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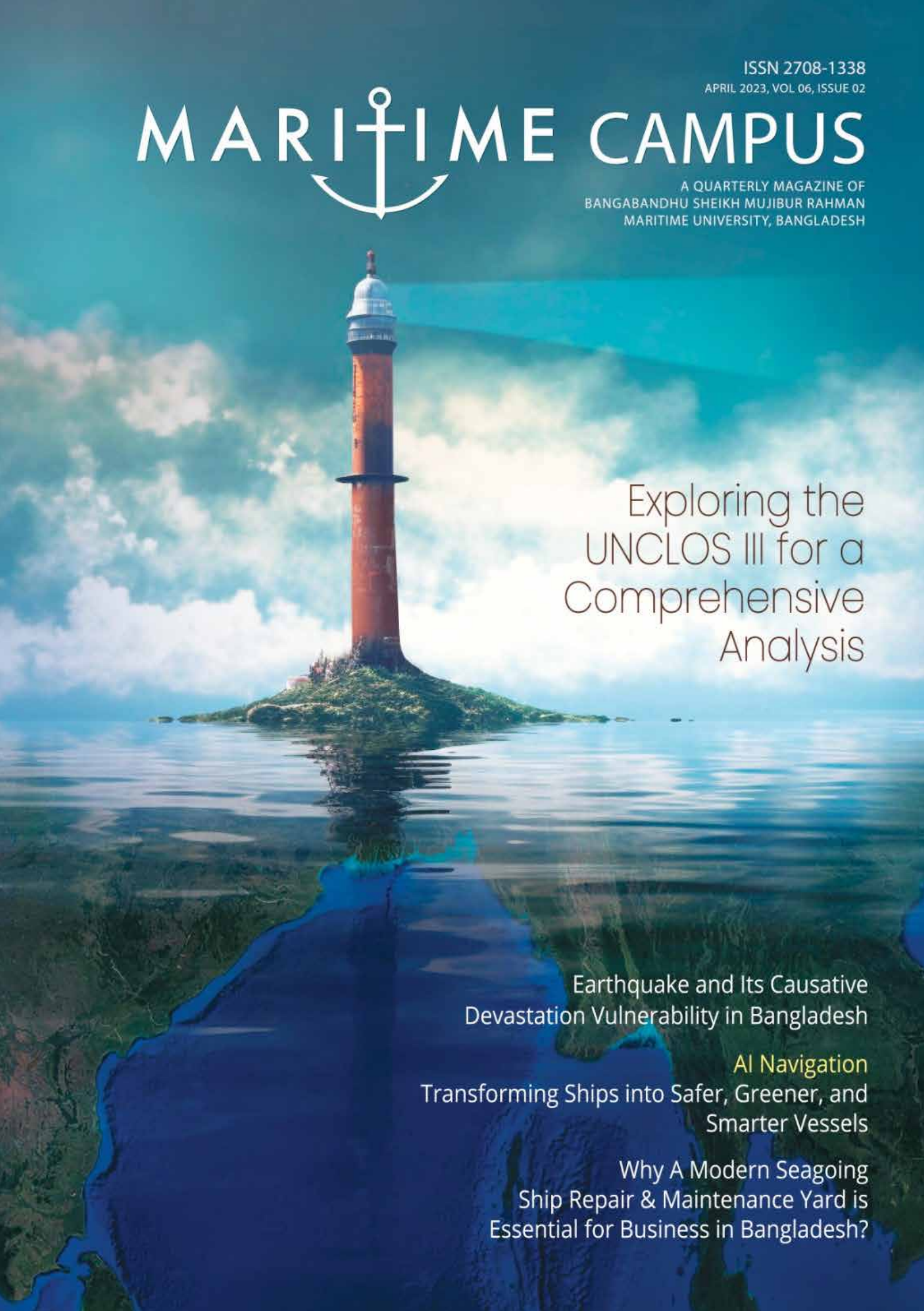
MARITIME CAMPUS

A QUARTERLY MAGAZINE OF
BANGABANDHU SHEIKH MUJIBUR RAHMAN
MARITIME UNIVERSITY, BANGLADESH



Exploring the UNCLOS III for a Comprehensive Analysis

Earthquake and Its Causative Devastation Vulnerability in Bangladesh

AI Navigation
Transforming Ships into Safer, Greener, and Smarter Vessels

Why A Modern Seagoing Ship Repair & Maintenance Yard is Essential for Business in Bangladesh?

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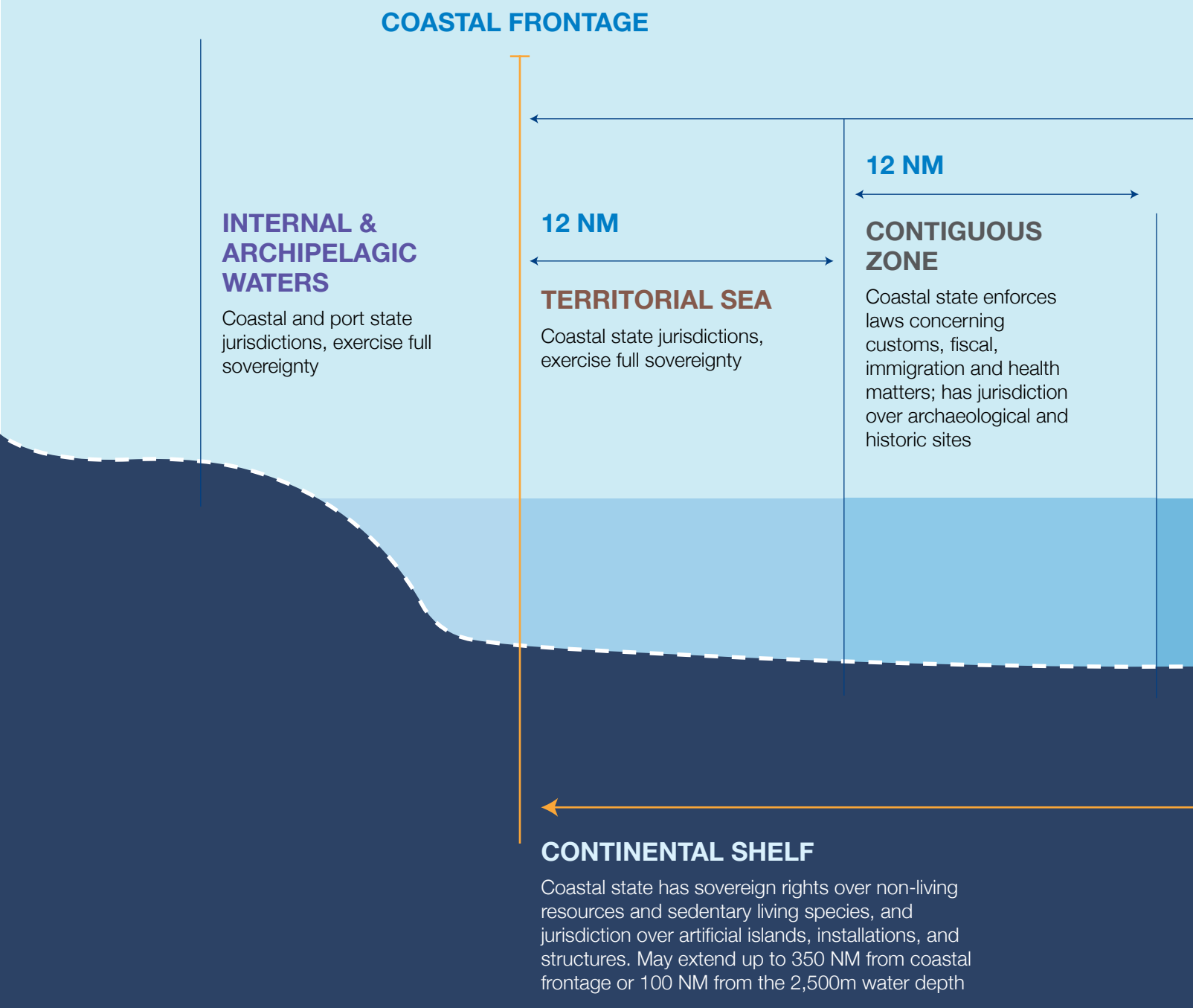
UNCLOS: UNITED NATIONS CONVENTION ON THE LAW OF THE SEA



NM: *NAUTICAL MILE*

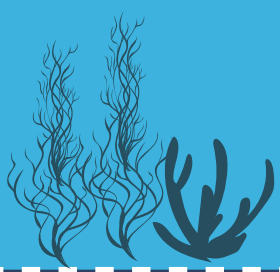
200 NM

EXCLUSIVE ECONOMIC ZONE

Coastal state has sovereign rights to explore and exploit natural resources (both living and non-living), and includes jurisdiction over artificial islands and offshore installations and structures, marine scientific research and environment protection

HIGH SEAS

No national jurisdiction or special rights, open for use by all state ships. Under jurisdiction of flag states



INTERNATIONAL SEABED AREA

Ocean floor and subsoil beyond national jurisdiction

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Maritime Campus

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Editorial

UNCLOS is a propitious convention for a maritime nation like Bangladesh

Greetings and welcome to the current issue of the Maritime Campus Quarterly Magazine, featuring recent insights from the maritime sector. This edition features articles on various aspects of the maritime industry, including law, regulation, technology, and sustainability.

The Lead Story in this edition, "Exploring the UNCLOS III for Comprehensive Analysis," presents a thorough summary of the United Nations Convention on the Law of the Sea. This article analyses the key characteristics of UNCLOS III and its global adoption. The text delineates the instances of states that dissented from UNCLOS III and their corresponding rationales. The article highlights Bangladesh's involvement in UNCLOS III and BSMRMU's provision of comprehensive education on international law from diverse perspectives.

The article "Earthquake and Its Causative Devastation Vulnerability in Bangladesh" in the Academica section offers insights into the geological conditions and factors contributing to earthquake vulnerability in different regions of Bangladesh. The author underscores the significance of appropriate physical planning and implementation of building codes to safeguard against earthquakes and the correlation between calamity and integrity.

The Perspective section features an article titled "Why A Modern Seagoing Ship Repair & Maintenance (R&M) Yard is Essential for Business in Bangladesh?" emphasising the necessity of such facilities in the country. This article analyses ship repair and maintenance, emphasising the developmental stages of the shipbuilding industry. It addresses the vulnerable state of shipbuilding firms in Bangladesh and highlights the worldwide, local, and national aspects of the ship maintenance industry.

The article "AI Navigation: Transforming Ships into Safer, Greener, and Smarter Vessels" in the Maritime AI section discusses the potential benefits of AI in the maritime industry. The article explores the potential of AI to enhance safety, efficiency, and sustainability in the shipping sector.

This edition of the Maritime Campus quarterly magazine presents informative articles covering diverse aspects of the maritime industry. We trust that this edition provides valuable information and captivates your interest. We anticipate providing further insights from the maritime sector in the coming times. The Editorial Board deserves a special mention for the tremendous work they have done to hasten the publication of this issue.

I thank the Chief Patron and Honourable Vice-Chancellor for their invaluable support in highlighting this matter. I express my appreciation to all departments for their cooperation in furnishing information regarding their respective activities.

Thanking you

Captain A T G M Sarker, (TAS), psc, BN (retd)
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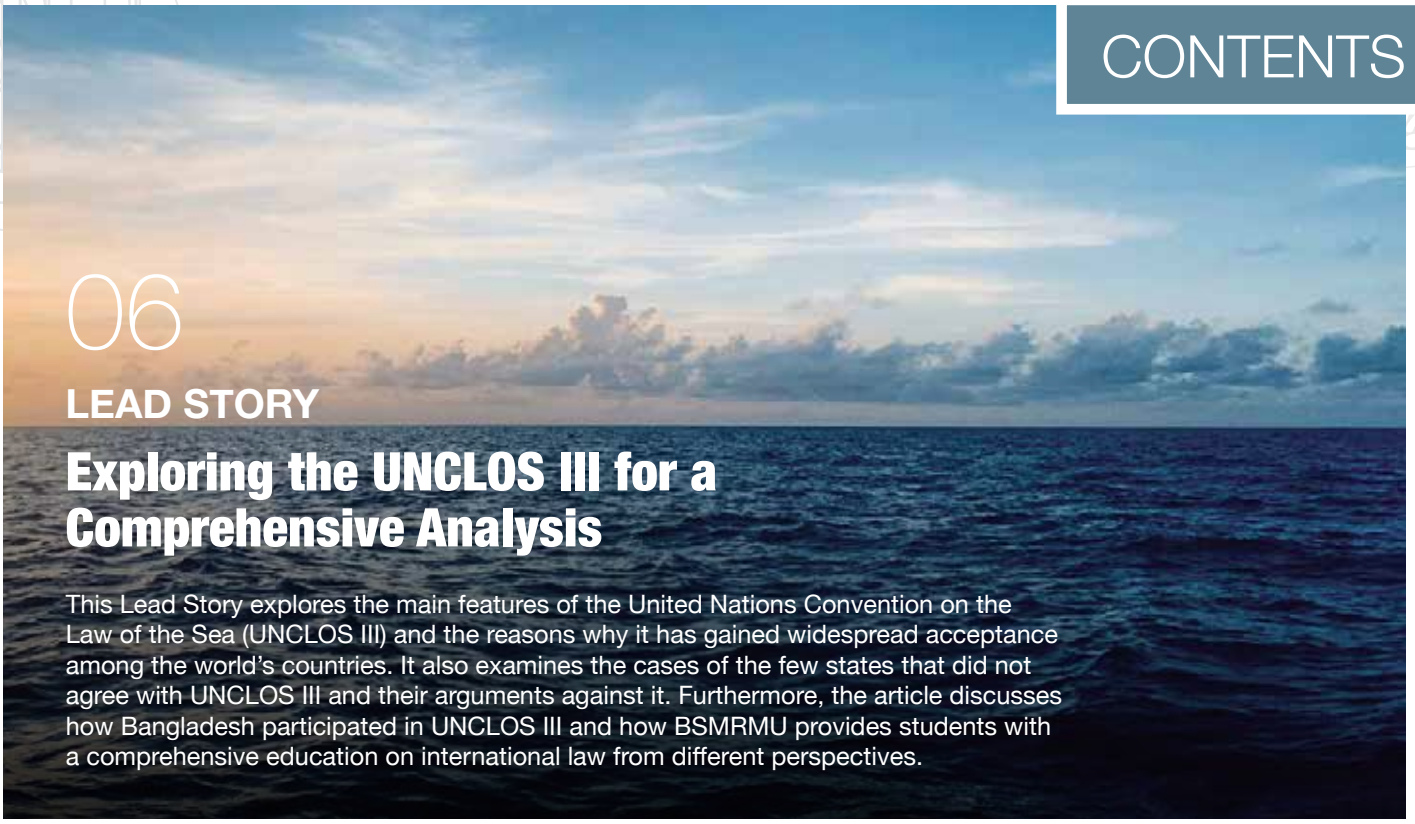


Exploring the UNCLOS III for a Comprehensive Analysis

Maritime Campus desk

After nine years of talks, the United Nations Convention on the Law of the Sea (UNCLOS III) was finally approved in 1982. The main piece of international law controls how the world's oceans and seas are used. A framework for managing the world's marine resources, such as fisheries, oil and gas reserves, and shipping lanes, is provided by UNCLOS III. It also lays forth states' obligations and rights concerning how they use the oceans and seas around the globe. This article will examine the historical justification for UNCLOS III, its conception and implementation, and why most nations have ratified it. We will also look at the countries that objected to UNCLOS III and why they did so. The article also discusses Bangladesh's participation in UNCLOS III and how BSMRMU helps students learn international law from many angles.

The Historical Importance of UNCLOS III

As the exploitation of marine resources increased at the beginning of the 20th century, the need for a comprehensive legal framework for the world's oceans and seas became evident. In Geneva, Switzerland, the first United Nations Conference on the Law of the Sea was convened in 1958 to establish a framework for managing the world's oceans and seas. However, the momentum for a new treaty acquired traction in the 1970s.

The need to resolve disputes over the title and use of offshore resources, such as oil and gas reserves, was a driving force behind UNCLOS III. Before UNCLOS III, the oceans and waters of the world lacked a comprehensive legal framework. This allowed countries to claim expansive ocean areas as their exclusive economic zone (EEZ), which frequently overlapped with the claims of other nations. This led to a situation in which disputes over offshore resources could escalate into armed conflicts, such as the Falklands War of 1982.

Safe navigation under UNCLOS: *ensuring vessels are commanded by adequately qualified personnel and respecting the rights and obligations of different maritime zones*

Beginning of UNCLOS III

UNCLOS III can be traced back to the 1974 United Nations Conference on the Law of the Sea, which took place in Caracas, Venezuela. Representatives from 159 nations attended the conference, which led to adoption of the "Declaration of Principles Governing the Seabed and Ocean Floor, and the Subsoil Thereof, Beyond the Limits of National Jurisdiction."

This declaration laid the groundwork for UNCLOS III by establishing that the seabed and ocean floor beyond the limits of national jurisdiction constitute the "common heritage of mankind." This means that the resources of the seabed and ocean floor would be administered by an international authority to benefit all countries, as opposed to being subject to exclusive claims by individual nations.

Officially commencing in 1973, UNCLOS III negotiations were conducted in a series of sessions at the United Nations headquarters in New York. The negotiations were intricate and contentious, with countries holding drastically divergent perspectives on critical issues. These issues included the scope of littoral state jurisdiction, delineating maritime boundaries, and administering marine resources.

Despite obstacles, UNCLOS III negotiations were effectively concluded on 10 December 1982. In December 1982, the treaty was unveiled for signature in Montego Bay, Jamaica.

Adoption of UNCLOS III

On 16 November 1994, UNCLOS III entered into force after being ratified by sixty countries. As of 1 May 2023, 168 countries, representing over 80% of the world's nations, have ratified UNCLOS III.

UNCLOS III provides an all-encompassing legal framework for the oceans and seas of the globe. It provides guidelines for managing marine resources and establishes the rights and responsibilities of states in their use of the sea. The treaty also establishes regulations for settling disputes and provides for establishing the International Tribunal for the Law of the Sea (ITLOS) to resolve disputes related to UNCLOS III.

A key provision of UNCLOS III is the establishment of the EEZ, which extends 200 nautical miles from the baseline of a coastal state. Within its EEZ, the coastal state has sovereign rights to explore, exploit, conserve, and manage the sea's natural resources and authority over certain activities, such as fisheries and scientific research.

Additionally, UNCLOS III contains provisions on maritime boundaries, which are used to delimit the extent of a coastal state's jurisdiction. The treaty provides guidelines for the delimitation of maritime boundaries, considering factors such as the coastlines' geology and the natural extension of land territory.

The overwhelming majority of nations signed and ratified UNCLOS III for a number of the following reasons:

1. UNCLOS III provides an all-encompassing legal framework for the oceans and seas of the globe. This framework reduces conflicts and gives countries certainty regarding their ocean use.

2. UNCLOS III establishes the principle that ocean resources are the common property of humanity. This indicates that rather than being the sole property of some countries, the benefits of the ocean belong to all countries.

3. UNCLOS III establishes guidelines for managing marine resources, such as fisheries and oil and gas reserves. This contributes to the responsible and sustainable management of these resources.

4. UNCLOS III provides for the peaceful resolution of ocean-related disputes. This reduces the risk of international conflict and promotes international cooperation.

UNCLOS III and ITLOS

One of the significant accomplishments of UNCLOS is the establishment of the International Tribunal for the Law of the Sea (ITLOS), a judicial body with the authority to adjudicate disputes regarding the Convention's interpretation and application.

A gathering of state parties elects ITLOS's 21 judges for nine-year terms, and the organisation is based in Hamburg, Germany. The ITLOS

UNCLOS promotes safe navigation, cooperation, and peaceful settlement of disputes among states

has jurisdiction over disputes submitted by state parties, international organisations, and other entities authorised by the Convention. ITLOS can also create specialised tribunals for maritime delimitation, fisheries, or environmental protection cases.

The International Tribunal for the Law of the Sea has contributed to promoting world peace and cooperation by resolving several disputes between state parties peacefully and impartially. Here are five case studies illustrating the function and influence of ITLOS:

- The M/V "Saiga" (No. 2) Case (Saint Vincent and the Grenadines v. Guinea): This case involved the seizure and detention of a tanker vessel by Guinea on suspicion of smuggling petroleum products in its exclusive economic zone (EEZ). ITLOS ordered the ship and its personnel to be released and awarded Saint Vincent and the Grenadines compensation for the damage sustained.

- The MOX Plant Case (Ireland v. United Kingdom): This case involved the United Kingdom's authorisation of a mixed oxide (MOX) fuel plant in Sellafield, which Ireland argued constituted a grave threat to the marine environment the Irish Sea. ITLOS issued interim measures to prevent the situation further deteriorating and assure cooperation between the parties pending arbitration.

- The Land Reclamation Case (Malaysia v. Singapore): This case involved Singapore's land reclamation activities in and around the Straits of Johor, which Malaysia alleged violated its sovereignty and territorial integrity and caused environmental damage. ITLOS issued interim measures to prevent the dispute from escalating further and to assure cooperation between the parties pending arbitration.

- The Dispute Concerning the Delimitation of the Maritime Boundary Between Bangladesh and Myanmar in the Bay of Bengal (Bangladesh/Myanmar): This case involved the delimitation of the maritime boundary between Bangladesh and Myanmar in an area where their respective claims overlapped. The International Tribunal for the Law of the Sea (ITLOS) determined the territorial sea, EEZ, and continental shelf boundaries between the parties based on equitable principles and pertinent circumstances.

- The Arctic Sunrise Case (Kingdom of the Netherlands v. Russian Federation): This case involved Russia's boarding, seizure, and detention of a Greenpeace International-operated vessel in protest of oil exploration activities in the Arctic. ITLOS ordered the vessel and its crew to be released upon posting a bond by the Netherlands and exhorted both parties to work together to resolve their dispute through diplomatic channels.

These cases illustrate how ITLOS supports the rule of law in the oceans and promotes the peaceful resolution of disputes between state parties. ITLOS also contributes to developing and elucidating international maritime law through its interpretation and application of UNCLOS in various contexts. Together with the United Nations Convention on the Law of the Sea (UNCLOS), ITLOS plays a vital role in promoting global peace and cooperation.

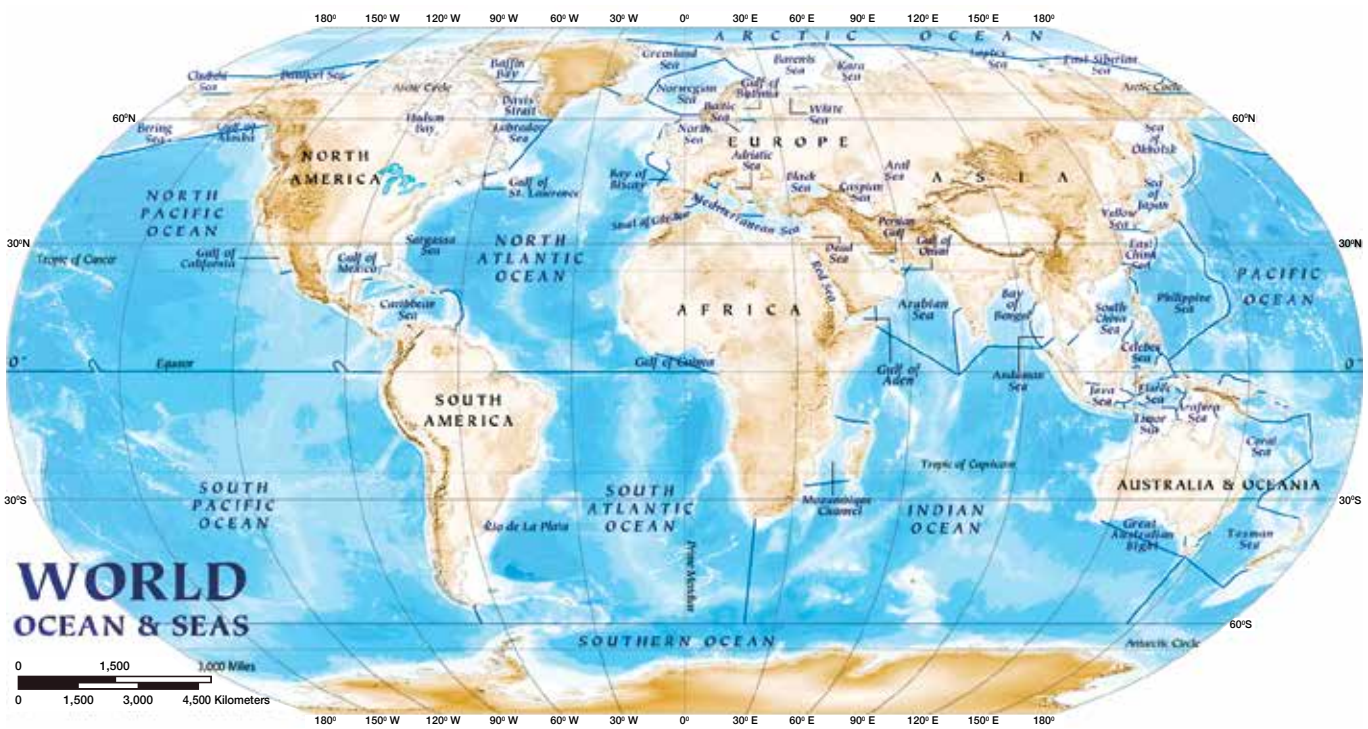
Bangladesh and Its Engagement with UNCLOS III

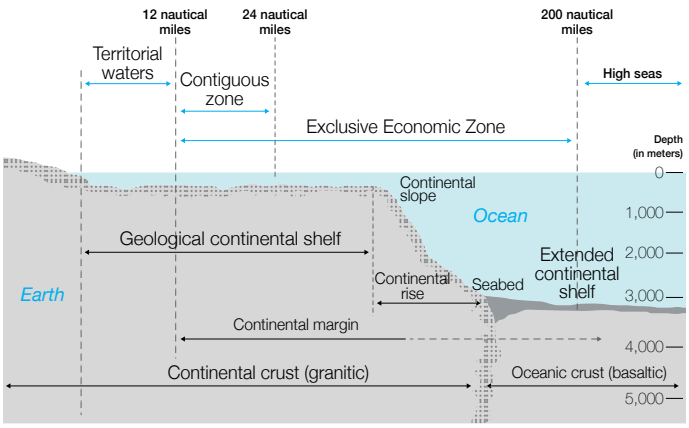
Bangladesh signed the United Nations Convention on the Law of the Sea (UNCLOS III) on the same day it was opened for signature on 10 December 1982. Bangladesh ratified the UNCLOS III on 27 November 2001.

Multiple factors contributed to Bangladesh's choice to sign and ratify UNCLOS III. As a coastal state, Bangladesh was strongly interested in the rights and responsibilities conferred by UNCLOS III on its maritime zones. UNCLOS III provides a framework for maritime boundary delimitation, exploiting natural resources in the exclusive economic zone (EEZ), and preserving the marine environment.

Secondly, Bangladesh was one of the nations actively participating in the negotiations for UNCLOS III, which lasted for nearly a decade. Bangladesh was a member of the Group of 77 (G-77), a coalition of developing nations that played a significant role in the negotiations and advocated for the interests of developing nations concerning the law of the sea.

UNCLOS has transformed the ocean governance landscape by establishing maritime boundaries, delineating exclusive economic zones, and ensuring the rights and responsibilities of coastal states





Defining Boundaries: UNCLOS guides nations in asserting their maritime rights, fostering cooperation and stewardship of the world's oceans

Thirdly, Bangladesh's signing and ratification of UNCLOS III was consistent with its commitment to international law and the peaceful resolution of disputes. UNCLOS III provides for the civil resolution of disputes through various mechanisms, including the International Tribunal of the Law of the Sea (ITLOS), which Bangladesh has used to settle maritime boundary disputes with its neighbours.

The signing and ratification of UNCLOS III were also consistent with Bangladesh's broader foreign policy goals, emphasising good relations with other nations, notably, its South Asian and Indian Ocean neighbours. By signing and ratifying UNCLOS III, Bangladesh demonstrated its commitment to the rule of law and its willingness to engage in constructive dialogue with its neighbours on issues about the direction of the sea.

Maritime Boundary Delimitation at the Bay of Bengal and UNCLOS III

Establishing maritime boundaries is a frequent source of contention between neighbouring nations. In the Bay of Bengal, Bangladesh, Myanmar, and India, they disagreed over the demarcation of their maritime boundaries. However, the dispute was effectively resolved due to the framework provided by UNCLOS III and the dispute resolution mechanisms established by the International Tribunal for the Law of the Sea (ITLOS).

The dispute pertained to delineating the maritime boundary between the three countries in the Bay of Bengal, specifically in the region known as the Bengal Basin. The region is rich in natural resources, including oil and gas reserves, and the competing claims of the three countries have led to tensions and the potential for conflict.

Bangladesh initiated arbitration proceedings under UNCLOS III in 2012 to determine the maritime boundary with Myanmar and India. The case was considered by a tribunal established according to Annex VII of UNCLOS III, which comprised judges from various nations.

The tribunal considered the pertinent provisions of UNCLOS III, such as the principle of equidistance and the need to consider relevant circumstances, such as the presence of islands and the natural extension of land territory. The tribunal also took into account the litigants' evidence, which included reports from geological and geographical experts.

In 2014, the tribunal ruled demarcating the maritime boundaries between India, Bangladesh, and Myanmar in the Bay of Bengal. The ruling established the tripoint between the three countries as well as the limits of their respective maritime zones.

The ruling was a significant accomplishment for the three countries because it resolved a long-standing dispute and established a clear legal framework for exploiting natural resources in the region. The decision was also a testament to the efficacy of UNCLOS III and the dispute resolution mechanisms established by ITLOS, which provided a forum for fair and impartial dispute resolution.

The successful resolution of the maritime boundary dispute between Bangladesh, Myanmar, and India in the Bay of Bengal clearly illustrates how UNCLOS III and ITLOS can effectively resolve disputes involving the world's oceans and seas. The ruling established a clear legal framework for exploiting natural resources in the region and helped reduce tensions between the three nations.

Future Challenges for Bangladesh with UNCLOS III

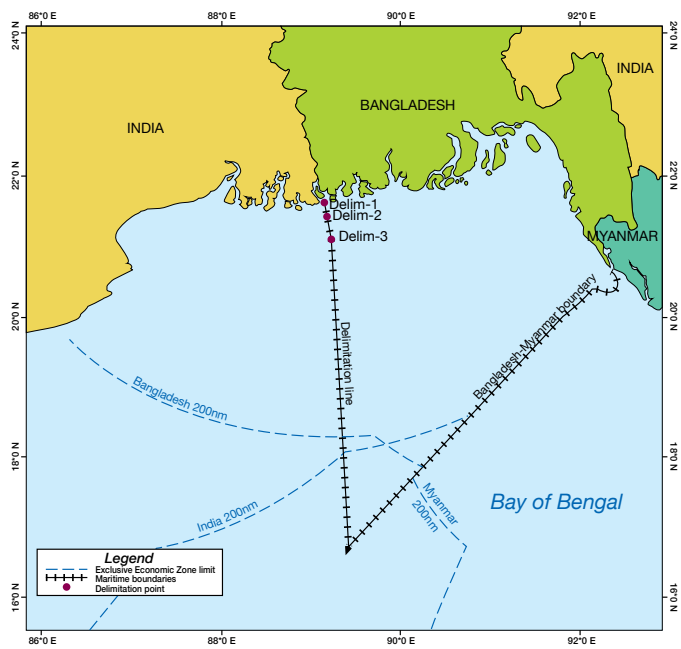
As with any international accord, signing and ratifying UNCLOS III is fraught with potential risks and obstacles. However, the benefits of UNCLOS III for Bangladesh are substantial and generally outweigh the challenges. The following are some potential future challenges Bangladesh may confront as a result of its membership in UNCLOS III:

1. Resolution of disputes

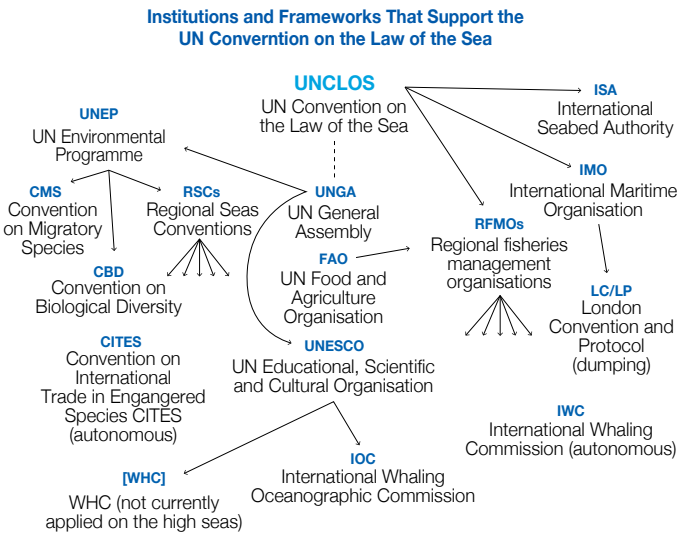
UNCLOS III includes some mechanisms for the peaceful resolution of disputes, including the International Tribunal for the Law of the Sea (ITLOS). While these mechanisms are generally effective, there is always the possibility that a dispute will arise that cannot be resolved through them, which could lead to tensions or even conflict between Bangladesh and other nations.

2. Enforcement

UNCLOS III establishes rules and standards for using and protecting the world's oceans and seas, but their enforcement can be difficult. Illegal fishing, piracy, and other maritime crimes are



Maritime delimitation between Bangladesh, India and Myanmar was effectively resolved due to the framework provided by UNCLOS III



prevalent in many regions of the globe. Enforcing UNCLOS III in these circumstances can be challenging, especially for developing nations like Bangladesh, which may need more resources to conduct effective maritime surveillance and enforcement.

3. Climate change

The effects of climate change on the world's oceans and seas include sea level rise, ocean acidification, and alterations in ocean currents and temperature. These alterations may significantly affect Bangladesh's maritime zones, particularly its flood- and erosion-vulnerable coastal regions. There is still much work to be done to devise effective strategies for mitigating and adapting to the effects of climate change on the oceans and seas of the world.

Although challenges are associated with signing and ratifying UNCLOS III, the benefits for Bangladesh are substantial and generally outweigh the risks. By adhering to the rule of law and the peaceful resolution of disputes, and by engaging constructively with its neighbours and the international community on issues related to the direction of the sea, Bangladesh can contribute to the stability and prosperity of its maritime zones.

Challenges Worldwide

The UNCLOS is a convention that provides a framework for determining the outer limits of the continental shelf beyond 200 nautical miles from the baselines, where states can exercise sovereignty over the seabed and subsoil resources. Several states have overlapping claims to islands, reefs, and waters in the South China Sea based on divergent interpretations of UNCLOS or historical arguments. China has asserted sovereignty over most of the ocean and constructed artificial islands and military installations on specific features. In 2016, a UNCLOS-established arbitral tribunal ruled in favour of the Philippines on most of its claims against China, but China rejected the decision and continued its activities. Climate change has created new opportunities and challenges for natural resource exploration and exploitation, shipping, tourism, and environmental protection in the Arctic Ocean.

UNCLOS provides a framework for determining the outer limits of the continental shelf beyond 200 nautical miles from the baselines, where states can exercise sovereignty over the seabed and subsoil resources. The UNCLOS is a comprehensive and balanced framework for regulating maritime affairs, but it is not without controversy and criticism. Some states have expressed concern that UNCLOS adversely impacts their security or economic interests in various ways. These include delimiting maritime boundaries between states with opposite or adjacent coasts, the regime of innocent passage through the territorial sea, and protecting and preserving the marine environment. This can lead to disputes over overlapping claims or competing interests in areas abundant in natural resources, such as oil, gas, fish, or minerals.

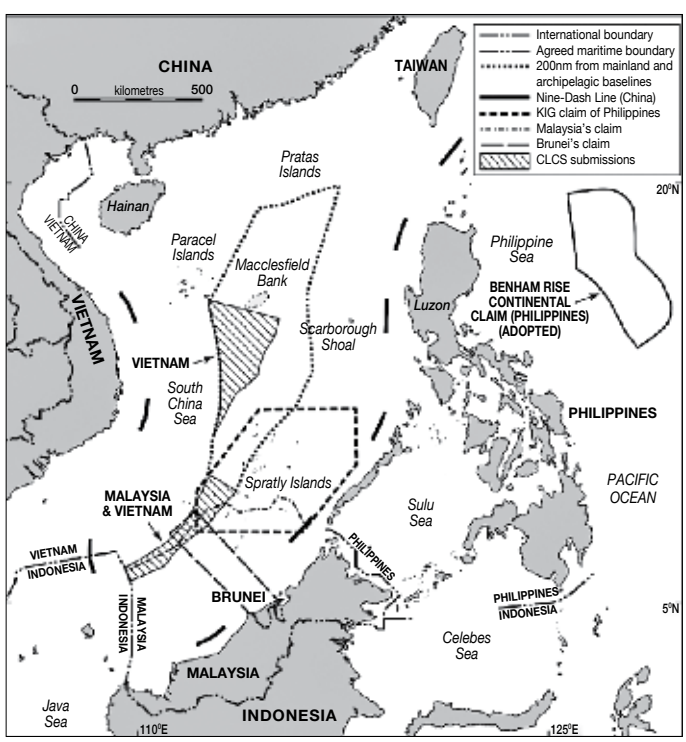
Additionally, some states have argued that the right of innocent passage is too broad and permits foreign ships to engage in activities that endanger their national security. Finally, some states have complained that these obligations are too expensive and impede their economic or development plans. Respecting and balancing these interests and perspectives through dialogue, negotiation, and the peaceful settlement of disputes per UNCLOS provisions are crucial.

Countries that Prioritise National Interests Over the Global Appeal of UNCLOS III

However, not all nations are parties to UNCLOS or recognise ITLOS's jurisdiction. These 15 UN Member States and 1 UN Observer State have not signed or ratified UNCLOS:

1. Andorra, 2. Eritrea, 3. Holy See (United Nations Observer State),
4. Israel, 5. Kazakhstan, 6. Kyrgyzstan, 7. Peru, 8. San Marino
9. South Sudan, 10. Syria, 11. Tajikistan, 12. Turkey,
13. Turkmenistan, 14. United States of America, 15. Uzbekistan,
16. Venezuela

Some nations have criticised UNCLOS and ITLOS for various reasons, including sovereignty concerns, political interests, and legal differences. The United States has not ratified UNCLOS and prefers to resolve maritime disputes through bilateral negotiations or arbitration. China is a party to UNCLOS but has declared to exclude disputes



The map highlights the ongoing challenges in the South China Sea, revealing the complexities and disputes that have hindered the effective implementation of UNCLOS in the region

Nurturing Maritime Legal Minds: *Students at BSMRMU engrossed in a dynamic classroom setting, eagerly absorbing knowledge and preparing to become influential contributors to international maritime law, shaping the future of ocean governance*

involving maritime delimitation, historic harbours or titles, military activities, and certain law enforcement activities from UNCLOS's mandatory dispute settlement procedures. China has also rejected the jurisdiction and decisions of ITLOS and other UNCLOS tribunals in several cases involving its maritime claims in the South China Sea, arguing that these cases involve questions of territorial sovereignty and historic rights that are outside the scope of UNCLOS and that the tribunals have violated the principles of state consent and impartiality. Turkey is not a signatory to UNCLOS and has voiced significant opposition to several of its provisions, including the definition of islands, the width of the territorial sea, and the delimitation of the continental shelf and exclusive economic zone.

Turkey believes these provisions are unjust and detrimental to its geographical position and interests in the Aegean and Eastern Mediterranean Sea. India is the fourth nation to express reservations about UNCLOS and ITLOS, having ratified UNCLOS in 1995 but made a declaration excluding from the jurisdiction of ITLOS or other UNCLOS arbitration tribunals disputes. India has also challenged the jurisdiction and admissibility of a case presented by Italy to the International Tribunal for the Law of the Sea in 2015 involving two Italian marines accused of killing two Indian fishermen off the coast of Kerala. Other nations, such as Russia, have criticised particular aspects of UNCLOS III, such as the establishment of EEZs and the unjust restrictions on Arctic Ocean resources.

BSMRMU and UNCLOS III

UNCLOS III is an international law treaty negotiated by the United Nations Convention on the Law of the Sea (UNCLOS III) and the International Tribunal for the Law of the Sea (ITLOS). Bangladesh's Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU) offers undergraduate programmes in LLB (Honours) in Maritime Law and postgraduate programmes in LLM Maritime Law. The Department of Maritime Law and Policy within the Faculty of Maritime Governance & Policy at BSMRMU provides students with a comprehensive understanding of UNCLOS III, ITLOS, and other pertinent international legal instruments. The programmes cover a variety of subjects, including international maritime law, the law of the sea, marine environmental law, maritime security, and maritime dispute resolution. This education and training provided by BSMRMU are essential for developing the capacity of Bangladesh and its regional partners to manage maritime resources, establish effective maritime governance mechanisms, and comply with UNCLOS III's international law obligations. BSMRMU is also promoting sustainable development and civil cooperation in the maritime domain.

Conclusion

The United Nations Convention on the Law of the Sea (UNCLOS III) and the International Tribunal for the Law of the Sea (ITLOS) are essential legal instruments that have significantly shaped the contemporary maritime order. The United Nations Convention on the Law of the Sea (UNCLOS III) provides a comprehensive legal framework for administering the world's oceans and their resources, and the International Tribunal for the Law of the Sea (ITLOS) is a crucial mechanism for resolving disputes regarding maritime boundaries and other maritime issues. Despite the widespread adoption of UNCLOS III by most countries worldwide, there continue to be implementation and enforcement challenges and concerns. However, through the efforts of institutions such as Bangladesh's BSMRMU and its Department of Maritime Law and Policy, the capacity of countries to navigate these obstacles and fulfil their legal obligations under UNCLOS III can be enhanced. In this way, the international community can work towards a more peaceful and sustainable future for the oceans and the communities that depend on them.

Earthquake and Its Causative Devastation Vulnerability in Bangladesh

Professor Dr Aftab Alam Khan

The recent earthquakes of February 6, 2023, and their more than 1200 aftershocks, rocked Turkey and Syria, killing people, according to the latest news. More to add: injuring more than a hundred thousand people, destroying more than a few hundred thousand civil structures, and leaving more than 74,000 buildings to abolish everything made the people of Bangladesh highly panicky, which is natural. However, it is not a matter of panic but of understanding such a disaster.

It should be reiterated first that the devastation from an earthquake is solely due to the irresponsibility and dishonesty humans tend to exhibit every moment of their lives. It would not be wise to explain the disaster everyone knows about. However, I will divide earthquake devastation into two segments; the earthquake and the devastation. An earthquake is a natural phenomenon. Hence, earthquakes will continue to occur as long as the earth exists. If earthquakes continue to occur, then what can humans do? Human beings can do proper physical planning and honest execution of the planning for protection. Disaster and honesty are irreversibly related. The execution of proper physical planning must abide by the rules of the earthquake-related building codes for the respective areas. Although earthquakes are global, their damage potential is highly variable depending on the absolute geological conditions of an area. An earthquake will lead to unprecedented devastation due to ignorance and irresponsibility regarding geological conditions.

An earthquake intrinsically relates to a fault and its rupture in the hard rock crustal segments. It is further intimately related to the tectonic plate margins. However, not all the faults in all the tectonic plate margins are the same and will rupture similarly due to an earthquake. The simple mechanism by which an earthquake occurs is the pattern of the accumulation of tectonic force (strain accumulation) and its release. Different types of rocks and geological conditions characterise each part of the continental region. The geological

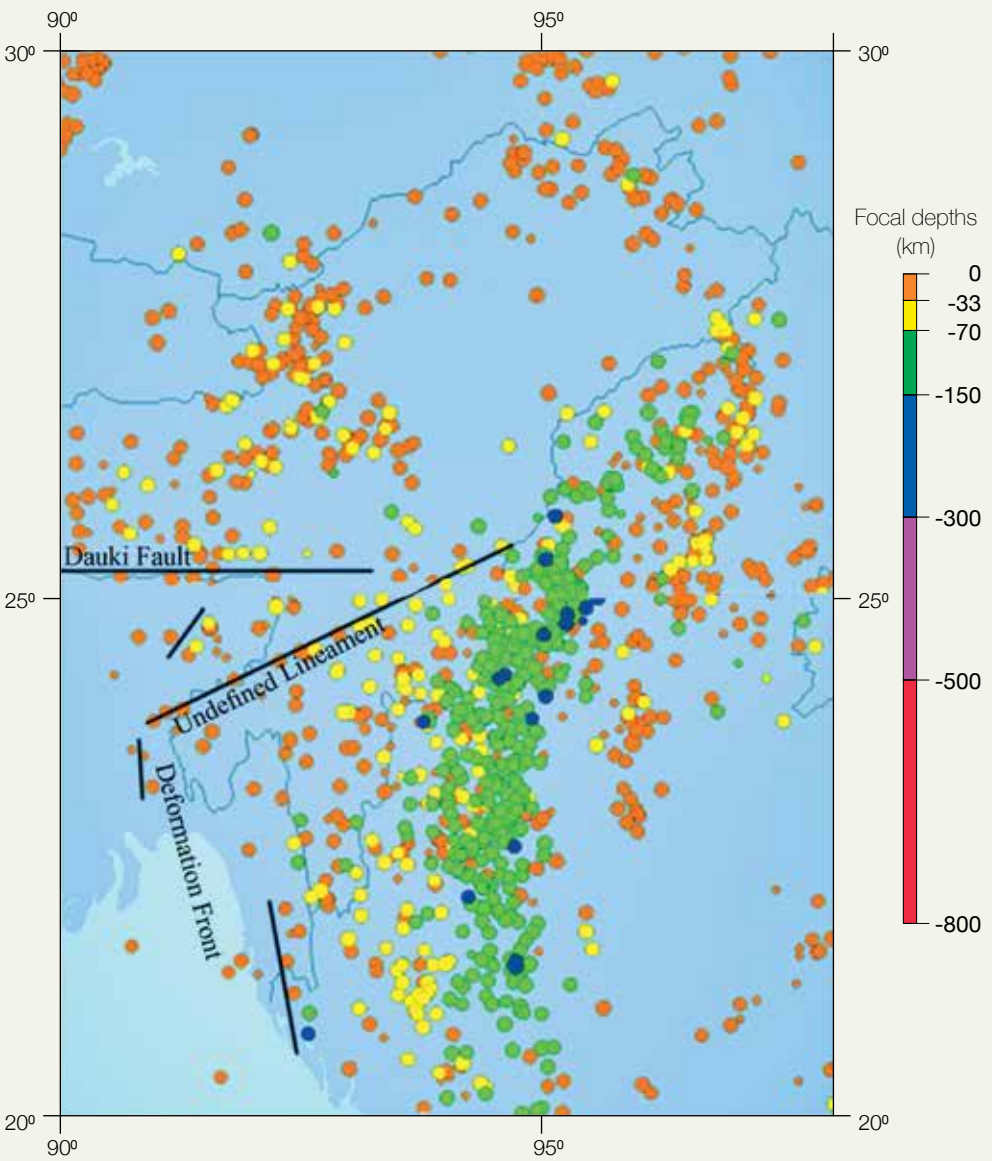
conditions of the earthquake-affected regions in Turkey and Syria greatly differ from those of Bangladesh. Igneous, metamorphic, and meta-sedimentary rocks dominate the region in Turkey and Syria, while sedimentary rocks and loose sediment deposits dominate Bangladesh. Further, geologically, Bangladesh is situated over a paleo-ocean basin where sediments have been deposited exceeding 20 kilometres in thickness for 65 million years, making Bangladesh the thickest sedimentary basin in the world. Even today, sediments pour in from the Himalayas every year into the Bangladesh delta at 2 billion tons per year, making the delta prograde seaward, and about 84 per cent of the coastal areas of Bangladesh are in the land accretion phase.

However, Bangladesh has become a vulnerable earthquake-prone region because of such geological conditions and a tectonically more or less active region. Nevertheless, Turkey and Syria's earthquake damage vulnerability is completely different from Bangladesh's.

Geodynamically, Turkey and Syria are experiencing various active plate motions, both linear and rotational, causing the hard rock continental areas much greater potential for reactivation and rupture of faults.

On the other hand, the Bangladesh region is experiencing earthquake force accumulation and release differently. Bangladesh can be divided broadly as the western passive tectonic margin that includes the region to the west of the line passing from Kolkata to Mymensingh (known as Kolkata Mymensingh Gravity High) to meet eventually with the east-west trending major vertical crustal dislocation of about eleven kilometres known as Dauki Fault that separates Sylhet region with the Shillong Plateau region. A branch of this fault, the Oldham Fault, where a large earthquake of magnitude 8.4 occurred in 1897, is known as the Great Indian Earthquake. The entire region to the east of the Kolkata Mymensigh line is relatively active since the Indian plate has made a collision with a very poorly defined Burmese plate.

The earthquake epicentre and focal depth map of Bangladesh, Assam, Mizoram, Tripura, and Myanmar



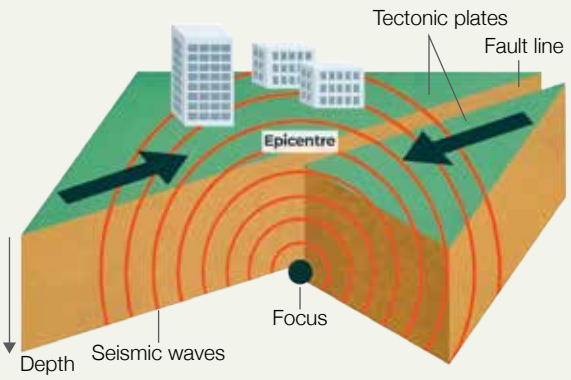
The assumed line of collision is located at much interior of the Arakan Yoma mountain belt, where persistent average magnitude earthquakes occur due to the activities between the Indian plate and the Burmese plate. Some geologists think that the junction between the Indian and Burmese plates is a major crustal dislocation inside Bangladesh that can produce mega-rupture earthquakes. However, there is no data to support this inference. Whatever data support tells us that a deformation front occurs inside Bangladesh from Sylhet down to Teknaf, a junction between the sedimentary basin to the west and the sedimentary folds to the east. Occasionally, this junction has made some faults due to the gravity subsidence of the sediment load in the basin. Further, all the sedimentary folds were formed lastly in about 5 million years ago. The present activities between the Indian and Burmese plates are limited in inducing or accumulating strain in the sedimentary layers. Sedimentary layers, because soft sediments can be saturated of strain accumulation very quickly; hence, it releases strain quickly to form moderate magnitude earthquakes. Large mega-rupture earthquakes need much longer for strain accumulation and release, for which data support is lacking.

The earthquake epicentre and focal depth map of Bangladesh, Assam, Mizoram, Tripura,

EARTHQUAKE

How do earthquakes happen?

Earthquakes happen when the Earth's tectonic plates move against each other, along a fault line. Energy - seismic waves - radiates outwards from the point of this movement below the Earth's surface, called the 'focus'. The 'epicentre' is the point above the focus on the surface of the Earth.



and Myanmar show dominantly average magnitude (4 – 5) earthquakes and average focal depths (depths of origin of an earthquake) 33 to 70 km (see the inserted figure). Such magnitudes and focal depths earthquakes can only generate ground shake, not fault rupture or fault movements. However, if seismic waves from such earthquakes are entrapped in the near-surface sediments for a long residence time will produce ground liquefaction means the oozing of jelly-type materials (mixture of sand and water) from underground, including ground amplification making a vacuum in the near-surface zone for buildings and other civil constructions to collapse, subside and tilt. Such properties largely characterise the entire Bangladesh ground. Traditional SPT tests cannot simply identify this kind of character.

Rather, it needs subsurface very shallow depths electrical resistivity tomography and shear wave tomography data acquisition, including a micro-tremor survey to identify such liquefiable zones for correct building code determination. In addition, the entire northeast region of Bangladesh, including Mymensingh, Netrokona, Sunamganj, and Sylhet districts, needs to take special care and assessment because of the Dauki Fault, which is the most vulnerable seismogenic fault accumulating strain since the earthquake of 1897. The return period of 8 and above magnitude continental earthquake is 3 to 4 hundred years if no strain is released after a major or great earthquake occurs. The Chittagong and Chittagong Hill Tracts region are vulnerable to average magnitude 5 and 6 earthquakes only to make ground subsidence and collapse. The geological and Tectonic status of the Chattogram and Chiattogram Hill Tracts region do not support a mega-thrust fault rupture earthquake, as opined by some earthquake specialists.

Professor Dr Aftab Alam Khan

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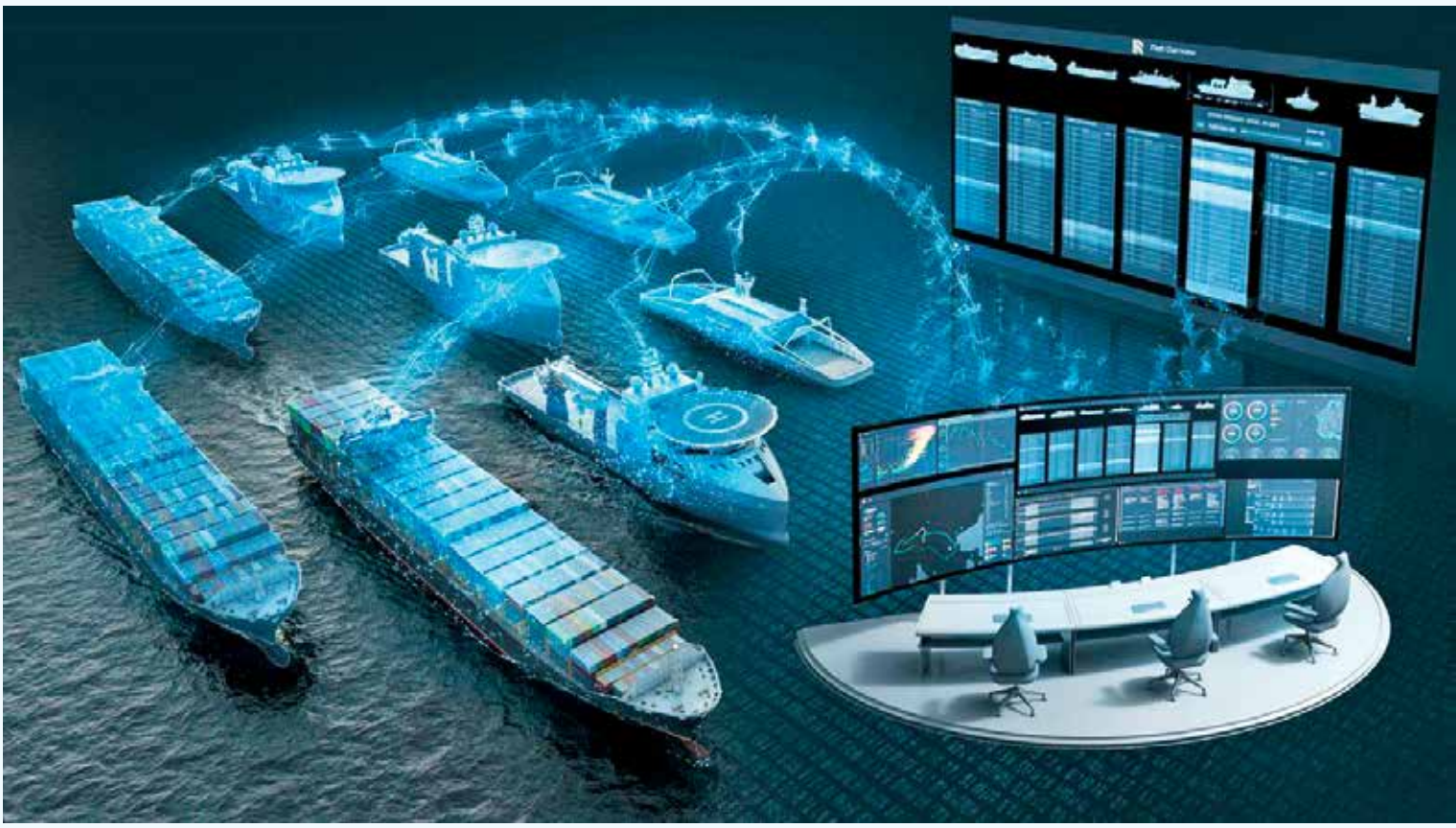

AI Navigation

Transforming Ships into **Safer, Greener** and **Smarter Vessels**

Md. Sajal Ahmed

Prologue

Artificial intelligence is sometimes known as machine intelligence. When intelligence is fed into a machine with an enormous number of algorithms and logic to execute three jobs at once, the machine gains "the ability to correctly interpret external data, learn from such data, and use such learning to achieve specific goals and tasks through flexible adaptation." When this artificial intelligence is linked with a ship's bridge and navigational equipment, it may bring the ship's navigational unit to life and convert it into a smart ship, resulting in safer, cleaner, and more ecologically friendly shipping.

The shipping business transports more than 90% of the world's products, making it an important component of the global economy. However, the shipping sector contributes significantly to pollution and environmental deterioration. Shipping contributes to around 3% of worldwide CO2 emissions and is expected to grow by 50-250% by 2050. As a result of these issues, there is rising interest in constructing smart ships that use artificial intelligence (AI) technology to improve navigation, decrease emissions, and increase safety.

Artificial Intelligence on Shipborne Navigation

AI-enhanced ship navigation uses machine learning, deep learning, and computer vision. The ship's AI system can evaluate radar, GPS, and sonar data to deliver real-time information on weather, sea state, and possible risks. Based on previous data, the AI system can forecast future circumstances, helping ship crews make safer and more efficient choices.

Integration of AI on Ship's Navigation

IMO has implemented the mandate to carry some navigational equipment in SOLAS CH-V "SAFETY OF NAVIGATION". There is a different requirement for different sizes and classes of ships. Among all the other navigational equipment few of the most important navigational equipment are:

i) RADAR and ARPA

ii) ECDIS and BACKUP

iii) STEERING GEAR and STEERING WHEEL

iv) COMPASSES (GYRO and MAGNETIC)

v) AIS

vi) GMDSS and GENERAL COMMUNICATION DEVICES INCLUDING DSC, VHF, MF/HF, TELEX, INMARSAT (B, C), FLEET 77 (FBB)

vii) Binoculars

viii) the Eldis lamp/signaling lamp

ix) Navigational lights

x) Integrated bridge system

xi) Engine order telegraph

xii) Rate of turning indicator

xiii) Auto-Pilot unit

xiv) Rudder angle indicator

xv) Voyage data recorder / simplified voyage data recorder

xvi) GPS receiver

xvii) Sound reception system 28 OF 55

xvii) Long Range tracking system

xviii) Ship whistle

xix) Echo sounder

xx) Anemometer

xxi) Speed Log

From the list mentioned above a lot of information is integrated into ECDIS, RADAR, and VDR. But none of this equipment can take action based on the information it gets. The Officer of The Watch (OOW) here acts as an integrator. He/she integrates all the information from the devices and additionally, s/he uses Lookout information manually. Then the OOW takes action according to the COLREGs and ordinary practices of the seaman. Among this navigational equipment, some are used manually and some are integrated into other equipment for better navigation. For integrating AI on ships, two more pieces of equipment are be required.

1. An AI computer

2. An Optical Sensor

The seamless integration of AI technologies into maritime shipping operations, revolutionising efficiency, safety, and sustainability in the industry

The AI Computer

The artificial intelligence computer will serve as the integrator of all navigational instruments. It will be encoded with Artificial Intelligence. Initially, navigational situations and associated tasks will be taught to the AI computer using machine learning techniques. It will be able to transmit signals to every piece of navigational equipment. It will supplant the Eldis lamp with a Signaling lantern controlled by a computer. The navigational lights will autonomously illuminate based on the situation determined by this computer. It will collect information from all extant 30 OF 55 equipment and an optical sensor. Then, it will transmit a signal to the Integrated Bridge System (IBS), Engine order telegraph, and autopilot unit. Maintain the necessary course and pace. This can be shown in the following way: **Step 1.** Data received from navigational equipment > **Step 2.** Data analysed in the AI computer > **Step 3.** Required Action displayed to be taken > **Step 4.** Human Confirmation > **Step 5.** Action signal transmitted to Steering motor and engine.

The Optical Sensor

An optical sensor is equipment that will act as the eye of the AI computer. From the optical sensor and also the Radar, ECDIS, AIS, and other navigational information inputted into the AI computer, the AI will be able to analyse the situation.

Shipborne Navigation Advantages from AI

Safety: The AI system alerts the ship's crew to possible threats before an accident.

Reduced emissions and costs: The AI system optimises the ship's route, speed, and fuel usage.

Better decision-making: The AI system gives the ship's crew real-time information and predictive analytics to make safer and more efficient choices.

Environmental effect: The AI system optimises ship operations, lowering emissions and shipping's environmental impact.

Challenges and Future Directions

Data security, system dependability, and crew training are only some of the obstacles that must be overcome when integrating AI into shipborne navigation. Shipyards, tech companies, and government agencies all have a stake in the success of smart ship development, and each must contribute heavily to the project.

The use of artificial intelligence (AI) in maritime navigation is predicted to increase in the future as more sophisticated AI systems become available. Interest in employing AI to allow autonomous shipping is on the rise since this has the potential to increase safety and efficiency while decreasing operational costs and carbon emissions.

Epilogue

The use of artificial intelligence (AI) in shipborne navigation has the potential to revolutionise the maritime sector, resulting in safer, cleaner, and more environmentally friendly transportation. While there are certain obstacles to overcome, the advantages of AI for shipborne navigation make it a promising technology for the future of shipping. The development of smart ships using AI technology necessitates cooperation among multiple stakeholders to guarantee that the advantages of this technology are achieved while solving the implementation issues.

Md. Sajal Ahmed

Junior Radio Instructor
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BSMRMU Vice-Chancellor pays homage to the Father of the Nation in Tungipara

The newly appointed Vice-Chancellor of Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU), Rear Admiral Mohammad Musa, paid a heartfelt homage to the Father of the Nation, Bangabandhu Sheikh Mujibur Rahman, on 16 February 2023, by placing a floral wreath at his mausoleum in Tungipara of Gopalganj.

The solemn occasion was attended by a delegation comprising the Treasurer, Registrar, Deans, Faculty Members, and Officers, who joined the Vice-Chancellor in paying their respects to the revered leader. The VC stood in solemn silence for some time after laying the wreath as a mark of profound respect for the Father of the Nation, Bangabandhu Sheikh Mujibur Rahman.

Following the wreath-laying ceremony, a dua mahfil was organised to seek eternal peace for Bangabandhu and his family, who were brutally murdered on 15 August 1975. The delegation prayed for the nation's well-being and paid tribute to the visionary leader, who has a tremendous impact on Bangladesh's history.

Later, the delegation visited the Bangabandhu Museum, Library, and Exhibition Center, which offered a glimpse into the life and times of the great leader. The museum showcased various exhibits and memorabilia, including photographs, letters, and personal belongings of the late leader, leaving the delegation in awe and appreciating his impactful legacy.

The Vice-Chancellor's homage to the Father of the Nation was a poignant reminder of the deep respect and admiration that Bangabandhu Sheikh Mujibur Rahman continues to command, even after all these years. His leadership and vision for an independent Bangladesh inspire many, and his legacy continues to shape the nation's progress and development.

BSMRMU observes Martyrs' Day and International Mother Language Day-2023

Bangabandhu Sheikh Mujibur Rahman Maritime University, Bangladesh, observed Martyrs' Day and International Mother Language Day-2023 with great solemnity and reverence. A delegation led by the Vice-Chancellor, Rear Admiral Mohammad Musa, paid homage to the language martyrs at the Central Shaheed Minar at the beginning of the day to honour the supreme sacrifices made by those who laid down their lives for the cause of preserving the Bangla language.

In light of the Language Movement and International Mother Language Day, the university held an essay competition and cultural programme, which the Hon'ble Vice-Chancellor graced as the Chief Guest. The programme showcased the rich cultural heritage of Bangladesh and the importance of the Bangla language in its development.

As the Chief Guest, the Vice-Chancellor distributed prizes among the winners of the competitions, inspiring and encouraging the students to strive for excellence in their academic pursuits. The programme concluded with prayers seeking the martyrdom of the language martyrs, the universal use of the Bangla language, and the prosperity of our country and the university.

The Martyrs' Day and International Mother Language Day-2023 observed by the BSMRMU remind us of the importance of preserving our language and cultural heritage. It is a testament to the university's commitment to promoting knowledge and learning while instilling a sense of national pride and identity in its students. The event was a resounding success, and its message will undoubtedly resonate with all who cherish the Bangla language and the ideals of the Language Movement.

Seminar on Prevention of Corruption held at BSMRMU

BSMRMU organised a Seminar on the Prevention of Corruption on 5 March 2023 to raise awareness and promote best practices to combat this scourge in all its forms. The event was graced by the BSMRMU Vice-Chancellor, Rear Admiral Mohammad Musa, as the Chief Guest, underscoring the university's commitment to promoting transparency, accountability, and ethical conduct in all its activities.

The seminar was a platform for eminent personalities from different fields to present their valuable papers. Mohammad Rajibul Islam, Director (Administration) of Bangladesh Public Service Commission, Director General (Prevention Wing) of Anti-Corruption Commission Md. Akhtar Hossain, and Director of IBBBS, BSMRMU Commodore Wahid Hasan Kutubuddin (retd), presented their papers, highlighting the critical importance of preventing corruption and providing valuable insights on practical steps to tackle this issue.

The seminar witnessed active participation from the university's teachers, students, officers, and staff, underlining the collective responsibility to promote ethical conduct and integrity in all walks of life. The event was informative, inspiring, and enlightening, providing attendees with a deeper understanding of the devastating impact of corruption on individuals and society.

On observing Historic 7 March

Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU) observed the Historic 7 March at its campus with a programme that included a screening of the speech of the Father of the Nation Bangabandhu Sheikh Mujibur Rahman, and a discussion session. The Vice-Chancellor of the university, Rear Admiral Mohammad Musa, graced the occasion as the Chief Guest, alongside the Treasurer, Registrar, Deans, Faculty Members, officers, and staff of the university. In the programme, Professor Kazi Ali Imam from the Department of Port and Shipping Management and Professor Dr Mariam Begum delivered speeches on the significance of the Father of the Nation's 7th March speech. The event was streamed live on BSMRMU's official Facebook page.

Exchange of Views Meeting among new Vice-Chancellor and students held

On 2 March 2023, an Exchange of Views Meeting was organised by BSMRMU to provide a platform for the students to express their thoughts and questions to Rear Admiral Mohammad Musa, the newly appointed Vice-Chancellor. The VC graced the occasion as the Chief Guest, highlighting the importance of such events in promoting open and constructive dialogue between the university administration and its students.

During the event, the BSMRMU Cultural Club performed, adding a touch of artistic flair to the proceedings. Students from different subjects and batches expressed their observations and made various requests related to academic and co-curricular activities to the new Vice-Chancellor. The exchange of ideas was vibrant and insightful, with the student's enthusiasm and passion for learning evident throughout.

The Vice-Chancellor listened attentively to the student's concerns and queries and supported their demands. He assigned tasks to the concerned authorities to ensure a healthy academic environment and facilitate the student's growth and development. The exchange of views was a resounding success, promoting transparency and accountability while fostering collaboration between the university administration and its students.

The Exchange of Views Meeting at BSMRMU served as a shining example of the university's commitment to promoting an environment of learning and growth for its students. The event showcased the university's focus on engaging its students and ensuring their voices are heard, setting an inspiring precedent for future events.

Celebration of the Birth Anniversary of Father of the Nation

BSMRMU celebrated the Birth Anniversary of Father of the Nation, Bangabandhu Sheikh Mujibur Rahman and National Children's Day-2023 with great enthusiasm. The Chief Guest of the programme was Rear Admiral Mohammad Musa, the university's Vice-Chancellor. The Treasurer, Registrar, Deans, Faculty Members, Officers, Staff and Students of the university actively participated in the event. The celebration commenced with the hoisting of the National Flag at sunrise, followed by a discussion on the life and legacy of the Father of the Nation. The ceremony ended with dua and Munazat. The event was a remarkable tribute to the great leader and his contributions to the country.

BSMRMU observes Genocide Day

On 25 March 2023, Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU) observed Genocide Day in a befitting manner at its campus. The Vice-Chancellor of the University, Rear Admiral Mohammad Musa, graced the occasion as the Chief Guest, and the Treasurer, Registrar, Deans, Faculty members, Officers, Staff, and Students of the university attended the function as well. The day's programme included a discussion session and a documentary screening, which were organised to mark the day with due solemnity. The event served as a solemn reminder of the atrocities committed during the 1971 Liberation War. It aimed to raise awareness about the importance of preserving the memory of the victims of the genocide.

BSMRMU Vice-Chancellor paid courtesy call to the Honourable President

On 16 March 2023, Rear Admiral Mohammad Musa, the Vice-Chancellor of BSMRMU, paid a courtesy visit to the Honourable President of the People's Republic of Bangladesh and Chancellor H.E. Md. Abdul Hamid at Bangabhaban. As a gesture of respect, the Vice-Chancellor presented a commemorative crest to the President and conveyed greetings from the university. During the meeting, Rear Admiral Mohammad Musa briefed the President on the progress of BSMRMU's educational and research activities and the ongoing efforts to establish a permanent campus. The Hon'ble President and Chancellor provided valuable guidance to ensure the progress of BSMRMU's educational activities and the successful establishment of the permanent campus. Furthermore, given the country's blue economy prospects, he expressed his optimism about the university's future potential.

A productive meeting with UGC chairman

To further elevate the standard of higher education and foster academic excellence, Rear Admiral Mohammad Musa, OSP, NPP, rcds, afwc, psc, PhD, the Vice-Chancellor of Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU), recently held a significant meeting with Professor Dr Kazi Shahidullah, the admired Chairman of the University Grants Commission (UGC). The meeting, held on 9 February 2023, served as a platform for fruitful discussions aimed at advancing the objectives of both institutions.

The engagement between Vice-Chancellor Rear Admiral Mohammad Musa and UGC Chairman Professor Dr Kazi Shahidullah represents a significant step forward in forging strategic partnerships within the academic landscape. It signifies the collective determination to improve access to quality education, nurture talent, and create an inclusive learning ecosystem.

BSMRMU Vice-Chancellor engages in fruitful dialogue with Chief of Naval Staff

In a remarkable display of collaboration and mutual interest, the Vice-Chancellor of Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU) Rear Admiral Mohammad Musa, OSP, NPP, rcds, afwc, psc, PhD recently held a significant discussion with the esteemed Chief of Naval Staff Admiral M Shaheen Iqbal, NBP, NUP, ndc, afwc, psc. The call, which took place on 6 February 2023, served as a platform for insightful deliberations on matters of strategic importance.

During this pivotal conversation, the Vice-Chancellor of BSMRMU engaged in an exchange of ideas with the Chief of Naval Staff, fostering a productive dialogue aimed at enhancing the synergy between the maritime university and the navy. The meeting encapsulated a shared vision of advancing maritime education and furthering the nation's maritime capabilities.

This exclusive interaction highlighted the commitment of both BSMRMU and the naval forces to collaborate and leverage their respective expertise for the betterment of Bangladesh's maritime sector.

BSMRMU observes Independence Day

BSMRMU celebrated the country's Independence Day with great zeal and enthusiasm on its campus. The Chief Guest of the event was the Vice-Chancellor of the university, Rear Admiral Mohammad Musa, together with the Treasurer, Registrar, Deans, Faculty Members, students, officers, and staff. The ceremony commenced with the national anthem being played, followed by various activities such as poetry recitation, essay competition, painting, photography and concept art competitions, which saw the enthusiastic participation of students.

At the end of the event, the university's Vice-Chancellor distributed prizes among the winners of these activities. The celebrations continued with Iftar, Dua and Munazat to mark Independence Day and National Day-2023. The event was a great success and showcased the patriotism and creativity of the students.

Vice Chancellor's inspiring visits enhance maritime education in Bangladesh

Rear Admiral Mohammad Musa, OSP, NPP, rcds, afwc, psc, PhD, the Vice Chancellor of Bangabandhu Sheikh Mujibur Rahman Maritime University, recently led an inspection team to two esteemed maritime institutions in Chattogram, Bangladesh. On 19 March 2023, the team visited the Bangladesh Marine Academy, followed by a visit to the Marine Fisheries Academy on 20 March 2023.

During their visit to the Bangladesh Marine Academy, the inspection team thoroughly explored the various facilities within the academy and engaged in extensive discussions with the esteemed faculty members. The Vice Chancellor provided invaluable guidance and direction to both the faculty members and the cadets of the academy. A noteworthy highlight of the visit was witnessing a captivating parade, where Rear Admiral Mohammad Musa graciously took the salute of the cadets. In a fitting tribute, the Marine Fisheries Academy organised a splendid cultural program in honour of the Vice Chancellor. Accompanying Rear Admiral Mohammad Musa were the officers of the Inspector of Academies/Institutes.

The inspection team from Bangabandhu Sheikh Mujibur Rahman Maritime University also embarked on a visit to the Bangladesh Naval Academy in Chattogram on 23 and 24 January 2023. The primary purpose of this visit was to explore the possibility of affiliation between the two prestigious institutions under BSMRMU. The team meticulously examined the training facilities available at the Bangladesh Naval Academy, and fruitful discussions were held with the academy's Commandant and other officers regarding various affiliation-related matters.

Furthermore, officers from the Inspector of Academies/Institutes played an instrumental role in a crucial meeting focused on signing a memorandum of understanding (MoU) on "Joint International Maritime Education & Training Cooperation." This significant meeting took place at the Bangladesh Marine Academy in Barishal, where authorities from Weihai Vocational College in China and Weihai International Economic & Technical Cooperative Company Limited (WIETC) were present. In addition to participating in the meeting, the officers also inspected the progress made in the development of training facilities at the Bangladesh Marine Academy in Barishal. These events occurred on 5 and 6 March 2023.

Notably, on 5 January 2023, an Assistant Inspector (Academy/Institute) attended a crucial meeting of the Admission Committee. The objective of this meeting was to address the filling of vacant seats in Government Marine Academies and the extension of the admission period in private Marine Academies for the academic year 2022-2023. This initiative aimed to streamline the cadet admission process in both government and approved private Marine Academies.

BSMRMU permanent campus project gains momentum as stakeholders convene for productive meeting

In a significant development, the highly anticipated Project Implementation Committee (PIC) meeting for the BSMRMU's permanent campus project was held on 18 March 2023. This marked the first gathering at the project area in Chattogram since its inception in 2019. The esteemed meeting was chaired by Vice Chancellor Rear Admiral Mohammad Musa, attracting the presence of key members from various institutions, including UGC, Education Ministry, Finance Ministry, Planning Commission, IMED, and BSMRMU.

During the meeting, one of the key focal points revolved around the revision of the project, emphasising the need for concerted efforts from all stakeholders to expedite the revision work. The committee engaged in thorough discussions, highlighting the significance of collaboration and support to ensure the project's smooth progression. The Vice Chancellor, Rear Admiral Mohammad Musa, played a pivotal role in steering the meeting towards a productive outcome.

Following the meeting, the committee, accompanied by the Vice Chancellor, embarked on an inspection of the ongoing work at the project site. The collective scrutiny of the project's progress allowed the committee members to gain first hand insight into the quality of work being carried out. Expressing satisfaction, the committee acknowledged the commendable standards and efforts put forth in the project's execution.

The BSMRMU's permanent campus project has been a focal point for the maritime education landscape in Bangladesh, aiming to provide state-of-the-art facilities to foster a conducive learning environment for future maritime professionals. The recent PIC meeting serves as a crucial milestone, signifying the project's steady momentum and the commitment of all stakeholders to its success.

As the project moves forward, stakeholders remain dedicated to ensuring its timely completion while upholding the highest standards of quality. The permanent campus holds immense promise, not only for the university but also for the overall advancement of maritime education in Bangladesh.

BSMRMU Vice-Chancellor and the collaborative discourse with BUP Vice-Chancellor

In a testament to the commitment of fostering academic partnerships and knowledge exchange, the Vice-Chancellor of Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU) Rear Admiral Mohammad Musa, OSP, NPP, rcds, afwc, psc, PhD recently held a significant call with Major General Md Mahbub-ul Alam, ndc, afwc, psc, Mphil, PhD, the Vice-Chancellor of Bangladesh University of Professionals (BUP). The meeting, which took place on 9 February 2023, marked a pivotal moment in furthering the collaboration between these prestigious institutions.

During this engaging discourse, the Vice-Chancellor of BSMRMU and the Vice-Chancellor of BUP engaged in a substantive conversation, highlighting areas of common interest and avenues for collaboration. The dialogue encapsulated the shared commitment to nurturing academic excellence and advancing specialised professional education within Bangladesh.

A discussion with Ambassador of the Kingdom of the Netherlands to Bangladesh

In a significant endeavour to strengthen international collaborations and foster bilateral ties, Rear Admiral Mohammad Musa, OSP, NPP, rcds, afwc, psc, PhD, the Vice-Chancellor of Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU), recently engaged in a productive meeting with Anne van Leeuwen, the esteemed Ambassador of the Kingdom of the Netherlands to Bangladesh. The meeting, held on 14 February 2023, served as a platform for constructive discussions aimed at deepening mutual understanding and exploring areas of cooperation.

During this pivotal meeting, Vice-Chancellor Rear Admiral Mohammad Musa and Ambassador Anne van Leeuwen engaged in an exchange of ideas, focusing on various aspects of mutual interest, including maritime education, research, and cooperation between the two nations. The discussion underscored the commitment of both parties to strengthen collaboration in the maritime domain and capitalise on shared expertise.

A high-level discussion held with Chittagong Port Authority chairman

In a significant effort to bolster collaboration and strategic partnerships, Rear Admiral Mohammad Musa, OSP, NPP, rcds, afwc, psc, PhD, the Vice-Chancellor of Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU), recently met the Chairman of the Chittagong Port Authority. The meeting, which took place on 23 February 2023, served as a platform for dialogue aimed at advancing mutual interests and fostering synergy between the esteemed institutions.

As Bangladesh continues its quest to become a regional maritime hub, partnerships between academic institutions and industry leaders are instrumental in fostering innovation, promoting best practices, and enhancing the nation's maritime capabilities. The Vice-Chancellor's call on the Chittagong Port Authority Chairman exemplifies the proactive approach of BSMRMU in forging impactful collaborations and strengthening its position as a key player in the maritime education landscape.

The engagement between BSMRMU and the Chittagong Port Authority sets a positive precedent for future collaborations, showcasing the collective efforts to drive sustainable growth and propel Bangladesh towards becoming a leading maritime nation in the region.

PM Hasina wants to establish a commercial forum between Bangladesh and Qatar

The development of a combined business forum, according to Prime Minister Sheikh Hasina, would unite the private sectors of the two nations and provide a platform for a mutually advantageous economic partnership. Sheikh Hasina called for the formation of a joint trade and investment committee by the governments of Bangladesh and Qatar on 6 March 2023.

She stated at the Doha Investment Summit, headlined "The Rise of Bengal Tiger: Potentials of Trade and Investment in Bangladesh," held at the St. Regis Doha Hotel in Doha, Qatar, that "our two nations need to reposition our ties based on a mutually beneficial economic partnership."

The prime minister also requested the cooperation of the non-resident Bangladeshis in Qatar in Bangladesh's efforts to build its nation by inviting a delegation of Qatari businesspeople to visit Bangladesh shortly.

As her government continues to be open to investment proposals in the infrastructure and logistics sectors, she advised businesses from Qatar to consider doing business in a few key industries in Bangladesh.

Sheikh Hasina noted the potential for Qatar investment in the energy sector, including in renewable energy, and claimed that Bangladesh could profit from Qatar's experience in offshore gas exploration and energy distribution systems.

She cited Bangladesh's agricultural expansion and said it opens up opportunities for collaboration in the agro-processing sector, including buy-back agreements with Qatar.

The prime minister reaffirmed her commitment to fulfilling Bangabandhu Sheikh Mujib's dream of building a "Sonar Bangla", expressing confidence that the Qatar leadership and people will continue to stand by Bangladesh in this regard.

Chairman of Bangladesh Securities and Exchange Commission (BSEC) professor Shibli Rubayat Ul Islam and executive chairman of Bangladesh Investment Development Authority (BIDA) Lokman Hossain Miah made two separate presentations focusing on the potential of trade and investment in Bangladesh. BSEC and BIDA arranged the event in partnership with the foreign ministry.

Bangladesh investigating multiple offshore wind sites in the Bay of Bengal

The Ministry of Power, Energy and Mineral Resources of Bangladesh is investigating offshore wind as a potential energy source.

The ministry recently awarded a contract to consultancy BLIX, working in a joint venture with CESI in Italy and Bangladesh-based Synotech for a pre-feasibility and detailed feasibility study for offshore wind farms in the country's waters.

In 2022, the Bangladesh Sustainable and Renewable Energy Development Authority set a target of generating 5 GW of onshore and offshore wind by 2030. The study awarded to BLIX and its joint venture partners is part of the pathway towards this target. Bangladesh has identified 26 potential blocks in deep and shallow seas in the Bay of Bengal.

A National Renewable Energy Laboratory study found that the country has wind speeds of 5.75-7.75 m/s. In the pre-feasibility study, the project team will assess which 26 blocks have the best wind energy potential.

First, a site selection methodology specific to the Bay of Bengal and Bangladesh power systems will be developed based on the most up-to-date offshore wind generation technologies. Then, the cost of implementing offshore wind farms in the Bay of Bengal will be analysed.

During the detailed feasibility study, the two most prospective blocks will be further investigated. This will include identifying the key requirements to implement offshore wind projects, a study of the power system and developing a solution to connect the wind farm to the grid.

In addition, a comprehensive economic/financial assessment of offshore wind projects will be prepared, and proposals for technical and regulatory support to deploy offshore wind farms will be created. To ensure the success of the study, sharing the findings with local stakeholders via dissemination is essential.

ExxonMobil wants gas exploration in Bangladesh's seas

ExxonMobil Corporation, one of the world's largest oil and gas companies, has expressed interest in exploring gas in all the open deepwater offshore blocks and some onshore blocks using the required two- and three-dimensional seismic surveys.

The company plans to implement the proposal, including production sharing contracts (PSC) negotiation and well exploration, in three phases over six years.

The proposal comes when Bangladesh finalises its model PSC, under which international oil companies will be offered larger output shares and increased gas prices.

In its proposal, ExxonMobil has expressed interest in direct negotiation for mutually acceptable PSCs covering all open deepwater blocks, data access for evaluation of selected onshore blocks needed for direct negotiation proposal, and participating in the planned tender for the offshore blocks.

Apart from this, ExxonMobil also wished to work directly with Norwegian survey company TGS and US firm Schlumberger. This joint venture is now conducting the multi-client survey in the Bay of Bengal to acquire a denser grid of 2D data during the initial acquisition phase.

The largest ship in the country's history to anchor at Payra Port in April

State Minister for Shipping Khalid Mahmud Chowdhury said Payra Port will welcome the largest ship in the country's history in April.

This information was disclosed at a review meeting on the implementation progress of some development projects at the Ministry of Shipping on 22 March 2023.

The first terminal of Payra port will be inaugurated in the first week of May, said State Minister for Shipping Khalid Mahmud Chowdhury.

He said that the 10.5-metre draught and 215-metre-long ship would anchor at Payra seaport in the first week of April.

Before the inauguration, the capital dredging work of Payra port will be completed on 26 March, the state minister said, adding that the dredging would make the port more viable and allow bigger ships to berth in the port.

State Minister for Shipping presided over the meeting while Shipping Secretary Md Mostafa Kamal, Chairman of Payra Port Authority Rear Admiral M Sohail, and others concerned were at the meeting.

New Bangladesh-Middle East service from CMA CGM

Bangladesh India Gulf Express (BIGEX), a new direct service, has been announced by CMA CGM Group.

According to the shipping firm, this is the quickest and only direct route connecting Bangladesh to the Gulf countries of Jebel Ali, Abu Dhabi, Nhava Sheva, and Mundra in India.

Starting 5 April 2023, the BIGEX service will depart from Chittagong Port on the m/v HONG AN. Every week, three 1,700-TEU ships will be sent out on the westbound cycle.

The cities in which the services are provided are as follows: Chattogram, Colombo, Mangalore, Nhava Sheva, Mundra, Jebel Ali and Abu Dhabi.By establishing the Bangladesh-India-Sri Lanka-Gulf corridor, BIGEX's presence reportedly changed Bangladesh's marine access to the Gulf and India. By adding Gulf and Indian ports in addition to the important Asian ports, BIGEX is anticipated to improve Chittagong Port's access to transhipment hubs.

The carrier claims that this expands market accessibility and shortens transit times, as evidenced, for instance, by the shipment of goods from Bangladesh to the US via Colombo. The full year of 2022 was marked by a strong financial performance from CMA CGM, with sales up 33% from the previous year.

BSC receives $22.48 million in compensation for ship hit by a missile in Ukraine

BSC has been compensated $22.48 million from a foreign insurance company for the damages from the missile attack on Banglar Samriddhi in Ukraine.

The funds have been transferred to the Sadharan Bima Corporation and will soon be passed on to the Bangladesh Shipping Corporation (BSC).

The Beazley Group, which operates within the British market Lloyd's of London, is one of two vessel insurers alongside SBC. The BSC had rented out Banglar Samriddhi to Danish company Delta Corporation when it arrived in Ukraine on 22 February 2022.

Unfortunately, only two days later, amid the war in Ukraine, it was destroyed by a projectile killing one of its crew members. The rest of them were evacuated at Olvia port soon after. Apart from damage to its navigation bridge, fire also affected other parts of the vessel.

The BSC had bought the ship for $26.3 million around four and a half years ago, and after depreciation, it was valued at $22.5 million.

Two more ocean-going vessels have been added to HR Line

Bangladesh-grown container carrier HR Line is all set to add two more ocean-going vessels – HR Turag and HR Balu – to its fleet, according to officials of HR Lines Limited, the operator of the shipping line. With the new addition, the number of Karnaphuli vessels will increase to eight. The six other vessels of the shipping lines are HR Sahare, HR Sarera, HR Rhea, HR Hera, HR Farha, and HR Aarai. Of them, four move on the Chattogram-Colombo route, and the rest two on the Chattogram–Singapore route. Some 350 Bangladeshi citizens are serving the ships.

The 1,100TEUs-capacity HR Turag is reached the Chittagong Port on 27 January, and it moved on the Bangladesh-Singapore route, while the 1,700TUEs-capacity HR Balu moved on the Bangladesh–Colombo route, HR Lines officials said.

The maritime sector still faces a shortage of skilled manpower: State Minister for Shipping

The country's maritime sector is facing a shortage of skilled manpower despite its potential for attracting investments, said State Minister for Shipping Khalid Mahmud Chowdhury.

"The sector will be in a good position soon by overcoming the challenges," the minister remarked while speaking at a seminar organised by the Bangladesh Maritime Law Society at the International Conference Centre of CIRDAP in the capital on 6 February 2023.

"Due to the government's efforts, shipyards have now become a potential sector. Bangladesh is now exporting ships as well," he added.

"Shipyards of Khulna and Narayanganj used to be quite vibrant. In 1996, Prime Minister Sheikh Hasina took the initiative to make various improvements.

"Besides, the premier helped the private sector in many ways. As a result, many people are now interested in investing in the maritime sector," he added.

Referring to the establishment of multiple marine academies by the present government, he said, "There was only one marine academy for education in this sector. The prime minister then established four marine academies and announced the establishment of three more."

"We are still not getting adequate skilled manpower. So, workers have to be brought from abroad," the minister added.

"We want the maritime sector of the country to reach a significant position," he remarked.

MAU secretary gets 2yr extension

Bangladesh government has extended the appointment of Secretary (Maritime Affairs Unit) at the Ministry of Foreign Affairs Rear Admiral Md Khurshed Alam (retired) for two more years.

The public administration ministry recently issued a notification regarding the extension of his contractual appointment.

His two-year tenure as head of the Maritime Affairs Unit has begun on January 20 or from his date of joining in continuation of his current contract.

The first meeting of the National Logistic Development and Coordination Committee held

The first meeting of the newly formed National Logistic Development and Coordination Committee was held on 2 February when a decision was made to work on formulating a National Logistic Development Policy within a year.

Prime Minister's Principal Secretary and National Logistic Development and Coordination Committee Chairman M Tofazzel Hossain Miah presided over the Prime Minister's Office (PMO) meeting.

He said that National Logistic Development Policy would be formulated to facilitate and ease business and trade and increase investment to achieve the national growth targets. He said that five sub-committees would also be formed to this end.

The committee decided to work on ensuring efficient transportation of goods and services and upgrading the country's logistic sector to international standards.

It will provide legal support to attract investment in the logistics sector and simplify the existing policy frameworks.

It will also provide guidance in formulating logistics sub-sector-based policies and development strategies.

The committee will monitor, review and evaluate the overall progress of implementing the logistics development strategy.

The committee decided to build an advanced and efficient logistic management system to reduce these negative effects.

On 22 January 2023, the 29-member National Logistic Development and Coordination Committee was formed.

Top officials of different government and private offices and export and import sectors joined the meeting.

The Director General of the Executive Cell of the Prime Minister's Office was made the member secretary of the committee, while the Bangladesh Bank governor, secretaries of different ministries, and heads of different government bodies were made members of the committee.

MGI adds four new ocean-going vessels to the fleet

Leading industrial conglomerate Meghna Group of Industries (MGI) has added four brand new UltraMax bulk carriers to its fleet of ocean-going vessels.

Each of the four vessels—MV Meghna Victory, MV Meghna Prestige, MV Meghna Hope and MV Meghna Progress—has 66,000 tons capacity, and they were delivered on 21 November 2022.

State Minister for Shipping Khalid Mahmud Chowdhury inaugurated the four vessels at a programme held on 27 February 2023 afternoon on the deck of Meghna Victory anchored at the newly built Patenga Container Terminal (PCT) of Chittagong Port.

This is the second 10-metre draught vessel berthed by the Chittagong Port Authority (CPA), having a 200-metre length in its jetties, and the first such vessel in Patenga terminal.

In December 2020, Meghna Group signed a deal with Jiangsu Yangzi-Mitsui Shipbuilding Co Ltd, a China-Japan joint venture company, to build the four Ultramax vessels at the cost of $104 million under a project financed by HSBC.

Out of the four, Meghna Victory, carrying 62,000 tons of wheat from Vancouver, Canada, arrived at the port's outer anchorage on 17 February and later berthed at PCT.

Another ship Meghna Prestige is now in Mongla port, while Meghna Hope and Meghna Progress are currently waiting to sail off the coast of China.

With these four vessels, the number of ocean-going vessels owned by MGI has risen to 22.

With the 22 vessels, the total cargo carrying capacity of MGI reached 12.20 lakh tonnes enabling the MGI to secure the top position in operating ocean-going vessels in the country, exceeding the long-time topper KSRM Group.

KSRM now has a total of 23 ocean-going vessels in its fleet, but their total cargo-carrying capacity is 11.77 lakh tons.

With MGI's new four, Bangladesh now has 95 flagged vessels.

Chittagong Port Authority (CPA) Chairman Rear Admiral Mohammad Shahjahan, Department of Shipping Director General Commodore Nizamul Haque, HSBC Bangladesh CEO Md Mahbub Ur Rahman and Chittagong Chamber of Commerce of Industry President Mahbubul Alam and NRB Bank Chairman Mohammed Mahtabur Rahman spoke at the programme chaired by MGI Chairman and Managing Director Mostafa Kamal.

NYK sends the first ship for green recycling in Bangladesh

Bangladesh-based ship recycling company, PHP Ship Recycling, has achieved a significant milestone by purchasing a ship directly from a shipping company for the first time. The ship, called KAMO, was sold by NYK and was beached at the company's facility in Chattogram on 9 March 2023. The sale is seen as a positive development for the industry, which has come under fire in recent years due to concerns over working conditions, lack of protection for workers, and pollution.

PHP Ship Recycling has been working hard to change this, following the Hong Kong Convention adopted by the International Maritime Organisation (IMO) in 2009. The company was awarded a Statement of Compliance by ClassNK in 2020, making it the first green ship recycling company in Bangladesh. It also obtained an ISO certificate for Energy Management, becoming the first ship recycling company in the world to have such a certification.

According to PHP's Managing Director, Mohammed Zahirul Islam, achieving these certifications required an investment of over $11 million and 12 years of intensive hard work. The ship recycling facility has 500,000 square feet of space at the edge of the Bay of Bengal and has a capacity of 160,000 metric tons of Light Displacement Tonnage (LDT).

NYK sent its own inspection team to PHP and evaluated the facility to stricter standards than those set out in the Hong Kong Convention. PHP became the first yard to be certified by NYK in Bangladesh.

More than 80% of shipbreaking yards in Bangladesh have been suffering in the past three years due to industry pressure stemming from environmental concerns, low prices, and inherent financial challenges due to Bangladesh's struggling economy. However, the certification obtained by PHP and other shipbreaking yards in the country could attract more business to the industry, especially as environmental standards become increasingly stringent.

Nor-Shipping Launches Ocean Campus In Partnership With World Maritime University

Nor-Shipping is launching a fresh initiative to strengthen and support the pipeline of new talent entering the world of maritime and ocean business.

Christened Ocean Campus, the dedicated 'island' of exhibition booths, will showcase the world's leading maritime universities and colleges, highlighting opportunities for potential students while working to bridge the gap between employers and the talent of tomorrow. The World Maritime University (WMU) in Sweden, the IMO's centre of excellence for postgraduate education, is the main Ocean Campus partner for both this year's event, running from 6-9 June, and Nor-Shipping 2025.

Alongside WMU, further confirmed campus participants include the Norwegian University of Science and Technology (NTNU), B.I. Norwegian Business School, UiT Arctic University of Norway, MLA College, Oslo MET and SINTEF Ocean. Norvik notes that the initiative is "the perfect fit" with Nor-Shipping 2023's main theme of #PartnerShip.

Nor-Shipping is a key meeting place for leading companies in the maritime industry and provides a rich opportunity for WMU to strengthen our connections with industry partners, as well as potential students.

Mejia to Lead World Maritime University

Professor Max Mejia has been named as the next president of the World Maritime University (WMU) in Malmö, Sweden.

Selected following a competitive selection process, Mejia—the university's current PhD program director and associate academic dean— will succeed Dr. Cleopatra Doumbia-Henry, whose term as WMU president will expire on 29 June, 2023.

WMU was founded by the International Maritime Organisation (IMO) in 1983, providing postgraduate maritime and ocean education, research and professional training. Each year, MarineLink's publisher New Wave Media produces a maritime training survey and report in partnership with WMU and Canada-based Marine Learning Systems.

Mejia studied Political Science at the U.S. Naval Academy and went on to obtain a Master of Arts in Law & Diplomacy at the Fletcher School at Tufts University. He is also a graduate of WMU, having received a Master of Science in Maritime Safety Administration in 1994. Mejia has a Licentiate of Engineering and a Doctor of Philosophy from Lund University in Sweden.

Before joining WMU in 1998, Professor Mejia saw duty on board various naval and coast guard vessels, as well as in shore-based facilities in the Philippines. During a sabbatical from WMU between 2013 and 2016, he served as the administrator (director-general) of the Maritime Industry Authority (MARINA) in the Philippines.

Dr Doumbia-Henry (LL.B, LL.M, PhD, LLD h.c, International Law) joined WMU as president in 2015. Prior to joining WMU, she served as the director of the International Labor Standards Department of the International Labor Organisation (ILO) in Geneva, Switzerland.

UAE launches first dedicated marine research rescue centre in the region

The UAE announced on 8 February 2023 the opening of the region's first dedicated marine research, rescue and rehabilitation centre, Yas SeaWorld Research and Rescue, in Abu Dhabi. Miral and SeaWorld Parks & Entertainment made the announcement.

Located on Yas Island, the 8,602 sq. meters centre will be a key contributor to marine life conservation in both the UAE and the wider region, conducting integrated research, rescue, rehabilitation, and education programs.

The centre's efforts will aim to improve the public's knowledge and commitment to the conservation of the region's marine wildlife, habitats, and ecosystems.

The Minister of Climate Change and the Environment, Mariam bint Mohammed Almheiri, attended the opening, along with Mohamed Khalifa Al-Mubarak, Miral's chairman.

Led by a team of dedicated marine scientists, zoologists and experts in research, rescue and animal care, the centre will play an important role in research and conservation efforts.

The research team will conduct fundamental and applied studies which focus on the marine ecology of the Arabian Gulf, covering topics such as marine biodiversity, ecosystem resilience, sensitive wildlife conservation, critical habitats restoration, fisheries, pollution and wildlife health.

U.N. delegates reach historic agreement on protecting marine biodiversity in international waters

Secretary-General António Guterres has congratulated U.N. member countries for finalising a text to ensure the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, calling it a "breakthrough" after nearly two decades of talks.

"This action is a victory for multilateralism and for global efforts to counter the destructive trends facing ocean health, now and for generations to come," said the U.N. chief in a statement issued by his Spokesperson late on the 5 March 2023 evening just hours after the deal was struck at U.N. Headquarters in New York, where tough negotiations on the draft treaty have been underway for the past two weeks. The agreement reached by delegates of the Intergovernmental Conference on Marine Biodiversity of Areas Beyond National Jurisdiction, better known by its acronym BBNJ, is the culmination of UN-facilitated talks that began in 2004.

Already being referred to as the 'High Seas Treaty', the legal framework would put more money into marine conservation and covers access to and use of marine genetic resources.

Through his Spokesperson, Mr Guterres said that the treaty is crucial for addressing the triple planetary crisis of climate change, biodiversity loss and pollution.

Fund supports marine monitoring, 'blue' economy

In Canada, British Columbia (B.C.)-based "blue" technology and innovation is creating jobs for British Columbians, building a sustainable ocean economy, cutting the cost of ocean research and reducing greenhouse gas emissions.

"British Columbian innovators are building connections, developing technology and fuelling research that will help transition B.C. to a low-carbon economy, including in the ocean-based sector," said Josie Osborne, Minister of Energy, Mines and Low Carbon Innovation. "Support for these leading-edge, pre-commercial projects ensures that British Columbians can continue to benefit from the growth and diversification of our first-class clean-technology sector."

Seven projects received a total of $7 million from the Province's Innovative Clean Energy (ICE) Fund, two of which will support the ocean-based economy.

British Columbia is home to a growing clean-energy sector and accounts for nearly 35% of Canada's clean-technology firms. Since 2008, the ICE Fund has committed approximately $112 million to support pre-commercial clean-energy technology projects, clean-energy vehicles, research and development, and energy-efficiency programs. ICE funding comes from a levy on the final sale of specified energy products – natural gas, fuel oil and propane distribution systems. ICE partnerships include First Nations, universities, municipalities and many emerging clean-technology companies throughout British Columbia.

Marine Battery Market worth $2,056 Million by 2030

The Marine Battery market size is projected to grow from USD 527 Million in 2022 to USD 2,056 Million by 2030, at a CAGR of 18.6 % from 2022 to 2030, according to a new report by MarketsandMarkets™. The anticipated growth in demand for hybrid and fully-electric vessels is driving market expansion.

Based on Ship Type, the commercial segment is projected to lead the Marine Battery market during the forecast period. Adopting hybrid and electrical systems to replace conventional propulsion systems to reduce the carbon and sulfur emissions from marine vessels is driving the marine battery market. Manufacturers are trying to respond to increasing industry demand to minimise greenhouse gas emissions. With this in mind, new commercial ship construction is expected to create 40% less carbon dioxide emissions by 2040.

Based on Battery Type, the lithium battery segment will dominate the market share during the forecast period. Hybrid and fully electric vessels rely on lithium batteries as a prime power source. These batteries have a long lifecycle and high power storage capacity regarding charge/discharge efficiency and low maintenance needs. They offer the highest specific energy of commercially available batteries, relatively high cycle life, and the highest energy density of commercially available batteries. Other market alternatives to lithium-ion are often unable to deliver the same level of energy density or cycle life. Different materials and chemistries in the electrodes and electrolytes, as well as production processes and related materials, can be found in lithium-ion batteries.

Based on Propulsion Type, the fully electric segment is projected to lead the Marine Battery market during the forecast period. The market is further segmented into conventional, hybrid, and fully-electric propulsion systems. Electric propulsion reduces the requirement for a huge distance between the diesel engine and the propeller shafts and rudders, significantly reducing overall mechanical equipment weight, higher tank capacity, and enhancing ship navigation efficiency. It helps significantly reduce the overall fuel emissions generated by a marine vessel.

The Marine Battery market industry has been studied in North America, Europe, Asia Pacific, and Rest of the World. Europe accounted for the largest market share in 2022, and it is also projected to witness the highest CAGR during the forecast period. The market for Marine Battery is expected to benefit from rising global trade operations, hybridisation and electrification of marine vessels while the escalation of global geopolitical rifts is driving the race for superiority in terms of military capabilities, as evidenced by increased defence expenditure and divestments in the modernisation of various defence vessels by countries. Furthermore, increased investment in R&D by major players and OEMs to manufacture superior energy storage systems to meet future sustainable and operational requirements will drive the market.

Major players operating in the marine battery market include Corvus Energy (Norway), Leclanché S.A. (Switzerland), Siemens AG (Germany), Saft SA (France) and Shift Clean Energy (Canada).

App for safely navigating waterways launched

The Department of Municipalities and Transport (DMT) of Abu Dhabi launched the Al Nalia smartphone app to provide access to Abu Dhabi's maritime safety maps on 20 March 2023.

Developed in collaboration with Abu Dhabi Maritime and Maqta Gateway - both of which are part of A.D. Ports Group - the application enhances the safety of marine navigation in the emirate and ensures the efficiency and ease of use of waterways in Abu Dhabi.

Al Nalia has been introduced as a follow-up to the launch of the Maritime Safety Maps in Abu Dhabi. The two launches demonstrate a qualitative shift in maritime navigation in the emirate by displaying important navigational information, including the major commercial transit lanes and connectivity routes, speed limits, mooring and anchorage areas, and designated locations for motorised and non-motorised recreational maritime activities, in real-time.

With its highly interactive interface, the app will help users search directly for the nearest marine facilities, including marinas, slipways, marine fuel stations, and locations designated for recreational activities like jet skis, marine water sports, swimming, and surfing.

The app has been named after the historical maps used by UAE's ancestors for navigating local waterways, which also marked information about the harbour and pearl diving sites. The name, Al Nalia, is a homage to the legacy and depth of sailing history in the UAE.

The programme aims to train a pipeline of ocean scientists

Universities in Africa must train a pipeline of interdisciplinary ocean scientists with the knowledge, skills and expertise to meet the growing needs of the Blue Economy and to tackle challenges emerging from global warming as well as overfishing.

One initiative that is expected to address the shortfall of skills in ocean science is the development of a new, high-quality, interdisciplinary, inclusive and internationally-recognised South African Masters in Ocean Sciences (SAMOS). This programme, expected to be implemented in 2026, will integrate the knowledge teaching capacities and student bodies of nine South African universities, reflecting the full breadth of expertise in ocean sciences found in South Africa and will address Sustainable Development Goal 14: Life Below Water, which aims to conserve and sustainably use the oceans, seas and marine resources.

South Africa is one of 38 countries in Africa that has a coastline, with Madagascar having the longest at about 4,800km and the Democratic Republic of Congo the shortest, with only 37km. Several higher education institutions in these countries have incorporated ocean science, often linked to economic activities such as aquaculture, into their higher education programmes.

Ghana, for instance, has been making advances in ocean science through the Maritime University, the University of Ghana and the University of Cape Coast, which is an African Center of Excellence in Coastal Resilience as recognised by the World Bank.

In South Africa, the University of Cape Town (UCT) and Nelson Mandela Universities (NMU) have emerged as leaders. NMU, for example, has a growing skills base in ocean science, including an ocean sciences campus that is known for pioneering transdisciplinary, postgraduate ocean sciences research, teaching, innovation and engagement.

UCT, on the other hand, offers two undergraduate degrees in ocean and atmospheric sciences and marine biology. In addition, the university offers a master's in Applied Ocean Sciences, which comprises coursework and a research project.

Both UCT and NMU are involved in the development of the new master's programme.

Cyprus and U.K. sign MoU to increase cooperation in shipping

The Cyprus Shipping Deputy Ministry (SDM) and the Department for Transport of the United Kingdom of Great Britain and Northern Ireland signed a Memorandum of Understanding (MoU) on 21 February 2023 to further strengthen shipping relations between the two states.

The agreement includes a range of commitments designed to address current challenges faced by the sector. Drafted to align with the needs and objectives of each country, the MoU aims to stimulate economic development on a mutually advantageous basis, with a specific focus on driving progress in shipping's response to climate change issues. Joint scientific and technical workshops, conferences, training programmes, seminars, and courses, amongst other initiatives, will be implemented to drive shipping towards its sustainability goals.

The core focuses of the agreement also include maritime safety and security and pollution from ships. The two states are also committing to jointly address issues around piracy, fraudulent ship registrations, seafarer welfare and training, and the implementation of transport-related sanctions that impact the sector. Both parties pledge to promote cooperation in shipping within the framework of international and regional councils such as the International Maritime Organisation and the Commonwealth.

Types of Rudders and Propeller of a Marine Ship

Nazrul Islam

When it comes to the intricate world of marine ships, efficient propulsion and maneuverability are paramount. Two vital components that significantly influence a ship's performance in the water are the rudder and propeller. These crucial elements work in tandem to steer, propel, and maintain stability in various maritime vessels. From cargo ships to cruise liners, each type of ship requires carefully chosen rudders and propellers that are tailored to its specific needs. In this article, we will delve into the diverse types of rudders and propellers employed in marine engineering, shedding light on their functionalities, designs, and the factors that influence their selection. By understanding the significance of these essential components, we can better appreciate the complex interplay between technology and navigation in the vast world of maritime transportation.

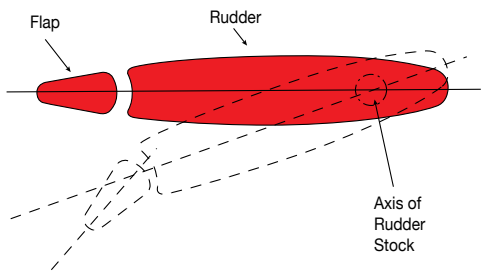
Types of rudder used in the ship

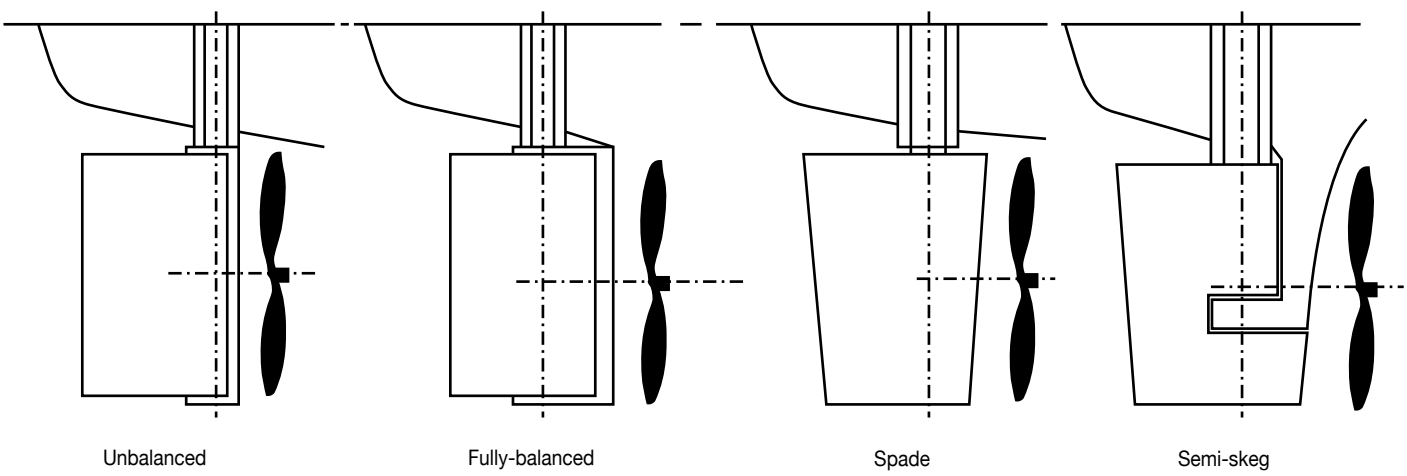
• **Balanced Rudders:** These are the most basic and typical kind of rudder. It has a flat surface that a counterweight or hydraulic cylinder balances to reduce the effort needed to rotate the rudder. Although balanced rudders are dependable and require little upkeep, they may perform less effectively in strong currents or high speeds.

• **Unbalanced Rudders:** These are comparable to balanced rudders but have a hydraulic cylinder or counterweight. Unbalanced rudders are harder to turn, although they perform better in strong currents or high speeds.

• **Spade Rudders:** These rudders are mounted on the aft of the keel and have a streamlined shape that reduces drag and increases efficiency. Spade rudders are commonly used on high-performance sailboats and racing yachts.

• **Flap Rudders:** These rudders have a flap that can be adjusted to increase or decrease the lift generated by the rudder. Flap rudders are commonly used on vessels that require high manoeuvrability, such as tugs and workboats.





• **Skeg Rudders:** These rudders are attached to a vertical fin or skeg, which provides support and lowers the possibility of rudder damage. On big boats like ferries and ships, skeg rudders are frequently utilised.

• **Twist Rudders:** These rudders have a twisted shape, providing better control and high-speed stability. Twist rudders are commonly used on fast ferries and other high-speed vessels.

Types of propellers used on the ship

• **Fixed Pitch Propeller (FPP):** The simplest and most common propeller used in ships is the fixed pitch propeller (FPP), which has a fixed blade angle that cannot be changed. FPPs are reliable and economical, but their efficiency and mobility are limited.

• C**ontrollable Pitch Propeller (CPP):** A propeller with movable blade angles can be altered to enhance effectiveness and manoeuvrability. Although CPPs are more expensive and sophisticated than FPPs, they are more effective and flexible.

• **Ducted Propeller:** A propeller enclosed in a duct improves efficiency and manoeuvrability by reducing turbulence and increasing thrust. Ducted propellers are commonly used in tugboats and workboats.

• **Azimuth Thruster:** A 360-degree rotating propeller and rudder combination offers exceptional manoeuvrability and accurate directional control. Cruise ships and ferries frequently use azimuth thrusters.

• **Contrarotating Propeller:** A propeller system that uses two propellers rotating in opposite directions, providing higher efficiency and speed than single propellers. Contrarotating propellers are commonly used on naval ships.

• **Waterjet Propulsion:** A propulsion system that propels a ship using a water jet provides excellent manoeuvrability and precise directional control. In high-speed vessels, waterjet propulsion technologies are frequently used.

Types of marine ships

1. **Bulk Carrier:** A cargo ship transporting dry bulk cargoes, such as coal, grain, or iron alloy.

2. **Container Ship:** A cargo ship designed to transport standardised shipping containers, which can be quickly loaded and unloaded using cranes and other equipment.

3. **Tanker:** A ship designed to transport liquid cargo, such as oil or chemicals.

4. **Ro-Ro (Roll-On, Roll-Off) Ship:** A ship designed to transport wheeled cargo, such as cars, trucks, and trailers.

5. **Passenger Ship:** A ship designed to transport passengers, such as cruise ships, ferries, or ocean liners.

6. **Research vessel:** a ship designed for scientific research, such as oceanography or marine biology.

7. **Tugboat:** A small, powerful boat designed to tow or push other vessels.

8. **Offshore Supply Vessel:** A ship that supports offshore oil and gas operations, transporting personnel, equipment, and supplies.

9. **Fishing Vessel:** A ship designed for commercial fishing, such as a trawler, longline, or crabber.

10. **Naval Ships:** A ship designed for military use, such as frigates, destroyers, or aircraft carriers.

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From the Shore to the Horizon

Discovering the Serenity of Kuakata and the Buzz of Its Industrial Neighbours

Noor Mohammad Shuvo

Nestled on the southern coast of Bangladesh, Kuakata is a hidden gem that offers visitors a chance to unwind and escape the hustle and bustle of city life. Known for its pristine beaches and stunning sunsets, Kuakata is quickly becoming a must-see destination for travellers seeking a unique and authentic experience. We, the students of Naval Architecture and Offshore Engineering 3rd batch, had the opportunity to spend four magical days in the serene speculation of Kuakata and the buzz of Industrial Neighbours on an internal study tour on Patuakhali, which included Durgashagor, Guthia Baitul Aman Mosque, Payra Thermal Powerplant, and Payra Deep Sea Port. Our respected Dean FET faculty members gave us their guidance throughout the tour. On our way to explore the coastal beauty of Kuakata, we stopped and witnessed the scenic beauty of Durgashagor and Guthia Baitul Aman Mosque. Durgashagor, locally known as Madhabpasha Dighi, is the largest lake in southern Bangladesh. The scenic beauty of the lake is a treat for the eyes. There is a small island in the middle of the lake; we couldn't visit it due to a shortage of time. The next stop was the historic Baitul Aman Mosque, also known as the Guthia Mosque. We said our Jumah prayer at the mosque. The architectural beauty of the mosque mesmerized us without any doubt. After praying, we headed to the Bangladesh Marine Academy, Barishal, for lunch. Amazed by their incredible hospitality, we headed to Kuakata sea beach.

It is famous for its panoramic sea beach, where one can witness both sunrise and sunset from the same beach. We've been able to see the beautiful light from the sunrise point. Small red crabs coming out of their home to seek food was also a treat to watch.

On our second day, we headed for BNS Sher-E-Bangla, which is planned to be the most extensive naval base in Bangladesh. The base is still under construction. The respected-on-duty officers warmly welcomed us. We've had a session related to the base's objectives, mission, vision, and facilities.

After we departed from BNS Sher-E-Bangla, we headed to Payra's 1320 MW thermal power plant. It's a coal-based power plant busy producing vital energy for Bangladesh. We had the privilege of seeing the functions of the powerplant. The plant consists of two units, each with a capacity of 660 MW. The plant's total capacity is 1320 MW, making it one of the largest power plants in the country.

On the third day, we went to Payra Deep Sea Port. The port covers an area of around 9,000 acres and has a natural deep-sea channel that allows large vessels to enter and exit the dock quickly. Payra Port has a modern container terminal that can handle up to 150,000 TEUs (twenty-foot equivalent units) of containers per year. The port authority welcomed us and answered our queries at our introductory session.

Visit to Payra Port

Visit to the Mausoleum of Bangabandhu Sheikh Mujibur Rahman

Visit to BNS Sher-E-Bangla

We visited a pilot vessel to see the container terminal under construction.

After visiting the industrial neighbours, we returned to the shores of Kuakata. The knockout stages of the FIFA World Cup were happening, and how could we ignore a football match at the beach? The boys of NAOE 3rd had an intense football match that ended in a draw. All the frenemies in that football match then soaked themselves in the misty water.

On our way back to the university premises, we went to the Mausoleum of the Father of the Nation, which is situated at Tungipara, Gopalgonj. The Mausoleum is a solemn and impressive structure that commemorates the life and legacy of Sheikh Mujibur Rahman. We got back to Dhaka after visiting such historical places in Bangladesh.

Throughout these four days, we've had some incredible experiences. Kuakata's stunning natural beauty, including its picturesque beaches and the famous sunset view, provided us with tranquillity and relaxation. The Payra Power Plant, on the other hand, is a remarkable feat of engineering that showcases the country's progress towards becoming a modern industrial nation. And Payra Port, with its strategic location and state-of-the-art facilities, is poised to become a vital hub of international trade and commerce. The memories we made are unforgettable.

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Sea Ranching

A Sustainable Approach for the Blue Economy of Bangladesh

Saif Khan Sunny

The rising worldwide demand for seafood and the reduction or stabilisation of most of the increased interest in sea ranching is due mainly to the availability of marine fisheries resources and advances in aquaculture technology. After peaking at 88.67 million tons in 1989, the global production from catch fisheries has stabilised or decreased. Many wild stocks that had historically supported commercial fisheries can no longer replenish abundance through reproductive recruitment and cannot regain their adaptation and genetic diversity due to the careless exploitation of marine living resources, disruption of ecological links, and damage to important habitats. The resources of the ocean are robust but limited. Several species' catch has decreased due to overfishing and habitat loss, and despite changes in management strategies, their populations have yet to recover. What additional proof is required to demonstrate the depletion of ocean resources? We must carefully consider the effects of irresponsible exploitation of the sea's living resources for our life-support systems because it is the last unexplored region of the world. The number of people has surpassed 6 billion and is still rising.

What is sea ranching?

Sea ranching is a form of aquaculture that involves the release of young fish or other aquatic species into the open sea to grow and mature in their natural environment. It differs from traditional aquaculture, which involves fish farming in enclosed tanks or ponds. Sea ranching consists of collecting wild fish or other aquatic species, which are reared in hatcheries or nurseries until they reach a specific size. They are then released into the open sea, where they continue to grow and mature until they are ready to be harvested.

Sea ranching is often used to conserve fish stocks that are threatened due to overfishing, habitat destruction, and other environmental factors. By releasing young fish into the open sea, sea ranching can help supplement wild fish stocks and provide a sustainable source of fish for commercial and recreational fishing. Sea ranching can also provide economic benefits, particularly in coastal areas where fishing is an essential source of livelihood. The release of fish into the open sea can create new opportunities for commercial and recreational fishing and for the development of the tourism industry.

World status:

Sea ranching, also known as marine ranching, is a practice that is used in many parts of the world to supplement wild fish stocks and support sustainable fishing industries. Here are some examples of sea ranching initiatives around the globe:

Japan: Sea ranching has been used in Japan for centuries and is a well-established industry. The Japanese sea ranching industry focuses mainly on cultivating seaweed, oysters, and sea bream.

Norway: Sea ranching is an important industry in Norway, particularly for Atlantic salmon. The country has been using sea ranching to supplement wild salmon stocks since the 1970s.

Chile: Sea ranching is a major industry in Chile, particularly for Atlantic salmon and rainbow trout. The country has used sea ranching to supplement wild fish stocks since the 1980s.

Australia: Sea ranching is used in Australia for various fish species, including southern bluefin tuna, mulloway, and abalone. The industry has been growing in recent years, particularly in abalone cultivation.

United States: Sea ranching is used in the United States for various fish species, including salmon, shellfish, and striped bass. The industry is significant in states such as Washington, Alaska, and Maine.

China: Sea ranching is a growing industry in China, particularly for shellfish such as abalone and sea cucumber. The country has used sea ranching to supplement wild fish stocks since the 1980s.

New Zealand: Sea ranching is used in New Zealand for various fish species, including paua, green-lipped mussels, and oysters. The industry has been growing in recent years, particularly in cultivating paua.

Prospects in Bangladesh:

Sea ranching is a form of aquaculture that involves rearing fish and other aquatic species in the open sea. This aquaculture method has significant potential for Bangladesh, given the country's extensive coastline and the large number of fish species found in its waters. There has been growing interest in sea ranching in Bangladesh in recent years, and there are several prospects for developing this industry in the country.

One of Bangladesh's leading prospects for sea ranching is the potential for increasing fish production. Bangladesh is the fourth largest fish-producing country in the world, with an annual fish production of around 4 million metric tons. However, the country's natural fish stocks are under threat due to overfishing, climate change, and other environmental factors. Sea ranching provides a sustainable alternative to wild-caught fish and can help supplement the country's fish production.

Another prospect for sea ranching in Bangladesh is the potential to create new employment opportunities. The aquaculture industry is a significant employer in Bangladesh, providing jobs for millions of people. Sea ranching has the potential to create additional jobs, particularly in coastal areas where there is a high demand for employment.

Sea ranching can also contribute to the conservation of fish species in Bangladesh. Many species of fish in Bangladesh are threatened due to overfishing, habitat destruction, and pollution. Sea ranching can help conserve these species by providing a controlled environment for their growth and reproduction.

In addition, sea ranching can also contribute to the development of the tourism industry in Bangladesh. Sea ranching can provide opportunities for tourists to observe fish and other aquatic species in their natural habitat and offer recreational fishing opportunities.

However, some challenges also need to be addressed to realise the potential of sea ranching in Bangladesh fully. One of the main challenges is the need for more technical expertise and infrastructure for sea ranching. There is a need for training and capacity building for farmers and fishermen, as well as for the development of appropriate infrastructure such as hatcheries, nurseries, and feed mills.

Another challenge is the need to address environmental concerns related to sea ranching. Sea ranching can impact the marine ecosystem, and there is a need to ensure that the industry is developed sustainably and responsibly.

In conclusion, sea ranching has significant prospects for development in Bangladesh, particularly in terms of increasing fish production, creating employment opportunities, and contributing to the conservation of fish species. However, some challenges must be addressed to realise this industry's potential fully. With the right policies, infrastructure, and technical expertise, sea ranching can play an important role in the sustainable development of Bangladesh's aquaculture industry.

However, sea ranching also has challenges, such as ensuring that the released fish do not negatively impact the environment or wild fish stocks. There is also a need for appropriate infrastructure, such as hatcheries and nurseries, to support the sea ranching industry.

Overall, sea ranching is a promising method of aquaculture that has the potential to contribute to the conservation of fish stocks and the sustainable development of the fishing industry.

In conclusion, sea ranching is a practice that is used in many parts of the world to supplement wild fish stocks and support sustainable fishing industries. While the species and methods used in sea ranching may vary depending on the region, the goal is to provide a sustainable source of fish for commercial and recreational fishing while conserving wild fish populations.

Artisanal fishermen in Bangladesh cast their nets in the Bay of Bengal, showcasing their age-old fishing techniques and deep connection to the sea, as they continue their vital role in sustaining coastal communities and preserving traditional fishing practices

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Why A Modern Seagoing Ship Repair & Maintenance (R&M) Yard is Essential for Business in Bangladesh

Capt Sayeed M Hassan, (S), NUP, psc BN

Bangladesh's Shipbuilding Industry Development Policy 2021 aims to make shipbuilding a sustainable industry that generates employment and earns foreign currency. However, the policy does not explicitly mention the development of modern ship repair and maintenance yards, which are attractive business opportunities internationally. Bangladesh has a comparative advantage in labour-intensive work, demonstrated in the ship recycling industry, and may be exploited in other service sectors. This article explores the importance of modern ship repair and maintenance yards in Bangladesh by examining the repair and maintenance aspects of ships, highlighting the stages of development observed in the shipbuilding sector, discussing the precarious condition of shipbuilding companies in Bangladesh, and emphasising the global, regional, and domestic state of the ship repair business. Additionally, the article takes an opportunity-based approach to justify the need for modern ship repair yards, based on four opportunity enablers: identification of opportunity, qualities of opportunity, the feasibility of opportunity, and competitiveness of opportunity. The conclusion emphasises the importance of developing modern ship repair and maintenance yards in Bangladesh to create employment, earn foreign currency, and develop skills for future shipbuilding.

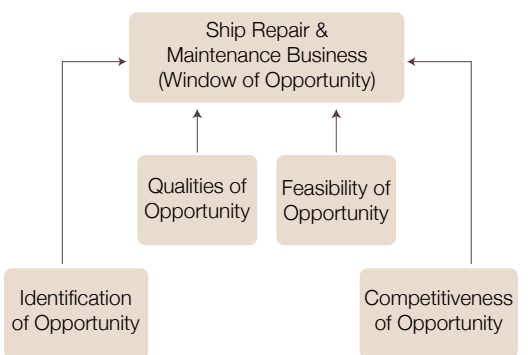


Figure 1: Conceptual Framework (Opportunity Enablers vs Window of Opportunity)

Crafting Maritime Excellence: Skilled workers in the shipbuilding and repair yards of Bangladesh diligently ply their trade, demonstrating expertise and dedication as they construct and refurbish vessels, contributing to the growth of the nation's maritime industry

An outlook of a ship repair industry

The ship repair industry is often considered part of the broader shipbuilding industry, encompassing new ship construction, ship conversion, and ship recycling. Ship repair tasks typically involve docking, cleaning, greasing, and scrubbing. They can usually be completed within days or weeks, unlike the years it takes to construct a new vessel. The repair industry is labour-intensive, and automation plays a relatively minor role. Everyday ship repair activities include steelwork, machinery work, electrical work, pipework, and painting. Typically, 70% of repair work is done while a vessel is in a berth, while the remaining 30% requires docking facilities such as dry docks or floating docks. An ideal modern repair yard would have slipways, jetties, berthing facilities, dry docks, floating docks, several workshops, experts, and skilled workers. Unlike shipbuilding, which is a product-oriented business, ship repair is service-oriented. Developing economies with a plentiful labour supply, such as Bangladesh, have an advantage in the ship-repair business. According to OECD studies, ship repair has become an attractive business with the growth of maritime trade and increasing gross tonnage of ships. Significant shipbuilding and ship repair yards are located in Asia.

Figure 2: Common Stages of Development (From Ship Repair to Shipbuilding)

How did giants become shipbuilders? From ship repair to shipbuilder

According to a recent report by UNCTAD (2022), China, the Republic of Korea, and Japan collectively account for 94% of the global shipbuilding market. These countries have established themselves as the primary maritime ship suppliers in the global market for several years, and their success in the industry took time to come about. As noted in Won's book "Korean Shipbuilding Industry: Growth and Mission," the evolution of the shipbuilding industry in these nations has followed a familiar pattern (see Figure 2). This results from the increased seaborne trade due to industrial and economic development in these countries.

The common stages that the world's former shipbuilding industry leaders, such as Japan, Korea, the US, and Britain, followed without exception can be summarised as follows. First, nations relied on merchant ships from other countries when trade was insignificant. Second, countries purchased new or used ships from developing shipping nations due to the need for increased trade. Third, shipyards for repairing ships were constructed as seaborne trade and foreign and domestic ships increased. Fourth, new shipyards were built as technologies for repairing ships were acquired, and the demand for domestic ships grew. The steel industry, an upstream industry in the supply chain, grew to meet the demand for steel required for shipbuilding. Fifth, based on cost leadership, these countries increased their market share in the world market. Labour costs were crucial in the shipbuilding industry, so the US and the UK are no longer competitive. China has surpassed Japan and the Republic of Korea.

In 2021, China accounted for 44% of the total gross tonnage delivered, while the Republic of Korea had 32%, Japan had 18%, and the Philippines had 1%, leaving the remaining countries to share a mere 5% of the market. These statistics suggest that there needs to be more demand for new building markets in developing countries like Bangladesh.

Shipbuilding: Where does Bangladesh currently stand?

Bangladeshi private entrepreneurs have shown a resilient spirit by constructing seagoing ships for the global market, despite facing considerable risks and uncertainties. Over the period from 2008 to the present, a total of 31 small ships, with a maximum weight of 8000 dwt, have been exported to Europe, Africa, and Asian countries (Figure 3). Two companies constructed these ships, Ananda Shipyard and Slipways Ltd and Western Marine Shipyard Ltd. The recent shipment of a locally built, 6100-ton load capacity, high-speed multipurpose container ship to the UK by Ananda Shipyard is welcome news for the industry, particularly given the current global political and economic conditions. However, as a whole, shipyards focused on building export-oriented new ships that need to be in better shape. Several prominent export-oriented shipyards in Bangladesh are fighting for survival.

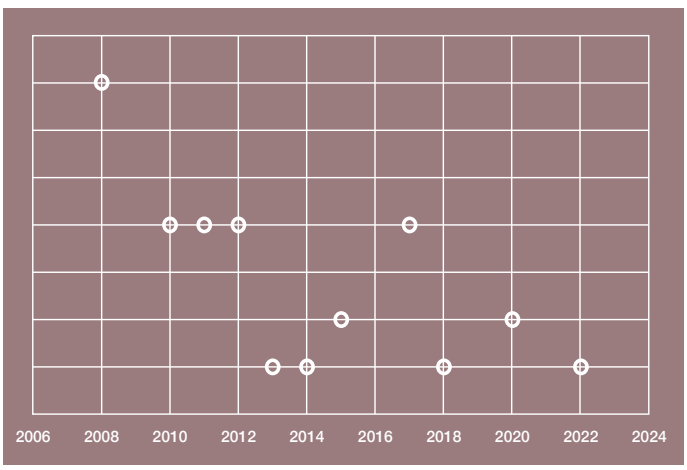


Figure 3: Export of Vessels from Bangladesh (2008 – 2022)

A study shows that constructing new ships costs 60% of materials, 20% of labour, and 20% of overhead. Due to a weak local supply chain, the local value addition, apart from labour, is negligible. The journey of new shipbuilding in the last decade is far from encouraging. A World Bank study has reported that Bangladesh lacks many necessary criteria for new shipbuilding, such as ship design quality, technical capabilities, processes, overall cost, people, and the business environment of shipbuilding compared to Korea, China, and Vietnam. The current policy, SBIDP 2021, has also recognised that shipbuilding requires more investment, advanced technology, and a lengthy period and has acknowledged that Bangladesh lags behind leading countries in terms of financial investment, resource allocation, and other facilities. Given these circumstances, the ship R&M business, where demand is much more stable, has the potential to earn foreign currency and to generate employment in Bangladesh.

Overview of ship repair business

Ship repair is a lucrative industry for many countries worldwide, driven by various factors such as pre-planned maintenance, unscheduled repairs, port state control regulations, second-hand ship sales, and the re-activation of laid-up vessels. Estimating the future demand for ship repair is challenging, with most requisitions typically originating from unscheduled repairs. Research suggests that the demand for repair and maintenance services positively correlates with the growth of the world fleet, which requires regular repair and maintenance throughout its lifecycle. As such, the market for repair and maintenance has tremendous potential to generate revenue.

Dry docking is integral to ship repair and maintenance, typically occurring every 30 months to comply with flag legislation and classification society rules. The cost of dry-docking is a significant component of a ship's operating expenses, often amounting to six or seven figures.

Despite the challenges posed by the COVID-19 pandemic, the ship repair industry has remained relatively stable, with over 11,000 vessels repaired in 2020. China has emerged as the global leader in ship repair, accounting for 49% of all ship repairs worldwide in 2020, up from 45% in 2019. The ship repair market is projected to grow at a compound annual growth rate of 7.77% from 2017 to 2022, reaching nearly $33,109.59 million in 2022 and expected to increase to $49,523.21 million in 2027, with further growth projected beyond 2032.

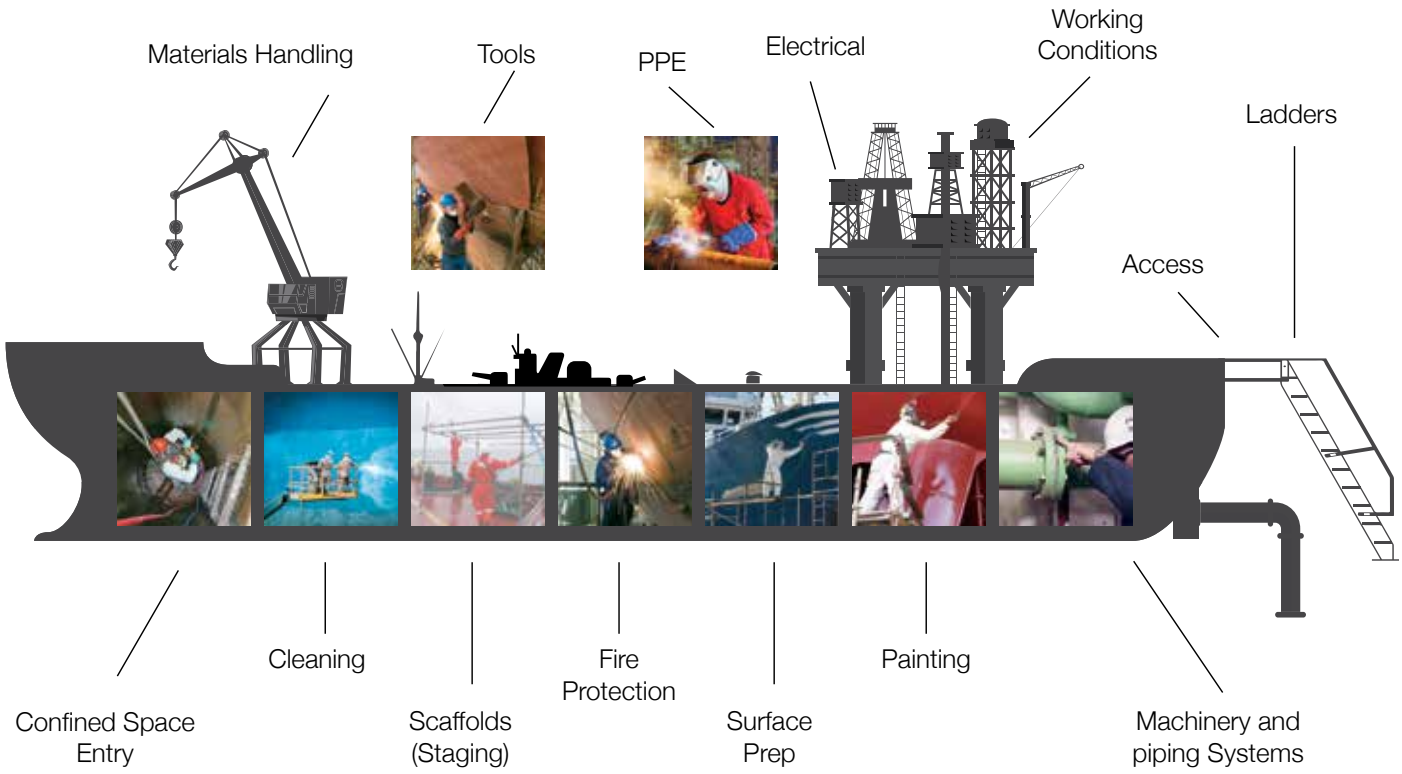
As the demand for new shipbuilding declines, shipbuilding countries like China are converting new building yards into repair yards. Meanwhile, India aims to capture 10% of the global ship repair industry in its 12th five-year plan, with seven permanently approved ship repair units currently operating in the country. The European shipbuilding industry is also advised to focus on its ship repair potential to remain competitive.

Furthermore, installing new treatment systems following the International Convention for the Control and Management of Ships' ballast water and Sediments represents a significant opportunity for the ship repair industry, valued at approximately USD 100 billion. As such, the prospects for the ship repair business are bright, with Asian repair yards currently accounting for 80% of work orders in 2022. However, there is a need for more suitable repair yards in countries such as Bangladesh, where modern and well-located ship repair yards have a high potential for success, as acknowledged by more than 95% of respondents in a recent survey.

What is holding back the ship repair business?

The shipbuilding industry in Bangladesh comprises three main components: new building, ship repair, and ship recycling. The contribution of the country's seagoing merchant vessel repair and maintenance (R&M) business is minimal. Most local ship repair yards primarily repair domestic vessels due to their limited capacity. The Chittagong Dry Dock Limited (CDDL) is a state-owned enterprise that offers only limited dry-docking facilities for seagoing merchant vessels in the country. Established in 1986, CDDL is located on the bank of the

Nurturing Maritime Dreams: *In Bangladesh, skilled artisans meticulously craft small ships, reflecting the country's commitment to shipbuilding prowess. This captivating photo captures the essence of their dedication, as they construct vessels that will navigate the waterways, fostering local trade, transportation, and livelihoods*



Shipbuilding and repairing processes

Karnaphuli River, and the maximum draught for navigating ships within the port is 9.5 meters. However, CDDL can dock ships of up to 22,000 dwt capacity, with a length of 175 meters and breadth of 24 meters, which needs to be improved for modern seagoing merchant vessels.

As a result, many Bangladesh-flagged merchant vessels, including the six newly procured vessels of the Bangladesh Shipping Corporation (BSC), either need help to enter the channel or be docked due to their larger dimensions. Therefore, these vessels must be sent to countries such as China, Singapore, Sri Lanka, Malaysia, Thailand, Dubai, or Oman for R&M services. The CEO of a leading ship management company has pointed out that Chinese shipyards offer the cheapest service prices compared to those in Singapore and Sri Lanka. The cost of R&M for each vessel is approximately USD 800,000 over five years, including two routine dockings and other expenses. Bangladesh's absence of a suitable repair yard means the country cannot provide R&M services to ship owners, creating a business opportunity.

Why a modern ship repair yard is essential for Bangladesh?

A modern port must prioritise repair and maintenance for high productivity and to establish a reputation that reduces technical and commercial risks to port users (UNCTAD, 1992). This is crucial for attracting deep-draught vessels, which are hesitant to dock at ports that cannot provide adequate safety measures. Although new seaports like Matarbari and Payra exhibit potential, a good ship repair yard along the coast is necessary to attract such vessels.

A ship repair yard-centric business presents an attractive opportunity for investors due to its timely nature, possible value, and durability. The low labour costs in Bangladesh make a modern repair yard attractive to ship owners. With more than 4000 vessels visiting the country's seaports annually, this would add significant value to the business. Additionally, the return on investment for a ship repair yard is expected to be faster than for a new shipbuilding yard. As an emerging economy with a rapidly growing maritime trade, Bangladesh is projected to reach the 25th rank by 2035 (CEBR). Hence, a modern ship repair yard business is likely durable with inherent competitive advantages.

Feasibility is a key factor in the viability of a business, and a modern shipyard in Bangladesh is viable for several reasons. The shipbuilding industry has considerable experience, so professionals have the ability and workers have the necessary skills to run a repair yard. Most ships visiting Bangladesh seaports are bulk vessels and stay longer, making a new repair yard an excellent place for carrying out repair work when needed. Moreover, shipbuilding companies are listed on the stock exchange, making it easy to raise capital from investors.

Competitiveness is also an aspect of a ship repair yard business opportunity. Diagnostic trade integration studies have shown that expanding maintenance and repair services is more stable and labour-intensive than building new ships. Since ship repair work is not prone to automation, developing economies with an abundant supply of labour, like Bangladesh, have a competitive advantage (OECD, 2008). The World Bank Group's diagnostic trade integration study on Bangladesh's shipbuilding sector also suggests an opportunity to expand maintenance and repair services.

In conclusion, a window of opportunity exists for a ship repair yard business in Bangladesh due to the unmet need and existing capacity in terms of skills, technical knowledge, and professionalism. The

exceptional value generated by a cost leadership ship repair yard would create revenue and jobs, leading to economic growth. The window of opportunity depends on the need, competency, and exceptional value the business generates, and it closes when the market matures.

Conclusion

This article sheds light on Bangladesh's ship repair and maintenance (R&M) industry and its potential for growth. At the government and policy-making levels, there needs to be more attentive efforts to the ship R&M business, resulting in no targets for exporting new ships to the international market. Despite having a rich history in shipbuilding, the industry has struggled to adapt to new technological changes and has failed to adopt the best international shipbuilding practices. Additionally, the industry needs a more robust supply chain dependent on the international market. A study reveals that the big players in shipbuilding became giants following a common stage of development, which suggests that Bangladesh should now consider a modern ship repair yard and gradually become a new builder of ships, as Japan, Korea, and China did, and now occupy 95% of the global market.

Furthermore, the demand for new buildings is declining, and many shipbuilding yards have fought for survival during the pandemic. Repair yards, on the other hand, have withstood these unwelcoming situations, and Chinese ship repair yards were able to do more business during this time. Even European shipyards focus more on the ship repair business, and neighbouring India wants to achieve a 10% share of the global ship R&M market. Due to compliance with International Maritime Organisation (IMO) conventions in the next few years, there is a business opportunity of USD 100 billion in the ship R&M market. This presents a massive opportunity for Bangladesh to flag vessel repair demand and capture a significant portion of the global market. Pursuing ship R&M business will enable Bangladesh to retain 60% of its revenue, create more job employment, and strengthen its supply chain.

However, to achieve success in this sector, government support is critical. Market-oriented policy support is necessary to overcome financial, technological, and regulatory challenges and ensure good governance in this sector. Collaboration between policymakers and professionals will stimulate this sector and instil confidence among entrepreneurs. Entrepreneurs' knowledge and creativity are crucial to success in any business, and instead of imitating others, they should opt for a business that no one can offer in the market. Ship R&M business in Bangladesh is where an entrepreneur may look for future investment.

Nevertheless, it is heavy industry and capital-intensive, and major shipbuilding countries prospered due to the proactive role and support of the government. Bangladesh has skilled experts and workers and can offer competitive prices in this business. However, direct and indirect government support is essential to make the business successful and grab the window of opportunity before it is eroded. In conclusion, policymakers need to recognise where the opportunity lies, identify strengths and weaknesses (both external and internal), and make realistic policy decisions to attain the target.

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Bangladesh's hazardous shipyards launch race for cleaner, safer future

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