage and operate port terminals and shipping, provide insights into best practices in port and shipping's regulation, management and operation, as well as increase integration between the national and regional institutions in the development and management of programmes focusing on ports and shipping.

### Malaysian Efforts towards Sustainable Management of the Straits of Malacca

The Straits is an important sea area for the littoral states, encompassing major marine and coastal ecosystems and supports a major fisheries industry (Tables 1 and 2). At the same time, more than 80,000 commercial vessels traversed the Straits in 2018. In addition, there are as many as 15,000 fishing vessels in the SOM, as well as numerous other vessels that are involved in cross-straits voyages between the three Littoral States. Navigation in the Straits is therefore an activity which requires the provision of adequate safety of navigation as well as environmental protection measures on the part of the Littoral States.

**Table 1. Important marine and coastal ecosystems in the Straits**

Characteristics	Figures
Length	About 500 nautical miles or 900 from Rondo Island to Koh Phuket (northern limit) to the Karuman Island and TanjungPiai. It is the longest Straits used for international navigation.
Width	Widest point - 220 nautical miles at northern limits Narrowest point – 8 nautical miles around Riau archipelago
Marine and Coastal Ecosystems recorded	<p><b>Mangroves</b> – estimated at about 498,109 hectares</p> <ul style="list-style-type: none"> <li>• Malaysia (93,503)</li> <li>• Indonesia (404,606)</li> </ul> <p><b>Coral Reefs</b></p> <ul style="list-style-type: none"> <li>• Malaysia – fringing reefs in Port Dickson, Payar and Perak Islands.</li> <li>• Indonesia – some fringing reefs in the northern Sumatera areas.</li> </ul> <p><b>Seagrass</b></p> <ul style="list-style-type: none"> <li>• Malaysia – Langkawi, Port Dickson, SeberangPrai, TelukNipah (9 species recorded).</li> <li>• Indonesia – East coast of Sumatera (12 species recorded).</li> </ul>
Fisheries landings	More than 700,000 metric tonnes from the West Coast of Peninsular Malaysia (largest component of landings comes from the Straits).
Population	23million in Peninsular Malaysia
Length of the Traffic Separation Scheme (TSS)	240 km

*Adopted from various sources*



**Table 2. Economic value of the Straits (000,000 USD)**

<b>Elements</b>	<b>Malaysian coastline</b>	<b>Straits-wide</b>
Coastline(km)	956.00	2,727.00
Fisheries	341.11	801.53
Aquaculture	57.62	155.96
Mangroves	1,747.65	5,557.87
Mudflats	31.58	31.34
Coral reefs	34.57	484.84
Seagrass	8.10	8.19
Seaweed	1.02	11.46
Beach	169.23	814.45
<b>Total</b>	<b>2,173.61</b>	<b>7,534.21</b>

Source: *GEF/UNDP/IMO Regional Program for the Prevention and Management of Marine Pollution in the East Asian Seas.*

The Cooperative Mechanism on Safety of Navigation and Environment Protection in the Straits of Malacca and Singapore provides for a framework cooperation between the littoral states (Indonesia, Malaysia and Singapore) and users of the Straits. It offers a platform to engage user states, the shipping industry and other stakeholders to participate and share the responsibility of maintaining and enhancing the safety of navigation and protection of the marine environment in the Straits so that it is kept safe and protected, and continues to be open for safe navigation. In its operation, the Mechanism duly respects the sovereignty, sovereign rights, jurisdiction and territorial integrity of the littoral states and is consistent with international law, especially in line with Article 43 of the United Nations Convention on the Law of the Sea (UNCLOS).

The specific components under the Cooperative Mechanism include the Cooperative Forum (CF), the Tripartite Technical Experts Group (TTEG) and the Project Coordination Committee (PCC). The CF is the main avenue for the conduct of general dialogue and exchange of views on issues of common interest in the Straits in a coordinated manner. The TTEG, on the other hand, the littoral states set guidelines which subsequently became the terms of reference for the TTEG and focuses on the following areas i.e. working to enhance safety of navigation, promote close cooperation and coordination as well as anti-pollution policy and measures in the Straits, and initiate consultation with the IMO and users



of the Straits. The TTEG has come a long way and proven to be an effective framework of cooperation which systematically coordinates measures between the three littoral states. Some of the more significant achievements include the following:

- The IMO-adopted a Routeing System in the Straits in 1981 for navigation;
- The IMO-adopted mandatory ship reporting system or STRAITREP which was implemented in 1998;
- Survey of critical areas and investigation of dangerous or unconfirmed shoals and wrecks in the Straits from September 1996 to June 1998; as well as
- Establishing close cooperation with the user states through financial and technical contributions through projects and other initiatives over the years.

The PCC is tasked to oversee the coordination of the implementation of projects in the Straits in cooperation between the littoral states and sponsors of these projects.<sup>3</sup> As examples, projects in the Straits include the following:

- (i) Removal of wrecks in the TSS area;
- (ii) Cooperation and capacity building on HNS preparedness and response;
- (iii) Demonstration project of Class B AIS transponder on small ships;
- (iv) Setting up of a tide, current and wind measurement system;
- (v) Replacement and maintenance of aids to navigation;
- (vi) Feasibility study on the emergency towing vessel (ETV) services;
- (vii) Concept study on real time monitoring of under-keel clearance;
- (viii) Ship traffic management system;
- (ix) Study on a blueprint for the future development of safety of navigation and environmental protection;
- (x) Guidelines on the place of refuge for ships in need for assistance; and
- (xi) Oil spill monitoring and risk assessment.

### **Challenges in the Straits**

The traditional issues from shipping activities in the SOM revolve mostly around accidental spills from ships carrying oil and hazardous substances, as well as illegal oily discharge during routine ship operations (which causes tarball pollution on the shores), and illegal dumping of solid waste, sewage and garbage.

Records show that more than 800 accidents have been recorded over the last decade or so. These incidents have resulted in environmental damages to the Straits, mostly from oil pollution as shown in Table 3. Besides oil pollution from

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<sup>3</sup> Increasingly, it can be seen that the focus of the littoral states and user of the Straits are slowly moving from more specific safety of navigation projects towards more direct 'environmental' focused projects.

spills, operational and illegal discharges also contribute oil pollution to the Straits' environment (Table 4). The Malacca Straits Environmental Profile prepared under the GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Sea for instance estimated the extent of oil pollution from shipping operations in the Straits as follows:

- Deballasting – significant
- Tank cleaning – uncertain
- Bilge water and sludge – 2 tonnes/day amounting to 730 metric tonnes/year
- Discharge from small vessels – 2 tonnes/day from Malaysian vessels and five times as much from Indonesian vessels amounting to about 4,400 metric tonnes/year

**Table 3. Some of the major oil, and hazardous and noxious substance spills in the Straits**

Date	Vessel Name	Type of Oil and HNS	Quantity of Spillage (barrels)	Location and Cause
6 Jan 1975	<i>Showa Maru</i>	Crude	54,000	Straits of Singapore Grounding
20 Sept 1992	<i>Nagasaki Spirit and Ocean Blessing</i>	Crude	100,000	Straits of Malacca Collision
15 Oct 1997	<i>Evoikos and Orapin Global</i>	Crude	175,000	Straits of Singapore Collision
21 May 1999	<i>Sun Vista</i>	Fuel Oil	14,000	Straits of Malacca Sinking
3 Oct 2000	<i>Natuna Sea</i>	Crude	49,000	Straits of Singapore Grounding
13 June 2001	<i>Indah Lestari</i>	Phenol	89	Johor Straits Sinking

Source: *Marine Department Malaysia*

**Table 4. Some of the illegal discharges from vessels recorded in 2018**

Date	Location	Type of substance spilled	Approximate quantity seen
21 Jan	SOM	Oil slick	1 – 1.5 m <sup>2</sup>
12 Mar	Tg Leman and Temalah Beach in Johor	Massive oil clod	2 km beach area
19 Sept	Pemanggil Island in Johor	Oil slick	50 m <sup>2</sup>
19 Sept	Tulai Island in Pahang	Oil slick	30 m <sup>2</sup>

Source: *Marine Department Malaysia*

Towards addressing the issue, a memorandum of understanding was established i.e. ASEAN Cooperation for Joint Oil Spill Preparedness and Response in November 2014. For the preparation of a Regional Plan, the first workshop was held in Singapore in 2016, the second workshop in Malaysia in July 2018, which led to the ASEAN Regional Oil Spill Contingency Plan (ROSCP) in November 2018. The roadmap looks into annual training and exercises including table top training. Malaysia is also presently the Chair of the Straits Revolving Fund, up to 2022. The cooperation enables the littoral states to take immediate remedial actions in the event of any oil pollution in the Straits. Further, according to the sources received from the Department of Environment Malaysia, the tightening of regulations concerning tank cleaning and disposal of bilge water and sludge have also further contributed to the significant decline of oil pollution incidents over time.

On a broader level, the shipping carrying capacity study for the Straits by MIMA estimated 122,640 vessels by 2024. Other studies including the World Bank's prediction was recorded at 122,500 vessels in 2025, and the Japan International Transport Institute (JITI)'s projection at 140,000 vessels in 2020. Although the three separate studies on the carrying capacity of the SOMS differ in their methodologies and with slightly different conclusions on the exact amount of shipping the Straits can carry and when that might occur, there is general consensus that shipping density will increase and that congestion will occur; with direct risks on the environment and resources in the Straits.

The more recent records of the number of ships reporting to the STRAITREP in 2017 were 82,644 in comparison to a total of 71,359 vessels in 2009 (Figure 2). The risk associated with shipping depends on the volume of shipping in a particular area, with the number of merchant vessels above 300 GRT in the Straits showing a growth over the years. More specifically, the figures entailed a steady increase from 2009 onwards especially in VLCC/ Deep draft vessels, tankers, and bulk carriers (Table 5). For instance, more than a two-fold increase was recorded in the number of tankers (at 20,629 vessels in 2015 compared to only 9,688 in 1995).

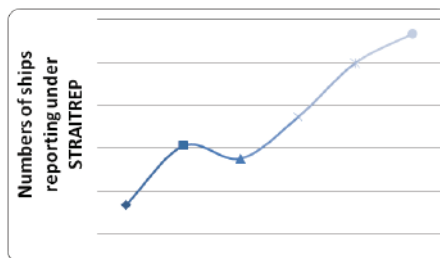


Figure 2. Numbers of ships reporting under STRAITREP (2009 – 2017)

Source: Marine Department Malaysia

**Table 5. Number of ships reporting under STRAITREP, 2009 – 2017**

<b>Types of Vessel</b>	<b>2009</b>	<b>2011</b>	<b>2013</b>	<b>2015</b>	<b>2017</b>
VLCC / Deep Draft	4221	4539	4825	5324	6711
Tanker Vessel	16398	16223	18296	18470	20629
LNG Carrier	3330	3830	4248	3936	4137
Cargo Vessel	8560	7996	7613	7144	7090
Container Vessel	22310	25552	24658	25389	24446
Bulk Carrier	11186	10851	12658	15168	15411
Ro-Ro	2394	2545	2998	3117	2629
Passenger Vessel	1250	877	1063	925	1776
Livestock Carrier	43	47	55	76	50
Tug / Tow	598	414	563	467	533
Government Vessel	67	57	58	87	54
Fishing Vessel	61	20	27	53	28
Others	941	577	911	803	962
<b>TOTAL</b>	<b>71359</b>	<b>73528</b>	<b>77973</b>	<b>80959</b>	<b>82644</b>

Source: *Marine Department Malaysia*

In terms of the smaller vessels, in 2004 a total of 1,131 ferry movements were recorded in the Straits in addition to 14,144 movements of barter trade vessels. The figure for 2015 stood at 73,691 domestic and 88,989 international voyages (Table 6). This makes for a very complex picture of navigation in the Straits and while vessels do take precautionary vessels vis-à-vis the small craft, the presence of so many such crafts do present a hazard to larger vessels.

**Table 6. Ferry and passenger handled at terminals under the Marine Department Malaysia**

Year	Domestic Voyage		International Voyage	
	Arrival	Passengers	Arrival	Passengers
<b>2016*</b>	65,481	4,476,650	79,404	1,539,716
<b>2015</b>	73,691	5,293,100	88,989	1,964,703
<b>2014</b>	52,605	3,321,580	58,306	1,060,358
<b>2013</b>	144,810	16,802,386	31,126	2,750,487
<b>2012</b>	134,618	15,274,897	29,206	2,423,170
<b>2011</b>	135,481	14,718,457	34,496	3,050,203
<b>2010</b>	151,850	14,620,058	35,229	4,348,094

Note (\*): Until November 2016

Source: *Marine Department Malaysia*

Given the increasing shipping density in the Straits, there are emerging threats and concerns which include the introduction of invasive alien species (IAS) carried by ships' ballast water and sediment, the identification of environmentally sensitive sea areas in the vicinity of dense shipping lanes, as well as harmful air emissions from shipping activities and related climate concerns. Acknowledging this, Malaysia has participated in a number of regional collaborative initiatives and projects. For instance, existing modalities include the marine environmental projects under the International Maritime Organisation (IMO) and the Norwegian Agency for Development Cooperation (Norad), as elaborated further below.

(i) Project 1: Assistance to East Asian countries in ratifying and implementing IMO instruments for the protection of the marine environment Initiating, facilitating and coordinating a legal, policy and institutional process which will lead the relevant ministries and administrations of the beneficiary countries (Cambodia, Indonesia, Malaysia, Philippines, Thailand and Vietnam) to undertake actions aiming at:

- putting in place a legal system that includes a process to prepare for and to ratify or accede to the relevant IMO Conventions which are of high priority to the countries, and promulgating laws and regulations giving full and complete effect to the IMO instruments;

- setting up organisational structures for discharging their responsibilities as Flag State, Port State and Coastal State; and
- setting up a system that will ensure that their ports provide the services of adequate reception facilities according to the maritime activities of the port.

The long term goal of the project is the ratification/accession and effective implementation of IMO instruments for the protection of the marine environment. The short term goal is to strengthen the national capabilities for countries to become part to and effectively implement IMO's environmental instruments.

(ii) Project 2: Prevention of pollution from ships through the adoption of Particularly Sensitive Sea Areas (PSSAs) within the South-East Asia region (Indonesia, Malaysia, Philippines and Vietnam)

The seas in the region possess globally and regionally significant ecological resources that are under pressure from many sources and activities, including international shipping. Preventing pollution from international shipping through appropriate protective measures would provide for long-term benefits to the marine environment in the region. The long-term objective is the protection of the marine environment from international shipping through the adoption by IMO of the PSSAs. This project hence assisted countries to prepare proposals to be submitted to IMO for the designation of PSSAs, areas recognised for their significance in terms of ecological, socio-economic or scientific criteria which are vulnerable to damage by international shipping, together with the adoption of protective measures applicable to international shipping. The aim being to lead countries through the whole process with the expectation that it will be easiest to replicate it in the future when needed. More specifically, Malaysia submitted a proposal for establishing a PSSA in the Kukup Island and Tanjung Piai in the southern part of the SOM to the IMO 71st Session of the Marine Environment Protection Committee (MEPC) Meeting in July 2017.

### **(iii) GloMEEP**

GloMEEP is a GEF-UNDP-IMO project aimed at supporting the uptake and implementation of energy efficiency measures for shipping, thereby reducing greenhouse gas emissions from shipping. The Project supports ten Lead Pilot Countries of the project to implement measures on the legal, policy and institutional reforms; awareness raising and capacity-building activities; as well as establishment of public-private partnerships to support low carbon shipping. The Lead Pilot Countries of the GloMEEP project include Argentina, China, Georgia, India, Jamaica, Malaysia, Morocco, Panama, Philippines and South Africa.

Some of the more recent developments include the following:

- The GloMEEP Project developed a package in 2018 to train maritime administrations on the provisions of this regulation i.e., the IMO data collection system for fuel oil consumption.
- From 1st Jan 2019, ships of 5,000 gross tonnages and above will have to collect consumption data for each type of fuel oil they use. These ships account for approximately 85% of CO2 emissions from international shipping.
- Data collected will be kept in a database hosted by IMO and provide a firm basis on which future decisions on additional energy-efficiency measures can be made.
- The GloMEEP training course, the first of its kind, was delivered in Hangzhou, China in Nov 2018. Some 25 participants learned how to develop a ship fuel oil consumption data collection plan, verify the data collected and how to report data to IMO.

### **Making a Situation Analysis and Moving Forward**

It can be observed that a number of initiatives have been taken to improve cooperation, coordination and integration to achieve greater coherence of policies and strategies dealing with governance at the regional and national level. Overall management strategy for improvement include regional initiatives and legislations, technology invention, data and monitoring system, effective enforcement, as well as awareness and education. In most cases however, successful implementation only works if effectively implemented at the national level.

The present environmental management in the Straits for example comprises of national and international laws which are supported by traffic management measures such as the Traffic Separation Scheme, the Mandatory Ship Reporting System and the Vessel Tracking Management System as well as national and sub-regional plans for oil spill response. The systems in place form the backbone of vessel-based pollution prevention and management in the SOM and could be considered as the 'life-support-system' of the Straits.

Examples that complement efforts by Malaysia, for instance, is the ratification of all MARPOL annexes (I – VI), the Ballast Water Convention, as well as other environment-related IMO conventions to ensure high standards are put in place for the improvement of safety of navigation and in ensuring environmental protection at the same time. This would also provide for the Straits a more comprehensive protection from vessel-based pollution and accord for more authority in taking environmental protection measures. Similar efforts should be implemented at the region-wide level (Figures 3 and 4).



As of 11 <sup>th</sup> Feb 2019	MARPOL 73/78 (Annex I/II)	MARPOL 73/78 (Annex III)	MARPOL 73/78 (Annex IV)	MARPOL 73/78 (Annex V)	VI)	London Convention 72	96	OPRC Convention 90	HNS Convention 96	HNS PROT 2010	OPRC/HNS 2000	ANTI FOULING 2001	BALLASTWATER 2004
	Brunei Darussalam	x											
Cambodia	x	x	x	x									
Indonesia	x	x	x	x	x							x	x
Malaysia	x	x	x	x	x			x			x	x	x
Myanmar	x	x	x	x				x					
Philippines	x	x	x	x	x	x	x	x				x	x
Singapore	x	x	x	x	x			x			x	x	x
Thailand	x							x					
Viet Nam	x	x	x	x	x							x	

Figure 3. Ratification status of the IMO Conventions in Southeast Asia, with a focus on SOMS

Source: <http://www.imo.org/en/About/Conventions/StatusOfConventions/Pages/Default.aspx>

Other forward looking initiatives undertaken for the Straits include the adoption of satellite technology image for early detection in the Malaysian waters and in the SOM through the Earth and Sea Observation System (EASOS), a cooperative programme by Malaysia and the UK Space Agency.

As of 11 <sup>th</sup> Feb 2019	MARPOL 73/78 (Annex I/II)	MARPOL 73/78 (Annex III)	MARPOL 73/78 (Annex IV)	MARPOL 73/78 (Annex V)	VI)	London Convention 72	96	OPRC Convention 90	HNS Convention 96	HNS PROT 2010	OPRC/HNS 2000	ANTI FOULING 2001	BALLASTWATER 2004
Australia	x	x	x	x	x	x	x	x			x		x
Bangladesh	x	x	x	x	x			x					x
Comoros	x	x	x	x				x					
India	x	x	x	x	x			x					x
Iran	x	x	x	x	x	x	x	x			x		x
Kenya	x	x	x	x	x	x	x	x					x
Madagascar	x	x	x	x			x	x			x		
Maldives	x			x									
Mozambique	x	x	x	x				x					
Oman	x	x	x	x		x		x					
Pakistan	x	x	x	x		x		x					
Somalia													
South Africa	x	x	x	x	x	x	x	x					x
Sri Lanka	x	x	x	x									
United Arab Emirates	x	x	x	x		x							
United Rep. of Tanzania	x	x	x	x		x		x					
Uruguay	x	x	x	x	x		x	x			x		x
Yemen							x	x			x		

Figure 4. Ratification status of the IMO Conventions in Southeast Asia, with a focus in the wider Indian Ocean Region

Source: <http://www.imo.org/en/About/Conventions/StatusOfConventions/Pages/Default.aspx>

On a broader level in the Indian Ocean however, marine pollution governance will have to be assessed against the overall legal, administrative and political context, and the constraints experienced by countries. The regional context is particularly important because countries share the same marine environment and consequently, national activities may be expected to have a transboundary impact. For instance, there is considerable variance in the legal, administrative and political situation across the countries in the Indian Ocean region, including the administrative structures and legislation pertaining to marine conservation and utilisation. Many of these countries have made progress towards improving national policies and legal and institutional frameworks with a view to achieving the goal of the sustainable management. However, the effectiveness of these efforts has been hampered by a number of constraints i.e., (a) legal and policy, (b) institutional, (c) fiscal, as well as (d) community participation and public awareness.

In addition, discussions at the IORA platform show the lack of institutional capacity to implement policies and enforce regulations is linked to financial constraints. The effort required to deal with the immense transboundary issues that impact on the region is beyond the means of any one country, all of which experience weighty domestic social and economic concerns. Therefore, there is a need to strengthen institutional capacity and improve integration and coordination between national and local government units, and tap into community-based participation to achieve the conservation and management objectives.

A major shortfall is the lack of widespread ratification of international agreements pertaining to the prevention of marine pollution (as illustrated in Figures 3 and 4 above). The participation of countries in relevant international instruments demonstrates commitment to address cross-cutting issues of transboundary concern. However, many of these international commitments are yet to be fully incorporated into domestic policies and legislation. Furthermore, there is also still the need to assess how countries in the region meet their national environmental objectives and how these objectives fulfil countries' international obligations and commitments. At the grassroots level, the lack of local stakeholders' consultation and involvement in planning, decision-making, implementation and enforcement undermine effective implementation by responsible agencies. There is thus a need for continuous coordination and collaboration not just between governments but also among agencies, and between the central government and the various sub-national units.

## **Conclusion**

Our dependence on seaborne trade and the transportation of oil means that the sea will continue to be at risk from maritime transportation. Addressing sea-borne

marine pollution requires a comprehension of multiple issues, and is multi-tiered involving different levels of policy-making, management and enforcement in the region. Much has been done to address the problem through a framework of international conventions, non-legal instruments, as well as regional and national actions. The prognosis may be good in some areas, but countries would have to be vigilant. At the same time, new issues would also need to be addressed to ensure that marine good governance is achieved.

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