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MARITIME CAMPUS

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

Maritime Education in the Context of Growing Digitalisation and Global Interdependence



Exploring the Depths
Revealing the Secrets of
Seawater Quality in the Bay of Bengal

The Making of BSMRMU's Dream Campus

Modernisation of Chittagong Port
to Build a Smart Bangladesh to Bolster Vision 2041

INFOGRAPHIC

INNOVATIVE TECHNOLOGIES FOR FUTURE OFFSHORE ENERGY INDUSTRY

The global offshore energy industry is rapidly evolving, with innovative technologies emerging that are shaping the future of the sector. These technologies are not only improving exploration and production but also increasing efficiency, safety, and sustainability. The offshore industry in Bangladesh is also experiencing significant changes, with improved access and increased applicability of energy technologies.

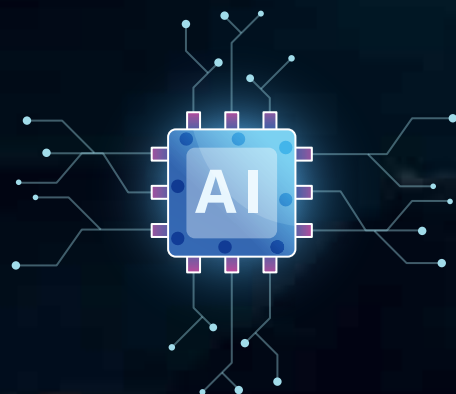


AUTOMATION

Automation is being used in the offshore industry to improve safety, efficiency, and productivity. Automated drilling rigs and robots are being used to inspect and repair subsea infrastructure, monitor transmission pipelines and tanks, and perform other tasks that are difficult or dangerous for humans to do.

ARTIFICIAL INTELLIGENCE (AI)

AI is being used in the offshore industry to analyze large amounts of data and improve decision-making. For example, AI can be used to analyze seismic data to identify potential oil and gas reserves.





ROBOTICS

Robotics is being used in the offshore industry to perform tasks that are difficult or dangerous for humans to do. For example, robots can be used to inspect and repair subsea infrastructure, monitor transmission pipelines and tanks, and perform other tasks.

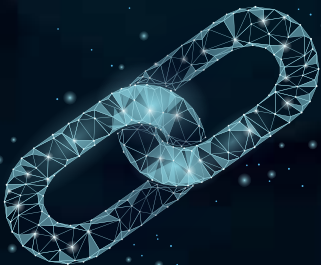
VIRTUAL REALITY

Virtual reality is being used in the offshore industry to train workers and simulate complex operations. For example, workers can use virtual reality to practice emergency response procedures or to simulate the operation of complex equipment.



BLOCKCHAIN

Blockchain is being used in the offshore industry to improve transparency and security in transactions. For example, blockchain can be used to track the ownership and transfer of oil and gas assets, reducing the risk of fraud and improving efficiency.



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Editorial

It is High Time to Sail for the Future of Maritime Education and Exploration

Welcome aboard the latest edition of "Maritime Campus," your trusted compass to the world of maritime knowledge, brought to you by Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU), Bangladesh. As we embark on this journey through the pages of this issue of our quarterly magazine, we are thrilled to present diverse insights and discoveries that reflect the ever-evolving maritime landscape.

In our lead story, "Maritime Education in the Context of Growing Digitalisation and Global Interdependence," Rear Admiral Mohammad Musa, OSP, NPP, rcds, afwc, psc, PhD, the Vice-Chancellor of BSMRMU, takes us on a profound voyage into the heart of maritime education. In an era characterised by rapid digitalisation and increasing global interdependence, Rear Admiral Musa underscores the important need for our maritime institutions to adapt and equip our students with the skills necessary to navigate the complex waters of the modern world. His thought-provoking perspective sets the course for the transformative journey we are about to embark upon.

In the Academica chapter, we delve deep into the mysteries of the Bay of Bengal with Dr Ferdousi Begum's article, "Exploring the Depths: Revealing the Secrets of Seawater Quality in the Bay of Bengal." Dr Begum's research opens a porthole into the intricate web of marine life and the vital importance of maintaining healthy seawater quality in our region. As we read her findings, we gain a profound appreciation for the intricate balance of life in our oceans and our responsibility to preserve it.

Turning our attention to infrastructure and development, "Modernisation of Chittagong Port to Build a Smart Bangladesh to Bolster Vision 2041" by Md. Sajal Ahmed invites us to envision the future of Bangladesh's maritime sector. The article explores how the modernisation of Chittagong Port is not just an infrastructure project but a strategic move towards realising the government's ambitious Vision 2041. By leveraging technology and innovation, the maritime industry is poised to play a pivotal role in shaping a smarter and more prosperous Bangladesh.

In "The Next Leap" chapter, we present a progress story of making BSMRMU's permanent campus, which is one of a dream in diligent translation into reality. It is becoming a success story with strategic planning, environmental consideration, and architectural innovation. With each passing day, the campus comes closer to embodying the lofty dreams of this nation—a testament to Bangladesh's unwavering commitment to its maritime future and a tribute to the legacy of Bangabandhu Sheikh Mujibur Rahman, after whom the university is proudly named.

Furthermore, the 'Campus Canvas,' 'Maritime Bangladesh,' and 'Around the World' sections will keep you updated on all significant maritime events and developments in the second quarter of 2023.

As we flip through the pages of "Maritime Campus," we are reminded that our journey in the maritime world is not just about ships and ports; it's about knowledge, innovation, and a deep commitment to stewardship of the oceans and the world around us. We hope that the articles presented in this edition inspire you, challenge your perspectives, and ignite your passion for the maritime industry.

Thank you for joining us on this voyage of discovery. We look forward to continuing this journey with you as we explore the ever-evolving world of maritime education, research, and industry.

Fair winds and following seas,

Captain Saad Emon Eshtiaque, (S), psc, BN

Editor and Controller of Examinations

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LEAD STORY

Maritime Education in the Context of **Growing Digitalisation** and **Global Interdependence**

Our lead story unfurls the captivating tale of maritime education, sailing through the uncharted waters of the 21st century. Discover how this story intertwines with the rising importance of geo-economy and our interconnected world. The author unveils three key facets: the evolution of maritime education in the digital age, its pivotal role in shaping the current geoeconomic landscape, and its profound impact on the intricate web of global interdependence.

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**Exploring the Depths: Revealing the Secrets of Seawater Quality in the Bay of Bengal**

This article invites the reader to join a journey of scientific exploration of the Bay of Bengal. The author reveals different water properties of this large sea and how they vary across different regions. The reader will also learn how the water changes indicate the diversity and well-being of marine life. The reader will appreciate why conserving this valuable water source is essential for our future.

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THE NEXT LEAP

A Vision Taking Shape on the Bank of Karnaphuli River**The Making of BSMRMU's Dream Campus**

Discover the construction journey of BSMRMU's permanent campus, where strategic planning, environmental mindfulness, and architectural innovation converge. The project is symbolising Bangladesh's commitment to its maritime future and honouring the Father of the Nation Bangabandhu Sheikh Mujibur Rahman. Witness this beacon of progress in this feature.

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PERSPECTIVE

Modernisation of Chittagong Port to Build a Smart Bangladesh to Bolster Vision 2041

In the quest for a smarter Bangladesh by 2041, Chittagong Port emerges as a pivotal player in shaping the nation's destiny. This article unveils the grand vision and challenges behind the modernisation strategy, offering a glimpse into the promising future of economic growth, competitiveness, and sustainability that lies on the horizon, but at a cost.

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News on Maritime Progress and Activities in Bangladesh



Maritime Education in the Context of Growing Digitalisation and Global Interdependence

Rear Admiral Mohammad Musa

In the 21st century, the maritime industry is crucial to facilitating global trade and transportation. With the advent of worldwide interdependence and the increasing importance of maritime commerce, there is a growing need for well-trained professionals in the maritime sector. Maritime education plays a vital role in preparing individuals to navigate the complex challenges of this industry. The maritime sector is essential to the global economy, transporting over 80% of the world's trade. As the world becomes increasingly interconnected, the maritime industry is becoming more competitive. This is leading to a growing demand for skilled maritime professionals. In this article, we will explore the significance of maritime education in the context of the growing importance of geo-economy and global interdependence, focusing on three key aspects: maritime education in the 21st century, maritime education in the current geoeconomic scenario, and the relationship between maritime education and global interdependence.

Maritime Education in the 21st century

The maritime industry has witnessed significant technological advancements and regulatory changes in the 21st century. As a result, the skills required by maritime professionals are also evolving. Maritime education institutions need to adapt their curricula and training methodologies to meet these changing demands.

The global maritime supply chain is a complex network of interconnected activities that facilitate the movement of goods across international borders. It involves various stakeholders, including shipping companies, port operators, logistics providers, and customs authorities. Maritime education plays a crucial role in understanding and managing this intricate supply chain. Today, maritime education encompasses a wide range of disciplines, including navigation, marine engineering, logistics, port management, maritime law, and environmental sustainability. Modern maritime education institutions integrate theoretical knowledge with practical training to equip students with the necessary skills to perform in their respective careers. This includes the use of advanced simulators, computer-based training, and hands-on experience aboard training vessels.

By providing education and training in trade facilitation and supply chain management, maritime education institutions equip professionals with the skills needed to optimise the global maritime supply chain's efficiency, reliability, and security. They foster a deep understanding of the interdependencies and challenges associated with global trade, enabling professionals to navigate the complexities of international supply chain operations effectively.

Additionally, contemporary maritime education emphasises the importance of interdisciplinary knowledge. Professionals in the maritime sector must comprehensively understand global economics, geopolitics, and international trade patterns. Therefore, maritime education programmes often incorporate business management, economics, and international relations courses to provide students with a well-rounded education.

The maritime industry is facing several challenges, including increasing competition from other modes of transportation, the need to comply with increasingly stringent environmental regulations, and the need to attract and retain qualified maritime professionals. In addition to these challenges, the maritime industry also enjoys several opportunities, including the growth of the global economy, the increasing demand for maritime transportation services, and the development of new technologies that can improve the efficiency and safety of maritime transportation. Maritime education must be prepared to address these challenges and opportunities to ensure that the global maritime industry remains competitive and efficient.

Maritime Education in Current Geoeconomic and Geopolitical Scenario

The geoeconomic race among states, regional and global players has become increasingly intense in recent years as countries vie for economic dominance and influence. Maritime trade routes play a critical role in facilitating global trade, making the maritime sector a focal point of geoeconomic competition.

In this context, maritime education is pivotal in enabling countries to develop a skilled workforce that can compete in the global maritime industry. Nations with well-established maritime education systems have a competitive advantage as they can produce highly trained professionals who understand the complexities of international trade, maritime law, and logistics.

Geopolitically, maritime discourse plays an essential role in current global scenario. The Russia-Ukraine war has a maritime dimension, especially regarding the control over the Black Sea. The conflict has significantly shifted the existing perception of maritime safety, given that the ships now have to operate within a tiny corridor in a conflict zone to avert disaster.

The COVID-19 has also impacted practises and norms in the maritime sector. The shipping industry has faced unprecedented disruption due to the COVID-related global supply chain problems. Key stakeholders in the maritime supply chain adopted several responses and risk mitigation measures to cope up with the disruption, continue to link supply chains, and enable smooth cargo flows. Among others, shipping carriers revisited their strategies to tackle the COVID challenges, such as reconsidering the frequency of their services and adjusting the levels of maritime transport connectivity, formulating new health regulations for the crew, offering remote working arrangements, prioritising the flow of essential goods, and promoting digital solutions to reduce physical contact, accelerate clearance procedures, and minimise paper-based processes.

Maritime education institutions can be drivers and platforms for innovation and technological advancements. As countries seek a competitive edge, they invest in research and development to enhance their maritime capabilities. Maritime education institutions may play a crucial role in nurturing talent and fostering collaboration between academia, industry, and government, thereby driving innovation in the maritime sector.

Maritime Education and Global Interdependence

Global interdependence has transformed the maritime industry by expanding trade volumes and increasing the interconnectivity of economies. The maritime sector serves as a crucial link in the global supply chain, facilitating the movement of goods and fostering economic integration among nations.

Maritime education is closely intertwined with global interdependence. It provides the necessary knowledge and skills to professionals who

Seaweed collection in coastal areas of Bangladesh is being conducted by the Genetic Engineering and Marine Biotechnology department of BSMMRU for research purposes





Students of Oceanography & Hydrography department of BSMRMU are in a practical learning session with oceanographic tools at sea

manage and operate international shipping routes, ports, and logistics networks. This includes understanding international regulations, compliance standards, and cultural sensitivities when dealing with diverse stakeholders from different countries.

Moreover, maritime education fosters a global mindset among students. Aspiring maritime professionals are exposed to diverse cultures and international perspectives through interactions with faculty, fellow students, and industry experts from around the world. This global exposure enhances their ability to work in multicultural teams and adapt to the dynamic nature of the maritime industry,

Science, technology and innovation have been changing the landscape of global maritime sector



which is characterised by interactions with individuals from various nationalities and backgrounds.

Furthermore, maritime education contributes to sustainable global interdependence. With increasing concerns about environmental degradation and climate change, the maritime industry is under pressure to adopt sustainable practices. Maritime education institutions are at the forefront of promoting environmental awareness and educating professionals on the importance of adopting eco-friendly technologies and techniques.

Maritime Education and Technological Advancements

In addition to the impact of global interdependence, maritime education is also influenced by rapid technological advancements. Emerging technologies such as automation, artificial intelligence, and digitalisation are transforming the maritime industry, creating new opportunities and challenges for maritime professionals.

Maritime education institutions are at the forefront of preparing students for the digital shipping age. These institutions incorporate maritime technology, policy and digitalisation courses to equip students with the knowledge and skills needed to navigate in the evolving challenges. For instance, training programmes on autonomous vessels and remote operations are becoming increasingly important as the industry explores the potential of unmanned ships. Maritime education institutions collaborate with industry partners to provide students with hands-on experience in operating and managing cutting-edge technologies.

Moreover, maritime education plays an important role in addressing the digital skills gap in the industry. As the maritime sector adopts advanced technologies, there is a growing demand for professionals who are proficient in data analytics, cyber-security, and digital supply chain management. Maritime education institutions are actively

integrating these subjects into their curricula to ensure that graduates are well-prepared to embrace the digital transformation of the industry.

Maritime education and Artificial Intelligence (AI) are two distinct fields that are increasingly converging to shape the future of the maritime industry. AI is revolutionising the way maritime education is conducted by providing sophisticated simulation and training tools. These AI-powered simulators replicate real-world scenarios, allowing students and maritime professionals to practice navigation, cargo handling and other critical skills in a safe and controlled maritime environment. The maritime industry generates vast amounts of data from various sources, including navigation systems, weather forecasts, cargo tracking, and more. AI can process and analyse this data in real-time scenario to provide valuable insights and support decision-making processes. AI plays a pivotal role in the development and operation of autonomous vessels. Maritime education is evolving to include training on AI-driven navigation systems, collision avoidance algorithms, and remote vessel monitoring. Training in AI-based safety protocols prepares maritime professionals to mitigate risks and respond effectively to emergencies. As the maritime industry becomes more connected through the Internet of Things (IoT) and digitisation, the risk of cyber-attacks also increases. AI can bolster cybersecurity defences by identifying potential threats and vulnerabilities. For example, a few applications of AI in the shipping industry are appended in the ensuing paragraph.

AI applications in the shipping industry

a. Fleet Management: AI can be used to optimise fleet operations and improve the efficiency of shipping routes by analysing data from GPS, weather and traffic.

b. Predictive Maintenance: AI can predict when equipment and vehicles will need maintenance, which will help reduce downtime and save costs.

c. Autonomous ships: AI can be used to develop autonomous ships that can navigate, dock, and make decisions independently, increasing safety and efficiency in the industry.

d. Cargo Optimisation: AI can optimise cargo loading and unloading by analysing cargo weight and volume data, vessel stability, and port infrastructure.

e. Risk Management: AI-based risk management systems can analyse data from various sources to identify and mitigate risks in the shipping industry, such as weather, traffic and piracy.

f. Supply Chain Management: AI can be used to optimise the entire shipping process, from order management to logistics and inventory management.

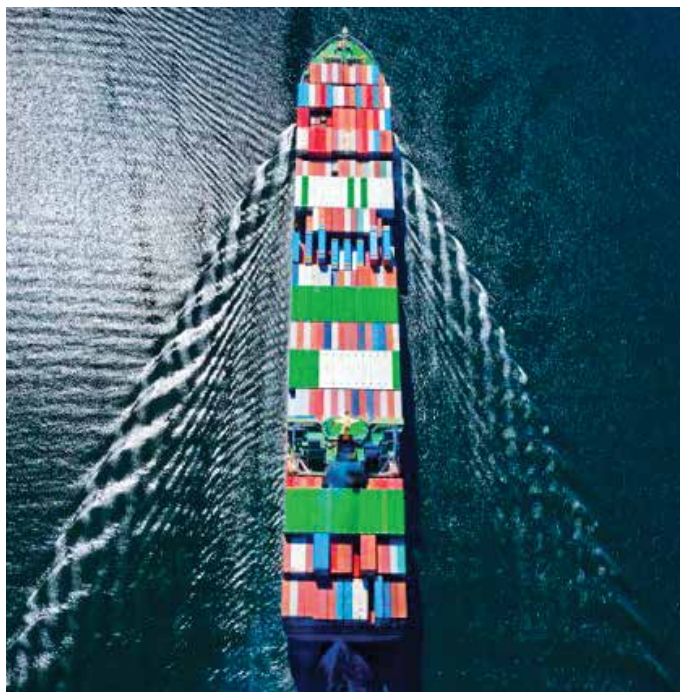
Maritime Education and Workforce Development

Maritime education is also crucial in addressing the global shortage of skilled maritime professionals. As the maritime industry expands and modernises, there is a pressing need for a qualified workforce to meet the growing demands.

Maritime education institutions collaborate closely with industry stakeholders to identify skill gaps and develop programmes that meet the industry's requirements. They provide specialised training and certification programmes that enable individuals to acquire the qualifications to work in a specific maritime sector. These programmes range from short courses to degree programmes, catering to the diverse needs of aspiring maritime professionals.

Furthermore, maritime education institutions actively promote lifelong learning and professional development. They offer continuing education programmes and courses to ensure maritime professionals stay updated with the latest industry trends, regulations, and technological advancements. This emphasis on continuous learning

Training with AI & using AI applications in the shipping industry





The honourable Vice-Chancellor of BSMRMU and the Director of CSIR-NIO Goa, India signs a MoU on Scientific Cooperation in Ocean Sciences



BSMRMU and National Ocean Technology Center (NOTC), China signed cooperation agreement on Marine Spatial Planning (MSP) for Advancing Blue Economy Development

is essential in a rapidly evolving industry where professionals need to adapt to new challenges and seize emerging opportunities.

Maritime Education and Sustainable Development

Sustainable development is a key global concern, and the maritime industry has a significant role to play in achieving environmental sustainability. Maritime education institutions recognise the importance of integrating sustainability principles into their programmes.

Maritime education promotes environmental awareness and encourages adopting sustainable practices in the maritime sector. Courses on maritime environmental management, renewable energy technologies, and green logistics provide students with the knowledge and skills to address the industry's environmental challenges. Maritime education institutions also collaborate with research organisations and industry partners to develop innovative solutions for sustainable maritime operations.

Ocean pollution is a pressing environmental issue that poses significant threats to marine ecosystems and human well-being. Maritime education plays a crucial role in addressing this challenge. By integrating courses on marine pollution prevention, waste management, and environmental sustainability, maritime education institutions raise awareness among future maritime professionals about the impact of human activities on the oceans. They equip students with the knowledge and skills needed to implement effective pollution prevention measures and promote sustainable practices in the maritime industry. Through research and innovation, maritime education institutions contribute to the development of solutions that mitigate ocean pollution, safeguarding the health and integrity of our oceans for future generations.

Maritime education institutions instil a sense of responsibility and ethics among students. They emphasise the importance of social

and ethical considerations in decision-making processes. Students are educated on issues such as human rights, labour conditions, and corporate social responsibility in the maritime industry. This holistic approach ensures that future maritime professionals are equipped with the values and mindset necessary to contribute to a sustainable and socially responsible maritime sector.

Furthermore, **SDG 14** (deals with Life Below Water), which aims to sustainably manage and protect marine and coastal ecosystems from pollution and address ocean acidification's impacts, can only be achieved by implementing Ocean Literacy with All (OLWA). In the same thread, one of the outcomes of the UN Decade of Ocean Science, 'An inspiring and engaging ocean', envisions a global society that understands and values the ocean concerning human well-being and sustainable development. Such an outcome can only be achieved by ensuring ocean literacy across the globe. The challenges identified under the UN Ocean Decade include at least two directly related to ocean literacy. These are **Challenge 9: 'Skill, Knowledge and Technology for All'** (Ensuring comprehensive capacity development and equitable access to data, information, knowledge and technology across all aspects of ocean science and for all stakeholders) and **Challenge 10: 'Change humanity's relationship with the ocean'** (Ensuring that the multiple values and services of the ocean for human well-being, culture, and sustainable development are widely understood, and identify and overcome barriers to behaviour change required for a step change in humanity's relationship with the ocean). Mitigation of most of the other challenges also has ample scope of being aided by ocean literacy.

Suggested Steps

Maritime education plays a key role in the context of growing geoeconomic competition and global interdependence. It equips individuals with the knowledge, skills, and global perspective needed to excel in the maritime industry. As the industry continues to evolve

and face new challenges, maritime education institutions must adapt their programmes to meet the changing demands of the sector. The following measures can be taken to strengthen maritime education:

a. Strengthen Collaboration among Education Institutions and Maritime Industries: Promote closer collaboration and partnerships between maritime education institutions and industry stakeholders, including shipping companies, port operators, and maritime associations. This collaboration can take the form of internships, guest lectures, joint research projects, and industry-driven curriculum development. Such partnerships will ensure that maritime education programmes are aligned with the needs and requirements of the industry, providing students with relevant and up-to-date knowledge and practical experience.

b. Enhance Practical Training and Simulation Facilities: Invest in state-of-the-art training facilities and simulators that provide students with realistic hands-on experience. Practical training aboard training vessels, simulators for navigation and engineering, and computer-based training modules can significantly enhance the learning outcomes for maritime students. By integrating practical training and simulations into the curriculum, maritime education institutions can bridge the gap between theory and practice, preparing students for real-world challenges.

c. Emphasise Interdisciplinary Knowledge and Skills: Recognise the importance of interdisciplinary knowledge in the maritime industry and ensure that maritime education programmes incorporate subjects beyond traditional maritime disciplines. Include business management, economics, international relations, environmental sustainability, and digital technologies courses. This interdisciplinary approach will equip students with a broader understanding of the maritime sector, enhancing their critical thinking, problem-solving, and adaptability skills.

d. Promote Continuous Professional Development: Establish continuous professional development mechanisms to keep maritime professionals updated with the latest industry trends and regulations. Offer short courses, workshops, and seminars that address emerging challenges and advancements in the maritime sector. Encourage professionals to engage in lifelong learning and provide incentives for acquiring advanced certifications and qualifications. By promoting continuous professional development, maritime education institutions contribute to the professional growth and competence of maritime industry professionals.

e. Foster International Exchanges and Global Perspectives: Encourage international exchanges and collaborations among maritime education institutions to promote cultural diversity and global perspectives. Facilitate student and faculty exchanges, joint research projects, and international conferences. This exposure to different maritime cultures, practices, and perspectives enhances students' understanding of the global nature of the maritime industry and prepares them to work in multicultural and international settings. By fostering global perspectives, maritime education institutions contribute to a more inclusive and interconnected maritime community.

Conclusion

As a result of globalisation and rapid technological advancement, like other sectors, the maritime domain is rapidly changing. Digitalisation and high-level automation lead to important changes in the operation of maritime business and, subsequently, the reconsideration of the role of seafarers. The shipping and other maritime businesses have become more technical, demanding highly skilled and specialised

crew ready to embrace continuously evolving technology. The mission of educational institutes is not only to prepare the people for today but also to meet future requirements. It requires them to understand the effect of digitalisation on the industry and adopt new programmes as well as benefits from automation based on IT technology to improve their teaching and learning methods. It is also necessary to establish close cooperation and collaboration between industry and education institutes in order to examine, evaluate and revise the education system to meet new challenges. A teaching system is required to rebound the ability of learners to use the information and understand the abilities of automated systems. As such, BSMRMU is on continuous persuasion on how we can improve our education systems to prepare young students for transforming them into future maritime professionals, as well as how we can get benefits from digitalisation to appreciate our teaching and learning activities.

Besides, it is also crucial to strengthen collaboration with maritime industry stakeholders, enhance practical training facilities, emphasise interdisciplinary knowledge, promote continuous professional development, and foster international exchanges. Accordingly, maritime education institutions can ensure that their programmes remain relevant and responsive to global maritime regulations and maritime industry needs and prepare students to excel in the dynamic and globalised maritime sector both ashore and at sea.

Rear Admiral Mohammad Musa, OSP, NPP, rcds, afwc, psc, PhD
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Bangabandhu Sheikh Mujibur Rahman Maritime University, Bangladesh



BSMRMU students gearing up to gather vital oceanographic data from the majestic Bay of Bengal



Exploring the Depths Revealing the Secrets of Seawater Quality in the Bay of Bengal

Dr Ferdousi Begum

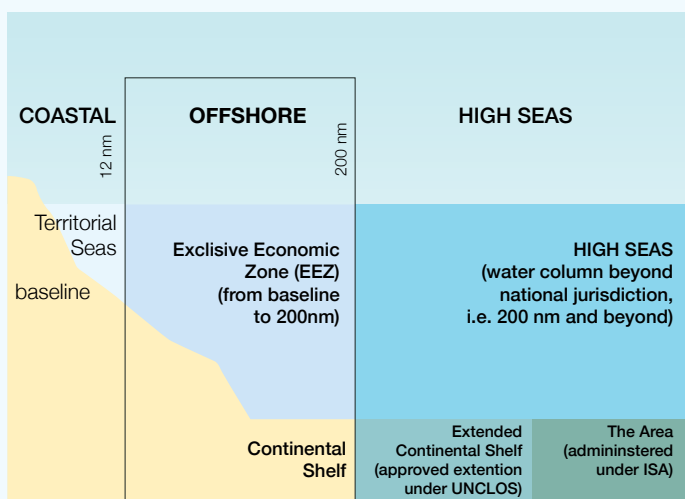


The Bay of Bengal offers enormous maritime opportunities for Bangladesh

Underneath the Bay of Bengal's shining surface is a hidden world of complexity. Seawater in this area comprises mostly water (about 96.5 per cent) and some salts (around 2.5 per cent). It also contains other things like dissolved materials, tiny particles, and a few gases from the air. This mixture isn't just a backdrop for sea life; it's more like a constantly changing picture influenced by things like the weather, where it is in the ocean, pollution, and what people do. People who love the sea recognise that the coastlines and the areas near the edges of the land in the Bay of Bengal are really important. But we need to understand these special waters fully. We need to know more about their properties—how they feel, how transparent they are, how salty they are, and more—to understand how life in the sea works. Imagine it like learning to dance: you need to know the steps to understand how the whole expression comes together. In this article, we're taking a journey to study the waters of the Bay systematically. We will learn about different parts of the Bay and how their water differs. We'll also find out how changes in the water can tell us important things about the creatures living in it and why taking care of these waters is important for the future.

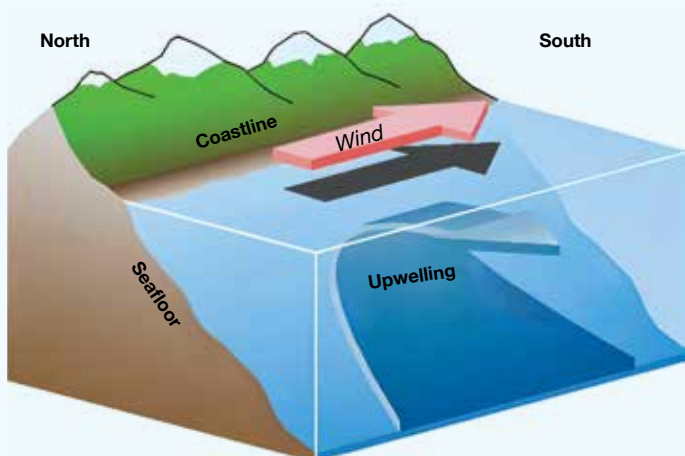
Unlocking the Marvels of the Bay of Bengal's Waters

The Bay of Bengal, a prominent extension of the Indian Ocean, presents an array of captivating features that make it a true maritime wonder. With Bangladesh occupying its North and Northeast parts, the coastline stretches over 480 km, enveloping a marine expanse totalling about 48,365 square nautical miles—an area comparable to the nation's size. This region boasts its expansive aquatic domains and a remarkable wealth of biodiversity. The intricate influence of mangrove forests, harbouring an abundance of valuable aquatic organisms, stands as a unique hallmark of its coastal areas. The Bay's diverse zones are internationally renowned for their productivity, attributed to their strategic geographical positioning and climatic conditions. Beyond its geographical allure, the Bay of Bengal beckons exploration into its geological mysteries, characterised by remarkable drainage patterns and sediment deposition.



Schematic diagram of coastal zones (CZs) and continental shelf zones (CSZs) of the sea

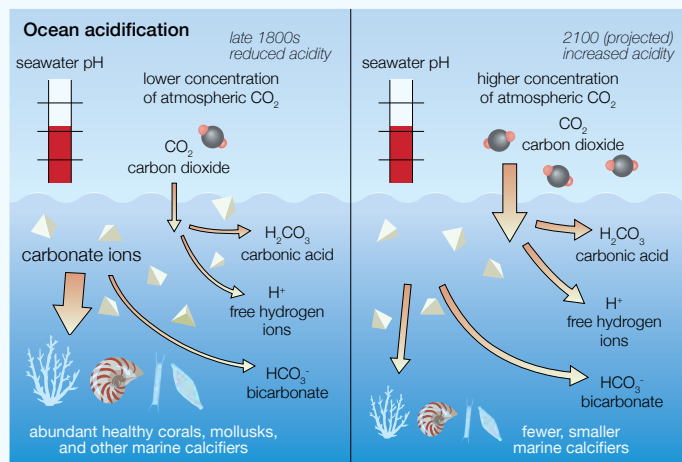
However, the very waters that hold such fascination also raise concerns. The seawater originating from various Bay zones emerges as a significant issue due to its critical role in socioeconomic advancement and human health. Over time, human activities, ranging from recreation



Wind-displaced surface waters are replaced by cold water that wells up from below during upwelling; modified by D. Reed from image by J. Wallace and S. Vogel, *El Niño and Climate*

to industrial growth, have contributed to pollution, impacting water quality and aquatic ecosystems. This holds especially true for coastal zones (CZ), where the majority of the world's most productive marine ecosystems thrive due to their adjacency to land. Meanwhile, the continental shelf zones (CSZ), situated between terrestrial and deep ocean environments, house a plethora of marine life. These zones, with their unique attributes, including low temperature and nutrient-rich waters, underscore the importance of seawater quality in sustaining marine resources and ecosystem stability.

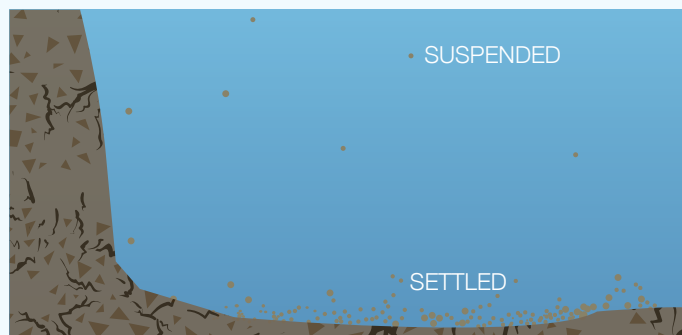
Examining the parameters governing water quality becomes paramount, as they greatly impact the well-being of aquatic organisms. A multitude of factors, ranging from temperature and pH to dissolved oxygen and heavy metal contaminants, shape the conditions of these waters. These properties influence aquatic life, dictating their distribution, migration, and feeding patterns. Ensuring good water quality hinges on carefully monitoring these physicochemical parameters, enabling the identification and management of pollution sources. As we navigate the realm of the Bay of Bengal, it's evident that uncovering the intricacies of its waters is not only a matter of scientific curiosity but also essential for safeguarding the delicate balance of its diverse ecosystems.



When CO_2 dissolves in seawater, it creates carbonic acid (H_2CO_3) and liberates H^+ , which subsequently reacts with carbonate ions (CO_3^{2-}) and aragonite (the stable form of calcium carbonate) to form bicarbonate (HCO_3^-)

The Building Blocks of Seawater Characteristics

Understanding the intricate makeup of seawater involves delving into various essential properties that significantly impact marine life and oceanic processes.



Some suspended solids can settle into sediment at the bottom of a body of seawater when they enter an area of low or no water flow and improve water clarity

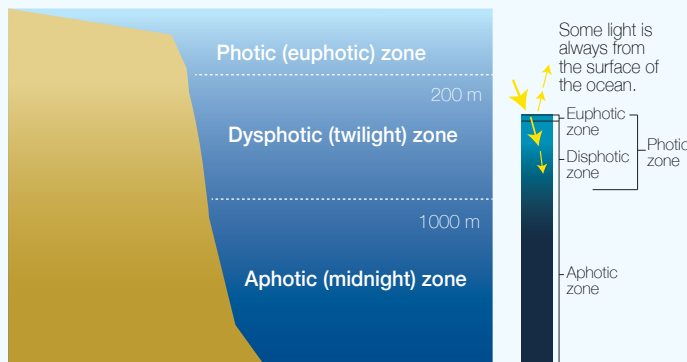
Temperature, the measure of heat in a fluid, plays a vital role in influencing aquatic organisms' chemistry and biological functions. It is expressed in degrees Celsius and also Kelvin in specific contexts.

Salinity, indicating chloride concentration in water, derives from evaporation, freezing, rain, river water, and melting ice. This measure, which varies between 31 to 38 gL⁻¹ in most seawater, greatly affects the distribution of organisms and minerals, with many aquatic life forms adapted to specific salinity levels.

pH, representing the balance of carbonic acid forms, reflects water stability and is influenced by carbonates, bicarbonates, and CO₂ content. Changes in pH are closely tied to other physicochemical attributes, impacting water quality and the ecological balance.

Electrical conductivity (EC) indicates the presence of dissolved ionisable salts, providing insights into the characteristics of materials. It's affected by dissolved solids, ions, and even suspended impurities, offering valuable information about water mineralisation.

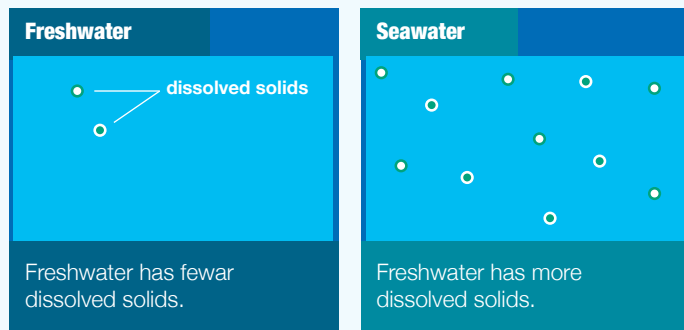
Turbidity, revealing water clarity through light transmission, signifies suspended solids such as clay, inorganic substances, and microscopic organisms. It's pivotal in gauging water quality, often linked to phytoplankton growth and sediment discharge.



Light penetration zones in the seawater columns and maximum light penetration into the photic zone with the low TDS levels in seawater for photosynthetic activity: euphotic and disphotic zones together make up the photic zone in clear seawater

Total dissolved solids (TDS) measurement highlights inorganic salts and trace organic matter, impacting biological and physical treatment processes. TDS concentration varies, with freshwater having less than 500 mgL⁻¹ and seawater ranging from 500 to 39,000 mgL⁻¹.

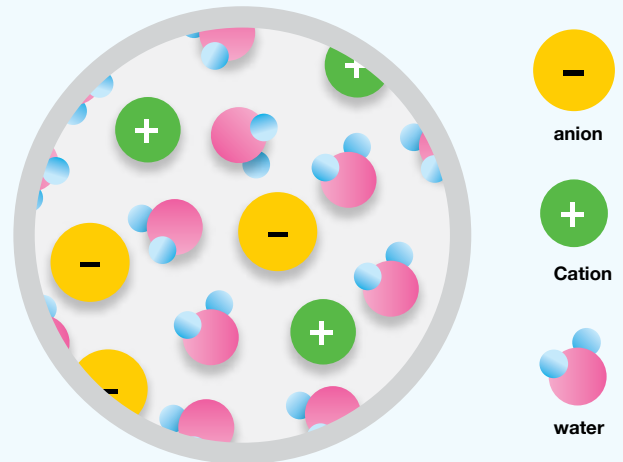
Density, a dynamic property of seawater, influences its circulation and distribution of water parcels due to variations in temperature and salinity. It's computed using the seawater equation of state and expressed as a density anomaly.



The presence of more dissolved solids makes seawater denser than fresh water

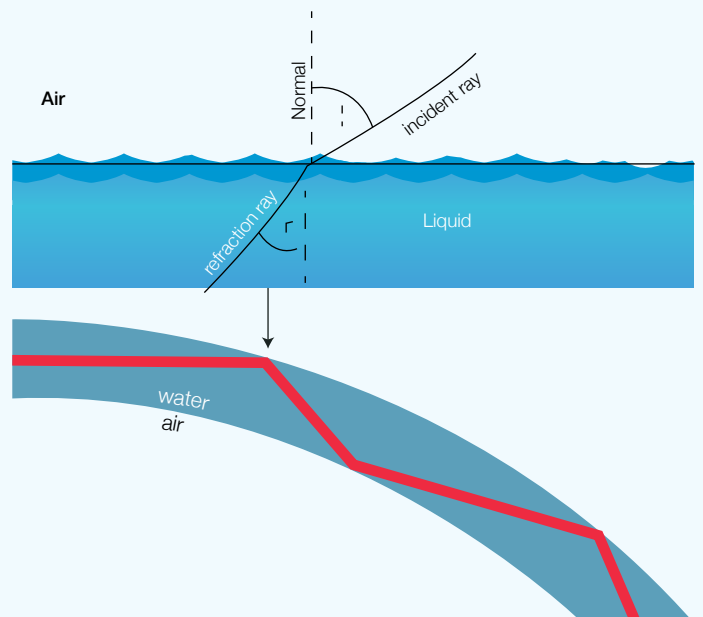
The Essentials of Seawater Dynamics

Within the realm of seawater, intricacies lie crucial characteristics that sculpt its nature and impact aquatic life. Electrolytes like chloride prompt a multi-zoned hydration atmosphere around ions, increasing order and, consequently, viscosity. While freshwater records a viscosity of 0.8900 mPa, seawater stands at 0.9590 mPa due to its electrolyte-rich characteristics.



Formation of a multi-zoned coulombic hydration atmosphere around the ions in seawater

Understanding the refractive index of seawater unlocks insights into density determination and underwater optical systems. The refractive index varies based on salinity, temperature, pressure, and wavelength. Dissolved oxygen (DO) emerges as a pivotal indicator of water quality, influencing the vitality of aquatic life. Its saturation, measured against temperature, pressure, and salinity, shapes the self-purification and sustenance of marine ecosystems. DO concentrations between 4-9 mgL⁻¹ favour diverse fish populations, while lower levels prove harmful, affecting species' growth and survival.



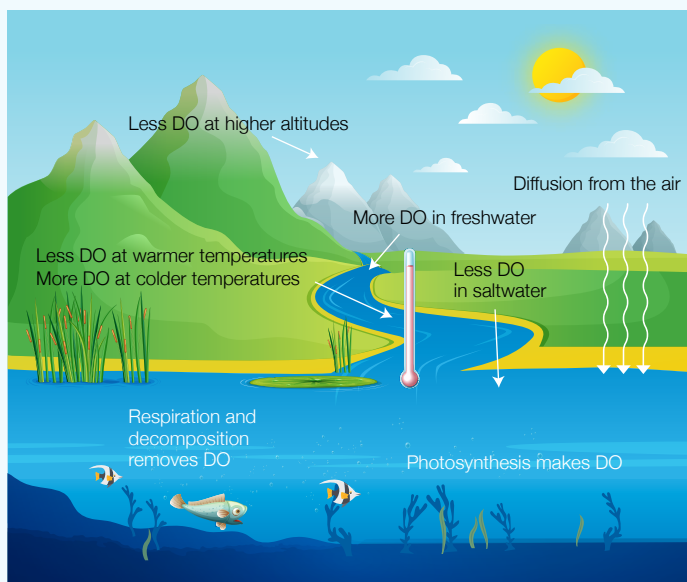
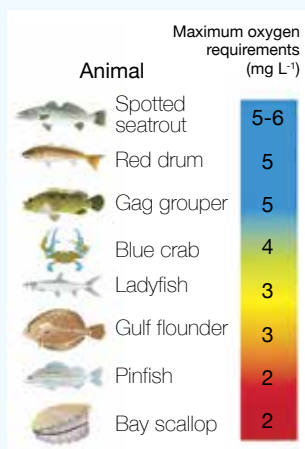
The higher the salt concentration in seawater produces more bending of light

BOD signifies the oxygen needed for organic matter degradation. Alongside BOD, COD serves as a key parameter for water quality assessment, reflecting organic pollution. The coastal zones (CZ) and continental shelf zones (CSZ) of the Bay of Bengal remain underexplored despite their potential for marine stock improvement. Attention is warranted for holistic management strategies. Seawater temperature variations between CZ and CSZ offer insights into local climatic influences, with CZ displaying higher pH values potentially due to sewage discharge. Turbidity measures light scattering, revealing sediment and particulate presence, often influenced by river-borne sediments.

Decoding Seawater's Properties for Environmental Understanding

Exploring seawater's properties brings a wealth of insights vital for environmental management. Total Dissolved Solids (TDS) analysis governs biological and physical wastewater treatment procedures. In the context of the coastal and continental shelf zones (CZ and

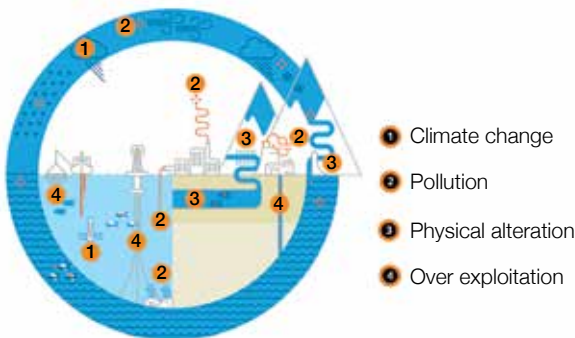
CSZ), TDS differences are noted – CZ exhibits higher average TDS values than CSZ, hinting at differing clarity. Density and viscosity values, influenced by electrolyte concentrations, offer subtle distinctions between CZ, CSZ, and freshwater. Salinity, a linchpin in seawater's chemistry and biological processes, bears higher average values in CZ, reflecting the intricate balance between evaporation, freezing, rain, river run-off, and melting ice. It also contributes to a higher refractive index in seawater, impacting light's behaviour.



When oxygen dissolves in water (DO), it can be used by aquatic organisms to breathe. Bodies of water with higher levels of DO can support many different kinds of aquatic organisms. It's harder for creatures to survive when there are low levels of DO, and when DO are extremely low, plants and animals can die.

Water cycle — Main issues affecting water quality and quantity

Water is present in every aspect of our lives. Unfortunately, the way we use and treat this precious resource not only impacts our health, it also impacts all life dependent on water. Pollution, over-exploitation, physical alterations to water habitats and climate change continue to undermine the quality and the availability of water.



Dissolved Oxygen (DO) serves as a beacon, writing down water quality and the health of aquatic systems. It is influenced by biological activity, photosynthesis, and respiration, with DO concentrations slightly higher in CSZ and CZ during winter seasons. The interplay between DO and turbidity unveils a complex relationship where higher turbidity can hinder light penetration, leading to reduced DO production. Chemical Oxygen Demand (COD), a marker for organic content in wastewater, differs between CZ and CSZ, reflecting distinct attributes of land and sea influences.

Surface water temperatures in both zones exhibit winter-related drops. pH values remain alkaline, with stability during winter seasons. While turbidity and TDS values correspond, the collected seawater samples correlate well with various physicochemical properties. Additionally, the concentrations of various elements like arsenic, mercury, lead, and others remain within permissible limits, affirming the waters' compatibility with aquatic life and human use. This comprehensive analysis underscores the harmonious interplay of seawater's multifaceted attributes, ultimately ensuring a positive outlook for the health of marine ecosystems and water resources.

The presence of all forms of dissolved organic matter in seawater, including both biodegradable and non-biodegradable, natural components found ubiquitously throughout aquatic environments and complex mixtures of organic compounds from many sources.

Conclusion

The Bay of Bengal, with its mesmerising beauty and hidden complexities, beckons us to embrace a future of conscious conservation. The interplay of science, policy, and responsible practices can transform these waters from a realm of uncertainty to a sanctuary of vitality. As we reflect on the implications of our findings, let us remember that the currents of change are in our hands. The journey to safeguarding the Bay's marine riches has just begun, and it is a voyage that requires the collective efforts of governments, researchers, industries, and communities alike. Together, we can navigate the seas of uncertainty and navigate toward a horizon where the Bay of Bengal flourishes in all its resplendent glory.

Dr Ferdousi Begum

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A Vision Taking Shape on the Bank of Karnaphuli River

The Making of BSMRMU's Dream Campus

Maritime Campus desk

Nestled on the verdant banks of the Karnaphuli River, the dream campus of Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU) is rising, an embodiment of Bangladesh's commitment to education and its seafaring legacy. This project, a collaboration between the Bangladesh University Grants Commission and BSMRMU, symbolises a confluence of heritage, education, and innovation, heralding a new epoch for maritime studies in the country.

The government's Vision 2041 has outlined an objective to introduce higher education in maritime sector in order to maximise the blue economic activities. This aligns with Goal 14 of the Sustainable Development Goals (SDGs), which advocates for the preservation and sustainable utilisation of seas, oceans, and marine resources to foster sustainable development. The SDGs underscore the importance of equipping all students with the necessary skills and lifestyles for sustainable development, human rights, gender equality, a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity by 2030. In line with this, the permanent campus project of BSMRMU, which aligns with the National Education Policy-2010 and the government's vision plans, is designed to significantly contribute to the achievement of these SDGs upon its implementation.

The campus, sprawling over 106.66 acres in Hamidchar under Chandgao Thana of Chittagong, is designed to be more than a mere collection of buildings; it is envisioned as a cradle of maritime knowledge and research that will empower future generations. With an estimated expenditure initially approved at BDT 1,18,396.84 Lakhs

and later revised to a prudent BDT 1,01,784.02 Lakhs, the project's financial blueprint is as comprehensive as its educational ambitions.

The timeline of this grand undertaking has been as fluid as the river it overlooks—originally set for completion in December 2021. But the timeline has been thoughtfully extended to June 2026. This is not indicative of procrastination, but of a careful extension to ensure the quality and sustainability in the development of a world-class educational environment.

The campus's inception has been marked by milestones of infrastructural achievements. The completion of the first phase of earth filling laid the groundwork, with millions of cubic metres of soil establishing a firm foundation. The construction of protective barrages—vital for the integrity of the campus against the river's might—has further shown the depth of planning invested in this project. The 860-metre and 370-metre barrages stand completed, while the 640-metre barrage is in the process of joining them, a symbol of the ongoing dedication to the task.

The campus's design is a testament of thoughtful architecture that respects the environment, highlighted by the project's environmental clearance. The layout promises a blend of functionality with aesthetic appeal, and creates a space that will inspire students, educators and staff.

Peering into the details of the Revised Development Project Proforma (RDPP) reveals the expansive scope of the project. Nineteen buildings are planned, each designed to cater to different facets of maritime

education and research, from state-of-the-art classrooms to research labs, from simulators to administrative offices. The capital expenditure, a substantial BDT 967.93 crore, is a clear indicator of the economic weight of the project, signifying a long-term investment in the nation's academic infrastructure.

The revenue expenditure of BDT 29.95 crores, while a smaller portion of the overall budget, is significant for the smooth progression of the project. It ensures that the day-to-day operations, from planning to procurement, from hiring to construction oversight, are managed efficiently.

The construction specifications provide a granular view of the project's immense scale:

- The first stage of soil filling, involving 18.62 million cubic metres of soil, began on 21 July 2019 and was completed by 30 June 2020.
- The second stage followed with 9.5 million cubic metres, starting on 26 October 2021 and culminating on 01 March 2023.

The barrage constructions, critical to the structural integrity of the campus, have their own timelines:

- The 860-metre barrage began on 28 January 2021 and was completed on 30 September 2022.
- The 370-metre barrage commenced alongside the larger one on 28 January 2022 and reached completion on 03 January 2023.

These undertakings, while immensely complex, have been executed with precision, reflecting the project management's adept handling of the construction schedule.

The campus, once completed, will not only stand as a physical edifice but also as a beacon of knowledge, shaping the future of maritime education in Bangladesh. It will provide a dynamic space for learning, research, and innovation, enabling students and faculty to pursue excellence in maritime affairs. The multifaceted nature of maritime studies, from naval architecture to maritime law, from oceanography to logistics, will find a home here, supported by facilities that match global standards.

Furthermore, the campus is expected to bolster the local economy, creating jobs, and fostering community development. The construction phase alone has opened up numerous employment opportunities, and upon completion, the university will continue to contribute to the economic vitality of the region.

Soil filling and construction work are well underway at BSMRMU's permanent campus in Chittagong, bringing to life the vision of a world-class maritime university that will serve the needs of students and the community for generations to come.



The Vice Chancellor of BSMRMU, Rear Admiral Mohammad Musa plants a sapling on the premises of the university's permanent campus in Chittagong, symbolising the institution's commitment to growth and sustainability

The significance of BSMRMU's dream campus extends beyond the confines of academia. It is poised to become a national landmark, symbolising Bangladesh's strides in higher education and its commitment to developing a knowledge-based economy. It is a reflection of the country's respect for its maritime heritage and its aspirations to become a significant player in the global maritime sector.

The story of BSMRMU's campus is one of a dream in diligent translation into reality. It is a narrative replete with strategic planning, environmental consideration, and architectural innovation. With each passing day, the campus comes closer to embodying the lofty dreams of its founders—a testament to Bangladesh's unwavering commitment to its maritime future and a tribute to the legacy of Bangabandhu Sheikh Mujibur Rahman, after whom the university is proudly named.

In the grand tapestry of Bangladesh's educational development, the BSMRMU campus is set to be a hallmark—a place where the maritime leaders of tomorrow will be nurtured, where research will break new grounds, and where the maritime flag of Bangladesh will fly high, signaling the nation's indomitable spirit and dedication to progress and sustainable prosperity.



BSMRMU Celebrates Pohela Boishakh-1430 with Grandeur



Honourable VC with the participants of cultural programme

In a magnificent display of tradition and culture, Bangabandhu Sheikh Mujibur Rahman Maritime University, Bangladesh (BSMRMU) celebrated the advent of Bangla Noboborsho-1430 in its campus. Rear Admiral Mohammad Musa, the honourable Vice-Chancellor of BSMRMU, graced the jubilant occasion as the distinguished Chief Guest.

Marking the occasion with artistic finesse, the university's Cultural Club orchestrated a captivating cultural programme in the auditorium. This spectacle featured the rendition of the National Anthem, symbolising the spirit of unity and patriotism, along with a melodious performance of the cherished "Eso He Boishakh" song, evoking the essence of renewal and jubilation.

Among the esteemed dignitaries present were the university Treasurer, Registrar, Deans, Teachers, Officers, and the student body, all united in joy and excitement. Together, they partook in the festivities, forging lasting memories that shall resonate through the annals of BSMRMU's illustrious history.

This glorious celebration of Pohela Boishakh reaffirmed the university's commitment to its cultural heritage.

BSMRMU Marks World Ocean Day with Enlightening Seminar



On 8 June 2023, BSMRMU organised an insightful seminar to mark the significance of World Ocean Day. The honourable Vice-Chancellor of the University, Rear Admiral Mohammad Musa, graced the occasion as the Chief Guest.

Distinguished scholars added intellectual depth to the seminar with their invaluable contributions. Professor Dr Aftab Alam Khan, the Head of the Department of Oceanography and Hydrography, and Tasrif Mohammad Minhaj, a dedicated Lecturer from the Marine Fisheries and Aquaculture Department, presented their thought-provoking papers, shedding light on key matters pertaining to our oceans.

The enthusiastic gathering comprised the Treasurer, Registrar, Deans, and the Heads of the various departments, all of whom actively engaged in the seminar's discussions. The teachers, officers, and the student community were equally ardent participants in this enlightening occasion.

This year's World Ocean Day embraced the theme "Planet Ocean: Tides and Changing," sparking meaningful dialogues on the pressing changes affecting our precious marine ecosystems. The seminar served as an enlightening platform, fostering a deeper understanding of the ocean's pivotal role and the urgent need for collective action in preserving its delicate balance.

BSMRMU's dedication to promoting awareness and advancing knowledge about oceanic affairs shone through this commendable initiative, demonstrating its profound commitment to maritime education and environmental stewardship.

BSMRMU Hosts Orientation Programme for Master's Students



Honourable VC addressing to the freshers of the Master's Programme

the curriculum, discipline, and enriching academic environment they shall embrace. This served to instil a sense of preparedness and excitement as they embarked on their educational voyage at this renowned institution.

The Orientation Programme stood as a testament to BSMRMU's unwavering commitment to nurturing and equipping the next generation of maritime leaders, fostering an environment of excellence and amiability for their intellectual and personal growth.

On 3 May 2023, Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU) organised an illustrious orientation programme for its newly enrolled master's students. Rear Admiral Mohammad Musa, the distinguished Vice-Chancellor of the University, graced the occasion as the Chief Guest, infusing the event with prestige.

Present at this significant gathering were the Treasurer, Registrar, Deans, Faculty members, officers, staff, and the students. Commencing the proceedings, the students received a warm and cordial welcome to the specialised maritime university, BSMRMU, marking the commencement of their academic journey.

During the programme, the students were provided with an insightful briefing encompassing essential aspects such as

A Glorious Celebration: BSMRMU Annual Gathering and Cultural Programme 2023



A group photo session of the participants with the Honourable Vice-Chancellor



A glimpse of the cultural show



Partial View of the audience

In a splendid showcase of maritime delightfulness and cultural splendour, the much-anticipated BSMRMU Annual Gathering and Cultural Programme-2023 graced the grounds of BNS Sheikh Mujib on 27 May 2023. At this event, Vice-Chancellor Rear Admiral Mohammad Musa graced the occasion as the Chief Guest, accompanied by his respected spouse, Mrs Nishat Rahman, who added to the colour of the event.

A jubilant convergence of intellect and spirit, the event witnessed the enthusiastic participation of faculty members, officers, staff, and the dynamic student body from all faculties, coming together to partake in the festivities.

Enlivening the events, the performances by the BSMRMU Cultural Club enthralled the audience as the echoes of artistry and heritage reverberated through the air. The celebration also took a sporting turn, with various sports events arranged to ignite the spirit of healthy competition and amity among the participants.

The Vice-Chancellor awarded the winners of these spirited contests as a gesture of encouragement and acknowledgement of their prowess.

The gathering also witnessed a captivating screening of a documentary, shining a spotlight on the history and achievements of BSMRMU. This documentary inspired a sense of pride and unity among the attendees, reinforcing their shared commitment to maritime excellence.

The aura of togetherness was further enhanced by the heartening sight of officers and faculties, accompanied by their beloved families, coming together as one, embodying the spirit of the BSMRMU community - a close-knit family dedicated to fostering a legacy of maritime education par excellence.

The BSMRMU Annual Gathering and Cultural Programme-2023 marked yet another milestone in the university's journey, instilling a happy sense of belonging and enthusiasm in the hearts of all fortunate to partake in this grand celebration of maritime greatness.

BSMRMU Inspector Observes Cadet Examinations at Bangladesh Marine Academy, Pabna

An Inspector (Academy/Institute) hailing from the Office of the Inspector of Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU) visited Bangladesh Marine Academy, Pabna, on May 30, 2023. The visit was to oversee the 3rd Semester Examination for the 2nd batch of cadets pursuing their maritime education.

The Inspector's presence during the examination underscores BSMRMU's commitment to maintaining academic standards and ensuring the smooth conduct of assessments. This visit also serves as an example of the collaborative efforts between maritime institutions in Bangladesh to provide a high-quality education to aspiring maritime professionals.

By observing the examination process, the Inspector plays a crucial role in upholding transparency, fairness, and the integrity of the assessment process. Such visits validate the cadets' hard work and provide valuable insights to enhance the overall education and evaluation methods.

The Vice-Chancellor of BSMRMU Leads an Inspection Team to International Maritime Academy



An inspection team led by the honourable Vice-Chancellor of Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU), Rear Admiral Mohammad Musa, paid an important visit to the International Maritime Academy located in Gazipur. The visit, which took place on June 19, 2023, aimed to assess the academy's training facilities and overall infrastructure.

During the visit, the Vice-Chancellor had the opportunity to witness a cadet parade, a display of discipline and maritime training excellence. Rear Admiral Mohammad Musa took the salute, acknowledging the dedication of the cadets towards their rigorous training.

The visit commenced on an eco-friendly note as the honourable Vice-Chancellor planted a sapling, symbolising growth and sustainability, at the inception of the inspection. This act highlighted the institution's commitment to environmental consciousness and its role in nurturing responsible maritime professionals.

The inspection team took a comprehensive tour of the academy's premises, including training facilities, cadet blocks,

laboratories, and workshops. This thorough assessment aimed to ensure that the institution is equipped with state-of-the-art amenities to provide top-tier maritime education and training to its cadets.

During the visit, Rear Admiral Mohammad Musa expressed his satisfaction with the infrastructure and training methodologies. He emphasised the importance of quality education and practical training in producing skilled maritime professionals who can contribute effectively to the maritime industry.

BSMRMU Delegation Explores Maritime Collaboration in China



An Assistant Inspector (Academy/Institute) from the Office of the Inspector of Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU) embarked on a productive visit to China from April 13 to 18, 2023.

The visit was part of a Bangladesh

delegation to assess the feasibility of a Memorandum of Understanding (MoU) involving Bangladesh Marine Academy-Barishal, Weihai Vocational College-China, and Weihai Xingya Shipping Company Limited.

Accompanied by esteemed representatives, including a Joint Secretary (Admin) from the Ministry of Shipping, Commandant of Bangladesh Marine Academy-Barishal, and a Member of the Department of Shipping, the Bangladeshi delegation explored avenues for potential collaboration in the maritime sector.

The visit to China served as an essential step in evaluating the practicality and benefits of the proposed MoU. It emphasised the commitment of both nations to fostering cross-border partnerships that enhance maritime education, training, and industry practices.

BSMRMU Inspection Team Visits Bangladesh Maritime Training Institute (BMTI)



A delegation from Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU) recently visited the Bangladesh Maritime Training Institute (BMTI), a sister organisation of the International Maritime Academy. During the visit, the inspection team had the opportunity to tour BMTI's facilities, including simulators, computer labs, administrative offices, and classrooms.

The delegation expressed their contentment with the infrastructure and offerings at BMTI. The visit highlighted BMTI's commitment to providing comprehensive maritime education and training, catering to the needs of aspiring maritime professionals.

BSMRMU Business Incubator “Startup BLUE” Champions Maritime Entrepreneurship with Business Plan Competition



On 12 June 2023, resounding enthusiasm filled the Sagarika Hall at the Bangladesh Navy Headquarters in Dhaka as the BSMRMU’s esteemed Business Incubator, “Startup BLUE,” successfully hosted a riveting Business Plan Competition. Admiral M Shaheen Iqbal, the distinguished Chief of Naval Staff, graced the occasion as the Chief Guest. At the same time, the Vice-Chancellor of BSMRMU, Rear Admiral Mohammad Musa, delivered a warm and welcoming address.

In his speech, the Chief Guest hailed the timely initiative of BSMRMU in organising this competition, lauding its instrumental role in aligning with the Government’s visionary Blue Economy Policy. Recognising the profound importance of sustainable development for Bangladesh, he congratulated the deserving winners, appreciating their commendable efforts.

In his address, the Vice-Chancellor shed light on the manifold initiatives undertaken by the university to nurture an educated and skilled workforce. Expressing gratitude to the maritime professionals and stakeholders for gracing the occasion, he also warmly acknowledged the spirited contestants for their wholehearted participation.

The competition, abuzz with innovation and creativity, saw enthusiastic students from various universities and institutions across the nation unveiling their groundbreaking maritime-related business plans. The brilliance of their ideas and the promise of fostering the Blue Economy resonated throughout the event, inspiring all in attendance.

Acknowledging the exceptional talent and entrepreneurial spirit showcased by the participants, the Chief of Naval Staff had the honour of presenting crests to the top three groups, recognising their exceptional startup plans.

The event’s resounding success was manifested by the impressive turnout of 20 participating groups, each presenting their visionary and inventive business plans, shaping a brighter future for maritime entrepreneurship in the country.

As a bastion of maritime education and enterprise, BSMRMU’s Business Incubator “Startup BLUE” continues to spearhead transformative initiatives, nurturing the next generation of maritime leaders and propelling Bangladesh towards a prosperous and sustainable maritime future.

Bangladesh Marine Academy, Barishal Hosts Key Meeting with Chinese Counterparts for Maritime Education Collaboration



In a significant stride towards strengthening international cooperation in maritime education and training, a two-day meeting was held on May 5 and 6, 2023 in Bangladesh Marine Academy-Barishal. The meeting brought together representatives from Bangladesh Marine Academy-Barishal, Weihai Vocational College-China, and Weihai International Economic & Technical Cooperative Company Limited (WIETC). The focus of the meeting was the signing of a Memorandum of Understanding (MoU) between Bangladesh and China to establish a Joint International Maritime Education and Training Cooperation initiative.

Inspector (Academy/Institute) and Assistant Inspector (Academy/Institute) from Bangladesh Marine Academy-Barishal played integral roles in the meeting, contributing to the discussions that

could pave the way for enhanced collaboration in maritime education between the two nations.

The meeting underscored the mutual commitment to fostering a robust maritime education framework encompassing comprehensive training, cutting-edge techniques, and knowledge exchange. The proposed collaboration seeks to capitalise on the strengths and expertise of both institutions - Bangladesh Marine Academy and Weihai Vocational College - to create a holistic learning experience for maritime cadets and professionals.

PM Urges Increased Swiss Investment in Bangladesh



On June 14, 2023, Prime Minister Sheikh Hasina emphasised the potential for greater Swiss investment in Bangladesh during her meeting with the President of the Swiss Confederation, Alain Berset. The Prime Minister highlighted the ample investment opportunities in her country and urged Switzerland to consider further investments.

The meeting took place at the bilateral meeting room in Palais des Nations. Foreign Minister AK Abdul Momen, Foreign Secretary Masud Bin Momen, and Prime Minister's Speech Writer Md Nazrul Islam were also present.

Foreign Minister Momen pointed out the positive trade and business relations between the two nations. Bangladesh engaged in a billion dollars' worth of trade with Switzerland, primarily exporting Ready-Made Garment (RMG) items.

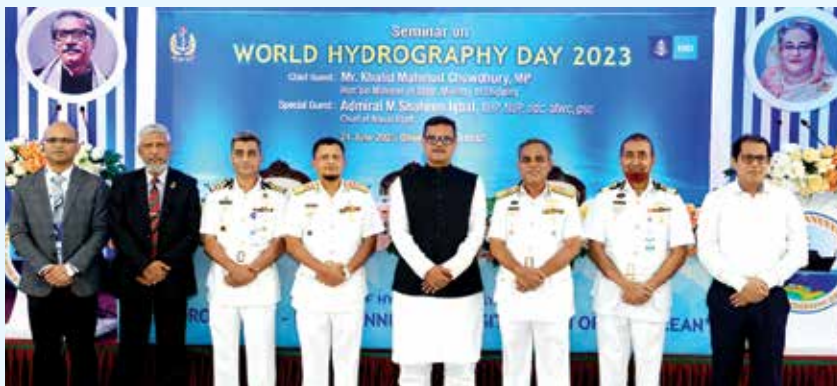
Prime Minister Sheikh Hasina also shared her personal journey, mentioning the challenges she faced after her father's assassination, the founding leader Bangabandhu Sheikh Mujibur Rahman. She described her efforts to establish democracy, voting rights, and food security in Bangladesh.

The Prime Minister appealed to President Berset to extend Bangladesh's Least Developed Country (LDC) status by three additional years. She underscored her commitment to realising her father's vision of a developed and prosperous Bangladesh.

Foreign Minister Dr AK Abdul Momen highlighted Bangladesh's priority of facilitating the safe return of Rohingya refugees to Myanmar, stressing that the Rohingyas wish to return to their homeland. He sought Switzerland's support in this endeavour.

In response, President Alain Berset assured Bangladesh of continued Swiss support on the Rohingya issue.

Bangladesh Commemorates World Hydrography Day



On June 21, 2023, Bangladesh, an esteemed International Hydrographic Organisation (IHO) member, celebrated World Hydrography Day in Dhaka, the capital city. This year's theme, "Hydrography: Underpinning the Digital Twin of the Ocean," set the tone for the event. A seminar hosted by the Bangladesh Navy at the Bangabandhu Military Museum aimed to emphasise the role of hydrography in creating the Digital Twin of the Ocean (DTO), a powerful tool combining hydrographic data with technology to enhance ocean understanding.

The DTO facilitates scenario simulations for assessing human activities, climate change, and natural disasters' impacts on oceans. State Minister for Shipping Khalid Mahmud Chowdhury and Chief of Naval Staff Admiral M Shaheen Iqbal graced the seminar. Representatives from diverse sectors participated, sharing insights on Ocean Conservation, Hydrographic Cooperation, and the Blue Economy. Bangladesh's hydrographic expertise, witnessed through international standard nautical chart production, underscores the nation's commitment to safe navigation and maritime advancement.

Bangladesh Takes Step Towards Ratifying Hong Kong Convention

Bangladesh, renowned for hosting the world's highest-paying end-of-life tonnage buyers, has green-lit the ratification of the Hong Kong Convention on shipbreaking practices (HKC). While formal processes remain, this decision assures the nation's adherence to the convention, advancing it closer to global enforcement.

The progression towards this choice began in 2018 when Bangladesh enshrined HKC provisions in national legislation. The pandemic-induced challenges hindered yard improvements to meet HKC standards, yet non-upgraded yards have a two-year window for compliance.

Supporters of European access to South Asian shipbreaking have lauded this move. The European Ship Recycling Regulation confines European owners to EU-approved yards, often yielding lower payments. This shift aligns with the evolving global trend towards HKC compliance.

John Stawpert, Senior Manager of the International Chamber of Shipping, highlighted the significance of Bangladesh's participation, anticipating an equitable playing field upon HKC's global enforcement. India has ratified the convention, and Pakistan remains the sole non-ratifying South Asian scrapping destination.

South Korean Ship Breaks Ground in Bangladesh for Green Recycling



South Korea's H-Line Shipping has embarked on a pioneering initiative by sending a significant scrap ship

to SN Corporation's environmentally compliant shipyard in Sitakunda, Chattogram. This momentous move marks South Korea's first-ever entry into a "green yard" under its green recycling initiative, aligned with the International Maritime Organisation's (IMO) Hong Kong Convention for Safe and Environmentally Sound Ship Recycling.

The precedent set by H-Line Shipping's choice of a Hong Kong Convention-compliant facility in Bangladesh is expected to encourage shipowners in Japan and South Korea to adopt similar sustainable practices. The maritime industry's shift towards eco-friendly ship recycling is pivotal for environmental preservation and global shipping's long-term viability.

SN Corporation, situated on a 13-acre site, operates an environment-conscious shipyard, meticulously following the Hong Kong Convention's procedural and performance standards. The yard's features, such as an impermeable concrete floor, advanced crane-cutting processes, and segregation of hazardous materials, emphasise operational safety and sustainability.

H-Line Shipping's decision signifies a notable stride in the maritime sector's commitment to responsible ship recycling. This movement aligns with Bangladesh's efforts to enhance workplace safety and sustainable practices in its shipbreaking industry, fostering a positive impact on global maritime practices and the environment.

Saudi Firm Awarded 22-Year Operation of Patenga Container Terminal



The Patenga container terminal, completed in July of the previous year, will now be operated by the Saudi company Red Sea Gateway Terminal (RSGT) for a duration of 22 years. Originally intended to be managed by the Chittagong Port Authority, the government

subsequently opted for a foreign operator following the PPP model.

This significant development marks a historic moment for Bangladesh, as it signifies the first instance in the country's history where a foreign enterprise will oversee port operations, highlighting the growing confidence of international companies in Bangladesh's future growth prospects.

Farming Future Bangladesh Empowers Youth in Climate Change Communication

Farming Future Bangladesh has orchestrated a pivotal training workshop to equip youth leaders, climate advocates, and life sciences scholars with vital skills to communicate the complexities of climate change and food security. The event, "Communicating the Science of Climate Change and Food Security: Exploring Issues and Trends," took place at the Sheraton in the capital on June 20, 2023, attracting 55 participants.

By fostering interdisciplinary cooperation, honing communication abilities, and promoting knowledge exchange, the workshop, graced by development professionals, facilitated profound discussions and insight-sharing. This platform bridges the gap between scientific intricacies and public comprehension, enabling young changemakers to catalyse positive transformations in their communities and work towards a sustainable future.

The significance of empowering youth to combat climate change and food insecurity was underlined by Anwar Faruque, former secretary of the Ministry of Agriculture and advisor of Farming Future Bangladesh. He stressed sustainable agricultural practices as the cornerstone of resilience.

Jiban Krishna Biswas, executive director of Krishi Gobeshona Foundation, delved into the challenges and opportunities surrounding food security amidst climate fluctuations. Biswas emphasised research's role in cultivating climate-resilient agriculture.

Md Arif Hossain, CEO and executive director of Farming Future Bangladesh, expressed unwavering confidence in the youth's potential to foster science communication. He recognised their leadership in steering sustainable climate change and food security approaches.

M Zakir Hossain Khan, founder and chief executive of Change Initiative, emphasised multi-stakeholder partnerships and collaborative knowledge-sharing. Such alliances are deemed pivotal in effectively addressing climate challenges.

Tony Michael, senior advisor of Oxfam, underscored the transformative power of effective science communication. He highlighted its role in mobilising communities, individuals, and governments towards a collective sustainable future.

Rajib Bhowmick, Director of Media and Public Relations at Independent University, highlighted innovative communication methods, such as digital visuals and storytelling, as key tools to convey the urgency of climate change and food security concerns. This workshop is a beacon for young leaders to ignite change through impactful communication.



Bangladesh and Sri Lanka Forge Maritime Cooperation



Bangladesh and Sri Lanka are discussing fortifying their maritime ties, with State Minister for Shipping Khalid Mahmud Chowdhury revealing their intent on May 12, 2023. After fruitful bilateral talks between Khalid Mahmud Chowdhury and Sri Lankan Minister of Ports, Shipping, and Aviation Nimal Siripala De Silva at the Bangladesh Secretariat in Dhaka, the nations explored avenues for enhanced maritime cooperation.

The prospective signing of a coastal shipping agreement between the two countries was a focal point, with its finalisation anticipated in an upcoming secretary-level meeting. Minister Khalid announced plans for a ministerial-level meeting in Colombo to address maritime sector matters.

Despite a previous postponement due to

challenges in Sri Lanka, a commitment to deepen collaboration was evident. Sri Lankan businesses expressed keen interest in expanding investments in Bangladesh, notably the Payra port.

During the meeting, Deputy Minister of Foreign Affairs of Sri Lanka Tharaka Balasuriya highlighted the blue economy's significance for both nations. This subject is set for further discourse.

De Silva commended Prime Minister Sheikh Hasina's leadership, acknowledging her influence beyond Bangladesh's borders. The discussion also encompassed plans to increase shipping traffic between the Chattogram and Colombo ports and logistical support for Colombo Port.

The Sri Lankan private sector's investments in Bangladesh, totalling USD 4.5 billion across diverse sectors, reflect confidence in the country's stable political environment. The readiness of Sri Lankan businessmen to invest in Chattogram and Payra ports demonstrates a novel paradigm of cross-national cooperation.

In the Indian Ocean region, Bangladesh and Sri Lanka, though geographically modest, hold substantial strategic importance. The Sri Lankan delegation's presence in Dhaka for the Conference of Indian Ocean Regional Countries signifies their commitment to regional collaboration.

The bilateral meeting was attended by esteemed officials, including Mustafa Kamal, Secretary of the Ministry of Shipping; Tharaka Balasuriya, State Minister of Foreign Affairs of Sri Lanka; Rear Admiral M Sohail, Chittagong Port Chairman; Professor Shudharshan Seneviratne, High Commissioner of Sri Lanka to Bangladesh, among others.

BIMSTEC Business Advisory Council Proposed, Bangladesh to Chair Next



Thailand introduced the proposal for establishing a business advisory council on June 13, 2023, aiming to foster trade and investment cooperation within the private sectors of BIMSTEC nations. This council would serve as a dynamic platform for member states – Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand – to interact and advance their business interests. As Thailand's chairmanship concludes after BIMSTEC's sixth summit in November, Bangladesh is set to take the helm.

The Thai foreign affairs vice-minister, Vijavat Isarabhakdi, highlighted the emphasis on incorporating business voices, including those of start-ups and small and medium-sized enterprises, in BIMSTEC's priorities during his speech at the BIMSTEC Business Conclave organised by the Indian Chamber of Commerce.

The ongoing Trilateral Highway project between Thailand and India was also cited as a potential trade facilitator. The collaborative Trilateral Highway project could bolster trade and strengthen people-to-people connections.

BIMSTEC members have already endorsed an agreement on maritime transport cooperation, which opens doors for new business avenues in the Bay of Bengal region.

With the focus on transforming from a least-developed country to a middle-income nation, Bangladesh's Minister for Industries, Nurul Majid Mahmud Humayun, expressed the importance of fostering a business-friendly environment through industry best practices. He highlighted the bilateral trade with India and acknowledged India's role as a key trading partner for Bangladesh.

Nepal's Industry and Commerce Minister, Ramesh Rizai, underlined the country's determination to smoothly transition from a least developed country to a developing one by 2026. Cooperation and connectivity among member states were highlighted as central to Nepal's strategy.

Sri Lanka's Industry Minister, Ramesh Pathirana, emphasised the resource-rich and maritime trade potentials of BIMSTEC members. Despite the economic challenges posed by the pandemic, various sectors such as plantation, apparel, light engineering, electronics, gems, and jewellery contributed to Sri Lanka's economic stability.

Myanmar's Commerce Minister, Aung Naing Oo, pledged active engagement across sectors to expand trade among member countries.

Bangladesh and Denmark Unveil Green Technology Action Plan

Bangladesh and Denmark have given the green light to a comprehensive Joint Action Plan, spanning 2023 to 2028, under the umbrella of the Sustainable and Green Framework Engagement signed between the two nations the previous year. The plan sets the stage for collaborative endeavours in sustainable development, particularly focusing on green and clean technologies and investment initiatives.

The Joint Action Plan was officially unveiled during the visit of Danish Minister for Development Cooperation and Global Climate Policy, Dan Jorgensen, to Bangladesh from June 12 to 13.

Key areas of cooperation highlighted at the second Bangladesh-Denmark Political Consultations held in Copenhagen on June 9, 2023, encompass renewable energy, energy efficiency, circular economy, sustainable urbanisation, climate change adaptation, agro-and-food processing, maritime, ICT, and the blue economy sectors. Denmark expressed a deep interest in boosting ties in these fields.

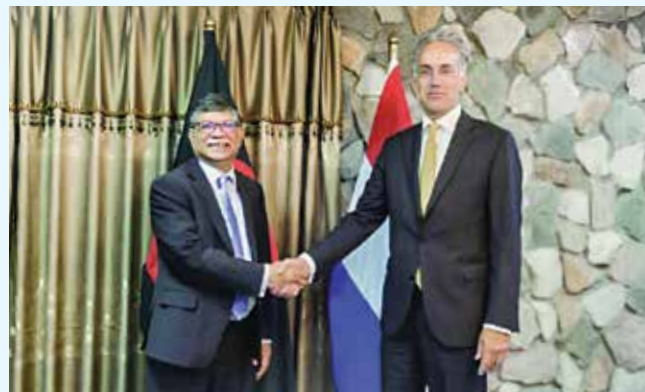
Emphasis was also placed on enhancing the ease of conducting business in Bangladesh to attract more Danish investment. The dialogue further extended to collaboration in science and technology, including higher education opportunities for Bangladeshi students in Danish universities and cybercrime prevention and digital economy training for Bangladeshi law enforcement officials.

These consultations covered regional and global concerns, including the Rohingya crisis, the Indo-Pacific dynamics, the Ukrainian conflict, and climate change. A shared commitment to close cooperation in various UN and other international elections was affirmed.

Following these discussions, Foreign Secretary Masud Bin Momen and Danish State Secretary for Trade and Global Sustainability Lina Gandlose Hansen engaged in talks to bolster Danish investment in Bangladesh.

The exchange was attended by notable figures, including Bangladesh's Ambassador to Denmark, Shahidul Karim, Denmark's Ambassador-designate to Bangladesh, Christian Brix Moller, and Director General (West Europe & EU) of Bangladesh's Ministry of Foreign Affairs, Kazi Russel Pervez, among others. Denmark's Ambassador to Bangladesh, Winnie Estrup Petersen, participated virtually.

Bangladesh and Netherlands Strengthen Bilateral Ties



Acknowledging Bangladesh's impressive socioeconomic progress, including its graduation from the Least Developed Countries (LDCs) category, the Netherlands has pledged its continued support for Bangladesh's economic diversification. Paul Huijts, Secretary-General of the Ministry of Foreign Affairs of the Netherlands, conveyed this sentiment during the Fifth Foreign Office Consultations between the two nations held in Dhaka on May 21, 2023.

In line with their commitment to enhancing collaboration, both countries resolved to further deepen their bilateral relations, particularly in the economic domain. They underscored mutual interests in trade and investment cooperation, the execution of Bangladesh Delta Plan 2100, human resource development, food security, agriculture, digital economy, and common global concerns like peace, security, water management, climate change, and Sustainable Development Goals (SDGs).

The consultations, led by Foreign Secretary Masud Bin Momen and Secretary-General Paul Huijts, acknowledged the historical Dutch assistance in Bangladesh's socioeconomic growth. The Netherlands' support in water resources management, food security, skills development, and the Ready-Made Garment (RMG) sector was also recognised.

Focusing on post-LDC graduation collaboration, both sides emphasised the potential for productive engagement between entrepreneurs, Small and Medium Enterprises (SMEs), and businesses. Their discussions encompassed water efficiency, digitalisation, circular economy, energy, climate adaptation, maritime affairs, design thinking, sustainability, and agriculture.

Both countries aim to foster deeper collaboration in trade, investment, and knowledge exchange by encouraging regular structured business interactions, including trade mission exchanges.

The consultations also touched on regional developments, emphasising the importance of enhanced cooperation and connectivity between the European Union (EU) and the Indo-Pacific region. Opportunities to strengthen Bangladesh and the Netherlands' engagement in multilateral forums were explored.

Expressing gratitude for Bangladesh's compassionate hosting of approximately 1.2 million Rohingya refugees, the Netherlands acknowledged ongoing global efforts to ensure accountability for human rights violations in Myanmar. The two nations reiterated their commitment to facilitating Rohingya refugees' safe, voluntary, and sustainable return to their homeland.



Lloyd's Register Triumphs in IMO NextGEN Connect Challenge

In an impressive display of maritime innovation, the Lloyd's Register Maritime Decarbonisation Hub (LR MDH) appeared victorious in the prestigious Singapore-IMO NextGEN Connect Challenge. Their winning proposal, titled 'Development of a Route-Based Action Plan Methodology based upon Silk Alliance,' garnered accolades for its visionary approach to reducing greenhouse gas emissions along shipping routes on a pilot basis.

This challenge was part of the broader IMO-Singapore NextGEN initiative, where 'GEN' signifies 'Green and Efficient Navigation.' Stakeholders were invited to submit methodologies aimed at developing actionable strategies for curbing emissions along shipping routes. The deserving winner was announced during the 2nd Accelerating Decarbonisation Conference held during Singapore Maritime Week.

Lloyd's Register's LR MDH earned this inaugural award for its pioneering proposal centred around the 'Silk Alliance,' a green shipping corridor cluster project designed to trial decarbonisation strategies for container ships predominantly operating in the Asian region. By leveraging the proven success of the 'First Movers' initiative, the LR Maritime Decarbonisation Hub aims to identify an initial batch of container ships to participate in this vital project.

Charles Haskell, Director of the LR Maritime Decarbonisation Hub, expressed his hopes that the successful implementation of a green corridor within the intra-Asia route will ignite a spillover effect, leading the shipping industry towards achieving its ambitious zero emissions goal by 2050. This strategic approach aims to foster knowledge, capability, and investments across the wider region, ensuring a fair and equitable transition that benefits Less Developed Countries (LDCs) and Small Island Developing States (SIDS) in the Asia Pacific.

Emphasising the importance of innovation and pilot projects in driving progress, IMO Secretary-General Kitack Lim commended the collaborative efforts of industry stakeholders, academia, and global research centres within the NextGEN Connect framework.

The Lloyd's Register CEO, Nick Brown, emphasised the importance of the IMO NextGEN Connect Challenge's endorsement, highlighting the pivotal role of LR MDH's green corridor methodology in stimulating the critical mass needed to accelerate much-needed infrastructure investments.

In line with NextGEN Connect's inclusive approach, the lessons gleaned from this transformative project will be actively shared to promote best practices that can be replicated across the maritime sector, particularly benefiting developing States.

The resounding success of Lloyd's Register in the IMO NextGEN Connect Challenge stands as a testament to the maritime industry's unwavering commitment to fostering sustainable practices and shaping a greener, more environmentally conscious future for global shipping.



Tragic Implosion Claims Lives of Submersible Crew on Titanic Expedition



In a devastating turn of events, a submersible carrying five individuals to explore the wreckage of the Titanic met a catastrophic fate, imploding near the shipwreck

site and resulting in the loss of all on board. The incident has sent shockwaves through the maritime research community and raised concerns about the dangers of deep-sea exploration.

The ill-fated submersible, named the Titan, was operated by OceanGate Expeditions and boasted a unique cylinder-shaped cabin made of carbon fibre, providing a roomier interior compared to traditional sphere-shaped cabins made of titanium. However, industry experts have highlighted that this design choice may have compromised the vessel's structural integrity, especially under extreme water pressure at depths where the Titanic rests.

The Titan went missing on 18 June 2023, and a US Navy acoustics system detected an "anomaly" consistent with an implosion on the same day. Authorities continued their search efforts, hoping for a different outcome. Still, the US Coast Guard eventually confirmed that a "catastrophic implosion" had claimed the lives of the submersible's pilot and four passengers.

Experts emphasise that the pressures at the Titanic's depth - roughly 12,500 feet (3,800 meters) below the surface - are immense, exerting approximately 6,000 pounds per square inch. Although innovative, the Titan's larger internal volume exposed it to even more external pressure, potentially compromising its structural integrity.

Maritime researchers have compared the destructive force of an implosion to a whale's bite, highlighting the challenges and risks of navigating such environments. Even with a composite hull and built-in sensors designed to withstand high pressures, the slightest defect could lead to a "near instantaneous implosion," experts warn.

Bob Ballard, a member of the team that discovered the Titanic wreck in 1985, expressed the astonishing energy involved in an implosion, stating, "It just takes out and literally shreds everything."

The tragedy echoes a similar disaster in 1963 when the USS Thresher, a nuclear-powered submarine, also suffered an implosion during a test dive, resulting in the loss of 129 lives.

As the maritime community mourns the loss of the Titan's crew, questions arise about the future of deep-sea exploration and the need for even more rigorous safety measures to protect those brave enough to venture into the depths. The incident serves as a solemn reminder of underwater expeditions' inherent risks and complexities, underscoring the importance of prioritising crew safety and vessel design in maritime exploration endeavours.

World Maritime University Commemorates 40th Anniversary with Conference on Maritime and Ocean Sustainability



The World Maritime University (WMU), established by the International Maritime Organisation (IMO), celebrates its remarkable four-decade journey as a global centre of excellence in postgraduate maritime and ocean education, research, and professional training. With over 5,800 alumni from 170 countries and territories, the WMU has fostered a vast network of well-qualified maritime experts, especially in developing nations.

The momentous 40th anniversary was marked with a vibrant international Conference on Maritime and Ocean Sustainability held in Malmö, Sweden, from 20 to 22 June 2023. IMO's Secretary-General, Kitack Lim, himself an esteemed graduate of WMU, expressed profound appreciation for the university's impact on its alumni, shaping their lives and careers and forging enduring connections.

Mr Lim extended his heartfelt gratitude to the City of Malmö, the Government of Sweden, and all generous supporters of WMU, recognising their pivotal role in the university's success. He emphasised the role of WMU graduates in shaping a brighter future for the international maritime community, ensuring the preservation of our oceans for future generations.

The outgoing President of WMU, Dr Cleopatra Doumbia-Henry, reflected on the institution's remarkable evolution over the years, now encompassing MSc programmes in China, distance learning initiatives, and a thriving PhD programme, solidifying its status as an esteemed centre for maritime education and research.

As the esteemed institution enters its fifth decade, Professor Max Mejia, WMU's incoming President, underscored the importance of capacity-building and knowledge creation in tackling maritime and ocean challenges, aligning with IMO's commitment to a greener and more sustainable maritime sector.

The conference, sponsored by IMO, the ITF Seafarers' Trust, and Ghana Ports and Harbours Authority, focused on key themes, including maritime and ocean sustainability, zero-emission shipping, fostering innovation, and protecting oceans beyond national jurisdiction.

Over the years, WMU has played a crucial role in enhancing global maritime expertise and advancing sustainable development in line with the United Nations Sustainable Development Goals. Its continued dedication to fostering talent and collaboration ensures a promising future for the maritime and ocean sectors worldwide.

Second International Day for Women in Maritime Celebrated with Global Recognition

On 18 May 2023, the International Maritime Organisation (IMO) commemorated its second International Day for Women in Maritime, underscoring the significance of collaboration and networking in advancing gender equality within the maritime sector.

IMO Secretary-General Kitack Lim highlighted women's crucial role in the industry, supporting the shift towards a decarbonised, digitalised, and sustainable future. However, Lim emphasised the urgency of addressing the gender imbalance and the sector-wide advantages of a diverse workforce.

The theme for this year's celebration emphasised the importance of collaboration and networking in achieving gender equality. Lim praised the IMO-established Women in Maritime Associations as inspiring networks that pave the way for women in the industry and motivate the next generation to join.

The two-day conference at IMO's London headquarters marked the occasion, with numerous organisations and companies from the maritime sector expressing their support and commitments.

The Mission to Seafarers celebrated its nearly 50/50 gender distribution among staff and a senior management team predominantly composed of women. However, they expressed the need for more female chaplains and ship visitors worldwide.

The International Transport Workers' Federation, International Chamber of Shipping (ICS), World Shipping Council, UK Maritime and Coastguard Agency, Princess Cruises, and Transport Canada also participated, recognising the contributions of women and advocating for further progress towards equality.

Various media outlets, such as TradeWinds, Splash247, JLA Media, and Safety4Sea, featured sector voices addressing the need for change and women's empowerment in the maritime sector.

The Women's International Shipping & Trading Association (WISTA) celebrated women working in the maritime sector, stressing the importance of recruiting and retaining female employees. WISTA International President, Elpi Petraki, highlighted that dedicated collaboration can bring about real change for all.

Prominent figures like Despina Panayiotou Theodosiou, CEO of Tototheo Maritime, and Sinikka Hartonen, Secretary-General of One Sea, shared their insights on the role of social awareness, training, and education in promoting diversity in the maritime industry.

As the sector marks this pivotal day, it remains united in its commitment to accelerate change, promote diversity, and achieve gender equality within the maritime community.

Fugro's Remarkable Effort Uncovers Montevideo Maru Wreck 80 Years After Tragic Sinking

In a truly extraordinary endeavour spanning nearly five years of meticulous planning, Fugro has played a pivotal role in locating the wreck of the Montevideo Maru, a vessel at the centre of one of history's most devastating international maritime disasters. Collaborating closely with the Silentworld Foundation and the Rabaul and Montevideo Maru Society, and with support from Australia's Department of Defence, Fugro harnessed its unmatched deepwater hydrographic and oceanographic expertise to successfully pinpoint the Japanese transport ship's wreckage at a depth exceeding 4000 meters off the Philippines' coast.

During World War II, the Montevideo Maru was tragically sunk by an American submarine in 1942, carrying approximately 1060 prisoners of war and civilians. The calamity claimed lives from at least 14 countries, including Australia, Denmark, England, Estonia, Finland, the Netherlands, Japan, Ireland, New Zealand, Norway, Scotland, Solomon Islands, Sweden, and the US.

The search mission commenced on 6 April 2023, 110 km northwest of Luzon in the Philippines, aboard the Fugro Equator, an advanced and well-equipped hydrographic survey vessel. Employing an autonomous underwater vehicle (AUV) equipped with sonar, the Fugro team recorded a positive sighting within 12 days. Expert analysis from the project team, comprised of maritime archaeologists, conservators, operations and research specialists, and ex-naval officers, confirmed the discovery a few days later.

John Mullen, director of the Silentworld Foundation, expressed his gratitude to the dedicated teams involved in the expedition, acknowledging the closure this discovery may bring to the families affected by this tragic disaster.

Fugro's CEO, Mark Heine, highlighted the significance of their skills and technology in finding resolutions to historical projects, profoundly impacting people's lives and contributing to creating a safer and more sustainable world. The discovery of the Montevideo Maru is a poignant moment in international military and maritime history, honouring the lives lost and the families forever impacted.

Maritime AI and Autonomy Market Projected to Reach \$5 Billion by 2028



A recent report focusing on the future of AI in the maritime sector foresees a combined value of \$5 billion for the AI-driven systems and vessel autonomy market by 2028. Currently, there are already 276 companies actively engaged in the maritime

AI segment. Lloyd's Register (LR) and Thetius jointly produced the report, urging maritime organisations to invest in enhancing their understanding of AI at all levels and to provide workforce education and training to ensure awareness of safety and regulations associated with advanced technology.

Titled "Out of the Box," the comprehensive study assesses autonomy and artificial intelligence in the maritime industry, projecting a joint market worth \$3.7 billion in 2023, reflecting a 57% increase from 2022.

The report further recommends establishing an independent cross-industry body to facilitate the safe development of artificial intelligence for maritime organisations and to manage the potential novel risks introduced by these emerging technologies.

Dipali Kuchekar, Product Manager, Autonomous Systems and Novel Technologies at Lloyd's Register, emphasised their commitment to adapting and evolving assurance processes to support the integration of AI and autonomous systems, ensuring that safety remains a paramount consideration for the shipping industry. Kuchekar also mentioned that Lloyd's Register is poised to support shipowners and operators as they evaluate the investment potential of autonomy and AI.

Building upon a previous 2022 study, "The Learning Curve - The State of Artificial Intelligence in Maritime," which highlighted the importance of prioritising safe testing environments for AI and autonomous technology, the new report stresses the significance of digital twin simulations and using designated ships as beta testers to prevent real-world incidents.

Collaboration between Schools and Industry Shaping Europe's Blue Economy



The Norwegian island of Frøya is famous for its optimal conditions for salmon farming and for Guri Kunna. This pioneering school has been training young individuals, as young as 16, to work in the fish farming industry for decades. The Guri Kunna school provides a comprehensive education in fish farming, including piloting boats and caring for fish at real salmon farms. Its success has inspired BRIDGES, a European-funded project aimed at enhancing collaboration between schools and the industry to foster skill development in the aquaculture sector across four Nordic countries.

Aquaculture plays a crucial role in the European Green Deal by promoting coastal economies and sustainable seafood. The blue economy generates millions of jobs, accounting for approximately 2.3% of all EU jobs. However, upskilling and reskilling

workers are essential to keep pace with the rapidly evolving industry. Projects like MarLEM are offering new Master's courses to address knowledge gaps, and digitalisation needs in maritime logistics. The ScienceDIVER project, led by the University of Thessaloniki, aims to make scientific diving more accessible by developing a universal training standard to facilitate international collaboration among scientists.

Experts predict a rising demand for highly skilled professionals in Europe's blue economy. By promoting collaboration between schools and industry and providing training opportunities, Europe's blue economy offers a vast sea of career prospects for bright minds interested in contributing to the future of this vital sector.

Professor Maximo Q. Mejia, Jr. Assumes the Presidency of World Maritime University



The prestigious World Maritime University (WMU) marks a momentous occasion as it installs Professor Maximo Q. Mejia, Jr. as its eighth President on 29 June 2023. Notably, Professor Mejia is the first President from Asia and the first to graduate from WMU. Founded by the International Maritime Organisation (IMO), WMU's mission centres around being a global centre of excellence in postgraduate maritime and ocean education, professional training, and research, all while promoting sustainable development.

President Mejia now fills the crucial position of Chief Executive Officer at WMU, under the appointment of the Secretary-General of the IMO, who also serves as the University's Chancellor. He succeeds Dr Cleopatra Dombia-Henry, who has led the university since 2015 and played a pivotal role in steering the institution's focus towards addressing climate change challenges in the maritime industry.

Taking the helm of WMU is critical for the IMO and the shipping sector. As the IMO is set to revise its decarbonisation strategy in July, calls for accelerated efforts towards net zero operations have grown louder, placing the university's leadership in maritime decarbonisation at the forefront.

Expressing gratitude for the privilege to lead WMU, President Mejia highlighted the institution's unique connection to IMO, its extensive global network, and stellar postgraduate education, preparing WMU graduates to be exemplary forces for good in the maritime and ocean sectors. He looks forward to guiding eminent maritime and ocean scholars, researchers, and professionals in bolstering global capacity building to support a blue economy.

Professor Mejia brings a distinguished track record as a global leader and scholar in maritime governance, policy, and administration, boasting over three decades of professional and academic experience. Prior to his presidency, he held various positions within WMU, including Director of the PhD Programme and Nippon Foundation Professor of Maritime Policy, Governance, and Administration.

His previous role as Administrator/Director General at the Maritime Industry Authority (MARINA) in the Philippines underscores his commitment to developing, promoting, and regulating the maritime industry. Professor Mejia has served on several senior diplomatic assignments, exemplifying his strong international advocacy for safe, secure, sustainable, and efficient shipping on clean oceans.

As WMU enters this new era under Professor Mejia's leadership, its significant role in shaping the maritime sector's decarbonisation efforts remains evermore pivotal and aligned with the pressing global need to address climate change challenges.

KMOU Signs Business Agreement With Ocean Platform And 6 Universities

Ocean Platform (CEO Bae Jae-ryu), a corporation incorporated by Korea Maritime & Ocean University (KMOU), entered into business agreements with leading domestic and foreign educational institutions to start fostering overseas manpower in the maritime industry. It is to suggest a solution to the manpower shortage that is holding back the shipbuilding industry for the first time in 10 years.

The contracting institutions are Ocean Platform and six overseas universities, including KMOU. Ocean Platform is an incorporated corporation composed of Busan, Ulsan, and Gyeonggi experts. It is a platform for experts to solve domestic shipyard difficulties and strengthen the shipbuilding industry's competitiveness. It educates and nurtures overseas human resources and supplies them to related industries.

This agreement was established to educate and nurture foreign manpower with competence and to stably settle the manpower in the shipbuilding and marine industry. It is a plan to induce a virtuous cycle of industrial growth by promoting the stabilisation of the shipbuilding industry.

Overseas universities participating in the agreement are Chennai Institute of Technology (India), National University of Technology (Pakistan), Polytechnic College of Construction, Technology (Mongolia), University of Colombo (Sri Lanka), North South University (Bangladesh), Sona College (Vietnam).

According to the agreement, participating organisations conduct appropriate training so that overseas manpower can be competitive in the maritime industry. Then we work together so that they can succeed until they get a job.

In particular, these organisations strive to nurture talents suitable for industries such as welding, painting, electricity, plumbing, and ship navigation, which require manpower supply and demand in the maritime industry.

Through these training courses, these institutions plan to efficiently nurture manpower for production skills and expand the field of fostering talent to include design manpower and engineers in the future.

President Doh Do-hee said, "The most important thing to do for the shipbuilding industry to take off again along with the good performance in orders is the smooth supply of manpower."

Previously, in February, the university signed business agreements with Ocean Platform and nine companies introducing foreign workers. Ocean Platform, Geoje Chamber of Commerce and Industry, Samsung Heavy Industries Partner Council, and Hanwha Ocean In-house Partner Council signed an agreement in May. This agreement is a follow-up measure for concrete and responsible implementation of the previous agreement.



Inspiring Ideas and Embracing Innovation

A Reflection on World Environment Day 2023 at BSMRMU

Afrin Rahman Sumoni

The atmosphere at the Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU), Bangladesh, was changed with excitement and enthusiasm as students, faculty members, and esteemed guests gathered to celebrate World Environment Day on June 5, 2023, organised by BSMRMU Science Club (BSMRMUSC). The event aimed to raise awareness about environmental issues, promote sustainable practices, and recognise outstanding contributions to environmental conservation.

Event 1: Rally for Environmental Awareness



BSMRMU Science Club (BSMRMUSC) Students convened to celebrate World Environment Day 2023



BSMRMU Unites for a Cleaner Coastline: Students, Teachers, and Officers Lead by Example in Beach Clean-Up Drive, Inspiring Coastal Communities and Tourists to Protect Our Shared Environment

The World Environment Day celebrations at BSMRMU began with a spirited rally to spread awareness about pressing environmental issues and encourage individuals to take responsibility for their actions. Students and faculty members came together, marching through the campus and nearby areas,

holding banners and signs advocating for sustainable practices and conservation.

The rally was a visual reminder of the collective power to bring about positive change.

Event 2: Idea-Based Presentation Competition

Following the rally, BSMRMUSC hosted an exciting Idea-Based Presentation Competition. Students were invited to showcase their innovative solutions to address critical environmental challenges. Participants presented their ideas on diverse topics such as eco-friendly waste management, sustainable transportation, and conservation initiatives.



The gathering was also addressed by Rear Admiral Mohammad Musa, the Vice-Chancellor of BSMRMU, who was the chief guest for the event

Event 3: Enlightening Speeches by Esteemed Speakers

Syeda Masuma Khanam, the Director (Joint Secretary) of Natural Resource Management, Department of Environment, Government of the People's Republic of Bangladesh, delivered an inspiring keynote address. Her profound knowledge and insights shed light on the critical environmental issues we face today and stressed the importance of collective action to address

them. Ms Khanam's enthusiastic speech left the audience feeling motivated and determined to make a positive impact.

The event's chief guest, Rear Admiral Mohammad Musa, the Vice-Chancellor of BSMRMU, also addressed the gathering. His presence highlighted the significance of academia and institutions in driving sustainable practices. Rear Admiral Musa emphasised the role of universities in nurturing future leaders and researchers who will spearhead sustainable development efforts.

Commodore M Ziauddin Alamgir (ret'd), Chairman of the Dean's Committee, the Dean of the Faculty of Engineering and Technology and the mentor of the BSMRMUSC, provided valuable guidance throughout the event. His expertise and support were instrumental in organising a successful celebration of World Environment Day. Commodore Alamgir's dedication to promoting sustainable practices and his role as a mentor always inspires students and faculty members alike.

Event 4: Prize-Giving Ceremony

Awards were presented in various categories of past events, such as the 3D Ship Design Competition, Quiz Competition, Best Presentation, etc.

The ceremony recognised the club's remarkable efforts and outstanding contributions throughout the year, including successful initiatives such as tree planting, recycling campaigns, and awareness drives.

The ceremony served as a testament to the university's commitment to nurturing a generation of environmentally conscious leaders. Indeed, World Environment Day 2023 at BSMRMU was an unforgettable celebration of environmental consciousness and innovation.

Afrin Rahman Sumoni

Undergraduate Student

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A Mesmerising Expedition

Exploring Kuakata, Payra Port, and Barishal in Southern Bangladesh

Tasnim Fatema Meghla

Introduction

Embarking on a captivating 3- to 4-day journey through the enchanting landscapes of Southern Bangladesh, I had the incredible opportunity to visit some remarkable destinations, each leaving an indelible mark on my heart. This report chronicles our exploration of the picturesque Kuakata Sunrise Point, the impressive Payra Thermal Power Plant, and the promising Payra Port. Additionally, we delved into the region's rich cultural and spiritual heritage by visiting the historic Guthiya Mosque and the serene Dhormosagor Lake in Barishal. Our adventure was further heightened with a visit to the Barishal Marine Academy, where we immersed ourselves in the beauty of the campus and experienced warm hospitality throughout our stay.

Day 1: Immersed in Cultural Splendours

The first day of our journey began with a visit to the historic Guthiya Mosque in Barishal. Adorned by intricate architectural details, the mosque emanated an aura of tranquillity and serenity. As the boys in our group offered their Friday prayers, we felt a profound spiritual connection. The experience served as a beautiful introduction to the region's rich cultural heritage.

Following the spiritual sojourn, we explored the nearby Dhormosagor Lake, which seemed to mirror the sky, creating an enchanting vista. The calm waters and the surrounding greenery provided a much-needed respite from the hustle and bustle of city life. We enjoyed strolls along the lake's edge, soaking in the peaceful ambience.

We arrived at the prestigious Barishal Marine Academy in the late afternoon. We were welcomed with warm grins and served lavish

The historic Guthiya Mosque in Barishal



meals on the campus. The friendly staff made us feel at home, and we savoured the delicious local delicacies, each bite revealing the essence of Bengali cuisine. The academy's campus was a sight to behold, surrounded by lush gardens and towering trees. After the meal, we explored the academy's premises, engaging in playful activities on the well-maintained playground and capturing countless photos to preserve the memories of this delightful visit.

Day 2: Greeted by Nature's Splendour at Kuakata Sunrise Point

As the sun cast its first rays over the horizon, we set off to experience the majestic beauty of the Kuakata Sunrise Point. Standing at the confluence of the Bay of Bengal, we witnessed a breathtaking spectacle. The vibrant hues of the sky painted a mesmerising canvas, blending with the gentle whispers of the waves crashing onto the shore. We were left amazed by nature's unparalleled artistry, and the experience felt like a spiritual awakening.



The majestic beauty of the Kuakata Sunrise Point

Later in the day, we headed to the illustrious Payra Thermal Power Plant, eager to witness its grandeur up close. As we ventured above the colossal boiler, we were amazed by the intricate machinery that powers the region. The knowledgeable staff gave us insights into the plant's operations and its significant contribution to the nation's energy needs. During our visit, the hospitable staff offered us delectable snacks, a gesture that added warmth to an already captivating experience. Additionally, we were privileged to witness their mother vessel with an impressive draft of 14 metres, a testament to their operational excellence.

Day 3: Unveiling the Future at Payra Port

Day three of our journey unveiled the dynamic world of Payra Port, a symbol of Bangladesh's progress and aspirations. Welcomed by the port authority, we saw the comprehensive area plan of Payra Port and the authority's commitment to providing a holistic living experience for

// New Waves //

its workforce and families. The ambitious project included hospital, school, and college provisions within the port premises. The vision for a self-sustaining community left us inspired by the port's foresight and dedication to its people. Boarding a pilot boat, we embarked on an enthralling tour of the seven rivers, revealing the heart and soul of the port's operations. The Shondha, Andharmanik, Meghna, Tentulia, Haringhata, Baleshwar, and Payra rivers showcased the vital connection between waterways and trade, a lifeline for commerce and prosperity. As we cruised along the streams, we marvelled at the port's strategic location, making it a gateway to regional and international trade.

Day 4: Exploring Kuakata's Cultural Delights

Our final day at Kuakata allowed us to delve deeper into the local culture by visiting a native place called Rakhine Polli. The vibrant colours, intricate designs of their traditional attire, and warm smiles instantly made us feel at home. We engaged with the locals, eager to learn about their customs and way of life, and were grateful for the chance to embrace their rich cultural heritage.

As we strolled through the market at Rakhine Polli, we were captivated by the array of handicrafts and artefacts that adorned the shops. We couldn't resist indulging ourselves and finding unique souvenirs to bring back for our loved ones. The variety of tribal dresses, shawls, and jewellery made from sea pearls and oyster shells was truly captivating. Each piece held a story, a connection to the sea, and the skilled hands that crafted them.

We hopped on a local transport called Van-gari to continue exploring the local lifestyle. The ride was an adventure as we navigated the narrow lanes and observed the bustling life of the coastal community. The Van-gari offered us an authentic glimpse into the everyday lives of the locals, fostering a deeper appreciation for the simplicity and authenticity of their way of living.

The final day of our journey beckoned us back to the serene beauty of Kuakata Sea Beach, where we stayed to soak in the enchanting vistas. The rhythmic sounds of the sea created a soothing melody, and we revelled in the tranquillity of the beach. The vast expanse of the Bay of Bengal instilled a sense of wonder, reminding us of the boundless possibilities.

As the sun began to set, we gathered for a delightful barbecue dinner with our esteemed Dean and our Proctor's family. The camaraderie and joy shared during the meal created cherished memories forever in our hearts. The evening concluded with laughter, stories, and an overwhelming sense of gratitude for the remarkable journey we had undertaken together.

Conclusion

As we bid farewell to this region, we carried with us cherished memories and a newfound appreciation for the diversity and uniqueness of Bangladesh. This captivating expedition to Southern Bangladesh will forever hold a special place in our hearts, a reminder of the enriching experiences that travel can offer and the connections we form with people and places.

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At the Payra Thermal Power Plant





The Ganges River Dolphin

A Tale of Survival and Our Responsibility

Kayes Mohammad

Dolphins, along with certain species of turtles, crocodiles, and sharks, are among the oldest creatures on Earth. The Ganges River dolphin was officially documented in 1801. It once lived in the Ganges-Brahmaputra-Meghna (GBM) and Karnaphuli-Sangu River systems in Nepal, India, and Bangladesh (as well as other productive river systems). However, the species has become extinct across much of its former range. Some familiar names of the Ganges River dolphin include the South Asian River dolphin, Ganga dolphin, and Gangetic dolphin. In local languages, the dolphin is referred to by various names, often reminiscent of its sound when breathing, such as Susu, Soos, Shushuk, Socho, Shus, and Suongsu. Due to their significance in this region, they are often regarded as the ‘Tiger of the Ganges’. The Ganges River dolphins are considered living fossils, the oldest surviving dolphin species.

Characteristics

Ganges River dolphins are usually grey or light brown but may also have a pinkish tone to the belly. The dorsal fin of the Ganges River is a tiny, low-lying, fleshy bulge on the back that is typically only a few centimetres high. They possess steep foreheads and flexible necks with unfused vertebrae, allowing them to turn their heads from side to side gracefully. Their snouts are elongated and slightly upturned (about 20% of total body length in females). Sharp, pointed, long teeth are visible even when their mouth is closed. The pectoral flippers on the sides of their bodies are notable for their large and paddle-shaped structure. Externally, the eye appears barely more significant than a pinhole that restricts light from reaching the retina, which cannot form clear images. But they may still serve as light receptors. Being functionally blind, Ganges River dolphins heavily rely on echolocation for navigation and hunting.

Habitat, Diet, and Behaviour

The Ganges River dolphins are essentially blind and can only live in freshwater. They commonly inhabit the deeper stretches of rivers,

Scientific Name: *Platanista gangetica*

Population: Less than 1800 (1200 to 1800)

Length: Up to 2.12 m (Male), 2.70 m (Female)

Weight: 150-170 Kg

Conservation Status: Endangered (IUCN)

Habitats: Freshwater rivers

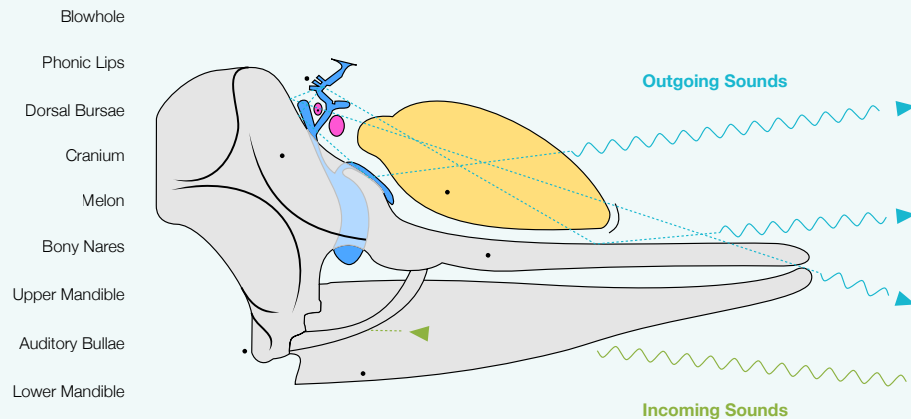
showing a preference for areas with eddies around islands, river bends, and confluences—favoured fishing spots for humans as well. They have developed

a unique side-swimming behaviour to navigate effectively through shallow waters. Regular dive of Ganges River dolphins lasts between 70-100 seconds. They generally navigate and hunt by echolocation (emitting ultrasonic sounds and listening for the reflected echoes when they bounce off fish and other prey), enabling them to “see” an image in their mind. This exceptional combination of hunting and navigating techniques enables them to thrive in their riverine environment.

Although Ganges River dolphins are frequently seen alone or in small groups, a mother and calf usually roam together. They consume a wide range of small and medium-sized fish and crustaceans. Moreover, they are typically reserved and shy toward humans.

Reproduction and Growth

The mating and reproductive behaviours of Ganges River dolphins remain in mystery. They give birth all year, but most deliveries are estimated to occur between October and March. Females are sexually mature at 10-12 years, while males mature earlier. After 9 to 11 months of gestation, only one calf is born to a female once every 2-3 years. Due to a longer rostrum, females are typically longer than men. The oldest observed Ganges River dolphin was a male (about 30 years old).



Sound propagation of Dolphin

Why They Matter

Indicator species: It serves as an indicator of the health of the Ganges River ecosystem, as its presence reflects the river's overall ecological well-being.

Biodiversity conservation: The Ganges River dolphin is an endemic species found only in the Ganges-Brahmaputra-Meghna (GBM) river systems. This species helps to preserve the unique biodiversity of this region.

Ecological balance: As a top predator in its habitat, the Ganges River dolphin plays a crucial role in maintaining the ecological balance of the river ecosystem by regulating fish populations.

Cultural and spiritual significance: The Ganges River dolphin holds cultural and spiritual importance for communities along the river. It is considered sacred by many and is an important cultural symbol.

Tourism and economic benefits: The presence of the Ganges River dolphin attracts tourists, contributing to local economies through eco-tourism and generating income for communities near the river.

Conservation Issues

From a population of 10 thousand, the Ganges River dolphin has drastically decreased to less than 2,000 in the past century. The absence of a coordinated conservation plan, lack of awareness, and ongoing anthropogenic pressure create relentless threats to the existing population. For these reasons, despite the high level of protection, its numbers continue to decline.

Threats

Infrastructure: The main threat to the river dolphins is water-related infrastructure (dams, barrages, diversions, embankments, etc.), leading to flow regulation and habitat fragmentation. Infrastructures has reduced their movement and diminished food availability due to disrupted fish/prey migration and breeding cycles.

Bycatch: Both dolphins and people prefer areas of abundant fish production and moderate water currents. Unfortunately, this leads to a higher risk of dolphins getting accidentally caught in fishing nets, known as bycatch.

Pollution: Ganges River dolphins are vulnerable to adverse health issues due to water pollution from industrial waste, agricultural run-off, and other sources of pollution. High pollution levels can harm their prey and devastate their habitat.

Deliberate Hunting: The Ganges River dolphin is still hunted for meat and oil, both used medicinally. Their oil is also utilised to attract catfish in net fishing.

Human Disturbance: Disturbance from human activities, including boat traffic, dredging, and underwater noise, is also a significant threat to the species.

Food Scarcity: Overfishing in the habitats of the river dolphin leads to food scarcity, impacting their ability to find an adequate food supply.

Steps Taken

The government recently approved the 'Dolphin Conservation Action Plan (DCAP)' to safeguard dolphin habitats. They also approved the 'Fund Management

Guidelines', 'Dolphin Atlas in Bangladesh', and the 'Management Plan for the Ganges River Dolphin in Halda River', with some amendments.

What We Have to Do

To build a future where humans live in harmony with nature, we must protect the Ganges River dolphin. The Ganges River dolphin can only be safeguarded with the help of local and other community's coordinated conservation plans.

- First, we must determine the recent and major threats to the species and their habitats for prioritised conservation action.
- We must bolster scientific research and change our policies and practices to conserve dolphins.
- There is also a necessity to change the navigation route and ban all kinds of fishing and dredging activities in the major habitats of the river dolphins.
- We must promote using natural fertilisers, afforestation of the riverbank, and discourage domestic sewage disposal and sand-mining activities in the dolphin habitats.
- Dolphin conservation and awareness-related programmes have to be conducted frequently with the fishermen and other riparian populations.
- Also, the local community members must engage in dolphin conservation and monitoring projects with financial support.
- As soon as possible, the government should strictly implement the 'Dolphin Conservation Action Plan' and other projects related to conserving the species.
- Finally, the government must undertake a coordinated conservation plan with the help of local communities, stakeholders, non-governmental organisations, and other partners.

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Modernisation of Chittagong Port to Build a Smart Bangladesh to Bolster Vision 2041

Md Sajal Ahmed

Introduction

The Chittagong Port serves as the primary national gateway for Bangladesh, facilitating more than 90% of the country's imports and exports and approximately 98% of its container trade. The entity holds significant importance in the logistics network of the nation. It forms an essential component of the sub-regional transportation framework that links the northeastern region of India, Bhutan, and Nepal to Europe, North America, and Southeast Asia. Modernisation of Chittagong Port is necessary to realise the goal of the Bangladesh government for a smart Bangladesh by 2041. This article aims to examine the strategy for modernising the port and the potential contribution it may make to the economic growth of Bangladesh. In order to collect information on the topic, the research relied on secondary data sources such as academic publications, papers, reports, and websites. According to the results, modernising the Chittagong Port will likely result in various positive outcomes, such as higher economic development and competitiveness, better regional connections, and enhanced environmental sustainability.

Chittagong Port Recently Completed Projects:

- I. Strategic master plan for Chittagong port.
- II. Chittagong Port trade facilitation project (CPA Component)
- III. Construction of backup facilities behind Berth No. 4 and 5 of the new mooring container terminals.
- IV. Installation of Vessel Traffic Management Information System (VTMIS)
- V. Procurement of one high-power tug (4500 BHP)
- VI. Procurement of one sea-going water supply vessel.
- VII. Procurement of 29 containers and cargo handling equipment.
- VIII. Procurement of three reconditioned container vessels to ply the Chattogram-Pangaon Route.
- IX. Installation of a surface water treatment plan.
- X. Procurement of one modern survey boat multibeam echo sounder.
- XI. Procurement of equipment for New-mooring Container Terminal (NCT)
- XII. Construction of overflow yard at new mooring colony.
- XIII. Procurement of two mobile harbour cranes.

XIV. Construction of the CPA hospital complex.

Chittagong Port Ongoing Projects:

- I. Shifting and re-construction of services jetty located near dock office to the upstream of jetty No. 1
- II. Enhancement of navigability in Karnaphuli River through dredging from Sadarghat to Bakalia Char.
- III. Construction of Patenga Container Terminal (PCT)
- IV. Procurement of two high-power tugs (5000 BHP)
- V. Procurement of necessary equipment for various yards and terminals of Chittagong Port.
- VI. Matarbari Port Development Project.

Chittagong Port Upcoming Projects:

- I. Construction of Bay Multi-Purpose Terminal.
- II. Expansion of Chittagong Port's yard facilities.
- III. Matarbari Port Development Project (Stage-1, phase-2)
- IV. Bay Multi-Purpose terminal at jetty no. 1-9 in the General Cargo Berth (GCB) area of Chittagong Port.
- V. Port sector master plan
- VI. Construction of Mirsarai/ Sitakunda Port
- VII. Expansion of Chittagong Port yard facilities with the truck terminal.
- VIII. Matarbari Port Development Project (Stage -2)
- IX. Procurement of various types of tugs, pilot vessels, and utility service providers for new future projects of the expanded port limit and CPA.
- X. Construction of heavy lift cargo jetty with backup facilities
- XI. Construction of Bay Terminal breakwater and navigational access channel.

Top 10 Smart Ports Around the World

Smart Ports means using automation and innovative technologies, including Artificial Intelligence (AI), Big Data, the Internet of Things (IoT), and Blockchain to improve performance.

New technology, methods, and solutions will replace the view of ports and container shipping as conservative and resistant to change, leading to a brighter, more connected future.

Port of Rotterdam



Port of Rotterdam

One of the most cutting-edge and productive ports in the world is Rotterdam. It is known as a “smart port” because of its forward-thinking utilisation of technology and data-driven solutions to boost productivity, ease traffic, and increase environmental sustainability. The port uses state-of-the-art technology, including IoT sensors, big data analytics, and AI, to improve efficiency across the supply chain. The port, for instance, has installed a computerised container tracking system that gives shippers and logistics providers access to real-time data on the whereabouts of their goods. The port also uses predictive analytics to enhance ship turnaround times by optimising vessel traffic and decreasing waiting periods. The Port of Rotterdam’s continued success thanks to these measures has inspired ports around.

Port of Hamburg

Much like the Port of Rotterdam, the Port of Hamburg has integrated several cutting-edge technologies, including IoT sensors, big data analytics, and AI, to increase operational efficacy and lower their overall environmental impact. For example, the port has recently installed an intelligent traffic management system that uses data collected in real-time to improve traffic flow and cut down on congestion. Additionally, it has implemented a cutting-edge energy management system that contributes to the reduction of energy consumption as well as emissions of greenhouse gases. A digital portal allowing shippers and logistics providers to book and monitor cargo in real time is one of the many digital initiatives that Hamburg has introduced to increase communication and cooperation amongst port partners. Through implementing these initiatives, the Port of Hamburg has evolved into one of the most technologically advanced and productive ports in Europe and a pioneer in environmental responsibility as well as technological advancement within the shipping sector.

Port of Antwerp

Another smart port that uses technology and data to maximise operations and sustainability in Antwerp. The port uses IoT sensors, big data analytics, and AI to improve efficiency and decrease environmental impact. Antwerp’s intelligent container terminal employs automation and robots to optimise container handling and vessel wait times. A smart logistics platform lets shippers and logistics providers monitor and control goods in real time at the port. Antwerp also uses renewable energy, reducing CO₂ emissions via electrification and hydrogen-powered solutions. These measures have made Antwerp one of the world’s most modern and sustainable ports, setting an example for other ports.

Port of Singapore

The Port of Singapore is widely regarded as one of the world’s most technologically advanced and efficient terminals. It has acquired a reputation as a “smart port” due to its innovative use of technology and data-driven solutions to improve efficiency, safety, and the environment. To maximise operations and expedite supply chains, the port has incorporated various cutting-edge technologies, including IoT sensors, big data analytics, and artificial intelligence. Singapore, for example, has developed an intelligent vessel traffic management system that utilises real-time data to optimise vessel movements and decrease waiting periods. Additionally, the port has implemented a digital container monitoring system that allows shippers and logistics providers to monitor their cargo in real time. In addition, Singapore has implemented a number of sustainability initiatives, including the use of alternative fuels, green port initiatives, and the adoption of environmentally responsible practices. These initiatives have enabled the Port of Singapore to become a maritime industry leader and a paradigm for harbours around the globe.



Clockwise: Port of Hamburg, Port of Singapore, Port of Shanghai, Port of Barcelona, Port of Antwerp

Port of Shanghai

Technology and data-driven solutions have been adopted by the Port of Shanghai, making it one of the world's busiest and most modern ports. To enhance logistics and simplify supply chains, the port has integrated cutting-edge technology such as IoT sensors, big data analytics, and artificial intelligence. Shippers and logistics providers, for instance, can now monitor the whereabouts of their goods in real time thanks to a sophisticated container monitoring system built in Shanghai. In order to improve traffic flow and lessen congestion, the port has also installed a sophisticated traffic management system that utilises real-time data. A number of green port efforts, eco-friendly business policies and using alternative fuels are just a few of Shanghai's sustainability endeavours. Because of these efforts, the Port of Shanghai has risen to prominence as an industry leader and an example for ports throughout the globe.

Port Le Havre HAROPA

The Port of Le Havre, part of the HAROPA port complex, is one of the smartest ports in Europe. It uses technology and new ideas to improve operations and make the port more environmentally friendly. The port has put in place a number of cutting-edge technologies, such as IoT devices, big data analytics, and artificial intelligence (AI), to improve supply lines and make them run more smoothly. For instance, Le Havre has built a smart container port that uses automation and robots to improve how containers are handled and reduce the time ships wait. The port has also created a digital tool that lets shippers and transport providers track and handle goods in real-time. Le Havre has also started a number of projects to make the city eco-friendly, such as using renewable energy sources, reducing CO₂ pollution through electrification, and coming up with new ways to be green. These projects have helped the Port of Le Havre become a star in environmentally friendly marine operations and a model for other European ports to follow.

Port of Los Angeles

The Port of Los Angeles is one of the world's busiest and biggest ports, and it has embraced technology and innovation to increase efficiency and reduce its environmental impact. In order to improve supply chain efficiency, the port has adopted many cutting-edge technologies, such as Internet of Things (IoT) sensors, big data analytics, and artificial intelligence. One such smart container port is the one Los Angeles has built, which employs automation and robots to speed up container processing and cut down on ships' idle time. The port has also installed an advanced traffic management system that utilises real-time data to improve traffic flow further and lessen congestion. Alternative fuels have been used, greenhouse gas emissions have been reduced by electrification and other means, and green port efforts have been initiated; these are just a few of Los Angeles' many sustainability initiatives. These actions have propelled the Port of Los Angeles to the forefront of environmentally responsible port management in North America.

Copenhagen Malmö Port (CMP)

The Copenhagen Malmö Port (CMP) is a contemporary, data-driven smart port optimising operations and sustainability. The port uses IoT sensors, big data analytics, and AI to improve supply chains. CMP has created a real-time digital container tracking solution for shippers and logistics providers. A smart logistics platform improves cargo management and tracking at the port. CMP also uses renewable energy and electricity to cut CO₂ emissions. These measures have made Copenhagen Malmö Port a pioneer in sustainable marine operations and an example for Scandinavian and European ports.

Port of Valencia

Valencia is Europe's smartest port, using technology to enhance operations and increase sustainability. To improve supply chains, the port has used IoT sensors, big data analytics, and AI. Valencia's smart

logistics technology improves freight handling and tracking. The port also includes a real-time digital container tracking system for shippers and logistical companies. Valencia also uses renewable energy, reduces greenhouse gas emissions via electrification, and implements green port activities. These measures have made Valencia a pioneer in sustainable marine operations and a model for other European ports.

Port of Barcelona

The Port of Barcelona is recognised as a leading “smart port” in Europe because it has embraced technology and innovation in order to enhance sustainability and maximise the efficiency of its operations. The port has integrated various cutting-edge technologies, including AI, big data analytics, and Internet of Things (IoT) sensors, to improve the efficiency of its supply chains and reduce waste. For instance, Barcelona has established a sophisticated logistics infrastructure enabling more effective freight management and monitoring. Additionally, the port has introduced a digital container tracking system, which gives shippers and logistics providers the ability to monitor the location of their respective shipments in real-time. In addition, Barcelona has implemented a number of programmes aimed at promoting sustainability, including the use of renewable energy sources, the reduction of greenhouse gas emissions via electrification and other measures, and the execution of projects aimed at promoting green port practices. These measures have assisted the Port of Barcelona in becoming a pioneer in environmentally responsible marine operations and have served as a model for other European ports to emulate.

Modernisation Plan

The goal of the modernisation plan for Chittagong Port is to bring the port’s facilities, equipment, and systems up to the level required to meet the expanding requirements of international commerce. The following are some of the most important initiatives that Chittagong Port can take to Build a Smart Bangladesh to Mitigate Bangladesh Government Vision 2041:

Expansion of Port Infrastructure

The proposal to modernise the port calls for increasing the facility’s capacity by establishing specialised container terminals and adding additional berths. Implementing a Public Private Partnership system for port handling can result in improved resource utilisation, efficient management, and increased capacity enhancement. Implementing the Public-Private Partnership (PPP) model and including renowned port developers and operators, such as PSA International from Singapore, will facilitate the exchange of technology and expertise by introducing their internationally recognised operational proficiency and innovative practices. International industry leaders can support sectors with growth potential by leveraging their extensive connections, the global network of ports, supply chain orchestration capabilities, and integrated cargo solutions that offer a range of value-added services. These leaders also prioritise adherence to international Health, Safety, Security, and Environmental (HSSE) standards.

Adoption of Technology

Using integrated technology to produce intelligent solutions for effectively regulating traffic and trade flows on the port is one definition of port automation. This leads to an increase in port capacity as well as port efficiency. To put it another way, all of the port’s assets have to be linked to one another and use the same protocols for them to be able to share data in real time.

Terminal capacity, container traceability, and worker productivity are expected to increase due to port automation’s streamlined and improved operations and coordination between assets and the

terminal operating system (TOS). In addition, increased container move productivity cuts down on the amount of time shipping liners spend berthed, decreasing the number of vessels waiting in line.

The container terminal serves as a complicated link between many supply chains, technological processes, and operational procedures. Along these lines and in a variety of other forms, automation may take place in the form of automatic stacking cranes that allow for quicker movement and placement of containers, automated mooring systems that will enable shorter mooring processes and automated vehicles that link containers coming out of the port into the hinterland.

Yard automation, the automation of the terminal interface, and the automation of the links between the foreland and the hinterland are the three subcategories under the umbrella phrase “port automation.”

Automated yard planning makes it possible to achieve this through better container positioning and increased throughput using identical vehicles. Automated Guided Vehicles (AGVs), Automated Stacking Cranes (ASCs), ship-to-shore cranes, and trucks all collaborate in a highly synchronised and pre-planned manner in order to maximise the efficiency with which travelling time and available space are used. Yard automation necessitates installing container position determination systems, which use sensors to pinpoint the precise location of each container inside the terminal at any given moment. This makes it possible for them to be effectively managed, which in turn makes it possible for them to be rapidly collected and loaded onto a ship or picked up for distribution inland.

Terminal interface automation includes Automated Ship-to-Shore Cranes (ASSCs), automated mooring systems, and Automated Gate Systems (AGSs), allowing easier port access for trucks. An operator is still in control, but its primary responsibility is monitoring the cranes rather than operating them. When it comes to rapidly identifying containers, all systems depend on either radio frequency identification (RFID) or optical character recognition.

These solutions will make the port more efficient, reduce the time needed to turn around goods and increase cargo safety.

Implementation of Position Detection System (PDS) Technology

PDS technology employs Radio Frequency Identification (RFID) tags and sensors to track items in an area. It provides real-time data on item position, status, speed, and direction. This system tracks cargo and equipment at ports for safe and efficient handling. PDS solutions help port operators locate containers, optimise yard space, reduce traffic congestion, improve safety, and boost global trade efficiency by delivering precise and up-to-date vehicle locations.

PDS technologies also improve security. Ports can detect suspicious activity and avert issues by real-time monitoring objects. This helps detect dangerous or stolen containers.

Here are just a few of the benefits of using PDS:

- I. Maximise the use of the yard by keeping track of the available space and the location of the containers in real time. This will make it easier to reorganise the containers and promote workers.
- II. Reducing the time spent searching for ‘lost’ containers is every dock worker’s worst nightmare. Finding a missing container in an area with ten thousand containers may take several days. Access to the previous position via PDS may transform a search into a pick-up job.
- III. PDS technologies help port operators discover potential safety issues before they occur. This is accomplished by real-time monitoring of the movement of equipment and containers. This helps create a safer working environment for both the personnel and the customers by lowering the likelihood of any accidents or injuries that may occur.

IV. Improved tracking technologies speed up loading and unloading at smart ports. Accurate positional data simplifies container management and speeds up worldwide operations.

V. PDS systems decrease freight delivery delays by giving comprehensive container movement data. Smart ports may use this data to make better shipping choices, resulting in quicker, more dependable shipments.

VI. Smart ports can manage resources and prepare ahead with improved tracking. This improves resource management throughout the sector by maximising efficiency and reducing waste.

Streamlining of Customs Procedures

In order to cut down on the amount of time it takes and the amount of money it costs to clear goods, the modernisation plan intends to streamline and simplify the customs processes. The proposal calls for the establishment of an online system for the clearing of customs, the reduction of paperwork requirements, and the enhancement of openness in customs operations.

Benefits of Modernisation

The modernisation plan for the Chittagong Port will provide multiple benefits, including:

Economic Growth: The modernisation of Chittagong Port is expected to augment its capacity, alleviate congestion, and optimise its efficiency, thereby rendering it a more appealing option for global shippers and investors. The increase in international trade and investment is expected to result in economic growth and employment opportunities in Bangladesh.

Increased Competitiveness: The implementation of the modernisation plan is expected to augment the port's competitiveness in the global market, rendering it more appealing to international shippers and investors. Enhancing Bangladesh's visibility in the global market will amplify investment and trade prospects.

Improved Regional Connectivity: The proposed modernisation scheme aims to enhance the port's connectivity with the regional economy, facilitating improved trade and investment links with neighbouring countries. The initiative above will offer novel avenues for trade to Bangladesh, thereby augmenting the nation's economic progress and advancement.

Enhanced Sustainability

The modernisation strategy will prioritise the enhancement of the port's ecological sustainability through the reduction of carbon emissions, the enhancement of waste management, and the adoption of environmentally friendly methodologies. The action is expected to enhance the general sustainability of Bangladesh's economy and the environment.

Conclusion

The modernisation of Chittagong Port holds significant importance in realising the developmental aspirations of the Bangladesh government for a smart Bangladesh by 2041. The proposed modernisation strategy entails augmentation of the port's infrastructure, integrating novel technologies, and optimising customs procedures. The modernisation of Chittagong Port is poised to yield several advantages, such as economic expansion, heightened competitiveness, better regional integration, and improved sustainability. Nonetheless, the execution of the strategy will necessitate substantial financial resources.

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