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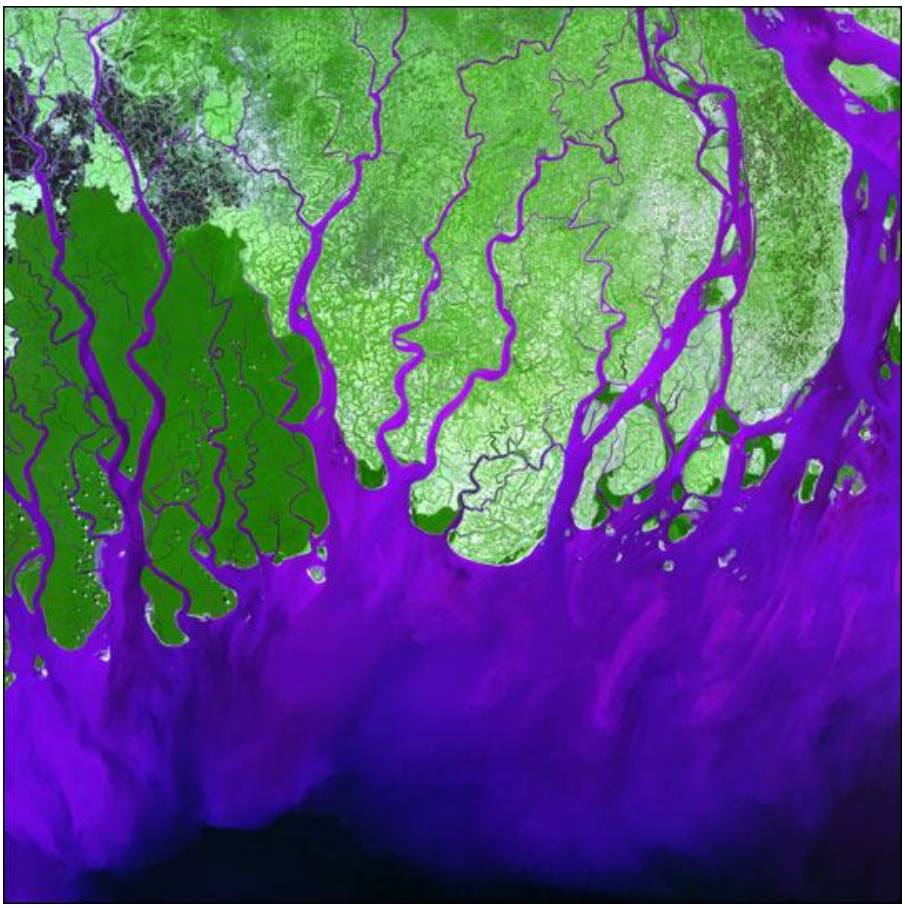

Governing Bangladesh's maritime space

An assessment of Bangladesh's maritime challenges and maritime domain awareness capabilities

David Brewster

Simon Bateman

Anthony Bergin

ANU National Security College

About the authors

Dr David Brewster is one of Australia's leading experts on maritime security in South Asia and the Indian Ocean region.

Dr Brewster's books include *India as an Asia Pacific power*, about India's strategic role in the Asia Pacific, *India's ocean: the story of India's bid for regional leadership*, which examines India's strategic ambitions in the Indian Ocean, and *India and China at sea: competition for naval dominance in the Indian Ocean.*

He regularly advises government agencies in Australia and around the Indian Ocean on a wide range of maritime security issues, including on maritime domain awareness and environmental security.

Dr Brewster is a Senior Research Fellow with the National Security College.

Captian Simon Bateman retired from full-time service in the Royal Australian Navy in 2021 after serving for nearly 40 years in various aviation and seagoing roles. His last position in the Navy was as the Australian Defence Adviser in New Delhi, India.

Captain Bateman is an alumnus of the Indian National Defence College, New Delhi, where he completed his studies in 2017. He also holds a Master of Maritime Studies degree from the University of Wollongong and a Master of Management (Defence Studies) degree from the University of Canberra.

Dr Anthony Bergin is a senior fellow with Strategic Analysis Australia. He was formerly the research director and deputy director at the Australian Strategic Policy Institute. He holds a doctorate on the law of the sea.

Dr Bergin has been a consultant to a wide range of public- and private-sector clients on matters related to maritime security. In 2022, he co-directed (with David Brewster), a baseline study for the Australian foreign ministry on regional arrangements in marine ecology in the Indo-Pacific.

He is the author of numerous articles and reports on Indo-Pacific ocean affairs, including 'Uniting nations: Developing maritime domain awareness for the Blue Pacific', *The Strategist*, 2018, and 'Strengthening law and order at sea for the blue Pacific', in *Maritime cooperation and security in the Indo-Pacific region*, Brill, 2022.

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The authors are solely responsible for the views expressed in this report, which do not reflect the official policies or positions of the Australian or French governments.

Contents

Executive summary and key findings

General

- Bangladesh's unique location on the world's largest river delta has a profound impact on its maritime interests and perspectives. This includes a relative focus on riverine and inshore activities and interests and less priority on offshore maritime activities.
- Bangladesh has significant maritime interests involving the economic and food security of the Bangladeshi people and the safety of users of the maritime space. Its maritime interests are likely to grow in coming years, including in areas such as:
  - managing sustainable growth in fish production (wild catch and aquaculture) and deep-sea fisheries
  - managing threats from marine pollution, including oil and chemical spills and marine plastics
  - ensuring the security of international maritime trade, including energy imports of oil, liquefied natural gas (LNG), liquefied petroleum gas and, in the future, 'green hydrogen'
  - ensuring the security of offshore industries, including offshore ports, installations and wind farms, and other renewable energy resources/sources
  - ensuring the security of undersea communications cables and other critical seabed infrastructure and marine scientific research.
- Bangladesh's maritime spaces are relatively congested, and a high proportion of its vessels are small and low- tech vessels, which creates significant challenges for maritime safety.
- Maritime safety is a major issue for Bangladesh. The frequency of marine accidents in Bangladesh is observed to be one of the highest in the world. Most incidents occur on inland waterways.
- Bangladesh's maritime domain awareness (MDA) system will need to reflect the balance and geographical location of its maritime interests.

Bangladesh and maritime domain awareness

- There are many agencies involved with the Bangladesh maritime domain. This means that effective MDA requires significant efforts in facilitating cooperation and information sharing among numerous military and civilian agencies.
- The maintenance of MDA is made difficult due to the high maritime traffic density in Bangladesh waters, including many thousands of small fishing boats in riverine and nearshore areas, and shipping lanes in the Bay of Bengal.
- Apart from the Bangladesh Navy and Coast Guard, there appears to be a relatively low level of understanding of coordinated MDA as a concept**.** The general level of understanding about coordinated MDA as a concept among civilian agencies is growing gradually but needs improvement.
- There is no central coordination body or centre for MDA or for otherwise coordinating the maritime operations of relevant agencies. In practice, coordination between agencies generally occurs through a network of Bangladesh Navy senior officers in key positions throughout various agencies.

Interagency coordination on maritime issues

- Bangladesh does not have a national oceans policy or maritime security strategy that would provide a framework for interagency cooperation and guidance on key priorities.
- The employment of senior naval officers in key government maritime roles appears to occur as part of a strategy to provide experienced human resources to run this complex organisation. They are well aided by civilian expertise and corporate knowledge holders.

- The River Police have a significant jurisdictional overlap with the Bangladesh Coast Guard in relation to the governance of riverine spaces. The two agencies are competing for resources without a clear differentiation of roles or delineation of primary areas of responsibility. That overlap might be addressed in regulations currently being developed under the *Territorial Waters and Maritime Zones Act 1974* (as amended in 2021).
- Bangladesh Navy and Coast Guard officers have powers of investigation and arrest under the *Territorial Waters and Maritime Zones Act 1974* (subject to amendment in 2021) and the *Customs Act 1969*. However, the Coast Guard does not have prosecution powers, meaning that those engaged in illegal activities must be delivered to the Bangladesh Police for arrest.
- Bangladesh's agencies rely on a wide-ranging body of legislation, from customs and fisheries to immigration and defence, when it comes to drawing upon enforcement powers at sea. This can sometimes lead to inefficiencies.
- There is no single maritime enforcement law that harmonises Bangladesh's existing enforcement regime, that provides a comprehensive framework for enforcing Bangladesh's laws at sea and that makes sure that maritime enforcement powers are exercised appropriately in the maritime environment, including in fishing, customs and migration matters.

MDA capabilities

- Overall, Bangladesh agencies maintain a degree of success in MDA despite limited resources and the lack of a central coordinating agency. MDA has also improved recently with the addition of new systems, vessels and aerial assets for the Bangladesh Navy and Coast Guard.
- Bangladesh is in the process of establishing its own coastal communications network with automatic identification system (AIS) and Global Maritime Distress and Safety System (GMDSS) capability, to be installed on around seven newly built communications towers.
- Other than in the Chattogram region,[1] Bangladesh does not have a coastal radar network. Bangladesh hopes to expand its coastal radar network beyond the Chattogram region, based on the new coastal communications network.
- There is no separate maritime rescue coordination centre (MRCC). The function of the MRCC is currently fulfilled by the Bangladesh Navy. It is understood that an MRCC is to be established in a new Department of Shipping facility (with the aim of opening in June 2024). This will be manned by departmental personnel; however, they will have a coordination role only, while the Navy and Coast Guard will provide the primary assets.
- The Director General Shipping (DG Shipping) has formal responsibility for coordinating a search-and-rescue (SAR) response in the Bangladesh search and rescue region. However, the Navy has been delegated that responsibility. So far, this has worked well. It remains unclear how a future MRCC will work in practice.
- The Bangladesh geostationary satellite *Bangabandhu-1*, launched in 2018, may be used to improve MDA communications with Bangladesh Navy and Coast Guard vessels. The forthcoming Bangladesh satellite *Bangabandhu-2,* when operational, may offer MDA cueing potential as it will be in a low Earth orbit.
- Bangladesh's unique maritime domain and large population involved in maritime activities creates potential for 'crowdsourcing' MDA solutions, including through mobile phone applications.
- Another indirect crowdsourcing opportunity lies within the community radio network currently used for cyclone warnings. It could potentially be used as a Coast Watch (*Upakūla Ghaṛi)* network to provide warnings on illegal, unreported and unregulated (IUU) fishing and drug/human trafficking.
- The Coast Guard, the Department of Narcotics Control and the River Police would benefit from better drone technology, especially in the coastal and riverine regions. Very low-draft ships or hovercraft could be introduced in those areas.

Regional cooperation

- Bangladesh's regional cooperation on MDA is satisfactory vis-a-vis India. However, there is now minimal cooperation with Myanmar, particularly since the worsening of Myanmar's civil conflict.
- Bangladesh appears to work quite closely with India on maritime issues, including IUU fishing, SAR, trade and port access. India would like to expand its existing coastal radar network into Bangladesh; however, Bangladesh would prefer to develop its own sovereign capability.
- Bangladesh is a partner in the Indian Information Fusion Centre—Indian Ocean Region (IFC-IOR), and a liaison officer has now been sent to the centre. No officer has been posted to the Singapore Information Fusion Centre.

Recommendations for the Bangladesh Government

Near term

1. Post a naval liaison officer to the Singapore Information Fusion Centre. This would improve situational awareness on any potential incoming maritime threats.
2. Ensure that the Chattogram Port Authority and other Bangladesh port authorities are following the International Maritime Organization (IMO) Guidelines on Maritime Cyber Risk Management detailed in MSC-FAL.1/Circ.3/Rev.1, 14 June 2021.
3. Bangladesh should take greater advantage of several free/low-cost MDA information platforms (such as Skylight) that are now becoming available, which combine AIS and satellite data with artificial-intelligence data analysis. Such platforms can provide a low-cost solution to many MDA needs.
4. Identify possible crowdsourcing solutions for MDA, such as the mobile phone application Live Operation Visual and Execution (LOVE) being used by the Narcotics Control Branch to identify possible drug smugglers. The existing community radio network could also be used to broadcast information relating to other maritime issues, in the same way that it is now used deliver cyclone warnings.

Mid-term

5. Develop a Bangladesh Maritime Spatial Plan.
6. Explore the possible MDA opportunities provided by the *Bangabandhu-2* satellite, including information-sharing arrangements.
7. Consider establishing a sovereign coastal radar network, leveraging off the existing coastal radio GMDS/GMSS infrastructure.
8. The new MRCC should be led by a senior civilian maritime official with significant SAR experience and manned with representatives from all key maritime agencies.
9. Consider widening the scope of the Sustainable Coastal and Marine Fisheries Project (SCMFP) Joint Monitoring Centre to make it a wider MDA centre manned by representatives of all the maritime agencies and jointly led by a senior maritime civilian official along with a senior naval officer.
10. Adopt a Civil Maritime Strategy / National Oceans Policy.
11. Establish a National Maritime Security Coordination Committee under the auspices of the Prime Minister's Office. This would be chaired by a representative of the Prime Minister and would bring together heads and senior officers of key agencies with responsibilities in the maritime domain. The role of the committee would include:
    a. facilitating the ongoing coordination of activities of relevant agencies, including through the establishment of joint training programs in selected areas (such as law enforcement and SAR) and standard operating procedures for interagency operations (for example, in law-enforcement operations)
    b. identifying areas requiring new or amended laws
    c. acting as a coordinating body in cases of major national emergencies in the maritime domain (such as mass-casualty events or Class 3 oil spills).

12. Move the Blue Economy Cell from the Ministry of Power, Energy and Mineral Resources to the Prime Minister's Office, giving it greater authority to coordinate 'blue economy' activities of different agencies.
13. Remove the jurisdictional overlap between Bangladesh Coast Guard and River Police in riverine operations by gazetting different areas of responsibilities for each agency.
14. Pass the 2004 Marine Environment Conservation Act to fulfil Bangladesh's legislative obligations associated with the MARPOL Convention.
15. Bangladesh should encourage and facilitate cooperation among key international donors in the maritime domain with the aim of identifying priority needs, allocating responsibilities and reducing overlap.

Long term

16. Establish a central agency with responsibility for maritime safety (including port state controls and oversight of SAR). This would reduce the load on the already overburdened DG Shipping.
17. Consider collating all relevant maritime enforcement laws to ensure that they are easily accessible and understood. In the longer term, a legislative overhaul might be considered in order to introduce new legislation that sets out a comprehensive set of powers and uniform procedures to be used to enforce Bangladesh's maritime laws, including in relation to fisheries, customs and migration. This could be modelled on a Maritime Powers Act like Australia's.
18. Enhance the Bangladesh Coast Guard's status as a separate institution with its own responsibilities to raise, train and sustain personnel with specialist expertise, rather than operating as an adjunct to the Navy. This could be achieved by the incremental establishment of a cadre of permanent Coast Guard personnel. Enhance the Coast Guard's own personnel strength with adequate training and sustained expansion of efficiency.

Introduction

This report provides an analysis of Bangladesh's maritime interests, threats and risks, and particularly its MDA capabilities and needs.

Bangladesh has important maritime interests. There is a growing understanding that the maritime domain is a significant source of opportunities, as well as threats and challenges, for Bangladesh. This requires an effective system of maritime governance.

MDA is an essential foundation for any country's ability to properly govern its maritime spaces. Without MDA, a country's jurisdiction over its maritime space may be more theoretical than real. Only with effective understanding of what is occurring in its surrounding maritime spaces can a country properly govern its maritime jurisdictions to exploit opportunities and address threats and challenges. 'Dark' space is ungoverned space where resources can be illegally taken or where illegal activities or other threats can go unaddressed. But, for any country, achieving MDA is a difficult task, requiring many government agencies and other stakeholders with interests in the maritime domain to work together effectively.

This report is the product of work undertaken by the National Security College, Australian National University, with Bangladesh Government ministries and agencies along with other stakeholders to assess the current state of Bangladesh's MDA and identify possible opportunities for improvement.

The principal aim of this report is to describe Bangladesh's MDA needs and capabilities and provide findings and recommendations to aid future policymaking. It is part of a project to enhance Bangladesh's understanding and awareness of its maritime spaces to better address challenges and threats and pursue opportunities in the maritime domain.

The report draws from visits by project team members in May, September and October 2023 and February 2024 to meet with representatives of nearly all the Bangladeshi agencies that have responsibilities in the maritime domain, backed by extensive secondary research. No classified information was used in preparing the report.

During the research for this report, it became apparent that there is a general desire within Bangladesh Government agencies to improve their understanding of Bangladesh's maritime domain as a key enabler for the development of the country's 'blue economy'. This is part of a growing awareness of Bangladesh's maritime resources, triggered by the delimitation of Bangladesh's Exclusive Economic Zone (EEZ) with neighbouring states in 2012 and 2014.

This report includes the following sections:

- Executive summary and key findings
- Recommendations for actions by the Bangladesh Government.
- Section One provides a basic description of the MDA concept. It explains what MDA means and how it is a key element in a country's ability to properly govern its maritime spaces.
- Section Two describes Bangladesh's unique maritime domain, blue economy and maritime interests. It explains how Bangladesh's location on the world's largest river delta leads to a highly distinctive set of interests and perspectives that blur common distinctions between 'inshore' riverine spaces and 'offshore' oceanic spaces.
- Section Three examines the challenges and threats that Bangladesh faces in its maritime domain. They include a range of transnational security threats, including IUU fishing, drug and human trafficking by sea, maritime piracy and armed robbery, and shipping accidents and maritime safety, as well as the overriding threats stemming from climate change.
- Section Four examines how Bangladesh governs its maritime domain. It outlines the roles and responsibilities of the various stakeholders and summarises their efforts to achieve MDA. It also outlines the legislative framework that is being used to support governance of the maritime domain.
- Section Five considers bilateral cooperation in maritime security between Bangladesh and key partners, as well as systems for regional cooperation in maritime governance and MDA.

We hope that this report will be useful in helping to build an understanding of the importance of MDA in Bangladesh and ways in which Bangladesh can enhance the governance of its maritime spaces to take advantage of opportunities and address challenges and threats that may arise.

David Brewster
Simon Bateman
Anthony Bergin

National Security College, Canberra, Australia
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Section One: What is maritime domain awareness?

1.1 The concept of maritime domain awareness

MDA is an essential foundation for any country's ability to properly govern its maritime spaces. In broad terms, MDA involves the ability to understand what is occurring in the maritime space. It involves the collection and collation of data, and analysis and understanding of that data, to allow responsible government agencies to make effective decisions as to how to respond to threats and challenges in the maritime domain (see box).

Definitions of MDA

Several formal definitions of MDA are used by countries and global agencies.

The IMO defines MDA as the 'effective understanding of anything associated with the maritime domain that could impact security, safety, the economy or the marine environment'.

The US Government further defines the maritime domain as 'All areas and things of, on, under, relating to, adjacent to, or bordering on a sea, ocean, or other navigable waterway, including all maritime related activities, infrastructure, people, cargo, and vessels and other conveyances'.

Although MDA is often largely focused on the governance of oceanic spaces far from shore, as the US definition of MDA makes clear, it can also apply to other spaces, such as navigable waterways. This is particularly pertinent in the case of Bangladesh.

Coastal states have been attempting to maintain awareness of their maritime domains ever since ships and boats first put to sea. In the early days, this depended on visual line of sight or what could be gleaned from intelligence ashore. Today, much more data has become available from sensors and technologies such as global positioning systems, automatic identification systems, satellite technology and other types of surveillance, reporting and communications systems.

There are many ways for vessels and other actors to be seen by and communicate with authorities. But there will be those who do not wish to be seen for various reasons, including being involved in IUU fishing, drugs and arms smuggling, human trafficking and other illegal activities. It is a challenge to 'see' those who want to be seen as well as those who do not.

MDA is important to guide effective responses to illegal activities, maritime safety and other maritime incidents, but effective MDA systems also have an important deterrence function. Illegal actors will often avoid maritime spaces that they know are well monitored. On the other hand, they may be drawn to maritime spaces that are effectively 'dark'.

Despite the growing availability of large amounts of data about the maritime domain, that data is often held by different government agencies or other commercial or foreign stakeholders without effective mechanisms for sharing, analysis and the making of decisions on the basis of that information. Achieving effective MDA therefore requires the establishment of systems to share, analyse and use information.

1.2 Achieving effective maritime domain awareness

Effective MDA provides a vital link between a country's ability to influence its maritime environment and its ability to respond to threats.

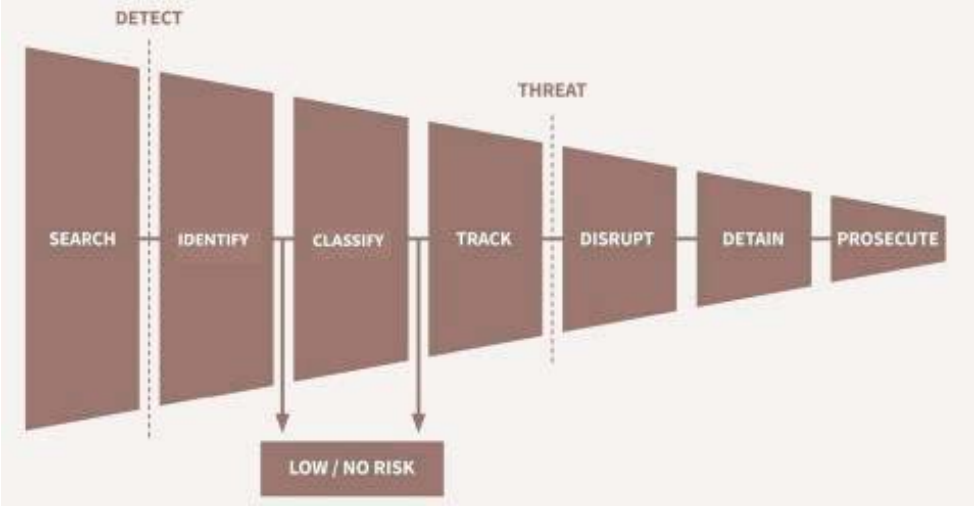
MDA cannot be accomplished simply through constructing infrastructure and networks at the national level to share, collate and analyse data. No country can achieve MDA by itself. Effective MDA requires international cooperation in

sharing data and intelligence and frequently also in the coordination of responses. That can occur at a bilateral or a multilateral level. In recent years, we have seen the establishment of 'regional information sharing centres', which act as clearing houses for information shared by states, commercial entities and other stakeholders in relation to a particular regional maritime area.

One can think about an MDA system in different ways. One way is that it is a complex system of systems that must all work together. The component systems include those used for the collection of information and data, including through reconnaissance, surveillance and reporting; the aggregation of data in a central location; analysis/processing (the interpretation of information, involving tools such as visualisations of information and statistics and trends analysis); and dissemination that involves the distribution of results to decision-makers and users.

Another way of looking at an MDA system is that it is a set of procedures through which awareness can be achieved and then used to respond to threats. An MDA procedural chain can be represented as shown in Figure 1.

Figure 1: MDA as a process



Source: David Brewster, 'Give light, and the darkness will disappear: Australia's quest for maritime domain awareness in the Indian Ocean', *Journal of the Indian Ocean Region*, 2018, 14(3):296–314.

For these purposes:

- Searching involves surveying a geographical area using active or passive technical or nontechnical means with the aim of identifying anomalous behaviour.
- Detection is the moment when an object or vessel is discovered through one or more sensors, visual detection or self-reporting through automatic identification systems (AISs) or vessel monitoring systems.
- Identifying the vessel may require data from a variety of sources.
- The vessel is classified by level of risk, considering factors such as location, track, type and whether it is using an AIS. This may involve data from a variety of sources, including commercial shipping and financial information.
- Accurate tracking enables authorities to determine the vessel's direction and possible destination, which may further elucidate the threat posed. If necessary, it also informs the planning of an interception at sea or on land.
- Disruption may involve the arrest and detention of crew members or the confiscation of illicit cargo. If the vessel is involved in an illegal activity, the interception/interdiction itself may disrupt that activity.
- Where appropriate, a vessel may be detained, and, if enough evidence is available to prove that a criminal offence has occurred, offenders may be prosecuted.

1.3 The common operating picture

The centrepiece of an effective MDA system is a 'common operating picture' (COP). This is the sum of data and intelligence drawn from many sources and organisations, such as data from commercially operated AISs, military or civil radar tracking, or incident reports from law-enforcement agencies. Information from non-government sources can also play an important role, including from commercial shipping companies, commercial satellite services and local fishers or other users of the maritime space.

That data is then cross-referenced and correlated (or 'fused') into a coherent single picture. An 'awareness' element is then applied, resulting in what is commonly referred to as a 'recognised maritime picture'.

For example, a vessel lacking positive data may be recognised as being a low risk as the crew and cargo criteria are validated from information already collected by various government agencies. Validation will also be achieved through a deep knowledge of the practices and customs of the commercial shipping and fishing industries, which are likely to account for the great majority of vessels in the maritime domain.

There are many technical challenges in creating a COP drawn from many different sources and agencies, including in synthesising different data formats, time stamping, data storage and retention, data modification and symbology. Importantly, raw data must be subjected to analysis (both human and computerised) to identify anomalies or other matters of interest.

The COP is intended to help decision-makers to make decisions and act based on shared, reliable and trustworthy information, and that information can often be sourced from local communities (see box and Recommendation 4).

Using crowdsourcing to help build the COP

In the Bangladesh context, there could be significant potential to improve the COP using what has been termed 'crowdsourcing'. There are nearly 17 million people involved in some form of fishing in the Bangladeshi maritime domain. They are a significant resource who could be utilised to contribute to the COP by reporting on vessels of interest. Crowdsourcing applications are being developed for mobile phones that allow for the easy sharing of images, locations and comments by ordinary people. That information can then be used by maritime law enforcement authorities to 'tip and cue' further investigation of potential vessels of interest.

1.4 Coordination of responses to threats

Although the concept of MDA does not technically involve responses to threats, as noted above, effective MDA should be part of an integrated process that involves coordinated responses to identified threats. Threats in the maritime domain frequently come within the responsibilities of multiple government agencies, and the lack of dissemination of intelligence and coordination of responses of those agencies can be just as much a problem as achieving awareness in the first place. Therefore, effective MDA systems also usually involve integrated mechanisms to disseminate intelligence to relevant agencies and coordinate their responses. Consequently, this report also considers those issues as part of its review of MDA.

In broad terms, MDA should be understood as a key element in effective governance of the maritime domain. This includes deterring bad actors from undertaking illegal activities as well as providing an effective basis for responses to illegal activities and other maritime incidents.

Section Two: Bangladesh's unique maritime domain and blue economy interests

This section of the report discusses Bangladesh's unique maritime domain and maritime interests related to the blue economy. These are the key drivers behind its priorities in developing MDA. It includes the following subsections:

2.1 Bangladesh's unique maritime geography
2.2 Bangladesh's maritime jurisdictions
2.3 Bangladesh's blue economy interests
2.3.1 Fisheries
2.3.2 Maritime trade
2.3.3 Energy and resources
2.3.4 Communications.

2.1 Bangladesh's unique maritime geography

Bangladesh's maritime geography is unlike that of any other country. This has important consequences for how MDA systems should be implemented in Bangladesh.

Bangladesh is an Indian Ocean littoral state located at the northern apex of the Bay of Bengal. It has a 710-kilometre coastline that primarily lies at the edge of the Lower Gangetic Plain. Although there are ground elevations up to 105 metres above sea level in the northern part of the plain, most elevations are less than 10 metres above sea level.

Elevations decrease in the coastal south, where the terrain is generally at sea level. With such low elevations and numerous rivers, water—and concomitant flooding—are predominant physical features.

The 77,700-square-kilometre delta created by the Ganges and Brahmaputra rivers in Bangladesh and West Bengal is the world's largest delta. Every year, the Brahmaputra and Ganges system carries 2 billion tons of sediment out to sea, which is more than any other river system, even the Amazon. The sediment creates islands known as 'chars', which are used for farming but are vulnerable to floods.

The delta is also the site of the world's largest mangrove forest in the Sundarbans region. This fragile area is protected by two global initiatives: the UNESCO World Heritage site system and the Ramsar Convention on Wetlands.

The *Brahmaputra River* enters Bangladesh as the *Jamuna*. It then joins the *Ganges* to form the *Padma River* and ends as the *Meghna.* The Meghna then splits into a massive delta that empties into the Bay of Bengal at a rate of 2.3 million cubic feet of water a second. This makes the Bay of Bengal one of the freshest seas in the world, with salinity close to zero near the coast.

In the Ganges Delta, the large rivers come together, both merging and bifurcating in a complicated network of channels. The two largest rivers, the Ganges and Brahmaputra, both split into distributary channels, the largest of which merge with other large rivers before themselves joining. This current channel pattern was not always the case. Over time, the rivers in the Ganges Delta have changed course, sometimes altering the network of channels in significant ways.

The Ganges Delta also means that the Bay of Bengal receives huge amounts of sediment—an average of about 665 million tonnes per year.[2] The turbidity of the water due to the sediment hinders photosynthesis, making the sea biologically less productive than would otherwise be the case.[3] The shallow water is well oxygenated, but the deeper water is seriously oxygen deficient, leading to 'hypoxic' areas in which animals find it difficult to survive.[4] This has led to some discussion of a 60,000-square-kilometre 'dead zone' in the Bay of Bengal. However, there has been little scientific research on its cause or consequences or whether it even exists as a continuing geographic feature.

The geography of the Bay of Bengal also makes it particularly subject to cyclones. Bangladesh experiences a large and likely growing number of tropical cyclones, including the two deadliest cyclones in the world in the past 50 years.[5] Bangladesh's low-lying geography and high population density make it especially vulnerable.

Riverine geography constrains maritime awareness

There is no comparable country in the world that is so overwhelmingly riverine in its geography as Bangladesh. Much of the country consists of a delta with wide rivers and low and often waterlogged ground.

This means that there is often no clear demarcation between 'offshore' oceanic spaces and 'internal' riverine spaces. It also means that waterborne interests and threats will be interspersed between ocean and rivers—with rivers frequently having greater relative importance.

The riverine nature of the country has a significant impact on its strategic outlook and is a fundamental factor in its maritime interests and its approach to the maritime domain.

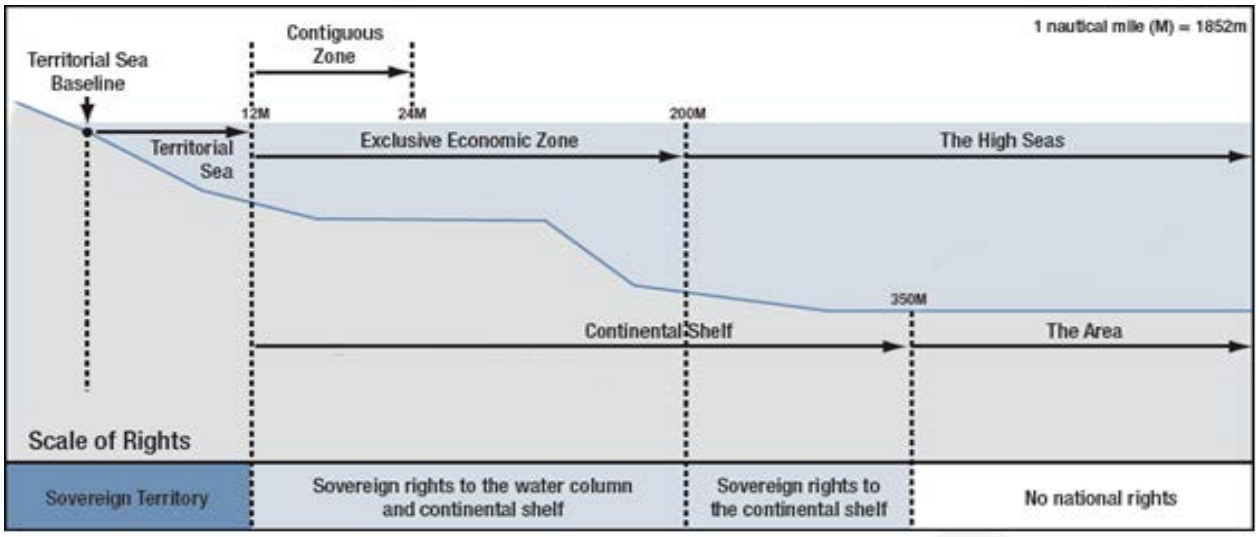
Bangladesh's principal perspective is largely riverine. Compared with other countries, it has relatively lesser interests in its own oceanic spaces or the maritime realm beyond its jurisdiction.

The uniqueness and complexity of Bangladesh's maritime domain make it difficult to achieve MDA, particularly considering Bangladesh's limited financial resources.

2.2 Bangladesh's maritime jurisdictions

The UN Convention on the Law of the Sea (UNCLOS) provides a basic framework for the different types of jurisdictions that littoral states can exercise over maritime spaces, including territorial waters, contiguous zones, exclusive economic zones and continental shelf. This can be illustrated as in Figure 2.

Figure 2: Illustration of types of maritime zones under UNCLOS



Source: Arctic Council, *Arctic Marine Shipping Assessment 2009 report*, Tromsø, Norway, 2009, p. 52.

Consistent with UNCLOS, Bangladesh's maritime jurisdictions include the following.

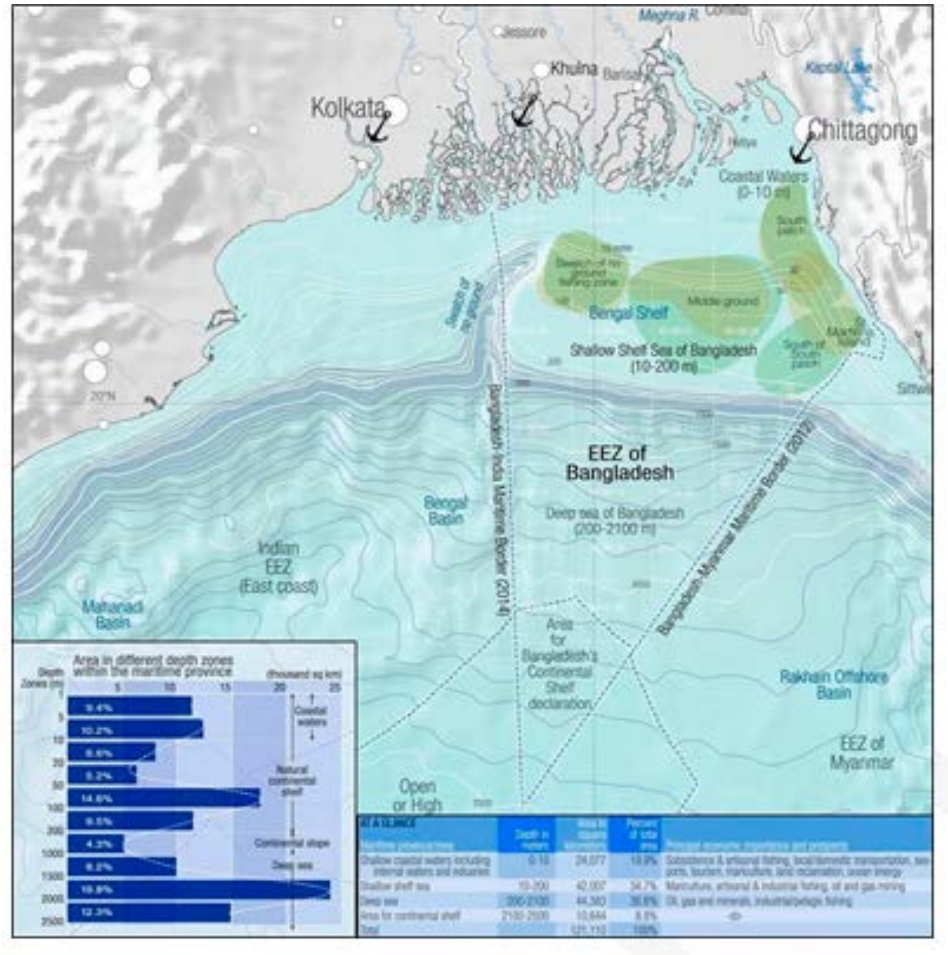
2.2.1 Inland waters, territorial waters and contiguous zone

This includes territorial waters within 12 nautical miles of land, measured from the baseline, which is the low-water line of a low-tide elevation. Areas of water to the landward side of the territorial sea are classed as 'internal waters' under Bangladesh's *Territorial Waters and Maritime Zones (Amendment) Act 2021*. Consistent with UNCLOS, the Act provides that Bangladesh can exercise customs, fiscal, immigration or sanitary laws up to 24 nautical miles from territorial sea baselines.

2.2.2 Exclusive Economic Zone

Following the delimitation of Bangladesh's EEZ in arbitrations with Myanmar in 2012 and with India in 2014, Bangladesh now has jurisdiction over a V-shaped EEZ covering 119,000 square kilometres (Figure 3). This is smaller compared to the EEZs of other countries in the region such as India (2.37 million km^2), Myanmar (532,780 km^2), Sri Lanka (510,000 km^2) and the Maldives (923,000 km^2). Nevertheless, formal boundary delimitations around a decade ago led to a belief that Bangladesh could now exploit significant maritime resources for its economic development, including what were believed to be considerable (but unexplored) deposits of oil and gas.

Figure 3: EEZ of Bangladesh



Source: Shahin Hossain Shuva, Mohammad Uddin, 'Marine spatial planning in Bangladesh: a review', *Journal of Coastal Zone Management*, November 2021.

2.2.3 Continental shelf

Bangladesh's rights to continental shelf are yet to be finally determined. It recently made a submission on those limits to the United Nations.[6] There is a so-called 'grey area' resulting from Bangladesh's EEZ arbitrations with Myanmar and India, in which Bangladesh may exercise continental-shelf rights inside the EEZs of Myanmar and India. This question is yet to be finally resolved.[7]

The international conventions and agreements related to ocean governance and the associated national laws and policies are listed in appendixes 2 and 3 of this report.

2.2.4 Maritime search and rescue region

Bangladesh's maritime search and rescue region pursuant to the International Convention on Maritime Search and Rescue overlaps its EEZ, extends further towards the Myanmar coastline and has an area of 170,627 square kilometres.

Bangladesh's flight information region (in accordance with the rule of the International Civil Aviation Organization) in respect of offshore maritime areas is substantially smaller than its maritime search and rescue region.

2.3 Bangladesh's blue economy interests

Bangladesh's unique geography also often makes its maritime interests and perspectives quite different from those of other countries, especially when it comes to developing its blue economy.

The blue economy concept is a way of understanding maritime-related economic activities in a manner that assists in comprehensive and coordinated governance. The blue economy is therefore an important conceptual entry point for assistance in maritime governance.

Bangladesh began seriously considering the blue economy following the demarcation of its maritime boundaries with Myanmar and India. There was a view that Bangladesh's EEZ would be a new source of considerable national wealth, particularly from offshore oil and gas deposits that were believed to exist. However, those deposits remain largely unproven.

In 2014, Bangladesh was chosen as a pilot country for blue economy development. Current management and exploration focuses on the UN Sustainable Development Goal (SDG) 14—Conserve and sustainably use the oceans, seas and marine resources for sustainable development.[8]

The Bangladesh Government's activities in the blue economy are coordinated by the Blue Economy Cell located within the Ministry of Power, Energy and Mineral Resources. The cell is currently undertaking an exercise in marine spatial planning, which is a key first step in coordinating and deconflicting different uses of the maritime domain.

There are other blue economy groups located in other agencies, including the Blue Economy Directorate within the Bangladesh Navy and the Maritime Branch in the Ministry of Foreign Affairs under the leadership of Rear Admiral Khurshed Alam.

The Ministry of Power, Energy and Mineral Resources' Blue Economy Cell appears to be principally focused on offshore oil and gas extraction and is unlikely to be the ideal location for a body that is intended to coordinate the blue economy activities of various ministries and agencies. Such a body should probably be located within the Prime Minister's Office.

Bangladesh has several specific maritime interests related to the blue economy, which are discussed further below. They include:

- fisheries
- maritime trade (including shipping, ports, shipbreaking and shipbuilding)
- energy and resources (including LNG imports, offshore gas deposits, renewable energy and seabed mining)
- communications.

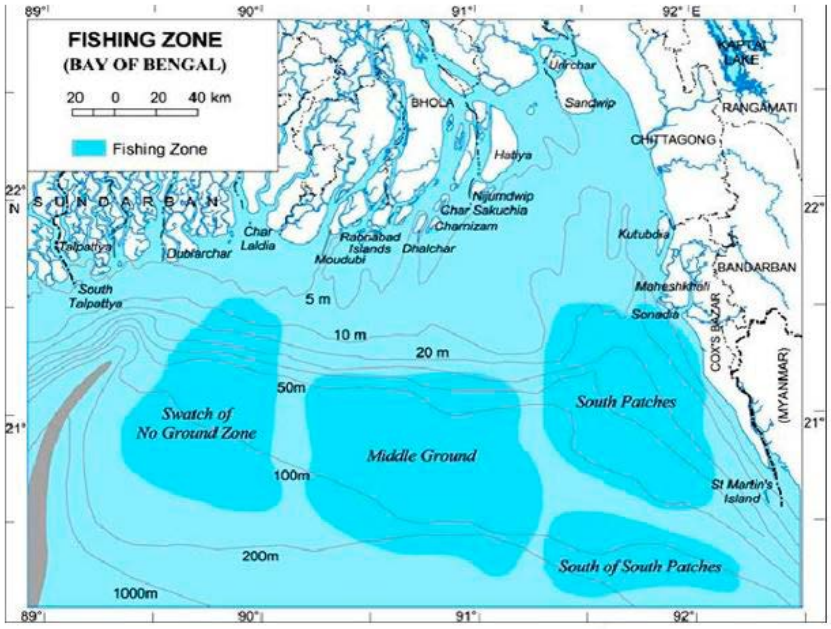
2.3.1 Fisheries

The fishing sector is extremely important in Bangladesh. It is a primary source of animal protein for the Bangladesh population as well as providing employment opportunities, food and nutritional security, foreign earnings, aquatic biodiversity conservation and socio-economic development.

Figure 4: Local Bangladeshi fishers

Source: 'Sea level rise predicted to affect 1.3 million people across Bangladesh by 2050', *Mirage News*, 27 April 2021, https://www.miragenews.com/sea-level-rise-predicted-to-affect-1-3-million-550332/.

Figure 5: Marine fishing areas in northern Bay of Bengal



Source: Suman Barua, Arni Magnusson, 'Assessment of offshore shrimp stocks of Bangladesh based on commercial shrimp trawl logbook data', *Indian Journal of Fisheries*, March 2018, 65(1):1–6.

Bangladesh is one of the world's leading fish-producing countries, with an annual total production of 4.134 million tonnes in 2017. The sector contributes 3.57% to GDP and 25.30% to agricultural GDP. It provides full- and part-time employment for more than 17 million people. That equates to about 10% of the population relying directly or indirectly on the fisheries sector for their livelihoods. Equally as important as its financial contributions, fish also accounts for approximately 60% of Bangladeshis' daily animal protein.

There are 67,669 small-scale artisanal fishing boats operating in Bangladesh. Of those vessels, 32,896 are mechanised and 34,810 are non-mechanised. There are 262 industrial trawlers (234 of which are active).[9]

Around 85% of fisheries production consists of wild-caught fish from inland waters and inland aquaculture (shrimp, fish). In 2017–18, the inland closed-water (aquaculture) sector accounted for 56.2% of Bangladesh's total catch, while the inland open-water catch (wild capture) accounted for 28.5% (Table 1).

In contrast, the offshore marine sector (artisanal and industrial) produced only 15.3% of the total catch, mostly *hilsa* fish, principally for domestic consumption. Hilsa is a freshwater fish that breeds in the river estuaries and then lives in the low-salinity waters relatively close to shore. A 2021 study estimated total annual offshore marine fish catches in the previous five years as being in the range of 626,000–671,000 tonnes per annum. (However, it should be acknowledged that the fish catch of artisanal fishers is probably grossly underreported, as only some 11 of the 200+ fish landing centres used by artisanal fishers report data.[10])

Table 1: Sources of Bangladesh's fisheries production, 2017–18

Location		% of total catch
Inland (riverine)	Farmed (aquaculture)	56.2%
	Wild caught in rivers	28.8%
Marine	Inshore (up to 40 m water depth)	13.4%
	Offshore (more than 40 m depth)	2.6%

Source: Bangladesh Department of Fisheries.

The relatively small proportion of marine catch to total fisheries production is a function of the overwhelming riverine nature of Bangladesh (both geographically and in strategic perspectives) and the very limited degree of activities beyond immediate inshore waters. In addition, the marine catch is largely harvested by artisanal fishers (mechanised and unmechanised); industrial trawlers produce only 17.5% of the total marine catch.[11]

The Bay of Bengal Large Marine Ecosystem (BOBLME) Project reports that there have been many marine fisheries surveys conducted in the Bay of Bengal dating back to 1859.[12] However, according to the Bangladesh Fisheries Ministry, much of the data has been inconsistent. More recently, a Bay of Bengal-wide study on fish stocks was undertaken by the Food and Agriculture Organization of the UN (FAO) in 1983. Another study made as part of BOBLME in 2012 was a land-based assessment, and Department of Fisheries officials consequently deemed it unreliable. The FAO-funded Sustainable Coastal and Marine Fisheries Project (SCMFP) has a mandate to address the marine fisheries statistical system.

In 2016, Bangladesh acquired the fisheries research vessel RV *Meen Sandhani.* This vessel has now conducted several surveys. In 2019, it reported that there was evidence of depletion and overfishing of several species.[13] The Department of Fisheries is acting to protect fish stocks through declaring marine protected areas (MPAs) and imposing fishing ban periods. Two of the four declared MPAs are in place for fisheries-conservation purposes and two for climate-change purposes (which together represent some 9% of Bangladesh's EEZ area). Consideration is being given to establishing a fifth MPA. There is also a 65-day ban on marine fishing in the Bay of Bengal between May and July each year, as well as other selected ban periods.

According to one national study, there may be an abundance of tuna and tuna-like fish in Bangladesh's EEZ.[14] However, there is no tuna industry in Bangladesh of any significance. Bangladesh has an allotment of tuna from the Indian Ocean Tuna Commission (IOTC), which is the regional fisheries management organisation for the Indian Ocean, but this is not currently used.

Efforts by the Ministry of Fisheries to promote that industry through issuing licences have failed. Vessels used by Bangladesh fishers are quite different from standard tuna-fishing vessels and are used only within 80–100 kilometres of the coast, primarily to catch hilsa (see box). The Ministry of Fisheries has plans to acquire two fishing vessels from a Chinese company, suitable for offshore longline fishing; however, as at March 2024, it is not clear whether that is proceeding.[15]

Limited offshore fishing

The Bangladesh Department of Fisheries has plans to expand its commercial trawler fleet that is legally entitled to operate only beyond the 40-metre depth line. There are currently around 200 licensed trawlers, mostly operating out of Chittagong. However, very few of them operate beyond the 40-metre line, and it seems that many operate illegally in inshore waters using illegal nets and techniques, including bottom trawling (which will be prohibited from 2025). There is little tradition in Bangladesh of offshore fishing, and there is also a view that the time and fuel costs of operating beyond the 40-metre line (involving lengthy transits, given Bangladesh's shallow waters) may make it uneconomic. The deeper waters off the Bay of Bengal are also relatively less productive compared with shallower waters.

The Bangladesh Navy is also involved in deep-water fishing through its Nou Kollan Foundation, which promotes the welfare of serving and retired naval personnel and their families. The foundation has received permission to procure two longliner and two purse seiner trawlers.[16]

Aquaculture

Aquaculture production more than doubled in Bangladesh in FY 2020–21 compared to FY 2008–09. Bangladesh is now the fifth largest aquaculture producer in the world. Aquaculture activities are generally undertaken inshore in riverine and neighbouring areas.

Approximately 20 million people are now involved in fish farming and its wider value chain.

2.3.2 Maritime trade

Shipping

Bangladesh has 80,000–90,000 vessels in total, which creates a relatively congested maritime environment and considerable challenges in regulating maritime safety. As of November 2022, there were some 90 seagoing Bangladesh-flagged vessels.[17] The Department of Shipping is working to make them environmentally compliant.

Maritime ports

Despite Bangladesh having a relatively small coastline and large land border, over 90% of its trade is seaborne. However, the great majority of international trade is conducted through a single, highly congested, deepwater port at Chittagong. Another deepwater port is currently being constructed at Matarbari, south of Chittagong.

In April 2023, Bangladesh granted permanent access to India to utilise the ports of Mongla and Chittagong for the transhipment of goods between Indian states.[18] Bhutan was also recently granted access to Mongla, Payra and Chittagong ports with the signing of the Agreement of Traffic-in-Transit between Bangladesh and Bhutan on 22 March 2023.[19]

The relative paucity of deepwater ports in Bangladesh represents a significant vulnerability for the country. Currently, Chittagong is the only deepwater port, handling over 92% of Bangladesh's import–export trade by volume (including 98% of container traffic). It is increasingly congested. In 2021, Chittagong Port handled 3.2 million twenty-foot equivalent units (TEUs), against projected needs of Bangladesh of 10–12 million TEUs per year by 2041. The port has 19 berths, including 14 container berths, and is located some 20 kilometres upstream from the mouth of the Karnaphuli River. Due to depth limitations and sharp bends in the river channel, the largest container vessels that can be handled by the port carry 2,400 TEUs.

Development of Matarbari deep sea port

A major new deepwater port is under development at Matarbari, financed by the Japan International Cooperation Agency. It will be served by a 14-kilometre channel dredged across the Bay of Bengal, with a minimum depth of 18.5 metres, allowing access by vessels with a maximum draft of 16 metres. Phase 1, which is due to be completed by 2025, will involve an annual handling capacity of 0.8 million TEUs and 1.7 million tonnes of bulk cargo. The port will also be able to handle coal and LNG. A second phase is planned to be completed by 2030.

Other important ports are located far upriver from the Bay of Bengal and can handle vessels with only relatively shallow drafts. They include:

- Mongla—located on the Mongla river, some 100 kilometres upstream from the Bay of Bengal. According to recent reports, China will lend some US$400 million for the redevelopment of the port by Chinese companies. This may facilitate transit trade to India's northeast states.
- Payra—located some 65 kilometres upstream on the Ramnabad Channel. Original plans to build a deep seaport for vessels with a draft of up to 14 metres were downgraded in 2021, so that it will now handle only vessels with drafts up to 10 metres. The port is being developed by two Chinese state-owned companies, China Harbor Engineering Company and China State Engineering and Construction Company, which were also involved in the development of the ports at Gwadar and Hambantota. Due to its location, this port will require constant dredging to maintain access.

The development of a new port at Sonadia (near Cox's Bazar), which was proposed by Chinese entities, was cancelled by the Bangladesh Government in 2020.

Shipbreaking and shipbuilding

Bangladesh has one of the largest shipbreaking industries in the world (along with China, India and Pakistan). The Chittagong shipbreaking yard is the second largest in the world. As at 2012, it employed some 200,000 Bangladeshis and provided around 50% of Bangladesh's steel requirements.[20] In June 2023, Bangladesh ratified the Hong Kong Convention for the Safe and Environmentally Sound Recycling of Ships. Those requirements will come into force in June 2025. After that, it will be illegal to recycle ships in noncompliant yards.

Bangladesh has a long history of shipbuilding in precolonial and colonial times. Currently, there is an active shipbuilding industry largely focused on building riverine and inshore vessels for domestic use. There are 10 'international standard' shipyards.

The Bangladesh Navy reportedly runs three shipyards commercially. All those yards have successfully constructed several warships and other craft for the Bangladesh Navy and other entrepreneurs. Recently, Khulna Shipyard has constructed two large patrol craft with antisubmarine warfare capability, five patrol craft and two tugboats specially designed for submarine handling.[21]

There are plans to expand the shipbuilding industry to build larger oceangoing vessels, including the recent construction of a 6,000-tonne vessel. This may to some extent be constrained by congestion in activities in and around Chittagong.

2.3.3 Energy and resources

Bangladesh has a high degree of energy import dependence for fossil fuels (oil, gas and coal), which makes the security of ports and import terminals extremely important.[22] This has led to considerable investment to diversify and secure energy sources.

One of the key functions of the new port being developed at Matarbari is to provide a coal import terminal to feed a new coal-fired power plant.

Bangladesh has also commissioned Russia to build a large 2,160 Mwe nuclear power station at Rooppur on the Ganges River, northwest of Dhaka.

A new single-point mooring that has recently been opened at Cox's Bazar will allow large tankers to unload petroleum products some 15 kilometres offshore.[23] Previously, petroleum had to be unloaded offshore onto lighterage ships to be landed inshore, reportedly taking some 11–12 days.

The security and reliability of LNG import facilities is currently of concern, and there are longstanding plans to explore and exploit potential offshore gas deposits.

Bangladesh is also seeking to diversify energy sources through the development of offshore wind farms.

LNG import facilities

Bangladesh is highly reliant on LNG, including using gas for around 60% of its power generation requirements. It currently relies on LNG imports for around 22% of total gas requirements, and imports are projected to rise to around 50% of total gas requirements in 2028 and 70% in 2041.[24] Bangladesh's LNG imports are currently received through two floating storage and regasification units (FSRUs), which are essentially converted LNG tankers, both located at Mohrdhkhali at Cox's Bazar.

Energy security is a major concern for Bangladesh. The worldwide energy crisis arising from the Russian invasion of Ukraine has forced the Bangladesh Government to buy gas on the spot market at high prices, which has resulted in high electricity prices and blackouts. Gas supplies were also recently interrupted when the two FSRUs were closed by a cyclone in southern Bangladesh.[25] There are plans to establish a third FSRU, also in Moheshkhali, by 2026.[26]

We assess that the FSRUs and associated pipelines for offloading gas and transporting it onshore are a major point of vulnerability for Bangladesh. There are instances of inadvertent damage to those facilities caused by fishing boats, and the shallow-water location of the facilities makes them highly vulnerable to intentional disruption. The inoperability of one or more of the FSRUs for an extended period could have a significant adverse effect on the Bangladeshi economy through its impact on power generation and industry.

Like many countries, in future years, Bangladesh may transition towards 'green hydrogen' for a significant portion of its imported energy needs.[27] That may create security issues analogous to those surrounding the import of LNG and the security of import facilities.

Plans to exploit offshore gas deposits

Bangladesh has considerable onshore gas deposits that meet around 56% of domestic demand for gas.[28] There are also reports of offshore gas deposits in Bangladesh's EEZ.[29] This is based on the experience of nearby Indian and Myanmar offshore fields. However, the exploration of deposits has been very limited, so the prospects for oil and gas exploration in the Bangladesh EEZ are still to be confirmed.

The Bangladesh Government previously contracted a Norwegian company to undertake a seismic survey of Bangladesh's EEZ, which was subcontracted to a Chinese research vessel. That created considerable sensitivities with neighbouring India.

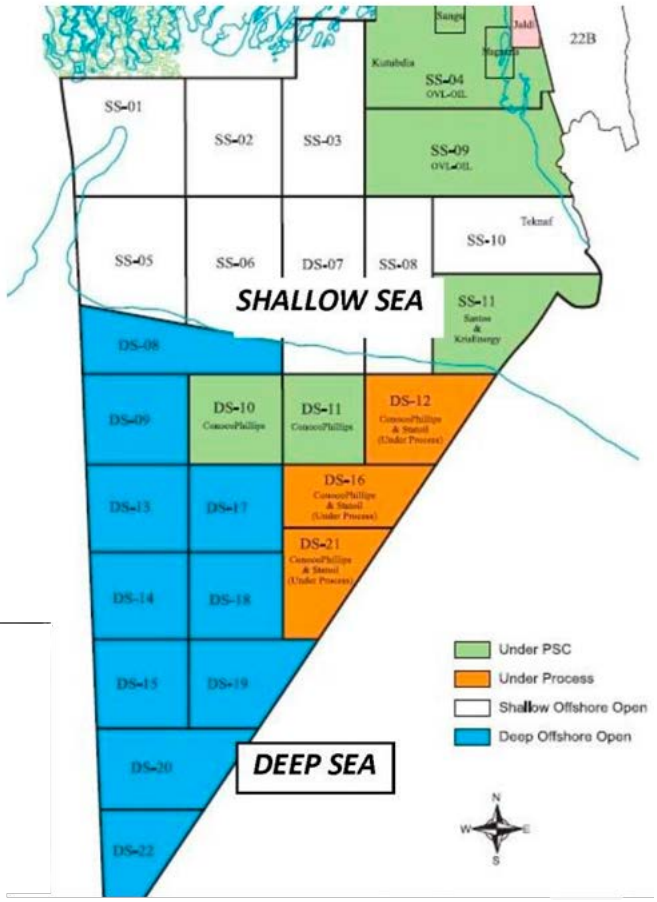
Previous tenders of offshore gas blocks to international companies (most recently in 2018) were not successful.[30] The Ministry of Power, Energy and Mineral Resources advised the project team that it is about to tender for exploration licences for 19 out of the 26 blocks available in the EEZ.

The development of offshore platforms would create significant new maritime safety and security issues, including spills and other accidents.

Figure 6: Bay of Bengal offshore platform

Source: 'Two recently-relinquished offshore gas blocks remain unexploited', *Dhaka Tribune*, 21 March 2021, https://www.dhakatribune.com/bangladesh/power-energy/239850/two-recently-relinquished-offshore-gas-blocks.

Figure 7: Geological basins in the Bay of Bengal and oil/gas exploration blocks in the shallow sea and deep sea in Bangladesh's EEZ



Source: MS Hossain, M Shahadat, SR Chowdhury et al., 'Opportunities and strategies for ocean and river resources management', in *Dhaka: Background paper for preparation of the 7th Five Year Plan*, Planning Commission, Ministry of Planning, Bangladesh Government, 2014, https://www.researchgate.net/profile/Sm-Sharifuzzaman/publication/272825296_Opportunities_and_strategies_for_ocean_and_river_resources_management/links/54f7d7740cf210398e934a54/Opportunities-and-strategies-for-ocean-and-river-resources-management.pdf.

Plans for offshore renewable-energy facilities

Bangladesh is embarking on a program to increase its sources of renewable energy. Limitations on the availability of land in Bangladesh and the shallow waters in the Bay of Bengal may mean that offshore wind generation has potential advantages compared with onshore renewable generation.

There are currently three wind farms in the maritime zone, and another nine are planned. Considerable work is currently being undertaken to assess suitable locations for onshore and offshore wind generation.

Figure 8: 60-MW wind-power project in Cox's Bazar

Source: J Chowdhury, E Sajid, 'Country's first big leap in wind energy in December', *Business Standard*, 21 July 2022, https://www.tbsnews.net/bangladesh/energy/countrys-first-big-leap-wind-energy-december-462702.

Seabed mining

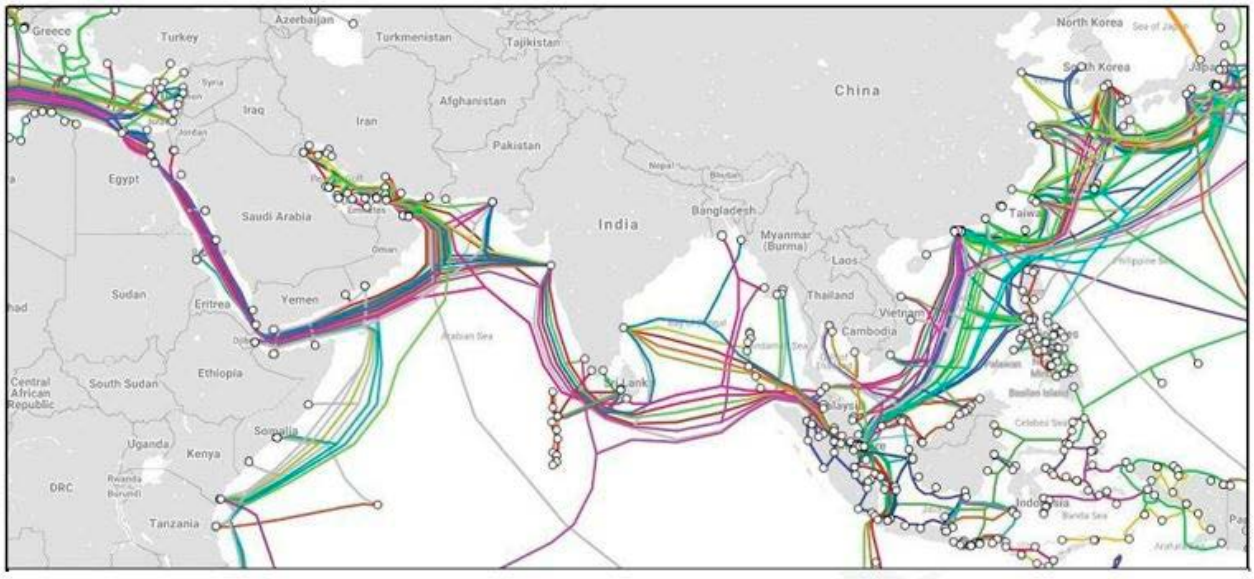
Seabed mining in Bangladesh's waters could also have significant environmental and security implications, bringing new actors and assets into Bangladesh's maritime domain.

Although several countries (including India and China) have been conducting exploration activities for seabed mineral deposits elsewhere in the Indian Ocean, there are no reports of exploration activities having been carried out or planned in Bangladesh's EEZ or continental shelf. Any such activities may require a significant update of the applicable regulatory system.[31]

2.3.4 Communications

Like most countries, Bangladesh is highly reliant on international communications through its maritime space. There are now two submarine cables landing in Bangladesh: SEA-ME-WE 4 (SMW4) and SEA-ME-WE 5 (SMW5), at Cox's Bazar cable landing station and Kuakata cable landing station, respectively. Both SMW4 and SMW5 are built and owned by Bangladesh Submarine Cable Company Limited. They are Bangladesh's only communications links that do not transit Indian territory. A third cable is planned.

Figure 9: Bangladesh subsea cables



Source: P Chauhan, S Agarwal, *Underwater communication cables: vulnerabilities and protective measures relevant to India*, Part 1, National Maritime Foundation, 7 April 2021, https://maritimeindia.org/underwater-communication-cables-vulnerabilities-and-protective-measures-relevant-to-india-part-1/.

Section Three: Challenges and threats in Bangladesh's maritime domain

The concept of 'maritime security' remains underdeveloped in Bangladesh. Although Bangladesh has a lengthy maritime history, it does not have an enduring maritime legacy in its strategic formulations.[32]

This section reviews key maritime security threats to Bangladesh. It contains the following subsections, which are not listed in any priority order:

3.1 IUU fishing
3.2 Drug trafficking by sea
3.3 Human smuggling by sea
3.4 Maritime piracy and armed robbery
3.5 Shipping accidents and maritime safety
3.6 Marine pollution
3.7 Cyber-threats
3.8 Climate Change
3.9 Illegal and unregulated sand mining.

3.1 IUU fishing

IUU fishing is an important threat to Bangladesh's maritime interests, but in a somewhat different way compared to many other countries. For Bangladesh, the principal threat probably involves domestic rather than foreign fishers.

However, very little hard data is available on the size of the problem. According to one 2015 report (using a land-based assessment), illegal fishing in Bangladesh was between 55,000 and 216,000 tonnes per annum or around 14%–54% of the total catch. It claimed that unreported catch (mostly by artisanal fishers) was even higher.[33] There are three broad categories of IUU fishing in Bangladesh, involving foreign fishers, industrial fishers and artisanal fishers (see box).

The scope of IUU fishing

The Bangladesh Department of Fisheries' 2019 National Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated (IUU) Fishing places IUU fishing in three categories:

- Foreign fishing vessels—generally from India and Myanmar, with the principal threat arising from misaligned seasonal breeding season closures.
- Bangladesh industrial fishing vessels—which are generally well regulated, although regulation would be improved by the development of a vessel monitoring centre.
- Bangladesh artisanal fisheries—which are largely unreported and unregulated, with illegal fishing occurring using prohibited monofilament gill nets and set bag nets and noncompliance with fisheries closures.

Since 1986, Bangladesh has not issued fishing licences to foreign operators (although, apparently, China has previously unsuccessfully requested licences and consideration may be given to permitting South Korean fishers). This means that currently there are no foreign operators legally entitled to be present in Bangladesh waters other than in transit, which potentially simplifies enforcement operations.

Although many observers cite the threat of foreign IUU fishers, in fact authorities have little or no knowledge of foreign commercial/industrial trawlers operating in Bangladesh's EEZ. There are currently no mechanisms for sustained surveillance of Bangladesh's EEZ beyond inshore areas. The Fisheries Ministry states that two Thai trawlers were

detained at Chittagong Port on suspicion of operating in Bangladesh's EEZ, but there is no other hard data on activities of foreign trawlers and it is possible that there is not significant activity.

Consequently, the scale of the problem is unknown.

Indian (and to a lesser extent Myanmar) artisanal/mechanised fishers, operating close to shore, do frequently drift across maritime boundaries. Bangladesh authorities will either warn off Indian fishers or detain and release them, while Myanmar fishers might be briefly detained.

However, overall, it appears that IUU fishing is much more a domestic matter, involving Bangladesh fishers not complying with banned periods or using prohibited fishing methods, or industrial fishers infringing on the 40-metre contour line that is intended to divide artisanal and industrial fishers.

Although the Bangladesh Fisheries Ministry undertakes periodic stock assessments in the country's own EEZ (for example, an FAO-funded assessment in 2019), there are no current regional stock assessments for the whole Bay of Bengal. The last regional stock assessment was conducted by the FAO in 1983. The IOTC, which is the regional fisheries management authority for the Indian Ocean, does not conduct any studies in the Bay of Bengal. Accordingly, there is little or no data on regional sustainability or the impact of illegal fishers.

3.2 Drug trafficking by sea

Drug trafficking is a significant security threat to Bangladesh. It principally involves the smuggling of 'yaba' (a mixture of methamphetamine and caffeine) from Myanmar, mostly for Bangladeshis' domestic use. According to Bangladesh maritime enforcement agencies, the great majority of this smuggling trade probably occurs overland, often using Rohingya refugees as 'mules', while a small portion of it occurs at sea, sometimes involving fishermen.

Yaba traders use vessel-to-vessel transfers at sea. If law-enforcement pressure is applied in the Teknaf region, they will move west to the Sundarbans area. It is very difficult to identify the boats involved, as 'crystal meth' can be mixed with real ice on board fishing boats. Some boats will have up to 2,500,000 shots of yaba on board. Shots retail at 30–40 taka each in the regions and up to 200–300 taka in Dhaka.

There is also a significant drug-smuggling problem from India involving Phensedyl, a codeine-laced cough syrup produced in India. Again, this is largely a land-based smuggling problem, although a portion of the trade could potentially occur by sea. It is likely that much of this trade occurs in inshore areas.

3.3 Human smuggling by sea

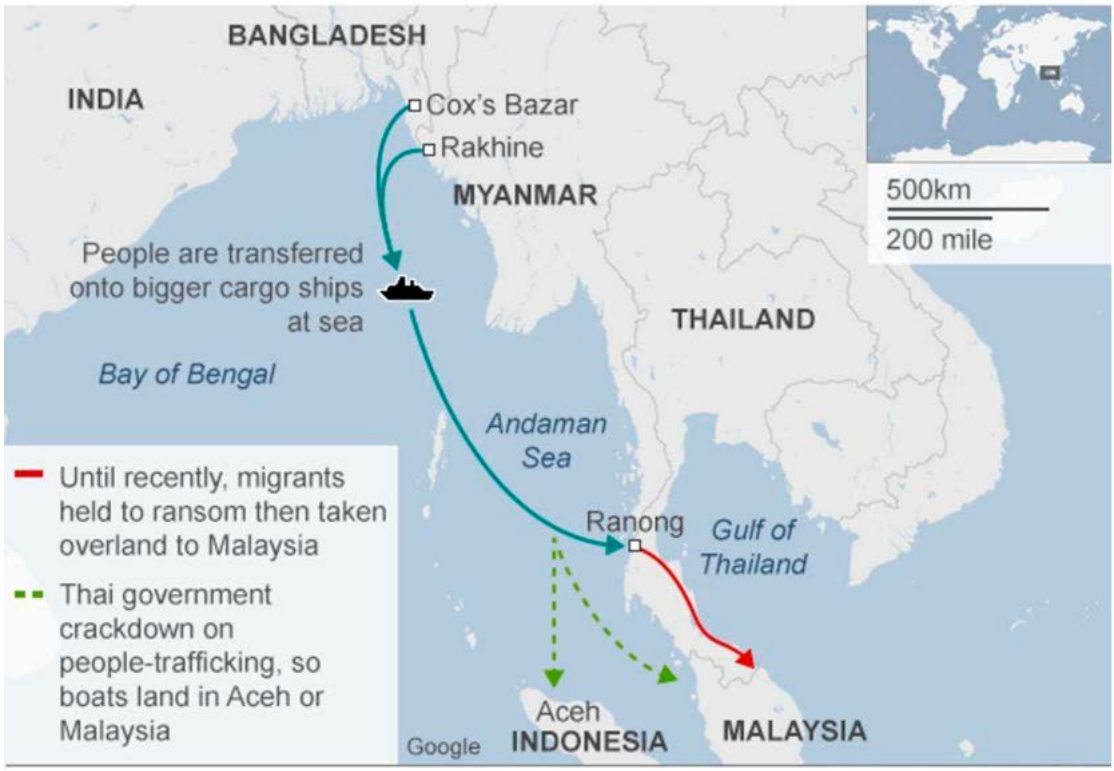
There is some human smuggling occurring at sea (both inward and outward), principally involving Rohingya refugees who are moving from Myanmar to Bangladesh or those who subsequently travel from Bangladesh camps to Southeast Asia.

Illegal migration concerns are particularly related to the Rohingya humanitarian crises. The great majority are located in camps at Cox's Bazar and the Myanmar border. Most of that population arrived by land and across rivers, but many arrived in Bangladesh in small boats after being forcibly displaced from Myanmar. Bangladesh maintains a database of 1.2 million such people, of whom only 60% are registered with biometric data. There is a significant risk that, as pressure increases in the camps, there will be an outflow of people, particularly by boat.

The great majority of inward movements occurred over the land border, and most of the remainder over the Naf River that demarks the Bangladesh–Myanmar border; only a very small portion arrived by sea. Bangladesh authorities will seek to prevent the arrival of Rohingya refugees into Bangladesh.

Although there are no reliable statistics available, there is also believed to be considerable outward traffic in human smuggling, particularly involving Rohingya refugees headed towards Southeast Asian countries (Thailand, Malaysia or Indonesia) in search of work or marriage (Figure 10). There is a significant risk that they will be attacked or left stranded at sea, and women and children are particularly vulnerable.[34] For example, in December 2022, around 160 Rohingya people were found adrift at sea after leaving Cox's Bazar and heading towards Malaysia.[35] Some interviewees state that the Bangladesh Coast Guard also tries to stop outward movements by sea out of concerns for safety, but others comment that the Coast Guard has relatively less interest in outward movements.

Figure 10: Bangladeshi and Rohingya trafficking routes



Source: 'Bangladesh PM says illegal migrants taint national image', *BBC News*, 24 May 2015.

It should be noted that human smuggling (involving a consensual transaction between organisers and passengers) is not a criminal offence in Bangladesh, although non-consensual human trafficking is.

3.4 Maritime piracy and armed robbery

The Bay of Bengal has long been a hotspot for maritime piracy and armed robbery. For some years, pirate gangs were very active in the Sundarbans area, which led to the establishment of a taskforce comprising the Rapid Action Battalion, the Border Guards, the Coast Guard and the Forest Service. That led to 589 arrests up until 2019.[36]

Another area of concern is armed robberies committed against ships in the anchorages around Chittagong. The 2022 Indian IFC-IOR annual report records seven instances of sea robbery in the Bangladesh region throughout that year.[37]

There is potential for a resurgence in piracy and armed robbery at sea in the inshore areas due to climate change as rice farmers lose their living due to increasingly saline water and turn to illegal practices.[38]

In legal terms, 'maritime piracy' involves robbery that occurs on the high seas, while 'robbery' is the same act that occurs within territorial waters. Armed robbery at sea remains a significant concern for Bangladesh. However, unlike pirates and

robbers elsewhere in the Indian Ocean (such as off the coast of Somalia), Bangladesh-based criminals generally do not have the ability to venture into the deep sea, so most criminal acts occur in inshore waters.

Incidents of armed robbery at sea have declined significantly in recent years (Table 2). Department of Shipping personnel advise that this is due to the establishment of vessel traffic management systems (VTMSs) in the major port areas. We have also been advised that in previous years many of the reported cases of armed robbery in the Chittagong port area were in fact misreported cases of pilfering of supplies by ships' crews for bartering with locals. Authorities have since clamped down on such misreporting.

Table 2: Incidents of maritime piracy and armed robbery reported in Bangladesh and Bay of Bengal

Year	Actual and attempted attacks—Bangladesh	Actual and attempted attacks—Bay of Bengal
2007	13	1
2008	12	
2009	19	
2010	24	3
2011	14	1
2012	11	
2013	6	
2014	16	2
2015	10	
2016	2	
2017	11	
2018	11	
2019		
2020	5	
2021		

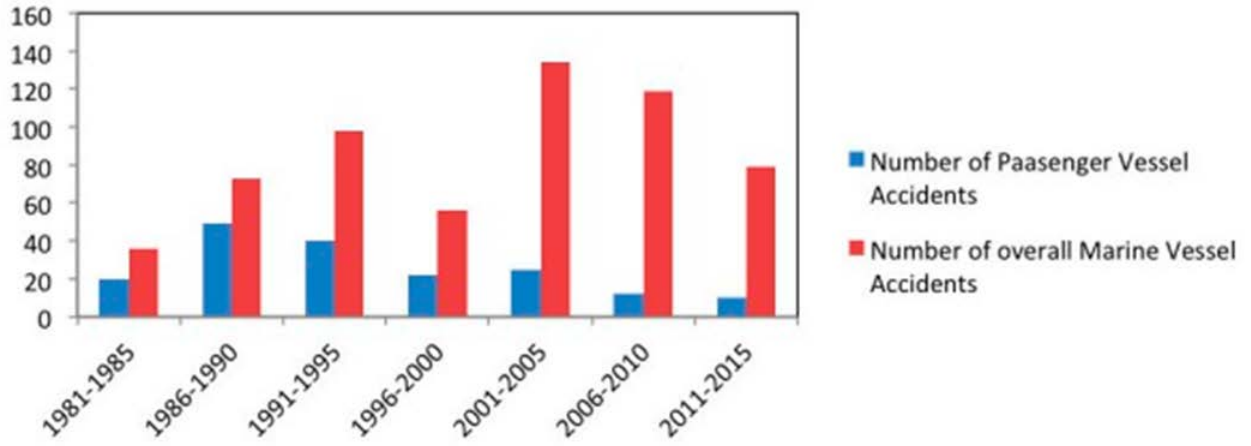
Source: Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in the Asia–Pacific (ReCAAP), *Annual report 2021—Piracy and armed robbery against ships in Asia*, Singapore, 2022.

3.5 Shipping accidents and maritime safety

Maritime safety is a major issue for Bangladesh. The frequency of marine accidents in Bangladesh is observed to be one of the highest in the world. Maritime disasters in the country took more than 10,000 lives in the past three decades.[39] Given Bangladesh's reliance on the maritime domain, especially the inland waterways, this could pose a significant threat to the development of the blue economy (see Recommendation 16).

As examples of this threat, figures 11 to 14 have been extracted from an analysis of passenger vessel accidents in Bangladesh from 1981 to 2015.[40] Ferry accidents have been the major contributor to fatalities in the maritime domain. The data was obtained from the Bangladesh Department of Shipping and the Inland Waterways Authority.

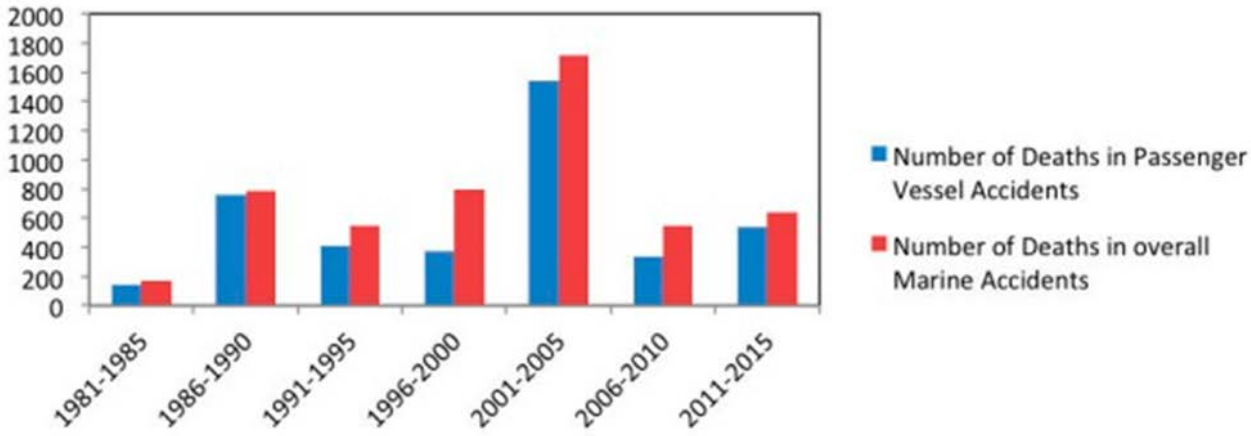
Figure 11: Number of maritime accidents, 1981 to 2015



Source: Sohanur Rahman, 'An analysis of passenger vessel accidents in Bangladesh', *Procedia Engineering*, 2017, 194:284–290, ISSN 1877-7058, https://doi.org/10.1016/j.proeng.2017.08.147.

While the numbers of passenger vessel and ferry accidents are reducing, they are still the major contributor to fatalities.

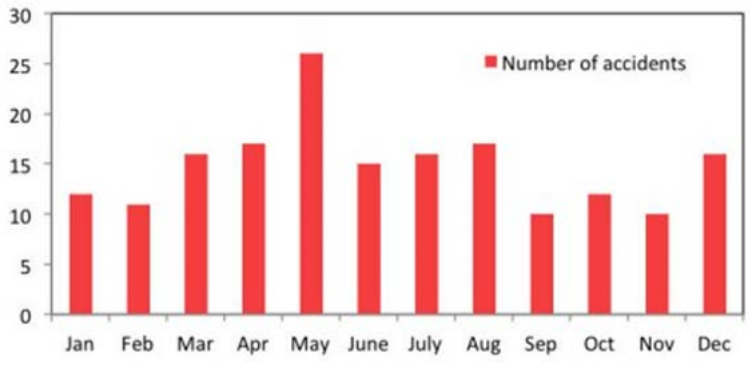
Figure 12: Number of fatalities as a result of marine accidents, 1981 to 2015



Source: Sohanur Rahman, 'An analysis of passenger vessel accidents in Bangladesh', *Procedia Engineering*, 2017, 194:284–290, ISSN 1877-7058, https://doi.org/10.1016/j.proeng.2017.08.147.

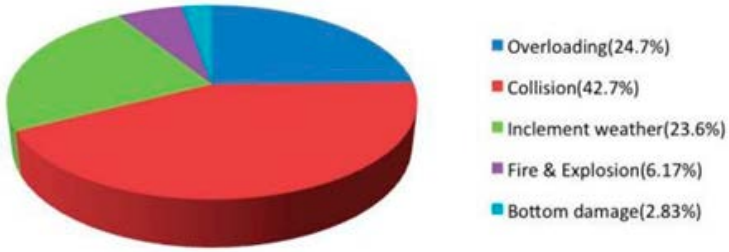
The number of accidents peaks in the March–May time frame due to the prevalence of sudden and strong northwesterly winds blowing across the country.

Figure 13: Seasonal variation of marine accidents, 1981 to 2015



Source: Sohanur Rahman, 'An analysis of passenger vessel accidents in Bangladesh', *Procedia Engineering*, 2017, 194:284–290, ISSN 1877-7058, https://doi.org/10.1016/j.proeng.2017.08.147.

Figure 14: Causes of maritime incidents, 1981 to 2015



Source: Sohanur Rahman, 'An analysis of passenger vessel accidents in Bangladesh', *Procedia Engineering*, 2017, 194:284–290, ISSN 1877058, https://doi.org/10.1016/j.proeng.2017.08.147.

The predominant cause of all maritime accidents is collision.

3.6 Marine pollution

Southern Star 7—oil spill incident

On 9 December 2014, the small oil tanker *Southern Star 7* collided with a cargo vessel on the Shela River in the Chadpai Wildlife Sanctuary within the Sundarbans UNESCO World Heritage site. The tanker sank, spilling 350,000 litres of furnace fuel oil and causing enormous environmental damage to the surrounding area, which is known for its exceptional biodiversity.

The incident highlighted the lack of preparedness that the relevant Bangladesh Government agencies had for an oil spill of this kind.

Bangladesh's riverine geography and high reliance on fisheries and agriculture make it extremely vulnerable to marine pollution from land- and sea-based sources in Bangladesh, neighbouring states and passing vessels. Bangladesh was listed among the top 10 polluters in the world in 2010.[41]

Bangladesh imports nearly 6 million tonnes of crude and refined oil per year. The oil is transferred from very large crude carriers to smaller tankers at an anchorage point 40 kilometres southwest of Chittagong Port. During the transfer process, oil inevitably escapes to the sea. The likelihood of pollution has recently been reduced through the

construction of a single-point mooring, which is connected to a pipeline that takes the oil ashore without the need for transfers to smaller vessels.

Globally, about 80% of marine pollution originates from land-based sources. In July 2023, the Dasherkandi Sewage Treatment Plant in Dhaka was completed. It was the first treatment plant of its kind in Bangladesh. Until then, nearly 80% of raw sewage had been dumped into rivers and canals leading into the Bay of Bengal. Land-based pollution also emanates from the environmentally poor practice of beaching vessels prior to shipbreaking.

All the major Bangladesh rivers deliver millions of tonnes of sediment every year. Included in the sediment are unknown quantities of agricultural chemicals, solid wastes, industrial residues and farm effluents. Also, vast amounts of solid and liquid wastes, such as heavy metals, acids, chromium, phenol, ammonia, plastic, alkali and pharmaceutical wastes, are discharged from industrial activity into the Bay of Bengal through rivers, canals and estuaries.[42]

Marine plastics have also become a major pollutant.[43] According to the United Nations Environment Programme (UNEP), 80% of the marine litter originates from land sources, and rivers potentially act as a major transport pathway. The 10 top-ranked rivers transport 88%–95% of the global load into the sea; eight are located in Asia, and the Ganges–Brahmaputra–Meghna is sixth on the list, delivering 72,845 tons per year. The marine litter and microplastic management strategies of the countries in the Bay of Bengal region are either non-existent or very weak and disjointed.[44]

Most of the big cities and industries are located near major rivers, which are repositories of most of the waste discharge from industries and municipal waste from the cities. There is no maritime litter monitoring program. However, the Solid Waste Management Regulations 2021 under the *Bangladesh Environmental Protection Act 1995* define the responsibilities of businesses involved in solid-waste management and impose collection, recycling and disposal obligations according to 'extended producer responsibility' on manufacturers of non-biodegradable products such as glass, plastics and bottles. The Regulations also include provisions for the treatment of solid waste, such as composting and energy recovery.[45]

Bangladesh is a signatory to MARPOL Convention; however, there is no domestic enabling legislation to give it effect. In 2004, the *Marine Environment Conservation Act* was drafted, but it is yet to be passed by the government (see Recommendation 14).

The Department of Environment has formulated the National Oil Spill and Chemical Contingency Plan, which has given the Coast Guard the task of taking control of oil-spill contingencies. It is apparent that the Coast Guard is not sufficiently resourced to conduct that task adequately.

Atmospheric pollution in the region is leading to rapid acidification in the coastal waters of the Bay of Bengal. The increased deposition of pollutants decreases the pH level of the water more rapidly than the carbon dioxide can dissolve, making the water more acidic. This will affect the marine ecosystem and create low-oxygen conditions for fish species.

3.7 Cybersecurity

As Bangladesh further develops its ports, cybersecurity is assuming greater importance. As ships and ports become more automated and digitised, they are becoming increasingly susceptible to cyberattacks on their information or operational technology or via ransomware.

In its 2022 annual report, the Indian Navy's IFC-IOR reported five instances of cyberattacks globally, one of which occurred at the Jawaharlal Nehru Port Container Terminal in Mumbai. The attack affected the management information systems, which disrupted container loading/unloading operations and led to congestion in the port area.[46]

All Bangladesh port authorities are encouraged to follow the IMO Guidelines on Maritime Cyber Risk Management detailed in MSC-FAL.1/Circ.3/Rev.1 14 June 2021 (see Recommendation 2).

3.8 Climate change

Perhaps the most significant challenge for Bangladesh in the maritime domain is the impact of climate change. In 2021, Bangladesh ranked seventh on the Global Climate Risk Index, which ranks countries that are most vulnerable to climate change.[47] This is predominantly due to the hazards presented by Bangladesh's unique maritime geography. One metre of sea-level rise will affect 17% of the country's area covering the flat coastal zone. That zone is home to 13% of Bangladesh's population of more than 150 million, or around 20 million people.[48]

While there is little hard data, climate change is already likely to be causing significant population displacement in Bangladesh. There are estimates that 300,000 to 400,000 migrants arrive in Dhaka each year. Salinity intrusion is considered a major factor for that movement, as many of the migrants originate from the coastal regions. In the low-lying Sundarbans area, rice farmers are increasingly turning to prawn aquaculture as salinity increases. The embankments, or polders, are unable to hold back the sea due to sea-level rise and an increasing number of severe weather events. Aquaculture employs fewer people than agriculture, so people are moving away to seek work.

The Bangladesh Government has recognised the risk and is formulating a national response (see box).

National climate change policies and plans

The Ministry of Environment, Forests and Climate Change coordinates a range of climate change policies and plans, including:

- the National Adaptation Plan of Bangladesh (2023–2050)
- the Delta Action Plan 2100
- the Mujib Climate Prosperity Plan
- the National Climate Finance Mechanism
- Ashrayan: Climate Resilient Shelter for Displaced People.

The ministry also coordinates such initiatives as:

- food security and climate smart agriculture
- integrated water resource management
- disaster risk reduction
- climate-resilient infrastructures
- the Global Centre of Adaptation Regional Centre.

Bangladesh has been remarkably successful in mitigating the risks associated with the increasing number of cyclones in the Bay of Bengal. Prior to the landfall of the most recent (Tropical Cyclone Mocha in May 2023), nearly 750,000 people were evacuated in anticipation of storm surges. This was extremely successful in reducing the subsequent death toll. The key enabler of this mitigation strategy is Bangladesh's community radio network.

The successful development of the network within coastal communities could see it being utilised as another crowdsourcing initiative for MDA in which the network issues warnings on IUU fishing and drug or human trafficking. The whole network could perhaps be rebadged with the Bangladeshi word for Coast Watch—*Upakūla Ghaṛi*.

3.9 Illegal and unregulated sand mining

Demand from Bangladesh's construction industry for sand has led to a boom in unregulated and illegal mining from rivers. It is exacerbating river erosion and poses a threat to all kinds of physical infrastructure, including homes, agricultural lands, schools, bridges and embankments in the river.

There appears to be weak enforcement of the *Quarry and Sand Management Act* to control sand mining activities. The law does not require miners to carry out environmental impact assessments before starting extraction.

Hotspots of illegal sand mining include districts in the Ganges River Basin and the Meghna River Basin. Because of the unregulated extraction of sand, Bangladesh's floodplains are sinking deeper, raising the probability of worsening floods and flood damage. There is a need for better monitoring and management of river-sand resources by Bangladesh and closer engagement with the dredging sector to consider river sand as a strategic material.[49]

Section Four: Maritime governance and domain awareness

This section has the following subsections:

4.1 Overview of Bangladesh agencies with responsibilities in the maritime domain

As in most countries, there are many Bangladesh agencies with responsibilities in the maritime domain, reflecting the complex nature of maritime affairs and the wide range of maritime interests and threats. There are around 13 Bangladesh Government agencies with key responsibilities regarding the maritime domain:

Armed Forces Division

- Bangladesh Navy

Ministry of Home Affairs

- Bangladesh Coast Guard
- Bangladesh Police / River Police
- Narcotics Control Branch
- Department of Immigration and Passports

Ministry of Shipping

- Department of Shipping
- Port authorities

Ministry of Fisheries and Livestock

- Department of Fisheries

Ministry of Environment, Forest and Climate Change

- Department of Environment

Ministry of Power, Energy and Mineral Resources

Ministry of Information and Communications

Technology Ministry of Law, Justice and Parliamentary Affairs

Ministry of Foreign Affairs, Maritime Affairs Unit.

Coordinating the actions of these agencies in the maritime domain or promoting the sharing of information between agencies is a difficult task. There is no single agency that is responsible for coordinating strategy or policies in the maritime domain (see Recommendation 11).

Bangladesh has not published a national oceans policy or a national maritime security strategy that would provide guidance to agencies as to their responsibilities or roles in addressing various maritime challenges or threats (see Recommendation 10).

In April 2023, Bangladesh released its Indo-Pacific Outlook. While it was not a policy document, it did detail several objectives associated with the maritime domain that are relevant to developing Bangladesh's MDA capabilities and could lead to the development of an overall maritime security policy (see box).

Indo-Pacific Outlook—maritime objectives

- Strengthen existing mechanisms on maritime safety and security in the Indo-Pacific, including response to emergencies at sea and conduct of search & rescue, and uphold the exercise of freedom of navigation & over-flight, in accordance with international law and relevant international conventions, including UNCLOS, 1982.
- Promote conservation, sustainable use and management of oceans, seas, and marine resources in the Indo-Pacific in pursuance of SDG-14 and other relevant internationally agreed development commitments.
- Continue tangible work towards addressing the challenges of climate change, biodiversity loss, marine pollution, and other significant and harmful impacts on the environment in line with relevant international conventions and commitments.

There is no centralised MDA system in Bangladesh involving the collection, fusion and analysis of information regarding the maritime domain. As is detailed in this section, several agencies operate their own surveillance centres or systems. Notably:

- The Bangladesh Navy operates an operations centre.
- The Bangladesh Coast Guard also operates its own operations centre.
- The River Police operates its own operations centre located in River Police Headquarters in Dhaka.
- Chittagong Port Authority and the Mongla Port Authority operate VTMSs in the vicinity of the ports operated by them. In the case of Chittagong, this extends some 50 kilometres offshore. In the case of Mongla, it extends to the mouth of the Mongla River (see discussion in Section 4.6).
- The Department of Shipping is building a maritime rescue coordination centre as part of its new command and control centre being established with the new South Korean-supplied GMDSS network (see discussion in Section 4.5).
- The Department of Fishing is developing a fisheries monitoring centre (see discussion in Section 4.7).

There are few formal systems for the sharing of information or intelligence between agencies or for the coordination of responses to threats or challenges. Rather, information sharing and coordination now often occur through an informal network of relationships among senior naval officers who head many of the agencies, including the Coast Guard, DG Shipping and port authorities. They will typically coordinate responses by phone and messaging.

4.2 Bangladesh Navy

4.2.1 Organisation and responsibilities

The Bangladesh Navy is Bangladesh's principal agency with responsibility for security in the maritime domain. It reports to the Minister of Defence (who is the Prime Minister) through the Armed Forces Division, which is part of the Prime Minister's Office.

Bangladesh Navy officers have powers of investigation and arrest under the *Territorial Waters and Maritime Zones Act 1974* (as amended in 2021) if those powers are conferred by government gazette. The Act does not cover waters upstream of the river mouths.

The Bangladesh Navy's official website details the Navy's responsibilities as follows:

- To safeguard/defend the territorial waters of the country.
- To keep the sea lines of communication open during a war.
- To keep the sea ports of Bangladesh open for shipping during a war.
- Protection of the Bangladesh fishing fleet.
- Coast guard duties.
- Patrolling in riverine waters of the country.
- Search and rescue at sea.
- Cyclone warning for naval ships and craft.
- Protection of Bangladesh merchant ships in the high seas.
- Assist the civil administration in maintaining internal security and peace, whenever called for such duties.
- Assist the civil administration in the event of natural calamities like flood, cyclone, tidal waves, earthquake etc. whenever called for such duties.
- Naval control of shipping (internal and external, inland or foreign) organisation.
- Oceanographic survey.
- Any other task for which the government may deem it necessary to deploy the Navy.

4.2.2 Surveillance capabilities

The Bangladesh Navy is a small and professional force consisting of five guided missile frigates, two patrol frigates, six corvettes and 68 minor surface combatants of different types. In 2017, the Navy also acquired two Ming-class submarines. The aviation component consists of two AW109 helicopters and four Dornier maritime patrol aircraft.

Naval vessels run a regular patrol pattern through all the Bangladeshi maritime zones. The aerial reconnaissance role is fulfilled by the Dornier maritime patrol aircraft; however, reconnaissance is irregular. Discussions with Navy personnel indicated that some coverage is provided by the *Bangabandhu-1* satellite, which is a geostationary communications and broadcast satellite (see Recommendation 6).

The state-owned Bangladesh Satellite Company Ltd has contracted with a Russian supplier to construct and launch a second satellite, the *Bangabandhu-2*. This will be a low-Earth-orbit satellite intended for Earth observation.[50] Once the *Bangabandhu-2* is launched, enhanced coverage may be provided. However, international sanctions against Russia associated with the war in Ukraine may significantly delay this project.

4.2.3 Blue Economy Cell

The Bangladesh Navy also has the Blue Economy Cell (previously referred to as the 'Blue Economy Directorate'), which is headed by the Director General of the Navy's research institute, the Bangladesh Institute of Maritime Research and

Development (BIMRAD). The cell reports to the Bangladesh Navy's Assistant Chief of Naval Staff (Operations) and provides advice on the protection of blue-economy assets as part of Operation Blue Guard. The Navy states that one Bangladesh Navy ship and one contingent remain deployed round the clock to ensure the security of personnel and ships engaged in blue economy activities. Bangladesh Navy ships regularly provide escort to LNG-carrying ships and necessary security support to domestic and foreign organisations engaged in blue-economy activities (seismic surveying, oceanographic research and submarine cable laying.[51]

The BIMRAD Director General position is always filled by a senior Bangladesh Navy hydrographic officer. BIMRAD is working with the Bangladesh Navy's Hydrographic Oceanographic Centre to develop a marine spatial data infrastructure for Bangladesh. This will be an interagency database that will be partially available to the public (see Recommendation 5).

4.2.4 Hydrographic surveying

Due to the dynamic status of the Bangladesh coastline caused by its deltaic nature and the effects of climate change, there is a requirement to conduct frequent hydrographic surveys. Maintaining the navigability of rivers, particularly those servicing upriver ports at Chattogram, Mongla and Payra, is also a major challenge. However, overall, Bangladesh appears to have a reasonable level of sovereign capabilities to survey its maritime spaces.

Hydrographic surveying of the Bangladesh offshore maritime zones is conducted by the Bangladesh Navy Hydrographic Service (BNHS). The Bangladesh Inland Water Transport Authority is in charge of surveying Bangladesh's inland waters.

The BNHS operates four small hydrographic vessels, the largest of which is the ex-HMS *Roebuck*, a 1,477-tonne, 210-foot coastal survey vessel that was operated by the Royal Navy until being sold to the Bangladesh Navy in 2010. The Darshak-class vessels were locally built in the Khulna Shipyards and commissioned in 2020. The Agradoot-class vessel was acquired from commercial service in 1996.

The BNHS is responsible to the International Hydrographic Office for the maintenance of 49 charts in the Bangladesh maritime zones. That work is coordinated through the Navy's Hydrographic and Oceanographic Centre in Chattogram, which acts as a hub for Bangladesh's hydrographic activities. The centre also produces annual notices to mariners and the Bangladesh tide tables, along with daily maritime meteorological forecasts.

The Bangladesh Navy operates a hydrographic school in Chattogram that has been recognised by the International Board on Standards of Competence for conducting Category 'B' courses since 2005.

In the 1990s and 2000s, France provided assistance to help modernise Bangladesh's hydrographic capabilities. In 2010, a memorandum of understanding (MoU) was signed between the Bangladesh Navy and the United Kingdom Hydrographic Office. Bangladesh Navy hydrographic officers have also previously received training from India, France, the UK, the US, Japan, Italy, South Korea and Australia.

4.3 Bangladesh Coast Guard (Ministry of Home Affairs)

4.3.1 Organisation and responsibilities

The Bangladesh Coast Guard is a paramilitary maritime law enforcement force operating under the jurisdiction of the Ministry of Home Affairs. Its personnel are seconded from the Navy. The Coast Guard was established in 1995 after the original Coast Guard Act of 1994 was enacted.[52] Section 7 of that Act detailed the following responsibilities:[53]

- protection of national interests in the maritime zones of Bangladesh
- prevention of illegal fishing in the maritime area of Bangladesh
- prevention of the illegal entering or leaving of Bangladesh through the maritime zones of Bangladesh
- enforcement of any warrant or any other order of any court or other authority in respect of any ship which has entered the territorial waters of Bangladesh or of any person on board such ship

- detection of activities causing the pollution of the environment in the maritime zones of Bangladesh and taking measures for their stoppage
- assurance of security of persons working in the maritime zones of Bangladesh
- prevention of the handing over and smuggling of drugs
- participation in rescue and salvage operations in times of natural catastrophes and salvage of vessels, human beings and goods met with an accident
- dissemination of information including warnings by radio or any other means in times of natural catastrophes
- rendering assistance to the Navy in times of war
- patrolling in the maritime zones of Bangladesh
- rendering assistance to the appropriate authorities for the ensurance of the security of the sea ports
- suppression of destructive and terroristic activities occurring in the maritime zones of Bangladesh, and rendering assistance in this behalf to other authorities.

In 2002, the government delineated the Coast Guard's areas of responsibility through a gazette notification. (see box). A further government gazette extended the Coast Guard's area of jurisdiction up to 1 kilometre landwards from the river bank or sea shore, principally to allow the force to continue 'hot pursuit' of criminals.

In 2016, the 1994 Coast Guard Act was repealed and replaced with the *Coast Guard Act 2016* (see Recommendation 18).

Bangladesh Coast Guard areas of responsibility

a. Territorial water and adjacent estuary in according to the *Territorial Waters and Maritime Zones (Amendment) Act 2021*

b. All rivers and canals of the Sundarbans

c. Passur River (from estuary to Chalna) to Shibsha River

d. Mongla Nala, Polihara River, Panghuchi River

e. Haringhata and Dhareshawari River (from estuary to Kumarkhali)

f. Bishkhali River

g. Payra/Burishawar River (from estuary to Aamtali)

h. Andharmanik, Nilganj and Khapra Bhanga River (Mohipur River)

i. Rabnabad Channel and Galachipa River (from estuary to Galachipa)

j. Darchirra and Bura Gouranggo River

k. Shahbajpur and Meghna River (from Meghna to Chowkia)

l. Karnaphuli River (estuary to Kalurghat River)

m. Sangu River (estuary to Jaldhar Channel)

n. Kutubdia, Maheskhali and Sandwip Channel

o. Bangladesh area in Naaf River (from estuary to Teknaf Bazar)

p. All the rivers and channels falling into the Bay of Bengal (from estuary to 5 nautical miles upstream)

q. The waterways from Chattogram and Mongla seaports to Dhaka

r. Other government-declared rivers, channels, islands and port areas.

4.3.2 Surveillance capabilities and shortfalls

The Coast Guard has an enormous area of responsibility for offshore, inshore and riverine waters and a small surveillance capability, especially to the outer EEZ boundary. It currently has four offshore patrol vessels (OPVs) of 1,300 tonnes; eight inshore patrol vessels; four fast patrol boats; and 103 assorted small craft. The United States has also provided four vessels built by Metal Shark Boats, and Japan has undertaken to provide four vessels with pollution-control equipment.

Given the diverse and unique nature of the coastline and the commonly rough conditions offshore in the Bay of Bengal, it is considered that the Coast Guard is significantly under-resourced to fulfil its responsibilities in coastal and offshore waters. Coast Guard representatives advise that it is in the process of replacing coastal and riverine vessels and adding two to four larger OPVs with helicopter decks to operate rotary uncrewed aerial vehicles. Those larger vessels would be able to patrol the outer EEZ, where the smaller 1,300-tonne OPVs currently have sea-state restrictions. It also plans to acquire a fixed-wing capability and, potentially, also hovercraft. Australia may be able to assist with a small hovercraft solution.

All Coast Guard officers and enlisted personnel are currently seconded from the Navy, and there are no plans to separately recruit and train enlisted personnel. This constant churn leads to a loss of corporate knowledge when it comes to key areas such as SAR and pollution control.

There is a significant overlap of jurisdiction with another agency within the Ministry of Home Affairs: the River Police. This could perhaps be remedied with the introduction of an omnibus Act, like the Australian *Maritime Powers Act 2013*, that clarifies the powers of the Bangladesh enforcement agencies (see Recommendation 17).

4.4 Bangladesh Police / River Police (Ministry of Home Affairs)

The Bangladesh Police also operate under the Ministry of Home Affairs. The police investigate and bring charges in respect of breaches of Bangladesh law, making it a key agency in the enforcement of Bangladesh law in the maritime domain.

The areas of jurisdiction of the Bangladesh Police are:

- any river, canal, lake or navigable riverine route and tidal riverine route or part thereof which has been published in the Government Gazette as per Bangladesh Inland Shipping Ordinance 1976 Section 2, subsection (f)
- a 50-metre area extending into the land from the high-water mark of the rivers, except for religious installations, educational institutions, market places or any other installations
- installations regarding riverine traffic, such as riverine terminals, ferry *ghats*, river ports, or other installations.

The Bangladesh River Police is a new organisation, having been established as a separate unit of the Bangladesh Police in 2013, and is still developing its capabilities. It now has some 2,000 personnel and 100 vessels, including vessels donated by the UN Office on Drugs and Crime (UNODC) and the Japanese Government, operating out of some 141 posts. Its operations are coordinated through an operations centre in its Dhaka Headquarters. It regards key threats as including fishing, pollution and robbery.

The River Police has received VBSS training from UNODC, and it has recently opened its own new training centre near the Sundarbans. Opportunities could exist for assistance with drone technology.

The River Police has a significant jurisdictional overlap with the Bangladesh Coast Guard (see box).

River Police roles

- Assist in river traffic management.
- Increase awareness against riverine accidents and assist other organisations in doing so.
- Maintain law and order in riverine ports, ferry terminals, passenger waiting areas and similar places.
- Check registration, fitness and other documents as per existing law and assist in taking legal actions if discrepancies are found.
- Subject to existing rules and regulations, assist in taking legal actions against the carrying of passengers beyond allowed capacity, charging of excessive fares in all ferries and vessels in the areas of jurisdiction.
- Take legal actions against the transportation of smuggling goods or narcotics in its areas of jurisdiction.
- Subject to existing rules and regulations, assist the concerned authorities in taking legal actions against pollution of environment.
- Subject to existing rules and regulations, assist the concerned authorities in taking legal actions against violating laws and regulations regarding protection and conservation of fisheries in its areas of jurisdiction.
- Subject to existing rules and regulations, assist the concerned authorities in taking legal actions in case of violations of existing laws and rules regarding impeding, poaching, illegal earth filling, diverting of river routes.
- Arrange, conduct and participate in national and international research, conventions, seminars, symposiums and so on, regarding the management of river routes and the riverine environment.
- Collect intelligence regarding offences taking place in its areas of jurisdiction for the purpose of investigation, and exchange that intelligence with the concerned units of Bangladesh Police.
- Maintain close liaison with and provide necessary assistance to the concerned persons, authorities, offices, or organisations in its areas of jurisdiction regarding the performance of its duties.
- Perform any other duties as per other concerned laws, rules, regulations, legal documents.

Figure 15: Police from Bangladesh patrol in the Naf River

Source: Thar Shwe Oo, 'Police from Myanmar and Bangladesh patrol in Naf River', *Eleven Media Group*, 12 March 2019, https://elevenmyanmar.com/news/police-from-myanmar-and-bangladesh-patrol-in-naf-river.

4.5 Department of Shipping (Ministry of Shipping)

4.5.1 Organisation and responsibilities

The Department of Shipping is the regulatory authority within the Ministry of Shipping and is responsible for maritime safety and the formulation and enforcement of maritime regulation. It is led by the DG Shipping, who is always a serving Bangladesh Navy commodore.

The department is also responsible for ensuring compliance with international conventions relating to maritime matters. As a regulatory body, its functions are administered in accordance with two main legal instruments:

- the Bangladesh Merchant Shipping Ordinance 1983
- the Inland Shipping Ordinance 1976.[54]

Another department within the Ministry of Shipping, the Inland Water Transport Authority, is responsible for the development of inland water transport. Once again, it is led by a serving Navy commodore.

The regulation role is quite difficult, as there more than 100,000 inland craft, of which only 15,000 are registered.

4.5.2 Coordination of maritime search and rescue

The IMO Global SAR Plan details DG Shipping as having the responsibility for Bangladesh's maritime SAR operations; however, this is currently delegated to the Bangladesh Navy until a maritime rescue coordination centre (MRCC) is built within a new Department of Shipping building in Dhaka.

It is being built with 'soft' loan assistance from South Korea, as part of a commercial contract with LG Korea to establish the Global Maritime Distress and Safety System (GMDSS) in compliance with International Telecommunication Union and IMO specifications.[55] The project includes building coastal communications stations at around seven points along the Bangladesh coast. The communications stations will provide coverage out to 80–100 kilometres and will be co-located on 75-metre lighthouses. This project has suffered significant delays since it commenced in 2014, and recent allegations of corruption may delay the project further.

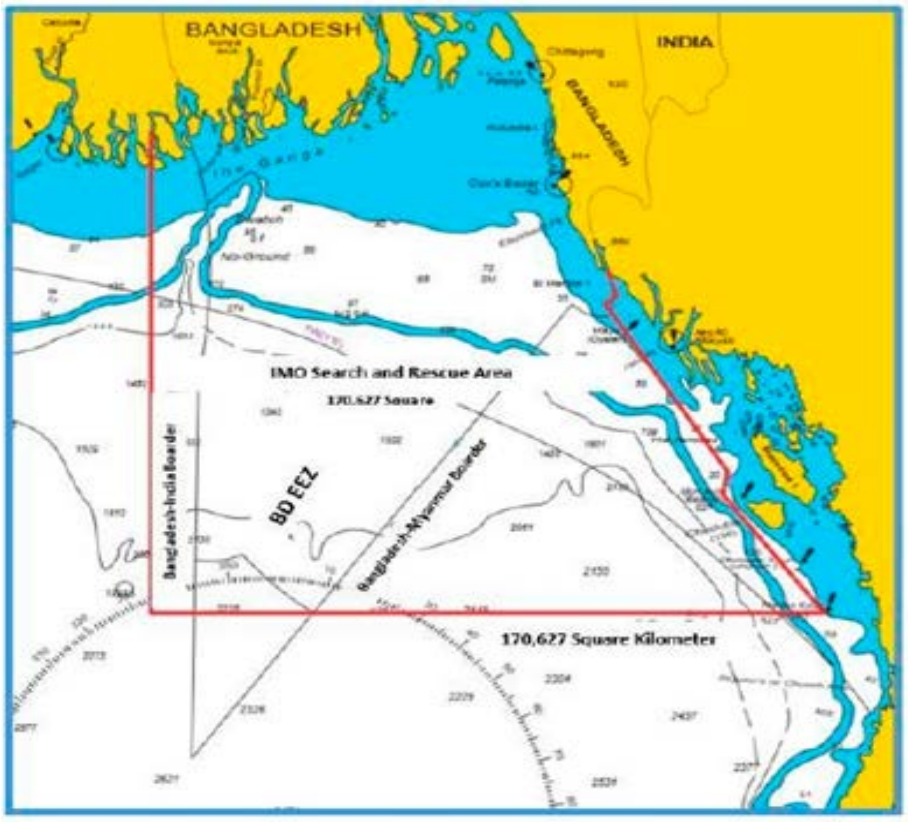
We understand that the Department of Shipping also has aspirations to install a coastal radar system in conjunction with these communications systems.

There still seems to be some uncertainty as to how the new MRCC will be operated. It is expected that the Navy and Coast Guard will retain responsibility, but with links to fisheries authorities, port authorities and other relevant agencies, although such representatives might not be co-located in the MRCC (see Recommendation 8).

The Bangladesh SAR zone encompasses the EEZ and extends towards the Myanmar coastline. Bangladesh is currently advised of any distress signals emanating from its zone by either India or Myanmar. VTMS provides close vessel tracking at Chittagong Port out to 50 kilometres.

There may be potential for Bangladesh's new low-Earth-orbit satellite, *Bangabandhu-2*, to be useful for SAR communications.

Figure 16: Bangladesh search and rescue region (SRR)



Source: Aurangzeb Chowdhury, 'Ensuring maritime security of Bangladesh: A focus on the roles of Bangladesh Coast Guard', PhD thesis, June 2020.

As previously noted, under the rules of the International Civil Aviation Organization, Bangladesh's flight information region is substantially smaller than its maritime SAR region. Aviation rescues are coordinated by the Civil Aviation Authority of Bangladesh Rescue Co-ordination Centre located at Dhaka Airport. In the event of an aircraft incident occurring in Bangladesh's maritime SAR region (whether occurring inside or outside Bangladesh's flight information region), it will be the responsibility of the Rescue Co-ordination Centre to coordinate with the MRCC and other key maritime agencies (the Bangladesh Navy and Coast Guard).[56]

4.6 Chittagong Port Authority (Ministry of Shipping)

All of Bangladesh's major ports are administered by their own port authorities. The Chittagong Port Authority is responsible for the management, maintenance and governance of Chittagong Port, which handles the great majority of Bangladesh's external trade.

The authority is established and governed by the Chittagong Port Authority Ordinance 1976 and operates under the Ministry of Shipping.

In 2015, the port authority significantly enhanced its MDA through the installation of a VTMS (Figure 17). The system monitors traffic in and around the port area 24 hours a day.

Figure 17: Chittagong VTMS

Source: JICA Survey Team

Figure 2.4-29 VTMS facilities in Chittagong Port

Source: JICA Survey Team

Figure 2.4-30 VTMS in Chittagong Port

Source: Japan International Cooperation Agency, *Preparatory survey on Matarbari Port Development Project in the People's Republic of Bangladesh: final report*, https://www.jica.go.jp/Resource/english/our_work/social_environmental/id/asia/south/bangladesh/c8h0vm0000bikdzb-att/c8h0vm0000dqx3lj.pdf.

4.7 Department of Fisheries (Ministry of Fisheries and Livestock)

4.7.1 Organisation and responsibilities

Fisheries in Bangladesh are regulated by the Department of Fisheries under the Ministry of Fisheries and Livestock. It operates under the following laws, strategies, policies and plans:

- *Marine Fisheries Act 2020*
- Marine Fisheries Harvest Policy, 2022
- Marine Fisheries Rules, 2023
- National Fisheries Policy, 1998
- National Fisheries Strategy, 2006
- *Fish and Fish Products (Inspection and Quality Control) Act 2020*
- Marine Fisheries Management Plan (Industrial), 2021
- National Plan of Action—IUU Fishing, 2021
- Nijum Diwp MPA Management Plan, 2021.

Bangladesh is also signatory to UNCLOS, the UN Fish Stock Agreement (1995), the FAO Port State Measures Agreement (2009) and the Conservation and Management Measures of the IOTC (2018).

4.7.2 Monitoring, control and surveillance of fisheries

In 2019, Bangladesh adopted the National Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated (IUU) fishing[57] which is intended to provide a road map for addressing the challenge of IUU fishing.

Bangladesh is seeking to improve its monitoring, control and surveillance (MCS) of its fishing fleets. It has the following MCS processes in place in respect of industrial vessels:

- Land catch at designated ports in the presence of officials
- Use only regulated gear
- Sailing permission required
- Regular shore-based inspections
- Catch certification.

In 2018, Bangladesh was granted significant funding by the World Bank (US$221 million) to conduct the Sustainable Coastal and Marine Fisheries Project (SCMFP). A $14 million share of the project has been allocated to marine fisheries, with three priorities:

- Marine fisheries management
- Improve aquaculture supply-chain infrastructure (with a focus on black tiger shrimp)
- Improve livelihoods of local marine fishers (currently working with 450 villages).

Stock assessment is a key focus of the SCMFP (see box).

Stock assessment

The last complete regional fish stock survey in the Bay of Bengal was conducted by the UN in 1983. A limited survey was conducted in 2018 by the Norwegian ship RV *Dr Fridtjof Nansen*.

Bangladesh also previously worked with its neighbours on the Bay of Bengal Large Marine Ecosystem (BOBLME) Project to form a better picture of marine living resources. The BOBLME Project published a transboundary diagnostic analysis in 2012 and adopted a strategic action plan in 2015.

As part of the SCMFP, the Department of Fisheries is seeking to place 8,500 Global System for Mobile Communications trackers in artisanal craft, 1,500 AISs in mechanised trawlers and five VMSs in industrial trawlers. It is intended that those systems will be monitored at a new fisheries monitoring centre being established at Chittagong. (This will be separate from the MRCC being established in Chittagong by DG Shipping.)

Funding for an interagency joint monitoring centre is included in the SCMFP. An MoU for its operation was signed on 7 December 2023. The centre will coordinate activities of the Department of Fisheries, River Police, Bangladesh Police, Coast Guard and Bangladesh Navy. MCS information will be shared with the Bangladesh Navy and Coast Guard, Customs, port authorities and DG Shipping. Tracking systems information is currently obtained from Navy and Coast Guard patrolling and port-in/port-out reports.

Interagency coordination is still phone and messaging-based. No software program is currently used. However, the Skylight platform (AIS with satellite data overlay) will be introduced with the assistance of the UNODC (see recommendations 3 and 9).

There is no formal system for Bangladesh fishers to report instances of IUU fishing.

The Department of Fisheries does not have its own enforcement vessels and relies on Navy, Coast Guard and River Police assistance.

The Department of Fisheries states that many MCS measures are not being implemented effectively or comprehensively. The department plans to improve MCS through establishing:

- an electronic vessel licensing system
- infrastructure for data collection by at-sea observers
- a new Fisheries Monitoring Centre
- a new vessel monitoring system and fisheries monitoring centre
- an electronic catch documentation scheme.

There may be opportunities for Bangladesh fisheries agencies to observe what is being done as part of the Pacific Community, where much work has been done on the coastal fisheries program. Additionally, the opportunity exists for the use of the Nemo system, which has proved to be a successful monitoring system for small fishing vessels.

4.8 Ministry of Power, Energy and Mineral Resources

The Ministry of Power, Energy and Mineral Resources has principal responsibility for, among other things, the import and distribution of energy, including LNG, and the development of Bangladesh's offshore hydrocarbon reserves. The ministry also houses the Blue Economy Cell, which is tasked with playing a coordinating role in the blue economy with other ministries (see Recommendation 12).

4.9 Ministry of Information and Communications Technology

The Ministry of Information and Communications Technology has responsibility for the regulation of undersea communication cables. The security of the cables is believed to be the responsibility of the Bangladesh Navy's Operation Blue Guard.

4.10 Department of Environment (Ministry of Environment, Forest and Climate Change)

The Ministry of Environment, Forest and Climate Change has responsibility for all environmental matters in Bangladesh, including in the maritime domain, through the Department of Environment. Among other things, the department is responsible for the National Oil Spill Action Plan and Standard Operating Procedure. The department is also in the process of finalising the Integrated Action Plan for Marine Protected Areas.

4.11 Narcotics Control Branch (Ministry of Home Affairs)

The Narcotics Control Branch operates under the Home Affairs Ministry. The branch's principal concern is the movement of methamphetamines across the Myanmar border (principally by land, but also by water). Yaba traders use vessel-to-vessel transfers at sea.

Narcotics Control Branch personnel are not armed, so they work closely with the Coast Guard, Border Guards, Customs and Navy, all of which are authorised under the Narcotics Control Act. Like fisheries officers, Narcotics Control Branch officers coordinate with the Coast Guard through phone and messaging applications.

The Narcotics Control Branch is developing its own mobile phone app called 'Live Operation Visual and Execution' (LOVE), which will allow civilians to report drug traffickers.

The branch has a limited maritime capability (small boats) in Teknaf to patrol the Naf River on the border with Myanmar (including four boats provided by UNODC). There is potential for the provision of small drones and training with Australian drug enforcement agencies.

4.12 Department of Immigration and Passports (Ministry of Home Affairs)

Department of Immigration and Passports operates under the Home Affairs Ministry. Its key concern is Rohingya refugees, many of whom are now arriving by river or coastal routes.

4.13 Ministry of Law, Justice and Parliamentary Affairs

The Ministry of Law, Justice and Parliamentary Affairs deals with the management of legal affairs and legislative activities. Representatives of the ministry state that Bangladesh generally lacks a legal and policy framework for maritime governance. However, the *Territorial Waters and Maritime Zones (Amendment) Act 2021* now allows the establishment of maritime tribunals, which can be presided over by assigned district judges (see Recommendation 13).

4.14 Ministry of Foreign Affairs / Maritime Affairs Unit

The Bangladesh Ministry of Foreign Affairs takes an active role in the maritime domain. It has a Maritime Affairs Unit headed by Secretary Khurshed Alam, who was formerly a rear admiral in the Bangladesh Navy and led Bangladesh's arbitration actions against Myanmar and India to settle the maritime boundaries of Bangladesh.

The Ministry of Foreign Affairs, in collaboration with relevant ministries, departments and agencies and the governments of the United Kingdom and the Netherlands, completed research work to determine the potential, presence, nature and reserves of gas hydrate and marine genetic resources, especially seaweed, in the seas of Bangladesh. Gas hydrate deposits in the Bangladesh EEZ alone are estimated to be equivalent to 17–103 trillion cubic feet of natural gas reserves. In addition, the research results show that some of the many species of seaweed found in Bangladesh have huge commercial potential, which can play a significant role in the blue economy of Bangladesh. The Maritime Affairs Unit is currently working for the commercial production of agar-agar from seaweed in order to tap this immense potential. The Maritime Affairs Unit facilitates engagement by Bangladesh agencies with counterparts in neighbouring states in relation to maritime affairs.

4.15 Bangladesh Satellite Company Limited (BSCL)

BSCL is a company owned and managed by the Bangladesh Government. It currently operates Bangladesh's first and so far only satellite, *Bangabandhu-1,* which is in geostationary orbit (Figure 18). It is reported that Bangladesh intends to launch a second satellite, *Bangabandhu-2* (BS-2), in 2023.[58] It is understood that BS-2 will be in low-Earth orbit and consequently could be a key MDA asset for Bangladesh.

Figure 18: Bangladesh satellite Bangabandhu-1

Source: European Space Agency, 'Bangabandhu-1', 29 January 2019, https://www.esa.int/ESA_Multimedia/Images/2018/12/Bangabandhu-1.

Section Five: International cooperation in maritime domain awareness

It is commonly said that no country, however rich or powerful, can achieve effective MDA by itself. International cooperation, principally with neighbours and other regional states, is a crucial element in achieving effective MDA. However, with some exceptions, maritime security cooperation between Bangladesh and neighbouring states, including the sharing of information on the maritime domain, is very limited, whether through bilateral or plurilateral arrangements. This is largely a function of the underlying lack of trust between countries in this region.

This section reviews the current state of Bangladesh's international cooperation in MDA and includes the following subsections:

5.1 Operational cooperation with neighbouring states

5.1.1 Bangladesh–India cooperation

There appears to be reasonably good operational cooperation or coordination between the Bangladesh and Indian navies and coast guards in policing their shared maritime boundary. However, there is little coordination or cooperation between respective civilian agencies. There are also significant sensitivities on the Bangladesh side regarding the sharing of information on the maritime domain.

Since 2018, the Bangladesh and Indian navies have also undertaken the Bangladesh–India Coordinated Patrol along their shared maritime boundary. The most recent, in 2022, involved both ships and maritime patrol aircraft.[59]

An MoU exists between the coast guards for the 'Establishment of Collaborative Relationship to Combat Transnational Illegal Activities at Sea and Develop Regional Cooperation between the Indian Coast Guard and Bangladesh Coast Guard'. Reportedly, the Bangladesh and Indian coast guards are in communication 'every day'.

There is also an MoU between the Bangladesh and Indian fisheries ministries. However, the biannual meetings between the ministries are reportedly more formalistic than substantive.

There appears to be an asymmetry in the treatment of fishermen who are found to be illegally operating over maritime boundaries, which is an ongoing source of friction. According to Bangladesh agencies, Bangladesh authorities generally instruct Indian fishermen to leave Bangladesh waters or, in some cases, detain and immediately release fishermen and their boats. However, according to the same sources, Indian authorities detain Bangladeshi fishermen on the basis of 'currency violations' (as UNCLOS does not permit their criminal arrest for illegal fishing), and there are a significant number of Bangladeshi fishermen in Indian detention. This is a source of irritation for Bangladesh.

Bangladesh and India have also signed an MoU on aids to navigation (AtoN), pursuant to which the countries will work on AtoN capacity building. The MoU will result in India providing advice on lighthouses and beacons, VTMSs and chains of AISs and conducting training as per International Association of Marine Aids to Navigation and Lighthouse Authorities training modules to AtoN managers and technicians for Bangladesh.[60]

Along with the 2023 formalisation of access to India to use the ports of Mongla and Chattogram for the transhipment of goods between Indian states, the two countries signed a coastal shipping agreement in 2015. Before that agreement, shipping cargo moving between the two countries would transit through Colombo, Singapore or Port Klang. There are now four agreed direct routes between ports in both countries.[61]

Bangladesh appears cautious about accepting offers of assistance from India to improve its MDA. As noted above, Bangladesh has not responded to Indian offers to establish a series of coastal radar stations. Bangladesh has also declined to post a liaison officer to the IOR-IFC operated by India near Delhi. Overall, this may reflect Bangladesh's concerns about 'handing over' its maritime domain data to India and a desire to retain sovereign control over its data and maritime governance (see Recommendation 7).

Capability-building assistance from India

India is also a major provider of assistance in Bangladesh maritime security, including through the provision of equipment and training. India's intent to do more in this area was explained by Indian External Affairs Minister Jaishanker during his speech to the most recent Indian Ocean Conference in Dhaka on 15 May 2023, when he stated that countries in the region should be 'exchanging information on white shipping, cooperating on coastal surveillance or collaborating on maritime domain awareness. Diplomacy cannot rest content merely by articulating positions; it equally needs practical action to back it up.'[62] However, there appears to be some caution on the Bangladesh side regarding MDA.

There is a 2019 MoU between India and Bangladesh for the provision of a 'stand-alone' coastal radar system comprising some 24 coastal radars (20 land-based and four anchored) on a grant basis, although Bangladesh authorities have not yet agreed to implement this.

Bangladesh is listed as a partner to the IFC-IOR; however, it is not certain whether the two countries have signed a 'white shipping' agreement for the exchange of AIS-based information. Bangladesh is planning to post a Bangladeshi liaison officer to the IFC-IOR in Delhi.

5.1.2 Bangladesh–Myanmar cooperation

We are not aware of any meaningful cooperation between Bangladesh and Myanmar authorities in the maritime space. There are significant threat perceptions in connection with Myanmar on the Bangladesh side. Bangladesh's principal concerns in relation to Myanmar involve stemming the flow of Rohingya refugees and illicit drugs arriving by land and sea. Those would not be concerns of Myanmar authorities.

In any event, it is likely that Myanmar's civil conflict would make maritime governance a very low priority. It is understood that in recent times Myanmar has largely withdrawn its coast-guard presence from Myanmar's neighbouring Rakhine State as a result of ongoing conflict between government and insurgent forces.

5.1.3 Bangladesh – Sri Lanka cooperation

Unlike among other neighbours, there is no real trust deficit between Bangladesh and Sri Lanka. However, there are no active arrangements between the Bangladesh and Sri Lankan maritime enforcement agencies (navies, coast guards) or fisheries ministries for the sharing of information or the coordination of enforcement actions.

5.1.4 Bangladesh–Indonesia cooperation

In September 2023, the Bangladeshi Foreign Minister met with the Indonesian Minister for Maritime Affairs and Fisheries. At the meeting, the Bangladeshis sought Indonesian assistance with real-time satellite tracking of vessels. Both countries agreed to cooperate further on most aspects of maritime security, particularly in the prevention of IUU fishing.[63]

5.2 Bangladesh and regional information fusion centres

Bangladesh's waters and the Bay of Bengal fall within the areas of responsibility of two regional information fusion centres: the Information Fusion Centre—Indian Ocean Region, sponsored by India, and the Information Fusion Centre, sponsored by Singapore.

The two centres could potentially be valuable mechanisms for sharing information on the maritime domain, including information on vessels of interest, between Bangladesh and neighbouring states. However, in practice, information-sharing arrangements are rudimentary and are not currently suited for the sharing of real-time tactical intelligence on the maritime domain. However, they do fill useful functions in the collection and collation of reports on incidents at sea.

Participation in such regional arrangements also carries political sensitivities for Bangladesh and other countries, reflecting their desire to have sovereign MDA capabilities.

5.2.1 Information Fusion Centre—Indian Ocean Region (IFC-IOR)

The Indian Navy established the IFC-IOR in 2018 as a regional information fusion centre whose area of responsibility covers much of the Indian Ocean, including the Bay of Bengal area. It is in Gurgaon, near Delhi, and is co-located with the Indian Navy's Information Management and Analysis Centre, which is the nodal point for India's national MDA capabilities.

The IFC-IOR is intended to collate information collected from around the Indian Ocean, including from AIS data and various current or planned bilateral 'white shipping' agreements between India and some 22 countries.[64] Those agreements are intended to facilitate the transfer of data on non-military shipping from partner countries for use in the IFC-IOR. Partner countries can access information from the centre principally through international liaison officers posted to Gurgaon from 12 partner countries that do not include Bangladesh.[65] In practice, mechanisms for sharing information remain quite rudimentary.

Bangladesh is planning to post its first liaison officer to the IFC-IOR.

5.2.2 Information Fusion Centre (IFC) Singapore

The IFC was established in 2009 by the Singapore Navy. It is located at the Changi Naval Base, co-located with Singapore's national MDA centre. Its area of interest includes the eastern Indian Ocean and the Bay of Bengal. Some 20 partner countries (which do not include Bangladesh)[66] have posted international liaison officers to the IFC. In practice, arrangements for information sharing remain rudimentary (for example, by email). The centre also engages closely with the shipping industry and other stakeholders, including information fusion centres, intergovernmental organisations and non-government organisations.

Bangladesh has not posted a liaison officer to the IFC.

5.3 Multilateral groupings relevant to the Bay of Bengal

The level of multilateral cooperation in the Bay of Bengal region is very low compared with other subregions in the Indo-Pacific.

5.3.1 Indian Ocean Rim Association (IORA)

IORA is the key political grouping of countries in the Indian Ocean region. Australia was one of the key sponsors in its establishment in 1997. However, for several reasons, including its size and diversity of members, lack of regional perspectives and institutional weaknesses, the group has had few concrete achievements. For some years, a maritime safety and security working group has met to discuss safety and security issues, although maritime safety issues do not appear to be a significant priority.[67]

In recent years, Bangladesh has been a prominent supporter, including as chair of the organisation from 2021 to 2023. It officially handed over that role to Sri Lanka in October 2023. During its term as chair, Bangladesh gave considerable emphasis to maritime issues, including the blue economy.

Despite its weaknesses, IORA remains an important grouping for potential initiatives involving the Bay of Bengal through its convening function.

5.3.2 Indian Ocean Naval Symposium (IONS)

IONS provides a forum for senior naval representatives from the littoral states of the Indian Ocean region for discussions on regionally relevant maritime issues. The symposium has three central working groups: Humanitarian Assistance and Disaster Relief (HADR); Maritime Security; and Information Sharing and Interoperability. Bangladesh is currently co-chair of the HADR working group, along with India. Bangladesh hosted the most recent meeting of the working group in August 2022.

For several reasons, IONS has found it difficult to achieve any significant outcomes during the course of its history; however, it remains a reasonable venue for naval personnel to discuss maritime security issues, particularly MDA.

5.3.3 Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)

BIMSTEC is the principal political grouping of countries around the Bay of Bengal. In addition to Bangladesh, its members include India, Sri Lanka, Myanmar, Thailand, Bhutan and Nepal. BIMSTEC was established in 1997 under the principal sponsorship of India and Thailand. The BIMSTEC secretariat is located in Dhaka.

Like IORA, BIMSTEC has had relatively few concrete achievements, reflecting its diversity of membership, lack of historical regional perspectives and institutional weaknesses. Despite being defined by the Bay of Bengal, it has given relatively little focus to the maritime domain. In recent years, BIMSTEC's effectiveness has also been hampered by tensions between Bangladesh and Myanmar and by the Myanmar military coup.

In 2018, BIMSTEC adopted the Master Plan for Trade Connectivity (2018–2022), which is intended to facilitate the development of ports and maritime and inland water transport. It is also intended to facilitate multimodal and intermodal connectivity for landlocked states and regions through inland waterways, including through Bangladesh.

5.3.4 Colombo Conclave

The Colombo Conclave is a regional security grouping established under the sponsorship of India, and now includes Sri Lanka, the Maldives and Mauritius. It operates at national security adviser level and focuses on a range of security-related issues, the majority of them in the maritime domain. It has a secretariat in Colombo.[68]

We understand that Bangladesh has informally indicated that it will join the Colombo Conclave as a member, although there has not been any public announcement, and membership of the group has some political sensitivities.

The Colombo Conclave is a potentially useful vehicle for enhanced cooperation on regional MDA.

5.3.5 South Asian Association for Regional Cooperation (SAARC)

Bangladesh is a member of SAARC, which was established in 1985 and brings together South Asian states. For some years, the organisation has been paralysed by India–Pakistan rivalries and has in many respects ceased to function as an effective group.

Nevertheless, some SAARC programs and arrangements continue in effect, such as the SAARC Agreement on Rapid Response to Natural Disasters and the SAARC Coastal Zone Management Centre.

5.3.6 South Asia Co-operative Environment Programme (SACEP)

SACEP is an intergovernmental organisation established in 1982 with Bangladesh and other South Asian states as members.[69] Its programs relevantly include the South Asia Seas Program (which is sponsored by the UNEP) and the Plastic Free Rivers and Seas for South Asia Project.

The South Asia Seas Program focuses on protecting and managing the marine environment and related coastal ecosystem of South Asia. Its four priority areas are managing the coastal zone, protecting the marine environment from land-based activities, human resources development and the development of national and regional oil- and chemical-spill contingency plans.

This led to the signing of an MoU on a Regional Oil and Chemical Spill Contingency Plan in 2016. This plan was used in the *X-Press Pearl* shipping accident near Sri Lanka in September 2020.

5.3.7 Bay of Bengal Programme

The Bay of Bengal Programme – Inter-Governmental Organisation (BOBP-IGO) is an intergovernmental organisation established in 2003 following on from the Bay of Bengal Programme of the UN Food and Agriculture Organization. Member countries include Bangladesh, India, the Maldives and Sri Lanka, while Indonesia, Malaysia, Myanmar and Thailand are cooperating non-contracting parties. Its offices are located in Chennai.

BOBP-IGO describes itself as a regional fisheries advisory body of the countries bordering the Bay of Bengal region. It serves as the member countries' think tank on transboundary and contemporary national issues concerning fisheries management.[70]

BOBP-IGO is mandated to assist the member countries in increasing the livelihood opportunities and improving the quality of life of small-scale/artisanal fisher folk in the Bay of Bengal region (see box).

BOBP–IGO objectives

The core objectives of BOBP-IGO are to increase awareness and knowledge of the needs, benefits and practices of marine fisheries management; enhance skills through training and education; transfer appropriate technologies and techniques for the development of small-scale fisheries; establish a regional information network; and promote women's participation in the marine fisheries value chain.

Key research themes pursued by BOBP-IGO include:

- Reimagining Regional Fisheries Management: Participatory Approaches for Near Real-time Stock Assessment
- Capturing the Hidden Harvest: A Framework for Small-Scale Multi-Species Fishery
- Shared Prosperity: Governance and Institutional Framework for Assessment and Management of Blue Economy in the Bay of Bengal
- Back to Basics: Revitalising Traditional Knowledge for Sustaining Fisheries Future
- Aquaculture–Fisheries Co-development for Stock Enhancement and Sea Ranching
- Insurance for Ameliorating the Climate Risks of Coastal Fishers of the Bay of Bengal Region
- Bay of Bengal Large Marine Ecosystem Project.

5.4 Capability-building assistance from extra-regional players

Bangladesh also receives assistance in building its MDA capabilities from the United States, Japan and UN agencies (see Recommendation 15).

5.4.1 Capability-building assistance from the United States

The US is providing significant assistance to Bangladesh in building its MDA capacity. It is considered that Bangladesh has also been determined to be a regional partner in the Quadrilateral Security Dialogue's Indo-Pacific Partnership on MDA, which was announced after the Quad Leaders' Summit in 2022.[71] The US has provided the Bangladesh Coast Guard with cutters, small uncrewed aerial vehicles and VBSS training to the Bangladesh Navy's Special Warfare Group. The US also plans to provide four Boeing RQ21 Blackjack drones to the Bangladesh Navy, apparently to be operated out of Cox's Bazar.

The US has also provided Bangladesh agencies with access to the SeaVision system (which is operated by the US Department of Transport). The system is based on AIS data (which provides limited detection of so-called 'dark vessels' that have switched off or spoofed their AIS signal). Some versions of SeaVision include an overlay of the HawkEye 360 system, which adds satellite-based radio-frequency detection and analysis of dark vessels; however, the HawkEye 360 overlay has not been offered to Bangladesh. US sources state that 20 user accounts have been provided to Bangladesh for the system. However, only a very small number of them are actively used, indicating that relevant Bangladesh agencies do not use the system significantly.

US sources also comment that the Bangladesh Navy and Coast Guard also lack digital connectivity between shore and ships, which limits the usefulness of SeaVision and similar platforms for vessels at sea.

The US Navy has also commissioned a study of Bangladesh's coastal surveillance requirements.[72]

5.4.2 Capability-building assistance from Japan

Although it does not have a specific focus on MDA, Japan has been proactive in working with Bangladesh on maritime security. The Japan Maritime Self-Defense Force has previously made relatively frequent port calls to Chittagong, and there is a memorandum of cooperation and exchanges between the Japan Self-Defense Forces and the Bangladesh Armed Forces providing for vessel and aircraft visits, unit exchanges, training programs and goodwill exercises.

Japan plans to ramp up its maritime security assistance as part of a Japan–Bangladesh strategic partnership arrangement announced in April 2023.[73] This refers to the commencement of negotiations on an 'Agreement for the Transfer of Defense Equipment and Technology'.

Under its December 2022 National Security Strategy, Japan announced a new category of 'official security assistance' (separate from official development assistance) to be provided to Bangladesh, as well as Malaysia, Philippines and Fiji, totalling ¥2 Billion (A$22 million). Official security assistance will be provided in three fields:

- Activities for ensuring peace, stability and security based on the rule of law
- Humanitarian activities
- International peace cooperation activities.

According to the Japanese Embassy, it was planned that consultants would undertake an assessment of Bangladesh's requirements in June–July 2023. The program was led by Japan's Ministry of Foreign Affairs.

According to the Japanese Embassy, there are no current plans to place a Japanese defence adviser in Dhaka, although the strategic partnership document does refer to Bangladesh considering opening a defence wing in Tokyo, and Japan opening a national security wing in Dhaka.

5.4.3 Capability-building assistance from the United Nations

UNODC aids Bangladesh through its Global Maritime Crime Program, with a principal focus on drug smuggling (IUU fishing is not technically a crime). UNODC provides VBSS training to Bangladesh's Coast Guard, River Police and port security agencies.

UNODC also has a separate MDA program, through which it has offered the Skylight MDA system to Bangladesh agencies, along with training and some 236 user accounts. The Skylight system is operated by a US non-government organisation and uses artificial intelligence to analyse AIS and satellite-based data on vessels to detect suspicious behaviour, such as 'dark vessels' and 'dark rendezvous'.

However, we understand that, as at March 2024, none of the Bangladesh Navy, Bangladesh Coast Guard or Bangladesh River Police use Skylight, although the Fisheries Department has several Skylight accounts.

Figure 19: UNODC Global Maritime Crime Program

Source: UNODC, 'The UNODC Global Maritime Crime Programme assists Member States in enhancing and coordinating their efforts against maritime crime', UN, no date, https://www.unodc.org/unodc/en/piracy/index.html.

Appendix 1: Acronyms and abbreviations

AFMA	Australian Fisheries Management Authority
AIS	automatic identification system
AMSA	Australian Maritime Safety Authority
AtoN	aids to navigation
BIMRAD	Bangladesh Institute of Maritime Research and Development
BIMSTEC	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation
BNHS	Bangladesh Navy Hydrographic Service
BOBLME	Bay of Bengal Large Marine Ecosystem Project
BOBP-IGO	Bay of Bengal Programme – Inter-Governmental Organisation
COP	common operating picture
DG Shipping	Director General Shipping4
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organization of the UN
FSRU	floating storage and regasification unit
GDP	gross domestic product
GMDSS	Global Maritime Distress and Safety System
GPS	Global Positioning System
HADR	humanitarian assistance and disaster relief
IFC	Information Fusion Centre (Singapore)
IFC-IOR	Information Fusion Centre—Indian Ocean Region
IMO	International Maritime Organization
IORA	Indian Ocean Rim Association
IOTC	Indian Ocean Tuna Commission
IUU	Illegal, Unreported and Unregulated Fishing
LNG	https://www.afma.gov.au/
MCS	monitoring, control and surveillance
MDA	maritime domain awareness
MoU	memorandum of understanding
MPA	marine protected area
MRCC	maritime rescue and coordination centre
OPV	offshore patrol vessel
Quad	Quadrilateral Security Dialogue
SAARC	South Asian Association for Regional Cooperation
SACEP	South Asia Co-operative Environment Programme
SAR	search and rescue
SCMFP	Sustainable Coastal and Marine Fisheries Project
SDG	Sustainable Development Goal
SOLAS	safety of life at sea

TEU	twenty-foot equivalent unit
UN	United Nations
UNCLOS	UN Convention on the Law of the Sea
UNEP	UN Environment Programme
UNODC	UB Office on Drugs and Crime
US	United States
VTMS	vessel traffic management system

Appendix 2: List of major international conventions related to oceans governance—Bangladesh

	Conventions / treaties	Related organisations	Number of parties	Bangladesh ratified/agreed
	Maritime delimitation and ocean governance			
1	United Nations Convention on the Law of the Sea (UNCLOS), 1982	UN (DOALOS)	168 (as of Feb 2021)	27 Jul 2001
	Trade			
2	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	UNEP	184	18 Feb 1982
	Pollution			
3	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (Basel Convention)	UNEP	190	1 Apr 1993
4	International Convention for the Prevention of Pollution from Ships, 1973/78 (MARPOL Convention)	IMO	159	4 Nov 2002
5	International Convention on Oil Pollution Preparedness, Response and Cooperation, 1990 (OPRC)	IMO	112	23 Jul 2004
6	United Nations Framework Convention on Climate Change (UNFCCC) & Paris Agreement	UN Climate Change	197	21 Sep 20161
7	International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention)	IMO	81	7 Sep 2018
	Fisheries			
8	Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UN Fish Stocks Agreement)	UN (DOALOS)	91	5 Nov 2012
9	Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (PSMA)	FAO	74	20 Dec 2019
	Conservation			
10	Convention Concerning the Protection of the World Cultural Natural Heritage	UNESCO	194	3 Nov 1983
11	Convention on Biological Diversity (CBD)	UNEP	196	20 Mar 1994
12	Convention on the Conservation of Migratory Species of Wild Animals (CMS)	UNEP	131	1 Dec 2005
	Shipping			
13	Convention on International Maritime Organization, 1948	IMO	171	27 May 1976
14	Convention on the International Regulations for Prevention of Collisions at Sea, 1972 (COLREGs)	IMO	–	10 May 1978
15	International Convention for the Safety of Life at Sea, 1974 (SOLAS)	IMO	167	6 Feb 1982
16	International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001	IMO	81	7 Sep 2018

Source: Minarul Hoque, 'Legal and policy framework of ocean governance', *Paal Magazine*, BIMRAD, vol. 5, issue 3, December 2022.

Appendix 3: List of national laws and policies related to oceans governance—Bangladesh

	Acts/policies	Related ministry / division / organisation	Came into force
	Maritime delimitation and ocean governance		
1	*Territorial Waters and Maritime Zones (Amendment) Act 2021*	MoFA / MAU	7 Dec 2021
	Maritime transportation, ports and shipping		
2	*Ports Act 1908*	MoS	18 Dec 1908
3	Pilotage Ordinance 1969	MoS	6 Jun 1969
4	Inland Shipping Ordinance 1976 and *Inland Shipping (Amendment) Act 2005*	MoS, BIWTA	21 Sep 1976 15 Mar 2005
5	Bangladesh Merchant Shipping Ordinance 1983	MoS	30 Jun 1983
6	National Shipping Policy 2000	MoS	Oct 2000
7	*Admiralty Court Act 2000*	Legislative and Parliamentary Affairs Division, MoLJPA	27 Nov 2000
8	*Payra Port Authority Act 2013*	MoS, PPA	10 Nov 2013
9	*Bangladesh Flag Vessels (Protection) Act 2019*	MoS	18 Nov 2019
10	*Chittagong Port Authority Act 2022*	MoS, CPA	13 Apr 2022
11	*Mongla Port Authority Act 2022*	MoS, MPA	13 Apr 2022
	Marine fisheries		
12	National Fisheries Policy 1998	MoFL	1998
13	*Marine Fisheries Act 2020*	MoFL	26 Nov 2020
14	Marine Fisheries Policy 2022	MoFL	6 Sep 2022
	Marine pollution and environment		
15	National Water Policy 1999	MoWR	1999
16	National Energy Policy 2004	MoPEMR	May 2004
17	Coastal Zone Policy 2005	MoWR	2005
18	*Bangladesh Environment Protection (Amendment) Act 2010*	MoEFCC	5 Oct 2010
19	*Bangladesh Water Act 2013*	MoWR, WARPO	2 May 2013
20	*Bangladesh Biodiversity Act 2017*	MoEFCC	19 Feb 2017

Source: Minarul Hoque, 'Legal and policy framework of ocean governance', *Paal Magazine*, BIMRAD, vol. 5, issue 3, December 2022.

Notes

1 In 2018, the Bangladesh Government officially changed the name of the city of Chittagong to 'Chattogram'. This report uses both names for the city and port. Sohini Bose, 'Modernising the Mongla Port in Bangladesh', Observer Research Foundation, 11 March 2023, https://www.orfonline.org/expert-speak/modernising-the-mongla-port-in-bangladesh/.

2 This section of the report includes information drawn from Captain Sabbir Mahmood, 'An approach to integrated coastal and ocean management for sustainable blue economy in Bangladesh' (unpublished). See also RJ Wasson, 'A sediment budget for the Ganga–Brahmaputra catchment,' *Current Science*, 25 April 2003, 84(8):1041–1047.

3 PN Vinayachandran, 'Impact of physical processes on chlorophyll distribution in the Bay of Bengal', *Indian Ocean Biogeochemical Processes and Ecological Variability*, 2009, 185:71–86.

4 Levin Helly, 'Global distribution of naturally occurring marine hypoxia on continental margins', *Deep Sea Research Part I: Oceanographic Research Papers*, September 2004, 51(9):1159–1168.

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ANU National Security College

national.security.college@anu.edu.au

The Australian National University

Canberra ACT 2600 Australia

www.anu.edu.au

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