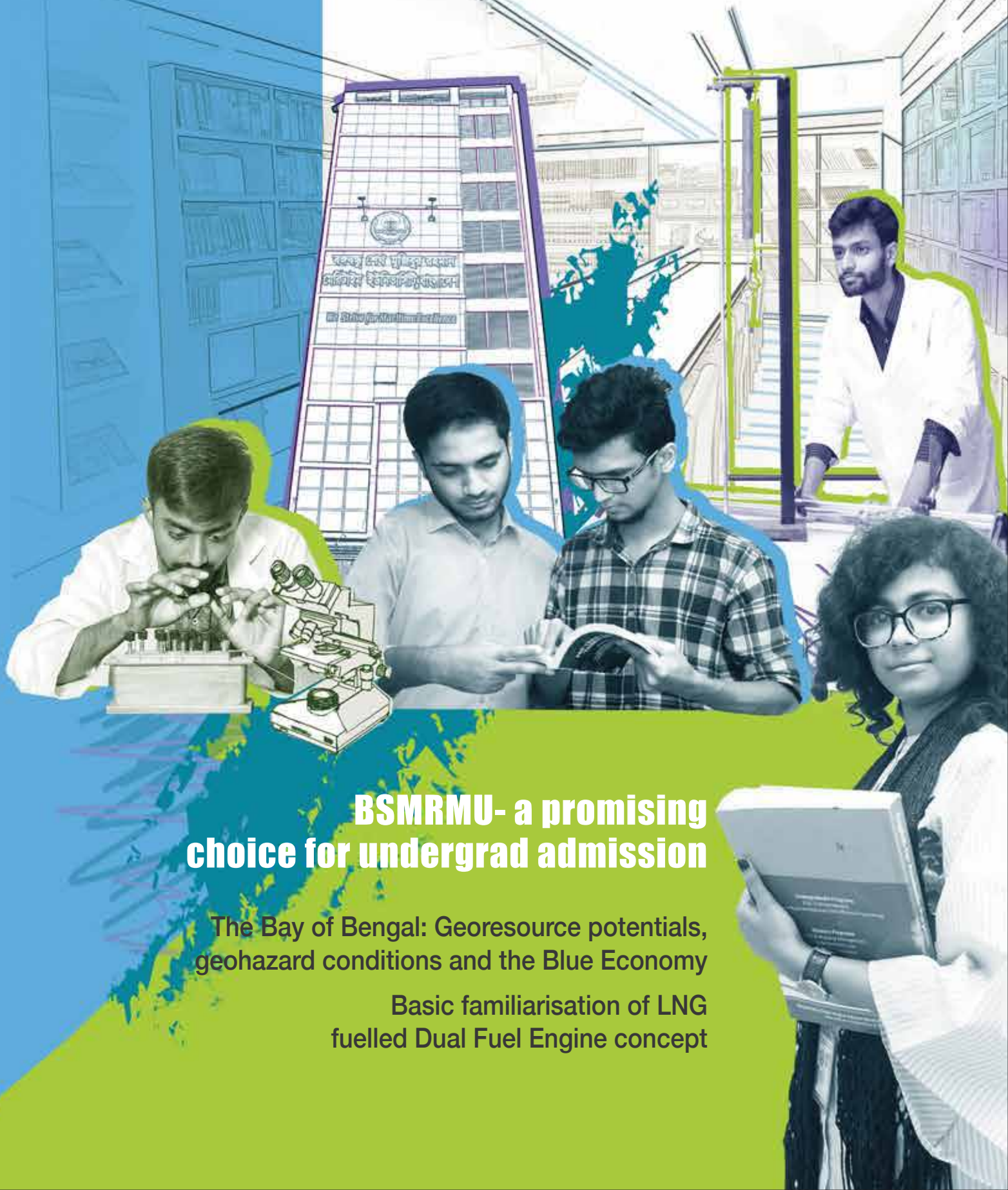


MARITIME CAMPUS

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

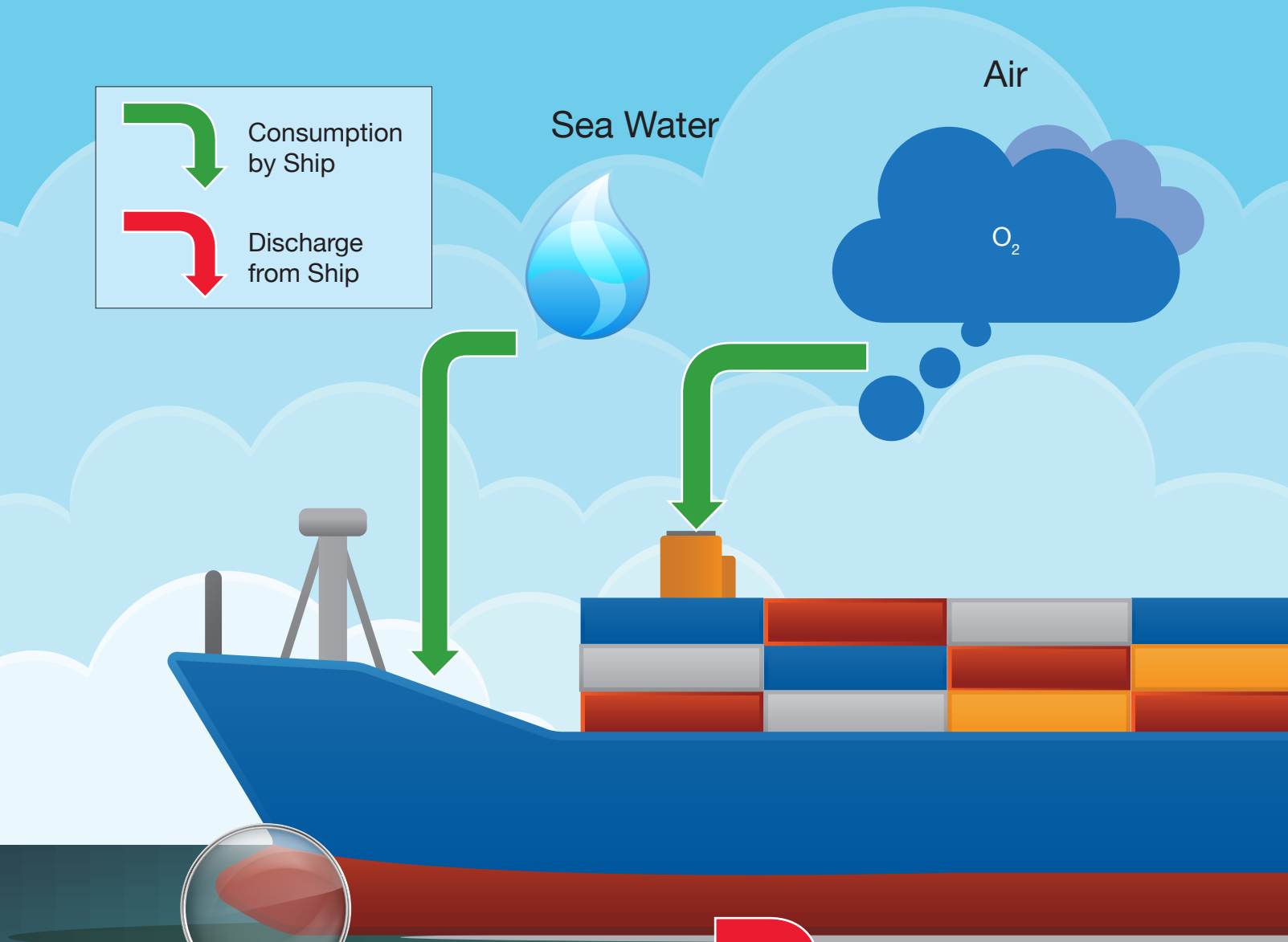
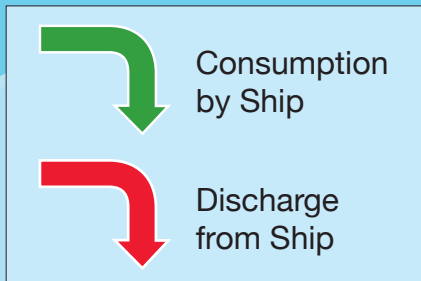


BSMRMU- a promising choice for undergrad admission

The Bay of Bengal: Georesource potentials,
geohazard conditions and the Blue Economy

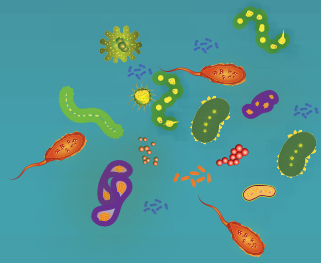
Basic familiarisation of LNG
fuelled Dual Fuel Engine concept

What Goes IN? What Comes OUT?



Hull Leaching

BWM Convention: Controls the Application of tributyltin on Ships Hull



Ballast Water

TBT Convention: Controls Ballast Water Exchange Process

Sewage

Annex IV: Grey W



Air Pollution

Annex VI: Limits Air Pollution from Ships

Fuel Oil



Lubricating Oil



CO₂
CO₂
CO₂

Sewage/Grey Water

Annex II: Limits Sewage & Grey Water Discharge

Oily Water

Annex I: Limits Oily Water Discharge to 15ppm

Garbage

Annex V: Limits Garbage Discharge at Sea



July 2019, Volume 2, Issue 3

Maritime Campus

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Editorial

BSMRMU- the right choice for 21st century higher education

Maritime professionals are the foundation talent of the maritime sector; they are the boosters for the development of local and global trade and the guardians of the marine environment and maritime safety. However, according to the BIMCO/ISF Manpower report, the sector is facing a shortage of maritime professionals, particularly for certain ranks and types of ships. As the resources on land are depleting, effective exploration and exploitation of maritime resources are therefore paramount towards economic emancipation of the country in the 21st century. With the aim to produce quality human resources for the local and global maritime sector, Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU), Bangladesh has been conducting both undergraduate and post-graduate programmes on various maritime disciplines. Realising the local and global potentials, undergraduate meritorious students should aspire to become maritime professionals by studying associated subjects. Currently, the university is running four undergraduate programmes under different faculties. Those are BSc (Honours) in Oceanography, BBA in Port Management and Logistics, LLB (Honours) in Maritime Law and BSc in Naval Architecture and Offshore Engineering. BSMRMU practices principle of non-discrimination which emphasises equal opportunities for everyone irrespective of gender, religion and caste in education and employment. Any aspirant who has passed HSC or equivalent examination is encouraged to enrol in undergraduate programmes of BSMRMU for a bright maritime career. In this issue, our lead story discusses the undergraduate admission courses, career prospects and admission processes elaborately.

Considering the georesource potential and low profile geohazards of the Bay of Bengal, Bangladesh should not delay to advance her Blue Economy programmes by optimum and efficient utilisation of resources; by sustainable, inclusive, and harmonious and environment friendly development; by exploiting the opportunities in emerging marine industries; and, by creating and streamlining legal and regulatory institutions which govern the access, use and protection of maritime resources. In the 'Academia' section we have included an article that deals comprehensively with these topics.

LNG (Liquefied Natural Gas) fuel is a great choice of the current maritime industry to comply MARPOL ANNEX VI, Regulation 13, and IMO TIRE-III NOx requirement. The demand for this technology is increasing day by day. Marine industry practitioners need to adapt to this technology for their sustainability in the future market. To understand this new technology, a basic familiarisation model of Dual Fuel Engine (DFE) concept is described in an article of this issue titled 'Basic familiarisation of LNG fuelled Dual Fuel Engine concept' which may be helpful to our maritime industry practitioners and students.

Additionally, the 'Campus Canvas', 'Maritime Bangladesh', and 'Around the World' sections will inform you about all the important maritime events and developments happened during the second quarter of this year.

I would like to thank all the departments for the support they have rendered by providing information about their respective activities. Finally, I appreciate the members of the Editorial Board for their remarkable contribution to this magazine.

It will be highly appreciated and we would be truly obliged if you leave your invaluable feedback and suggest new ideas for further improvement of this magazine. Thank you for being with us all the while, and keep staying with us.

Thanking you

Captain A T G M Sarker, (TAS), psc, BN (retd)
Editor and Controller of Examinations



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LEAD STORY

BSMRMU- a promising choice for undergrad admission

In BSMRMU, Bangladesh, 4 year full-time regular undergraduate programmes are divided into 8 semesters. The duration of each semester is 26 weeks. In each semester, 16 weeks are dedicated for classroom learning, while remaining weeks are utilised for makeup classes, preparatory leave, final examination and other curricular and co-curricular activities. After four years of sincere study, students become graduate and prepare themselves for the next stage learning.



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ACADEMIA

An appraisal of georesource potentials and geohazard conditions in the Bay of Bengal for sustainable development of Blue Economy in Bangladesh

'Blue Economy' aims for holistic and sustainable development along with enhancing human welfare. It is a broad concept as it is not only confined to minerals and marine products but also includes even maritime activities like shipping services, trade and business. This concept visualises oceans as the development spaces in which activities like conservation, sustainable energy production, mineral wealth extraction, bio-prospecting, marine transport etc. are integrated.

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Basic familiarisation of LNG fuelled Dual Fuel Engine concept

One day the LNG fuel technology will replace the existing conventional fuel technology in our shipping industry along with other renewable energy like wind power and hydro-electric power to make our health and environment safe from the various harmful emission.

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CAREER CRUISE

Port managers for efficient commercial shipping

With the growing importance of international trade, the need for skilled individuals to manage ports has increased. Services of shipping and port management professionals are required by both government agencies and private sectors.

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MARITIME BANGLADESH

News on maritime progress and activities in Bangladesh

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Notable news from the global maritime sphere

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FOCUS

MSP training in Bangladesh

The 20-day overseas training course was attended by 28 participants from related government departments, universities, research institutes and enterprises of Bangladesh. The conduct of the training course was strongly supported by the Economic and Commercial Counsellor's Office of the Chinese Embassy in Bangladesh, as well as the Sino-Bangladesh co-organisers – National Ocean Technology Centre, China, Blue Economy Cell, Bangladesh, BSMRMU, Bangladesh and the University of Chittagong, Bangladesh.

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NEW WAVES

Representation of females in maritime sector of Bangladesh

The myths that females are unlucky or under safety risk or not capable to fight tough sea life has already been proven wrong by Bangladeshi young and vibrant seafarers. Bangladeshi females are 'onboard with gender equality'.

Circular economy and Port of Rotterdam

As Chattogram Port is the gateway and logistics hub for Bangladesh, close attention can be given to the port so that a sustainable port development can be implemented. Research projects can be done based on Chattogram port and its circular economy.

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SUB TOPIC

BSMRMU cafeteria serves fresh and healthy food

Bangabandhu Sheikh Mujibur Rahman Maritime University has a well decorated and well-maintained cafeteria on the third floor of the temporary campus. The cafeteria is being operated since September 2015. There are adequate seating arrangements for teachers as well as students.



// Lead Story //

BSMRMU

A promising choice for undergrad admission

Maritime Campus Desk

Introduction

After passing the Higher Secondary Certificate (HSC) or equivalent examination, students of Bangladesh often find themselves in a quandary as they are bombarded with undergraduate admission information from families, friends and relatives. Sometimes, puzzled by circumstances they take wrong decisions regarding enrolment in universities. As we have seen in our society, bright students usually take admission in popular programmes of business administration, medical sciences and engineering technology. As a result, we see a shortage of talented students in other programmes. Maritime sector is one of them in which many students feel less attracted due to the lack of awareness about the enormous potentialities in this sector. With the globalisation of the world's economy, we are now living in a global society. Both the states and each individual are relying on the global economy which is supported by the maritime sector. The maritime sector transports and manages over 90% of the world's commerce and it is said that without maritime transportation, one half of the world would freeze for lack of fuel to heat it, and the other half would starve for lack of the grain that gives it its daily bread.

Maritime professionals are the foundation talent of this sector; they are the boosters for the development of local and global trade and the guardians of the marine environment and maritime safety. However, according to the BIMCO/ISF Manpower report, the sector is facing a shortage of maritime professionals, particularly for certain ranks and types of ships. The shortage of maritime professionals, especially officers, all of whom are the lifeblood of the local and global maritime sector, threatens the development of the industry at home and abroad. As the resources on land are depleting, it has become imperative for the nation to look towards the sea for its survival. Effective exploration and exploitation of maritime resources is therefore paramount towards economic emancipation of the country in the 21st century.

Under the pragmatic leadership of Prime Minister Sheikh Hasina, Bangladesh has been endowed with a large sea area by resolving maritime boundary dispute with India and Myanmar. Additionally, Prime Minister's Vision 2021, Vision 2041 and the Delta Plan 2100 all are interweaved with the maritime sector and the Blue Economy of Bangladesh. To materialise her visions, we need quality human resources in the maritime sector. We need experts in marine fisheries, in shipping industry, in coastal tourism and in sea resources exploration of the Bay of Bengal.

With the aim to produce quality human resources for the local and global maritime sector, Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU) came out as the first ever maritime university of Bangladesh by an Act of the Parliament on 26 October 2013. Several MoUs have already been signed with 11 reputed maritime universities of the world for necessary supports to maintain high standard in education system. Towards attaining its goals, the university has been conducting both undergraduate and post-graduate courses on various maritime fields. Realising the local and global potentials, undergraduate meritorious students should aspire to become maritime professionals by studying associated subjects. In this regard, BSMRMU has no other alternative in Bangladesh. Currently, the university is running four undergraduate programmes under different faculties. The university is set to run two more undergraduate programmes i.e. BSc (Honours) in Harbour and River Engineering, and BSc (Honours) in Marine Fisheries.

How to become a BSMRMU graduate?

The undergraduate admission process starts just after HSC examination. Aspiring and eligible candidates apply and sit for admission test conducted by the university authority. Later, the university starts its enrolment procedure with selected students who score highest marks in the test. In BSMRMU, Bangladesh, 4 year full

time regular undergraduate programmes are divided into 8 semesters of 6 months each (2 semesters in each year). The duration of each semester is 26 weeks. In each semester, 16 weeks are dedicated for classroom learning, while remaining weeks are utilised for makeup classes, preparatory leave, final examination and other curricular and co-curricular activities. After four years of sincere study, students become graduate and prepare themselves for the next stage learning. And for further study, the university currently offers Master programmes in Port & Shipping Management, Maritime Law, Maritime Business, Marine Biotechnology and Maritime Science. The university intends to run MBA in Maritime Tourism and Hospitality Management and Master in Maritime Development and Strategic Studies from October 2019.

BSMRMU at a glance

Vision

Envision promoting and creating a learning environment for higher maritime education with excellence, through state-of-the-art facilities and gadgets, competent faculty and staff, expanded frontier of research based knowledge and international standards supportive of the new horizons in diverse fields by 2021.

Mission

BSMRMU is committed to provide quality education based on state of the art technological support responsive to the emerging challenges at home and abroad. BSMRMU is dedicated to nurture and develop world class professionals, who would serve the mankind with strong sense of ethical values and competence and ready to face the competitive world of maritime business, service and employment.

Speciality

- The first specialised public university of Bangladesh in the maritime sector
- Offers career-focused programmes with innovative and specialised courses
- Blends national and internationally faculties
- English language support
- Friendly, close-knit, convenient campus
- Merit based scholarship and award

Facilities for students

The university offers modern and effective learning and recreational facilities to produce competitive human resources. These are,

Classrooms: The classrooms of BSMRMU are spacious and well ventilated, air-conditioned and equipped with state-of-the-art audio-visual equipment, classroom aids and seating arrangements.

Computer labs: Computer lab facility is available for the students of BSMRMU. The lab computers are connected by both Wi-Fi and broadband internet network. This facility has been established with a view to enhancing computer literacy and skill of the students.

Library: The library has ensured full access facilities to 2200 e-books of Taylor and Francis group under the University Grants Commission Digital Library programme (UDL). Besides this, the library is planning to become a member of INASP (International Network for the Availability of Scientific Publications) that will keep the readers updated by providing almost 20,000 scientific e-journals and some e-books.

Health-care: The Medical Centre of BSMRMU is dedicated to providing free medical services to the students, teachers, officers and staff of the university. Family members of teachers, officers and staff are also provided with free medical services. The Medical Centre

provides general check-up, medical advice and commonly used essential medicines. The centre remains open during office hours.

However, emergency medical services are available round the clock.

Cafeteria: The cafeteria provides the best quality foods and beverage at a reasonable price. The cafeteria remains open from 8:30 am to 5 pm for teachers, students and staff. Besides, the cafeteria is equipped with an LED TV for entertainment and river osmosis water purifier for providing pure drinking water.

Transport: BSMRMU Mechanical Transport office provides transport service to the BSMRMU community with the convenient and safe journey for officers, teachers, staff and students through some convenient transportation options, like Jeep, Car, Microbus, Mini Bus, Pick Up and

Motorcycle. Mechanical Transport office is always ready to provide the best transport facility with limited recourse.

Auditorium: BSMRMU has a large auditorium. The auditorium is equipped with the modern sound system, multimedia projector and air condition system. All types of formal academic programme, meetings, functions, and lecture and discussion sessions are frequently held in the auditorium.

Campus Shop: BSMRMU produces some gift items which are displayed in the cafeteria for sale.

Residential facilities: BSMRMU is providing residential facilities to the undergraduate students. There is one hostel for male students in where 40 students are availing accommodation facility. There is another hostel for the female students in Mirpur DOHS.

Students activities outside the campus: Students of different academic programmes are regularly visiting diverse maritime organisations namely Chittagong port, Pangaon Internal Container Terminal, Bangladesh Navy Hydrographic and Oceanographic Centre (BNHOC) etc. as part of their academic activities. Oceanography Programme's students go on board sea trip to carry out practical bathymetric and oceanographic data collection with SBES, MBES and Acoustic Doppler Current Profiler etc. in the Bay of Bengal. Besides this, overseas study tour is arranged for Master's level students to gather practical experience from foreign academic institutions.

Collaboration and affiliation

BSMRMU is currently collaborating with 10 overseas and 9 home institutes. Bangladesh Marine Academy and Bangladesh Marine Fisheries Academy are affiliated institutes.

The aim of BSMRMU is to become one of the finest campuses in the world where the enthusiastic learners will conduct research on different subjects in pursuit of knowledge with excellence, dignity and



A BSMRMU student at his lab-work

// Lead Story //

morality which will ultimately benefit the world in general and the country in particular. Here is a list of collaborating universities at home and abroad:

Collaborating University/ Organisation (Overseas)	Collaborating University/ Organisation (Home)
Shanghai Maritime University	University of Chittagong
Dalian Maritime University	University of Dhaka
Myanmar Maritime University	Military Institute of Science and Technology
Indian Maritime University	Khulna University
Western Sydney University	Jahangirnagar University
University of Hawai'i at Hilo, USA	Bangladesh University of Professionals
Vietnam Maritime University	Dockyard Engineering Works Limited
China Oceanic Development Foundation	Noakhali Science and Technology University
Nautical Institute, London	Institute of Water Modelling (IWM)
University of Strathclyde, UK	

Proposed institutes: There are four proposed institutes in BSMRMU to support global standard learning experience of the students. These are,

1. Institute of Professional Languages
2. Institute of Bay of Bengal and Bangladesh Studies
3. Institute of Renewable Energy and Marine Resources
4. Institute of Disaster Management

Faculties, departments and programmes of BSMRMU

BSMRMU currently conducts 4 undergraduate programmes.

Running undergraduate programmes

1. BSc (Honours) in Oceanography
2. BBA in Port Management and Logistics
3. LLB (Honours) in Maritime Law
4. BSc in Naval Architecture and Offshore Engineering

Upcoming undergraduate programmes in January 2020

1. BSc (Honours) in Harbour and River Engineering
2. BSc (Honours) in Marine Fisheries

LLB (Honours) in Maritime Law

Faculty of Maritime Governance and Policy is one of the pioneer faculties of the university that offers 'LLM in Maritime Law' and LLB (Honours) in Maritime Law under the Department of Maritime Law and Policy. The faculty provides an excellent teaching and learning environment. In addition to the regular academic activities, the faculty frequently arranges seminars, workshops and guest lecture on contemporary subjects. Global standard curriculums are followed to impart quality education by the qualified and competent teachers. In parallel to LLM and LLB programmes the department is conducting the certificate courses in different contemporary disciplines on Maritime field. LLB (Honours) in Maritime Law programme is a 4 year full time regular undergraduate programme. The programme is divided into 8 semesters of six months each (2 semesters in each

Faculties	Departments
Faculty of Maritime Governance and Policy (FMGP)	<ul style="list-style-type: none"> • Department of Maritime Law and Policy • Department of Maritime Security and Strategic Studies • Department of Maritime Safety Administration
Faculty of Shipping Administration (FSA)	<ul style="list-style-type: none"> • Department of Maritime Science • Department of Port and Shipping Management • Department of Transportation and Logistics Management
Faculty of Earth and Ocean Science (FEOS)	<ul style="list-style-type: none"> • Department of Oceanography and Hydrography • Department of Mining • Department of Marine Fisheries and Aqua Culture • Department of Marine Biology • Department of Genetic Engineering and Biotechnology • Department of Environment Studies
Faculty of Engineering and Technology (FET)	<ul style="list-style-type: none"> • Department of Naval Architecture and Offshore Engineering • Department of Ocean Engineering • Department of Marine Engineering • Department of Harbour and River Engineering • Department of Electrical & Electronics Engineering • Department of Telecommunication Engineering • Department of Control Engineering and Mechatronics
Faculty of Computer Science and Informatics (FCSI)	<ul style="list-style-type: none"> • Department of Computer Science and Information Technology • Department of Software and Network Engineering • Department of Information System Security
Faculty of Maritime Business Studies (FMBS)	<ul style="list-style-type: none"> • Department of Management • Department of Accounting and Information System • Department of Finance • Department of Economics • Department of Marketing • Department of Maritime Tourism and Hospitality Management
Faculty of General Studies (FGS)	<ul style="list-style-type: none"> • Department of English • Department of Mathematics • Department of Physics • Department of Chemistry • Department of Bio Chemistry • Department of Social Science and Anthropology • Department of Material Science • Department of International Relations • Department of History • Department of Land Administration and Water Management



Spacious and well-ventilated classrooms of BSMRMU

"Our university gives utmost importance to practical knowledge and this is achieved by the many study tours in the course curriculum and also the guest lecture sessions are conducted by the university to improve our knowledge base. I am very privileged to get myself admitted in BSMRMU."

– Rafiul Usman, 1st Batch, LLB (Honours) in Maritime Law, BSMRMU

year). Total credit hours of this programme are 141 including 6 credit hours for thesis/internship. Besides regular courses, workshops, seminars, guest lectures and certificate courses on contemporary issues are arranged frequently for the students.

Programme outcome

In general, the programme will enable its graduates to deal with civil, criminal and maritime legal problems. On completion of the programme the graduates are expected to acquire the ability to:

- Apply the knowledge of maritime and general law in the field of legal profession
- Evaluate legal problems especially in maritime fields and develop practical solutions
- Work effectively in teams and provide leadership
- Effectively communicate orally and in writing
- Understand managerial, professional and ethical responsibility

Career prospect

- Lawyer in the admiralty court and marine court
- Law officer and legal adviser of port, shipping and shipbuilding industries such as shipping liners, sea ports, container depot/terminals, shipbuilding organisations, logistics company, freight forwarding agencies and various maritime organisations at home and abroad;
- Academic career in university and maritime institutions at home and abroad;
- Govt. organisations including bank and insurance companies.

BBA in Port Management and Logistics

BBA in Port Management and Logistics programme is a 4 year full time regular undergraduate programme which is being run under the Department of Port and Shipping Management. The department started its formal journey under the Faculty of Shipping Administration. BBA in Port Management and Logistics programme is divided into 8 semesters of six months each (2 semesters in each year). Total credit hours of this programme are 135 including 3 credit hours for internship and 6 credit hours for thesis/project/review paper. Besides regular courses, workshops, seminars, guest lectures and certificate courses on contemporary issues are arranged frequently for the students. The programme also includes three study tours in the ending of three years.

Programme outcome

After the successful completion of the undergraduate programme, the students will be able to

- Plan, organise and control the port, terminal, depots etc.
- Manage shipping and shipping ancillary business
- Execute strategic maritime decision
- Design transportation routes and logistics
- Manage supply chain and logistics activities in different companies

"BSMRMU is a university for hard-working and goal-oriented young people. It has a lot to offer for the meritorious student who's also willing to contribute. BSMRMU in my opinion is a prestigious maritime university of South Asia. I was selected for several local and international universities, but I took admission in BSMRMU to study maritime programmes since I believe it will open door to interesting employment in technical fields in private enterprise, and in state-level government positions."

– Humayun Rashid Askari, 1st Batch, BBA in Port Management & Logistics, BSMRMU



Students at the rich library of BSMRMU

Career prospect

- Port, shipping and logistics industries such as shipping liners, sea ports, container depots/terminals, freight forwarding companies and various maritime organisations at home and abroad.
- Academic careers at home and abroad
- Working as executives in commercial part of different corporations
- Research firm in maritime field
- Govt. maritime organisations

BSc (Honours) in Naval Architecture and Offshore Engineering

Bachelor of Science in Naval Architecture and Offshore Engineering is a 4 year full time regular undergraduate programme that is being run under the Department of Naval Architecture and Offshore Engineering. The programme is divided into 8 semesters of six months each (2 semesters in each year). Total credit hours of this programme is 160 including 6 credit hours for thesis. Besides regular courses, workshops, seminars, guest lectures and certificate courses on contemporary issues are arranged frequently for the students. The programme also includes one industrial attachment at the end of the 3rd year. The duration of each semester is 26 weeks. In the first two years, students will study humanities, science and allied engineering courses. It will also include courses on basic offshore engineering and naval architecture, fluids, materials,

"NAOE course curriculum of our university is one of the best. We have the best faculty members who help us out in every possible way. I anticipate more students for this particular stream in the future."

- Sumsil Arafin, 1st Batch, BSc in NAOE, BSMRMU

structures, etc. In 3rd and 4th years, students will specialise in both the Naval Architecture and Offshore Engineering field, such as marine structures, dynamics, marine hydrodynamics, ship resistance and propulsion, marine engineering systems, offshore standards, maritime rules and regulation, ship and offshore design and analysis. Students will also conduct research project and thesis aimed at solving engineering challenges for the industry.

Career prospect

Graduates from this programme will be able to develop their career as

- Offshore Engineers
- Naval Architects
- Structural Engineers
- Subsea Engineers

- Drilling Engineers
- Marine Engineers
- System Engineers
- Project Managers in the relevant discipline.

In their challenging career, they will need to design, plan and manage the construction, installation, operation and maintenance of ships, offshore platforms and subsea systems.

Programme outcome

In general, the programme will enable its graduates to engineer shallow and deep-water structures from offshore jackets to semisubmersibles, including mastering the design and building procedure of different types of floating structures and ships. On completion of the programme, graduates will be able to:

- Apply knowledge of mathematics, science, and engineering in the field of Naval Architecture and Offshore Engineering
- Evaluate engineering problems and develop practical solutions
- Interpret the results of engineering experiments appropriate for Naval Architecture and Offshore Engineering
- Use the techniques, skills and modern engineering tools necessary for engineering practices

BSc (Honours) in Oceanography

Considering the need to prepare talented, skilled and qualified oceanographers to investigate the vast ocean resources of the country, the university offers Bachelor of Science in Oceanography programme. The main objective of this programme is to develop human resources to study the ocean and coastal processes and ensure the sustainable management of ocean resources. This programme is conducted by the Department of Oceanography and Hydrography under the Faculty of Earth and Ocean Science (FEOS). The programme is a 4 year full time regular undergraduate programme. The programme is divided into 8 semesters of six months each (2 semesters in each year). Total credit hours of this programme is 160 including 6 credit hours for thesis.

"Campus life of BSMRMU is amazing, not only you will explore the academic environment but also you will be provided a platform with practical learning, since the university has state of the art practical labs. The university will also encourage you to take part in co-curricular activities for your future development."

- Zalisatun Haque Hreedi, 2nd Batch, BSc in Oceanography, BSMRMU

Programme outcome and career prospect

A degree on Oceanography not only provides sound scientific knowledge of the marine environment, but also provides diverse opportunities to develop the career. With laboratories, offices and the sea being the place of work, the job of an oceanographer will be varied and research intensive. Depending on their degree and specialist module choices, graduates from the Department of Oceanography and Hydrography can apply for jobs in the following areas (home and abroad):

- Academic career in maritime institutions at home and abroad
- Exclusive opportunity to build research career in maritime field
- Public and private maritime organisation
- Career related to SDG, Blue Economy and Delta Plan 2100 in government, non-government and international organisations
- Port, Shipping and Shipbuilding industries
- Paleoclimate research institute

BSc (Honours) in Harbour and River Engineering

Bangladesh is the largest delta of the world. Its rivers and floodplains, which make up 80% of the country, support life, livelihoods and the economy. Bangladesh is a rapidly developing country, envisaging to be a middle-income country by 2021. The country faces major inter-related delta challenges in water safety, food security and socio-economic development and is prone to natural calamities such as floods, cyclones, and droughts. There is already high pressure on the available land and water resources in the delta. In order to materialize the Prime Minister's Delta Plan 2100,

the only specialised public maritime university BSMRMU has introduced the Department of Harbour and River Engineering. The department will help the nation to meet the engineering needs for the shipping industries and waterborne transport infrastructure development by providing specialized knowledge pertinent to these industries.

Programme outcome

The programme will enable its graduates to engineer harbour and river including mastering the design and building procedure of different types of structures. On completion of the programme, graduates will be able to:

- Apply knowledge of major inter-related delta challenges in water safety in the field of Harbour and River Engineering
- Interpret the results of engineering experiments appropriate for Harbour and River Engineering
- Use the techniques, skills and modern engineering tools necessary for mitigating natural calamities such as floods, cyclones, and droughts

BSc (Honours) in Marine Fisheries

Bachelor of Science (Honours) in Marine Fisheries is a fully integrated professional course of study for the persons willing to prepare themselves for variety of careers in the Fishing sectors, Fish Processing Plants, Aquaculture Farms and Hatcheries, Integrated Costal Management, Marine Spatial Planning, fisheries research etc. The duration of this course is 4 (Four) years. In this period students learn how to maximize the proper and sustainable utilization of marine living resources. Students will get sufficient practical knowledge regarding Marine Resources during their research project at final year.

Programme outcome

- Provide and equip students with knowledge, understanding, proficiencies, skills, competences, attitudes and values to qualify and prepare them for marine fisheries sector.
- The programme will provide world class education in fish processing, aquaculture farms and hatcheries as well as any managerial position in maritime domain
- The program will produce graduates who are qualified to pursue a professional career or advanced studies in a related field of specialisation.

The computer lab in BSMRMU has been established with a view to enhance computer literacy and skill of the students





BSMRMU students in a study tour

Career prospect

After successful completion of Bachelor of Science (Honours) in Marine Fisheries course, students can accommodate themselves into,

- Commercial fishing industry
- Fish processing industry
- Fish/shrimp hatchery
- Aquaculture farm
- Coastal and marine tourism industry
- Government organisation and NGOs in various capacity
- Freelance consultants

Eligibility for admission

Applicants who have passed HSC or equivalent examination in the current or previous year are eligible to apply. They must have passed HSC/equivalent examination and SSC/equivalent examination with minimum GPA 3.5 each. And Students who have passed IGCSE/O level exam in at least 5 subjects and IAL/GCE A level exam in at least 2 subjects are eligible to apply. Out of the 7 subjects in IGCSE/O Level and IAL/GCE A level candidates should get minimum 4 B grades and 3 C grades. No D grade will be accepted. Additionally, candidates from O level and A level or from all other boards, outside the country have to obtain 'Equivalence Certificate' from appropriate authority. For BSc (Honours) in NAOE, applicants must have obtained minimum 'A' grade in any two subjects from Mathematics, Physics, Chemistry and English with minimum 'B' grade in rest of the subjects. Applicants with GCE must have passed minimum five subjects in O-Level including Mathematics, Physics and Chemistry and minimum two subjects in A-Level including Mathematics and Physics. For candidates who want to enrol in BSc (Honours) in Oceanography, they have to obtain minimum 'A' grade in any two subjects from Mathematics, Physics, Chemistry, English and Biology with minimum 'B' grade in rest of the subjects. Applicants with GCE must pass minimum five subjects in O-Level including Mathematics, Physics and Chemistry and minimum two subjects in A-Level including Mathematics and Physics. Applicants must also have Biology in A-Level.

Admission procedure

BSMRMU will invite applications from interested candidates for admission in undergraduate programmes by publishing advertisements in the national dailies and BSMRMU website. LLB

(Honours) in Maritime Law candidates will have to sit for a written admission test on Bangla, General Knowledge and English, Critical reasoning and Analytical Ability. Syllabus of the admission test will be on the current HSC Syllabus, general knowledge, critical reasoning and analytical ability. In BBA in Port Management and Logistics programme, an eligible candidate will have to sit for a written admission test on English, Basic Mathematics, Analytical Ability and General Knowledge on Maritime Affairs. NAOE candidates have to sit for a written admission test on Mathematics, Physics, Chemistry and English based on their HSC syllabus. Candidates will be selected finally on the basis of their combined marks obtained in the written admission test, HSC/equivalent examination and SSC/equivalent examination. Weightage will be like: written test-50%, HSC/equivalent examination result-30% and SSC/equivalent examination result-20%. Final merit list along with waiting list will be published on BSMRMU notice board as well as on BSMRMU website.

BSMRMU invites you

BSMRMU practices principle of non-discrimination which emphasises equal opportunities for everyone (irrespective of gender, religion and caste) in education or employment. Aspirants who have passed HSC or equivalent examination can enrol in undergraduate programmes of BSMRMU. To get more admission related information, please visit the temporary university campus located at plot# 14/06-14/23, Pallabi Mirpur-12, Dhaka-1216. The university always welcome and encourage the potential candidates who want to pay a visit to get an image of the overall atmosphere.

Contact:

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Conclusion

Victory over Maritime Boundary Dispute with Myanmar and India has opened a new era in the maritime sector which is likely to act as a positive catalyst for increasing maritime zone awareness of the policymakers. Other prospects may include the establishment of BSMRMU, the establishment of Maritime Affairs Unit (MAU) at Ministry of Foreign Affairs (MOFA) and the establishment of Bangladesh Oceanographic Research Institute (BORI). Therefore, within a decade, Bangladesh should observe a boom in maritime professions. BIMCO/ICS manpower report forecasted that there will be a shortage of 1, 47,000 marine professionals by 2025. Bangladesh, being a maritime nation, has a long tradition and reputation of supplying maritime professionals around the globe, hence, the undergraduate youth must seize the present opportunity to become a maritime professional.

MSP training in Bangladesh

Capt W H Kutubuddin, (N), ndc, afwc, psc, BN



On October 10, 2018, the “2018 Overseas Training Course on Marine Spatial Planning for Bangladesh”, hosted by the Ministry of Commerce of China was held in Dhaka. Rear Admiral Md. Khurshed Alam (retd), Secretary, Maritime Affairs Unit, Ministry of Foreign Affairs in Bangladesh graced the opening ceremony as the chief guest and Rear Admiral M Khaled Iqbal, BPS, ndc, psc, Vice-Chancellor, Bangabandhu Sheikh Mujibur Rahman Maritime University attended as the special guest. Obviously, first such overseas training programme organised by China in Bangladesh ushered a new model of cooperation and exchange of views between the two countries. Chinese experts have sincerely shared with Bangladesh the skills and

achievements China has made in Marine Spatial Planning. In his speech, the special guest, Rear Admiral, M Khaled Iqbal, the Vice-Chancellor, BSMRMU, said that the Government of Bangladesh is aware of the importance of the marine economy, and the training course can precisely promote its development of the marine industry. He has expressed his hope that all participants will be able to seize the opportunity of this training, and will soon become the backbone of the research and development of Blue Economy of Bangladesh. The chief guest, during his speech said “Now Marine Spatial Planning (MSP) is very much important to manage marine activities more sustainably and to implement improved area-based protection and conservation of marine living and non-living resources. The attention of our government to ocean governance and the development of Blue Economy have reached its peak in recent years and political will of the government is all-time high. Ocean management has been incorporated for the first time in the country's 7th Five Year plan and Blue Economy Cell has been established for inter-ministry coordination for its implementation”.

The 20-day overseas training course was attended by 28 participants from related government departments, universities, research institutes and enterprises of Bangladesh. The conduct of the training course was facilitated by the Economic and Commercial Counsellor's Office of the Chinese Embassy in Bangladesh, as well as the Sino-Bangladesh co-organisers – National Ocean Technology Centre, China, Blue Economy Cell, Bangladesh, BSMRMU, Bangladesh and the University of Chittagong, Bangladesh. According to the plan, this training combined the Bangladeshi training needs with the actual situation of local Marine Spatial



// Focus //

Planning management, and adopted a combination of special lectures and practical teaching, focusing on China's marine functional zoning and blue economic development, and comprehensive marine observation technology.

The people of China and Bangladesh have been good neighbours and friends from ancient times. China and Bangladesh have joined hands echoing the enthusiasm of the government in Blue Economy concept. It is expected that training programme will soon be full of "the taste of harvest". It will also promote mutual knowledge sharing and experience between the Blue Economy of China and Bangladesh. Through mutual exchanges and discussions, both sides will jointly enhance their development capabilities. With such high note the training was successfully completed on 29th October 2018 and all the participants were awarded course completion certificates. Md. Abdus Samad, Secretary of Ministry of shipping was present as chief guest in the closing ceremony.

Looking back to the first 20-day long overseas training course jointly organised by China and Bangladesh, the training schedule was justified, and the training objective was very suitable for the contemporary demands of Bangladesh's Marine Spatial Planning. However, classroom teaching was not the end. Practical research can encourage participants to put what they have learned in the



classroom into exercise. Under the guidance of Chinese experts, participants completed a comprehensive survey of marine functional zoning.

In the closing ceremony, Md. Abdus Samad, Secretary of Ministry of shipping, said, "Our Bangladeshi people should take the example of Chinese people and strive to change the status quo". He also said "With the platform of the first overseas training course between China and Bangladesh, we will promote the Blue Economy that will assist in achieving the vision 2041 of the Government of Bangladesh." "Where many help to gather firewood, the flames shoots high", the Sino-Bangladesh overseas training course had a good opening and successful ending. The training sponsors National Ocean Technology Centre, the Blue Economy Cell, BSMRMU, University of Chittagong received lots of accolade for their efforts and endeavours in this overseas programme.



Capt W H Kutubuddin, (N), ndc, afwc, psc, BN

Director

Institute of Bay of Bengal and Bangladesh Studies





An appraisal of georesource potentials and geohazard conditions in the Bay of Bengal for sustainable development of Blue Economy in Bangladesh

Aftab Alam Khan

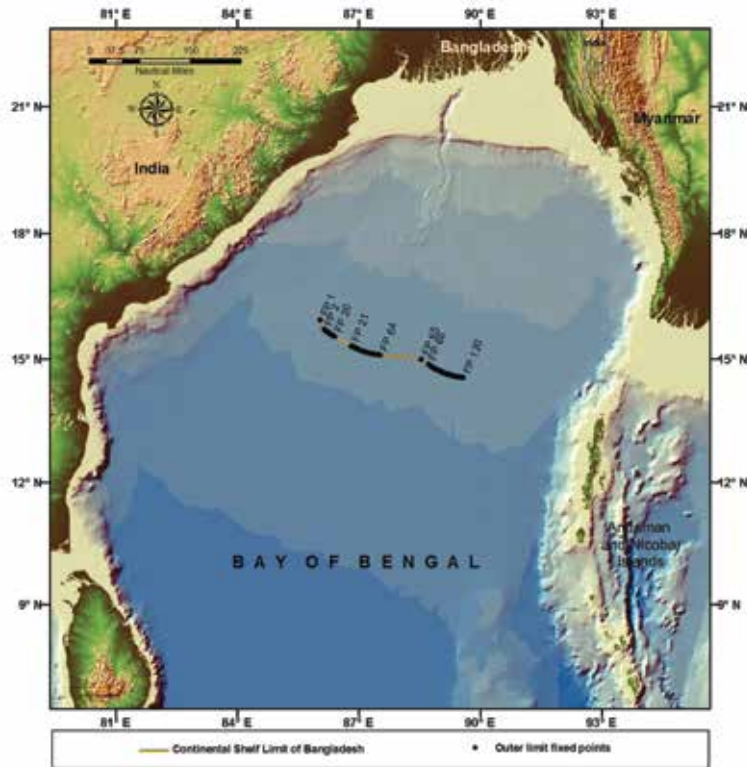
Overview

Formation of the Bay of Bengal is linked to the opening of the Indian Ocean which covers an entire off-shore region of Bangladesh. Geological processes and tectonic activities in the Bay of Bengal of the Bengal Basin have greatly influenced in enriching the bay from resource point of view. Formation and spreading of new seafloor of the Bay of Bengal have been continued being enriched by georesources with the Indian plate motion to the north and northeast. 'Blue Economy' is a concept that can significantly contribute to the socio-economic development of the nations situated around the oceans and seas. However, the sustainability of 'Blue Economy' greatly depends on the proper assessment and utilisation of the marine georesources. It is equally important to evaluate the geological hazards of the seas and oceans around the coastal countries in order to better safeguard the development of 'Blue Economy'. Although Bangladesh is situated along the coast of northern Bay of Bengal having the largest continental shelf and the longest deep-sea fan within its legal exclusive economic zone (EEZ),

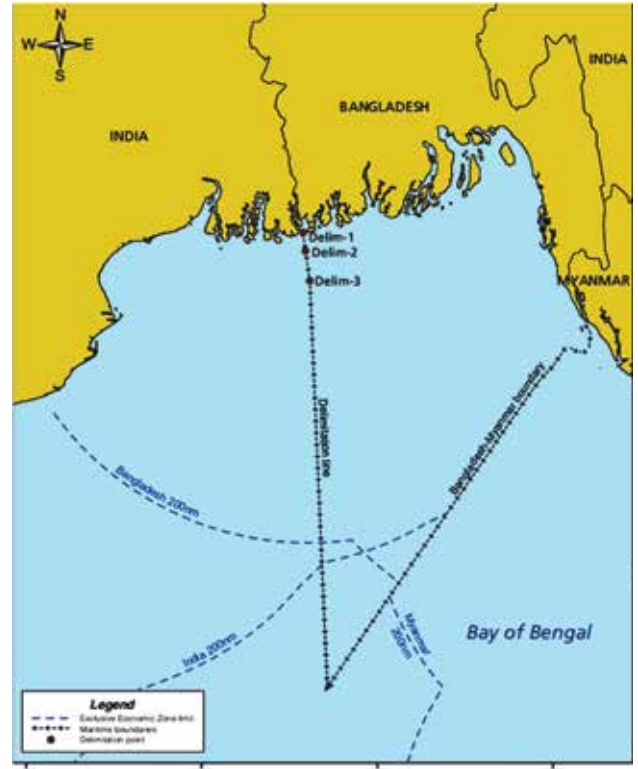
it is the least studied and explored bay in the region that demands much greater attention. In this article, possible geological resources like oil, gas and mineral potentials of the Bay of Bengal within EEZ of Bangladesh will be discussed. Additionally, geological hazards like earthquake, tsunami and other ocean-related geological hazards and their probable impact for proper planning and development of a sustainable 'Blue Economy' will be highlighted.

The Bay of Bengal

Bay of Bengal, large but relatively shallow embayment of the north-eastern Indian Ocean, occupying an area of about 2,173,000 square km. It lies roughly between latitudes 5°N and 22°N and longitudes 80°E and 100°E. It is bordered with Sri Lanka and India to the west, Bangladesh to the north, and Myanmar (Burma) and the northern part of the Malay Peninsula to the east. According to the definition of the International Hydrographic Bureau, the southern boundary extends from Dondra Head at the southern end of Sri Lanka in the west to the northern tip of the Indonesian island of



Map illustrates the line depicting the outer limits of the continental shelf of Bangladesh overlain on a gridded bathymetric of the northern Bay of Bengal.



Map illustrates the line depicting the outer limits of the continental shelf of Bangladesh overlain on a gridded bathymetric of the northern Bay of Bengal

Sumatra in the east. The bay is about 1,600 km wide, with an average depth of more than 2,600 metres. The maximum depth of water reaches to about 4,694 metres at the southern part of the bay. The Bay of Bengal is bordered to the north by a wide continental shelf having water depths ranging between 20 m to 200 m that narrows to the south and by slopes of varying gradient on the northwest, north, and northeast, all cut by canyons from the rivers. The deep floor of the bay is occupied by a vast abyssal (deep-sea) plain that slopes to the south. The offshore region of Bangladesh that occupy 63,000 sq. km area in waters shallower than 200 m is a southward extension of the Bengal Basin in the Bay of Bengal. The maritime boundary of Bangladesh covers mostly the central part of the northern Bay of Bengal up to approximately 18°N latitude.

The Bay of Bengal is a northern extended arm of the Indian Ocean. Bengal Deep-Sea Fan, the largest deep-sea fan in the world and Swatch of No-ground, a deep-sea canyon located at the head of the Bay of Bengal are the two main geological features intrinsically related to the present context of the Bay of Bengal. Bengal fan is attributed to the deposition of about 4 km thick sediments derived from the Himalaya Range and transported to the Bay of Bengal by the Ganges-Brahmaputra river system forming one of the largest deltas of prograding nature in the continental shelf of Bangladesh. The continental shelf of Bangladesh extends to about 200 km. Swatch of No Ground, on the other hand, is a tectonic element that marks the line of crustal break coinciding with 'down to the basin faults' in the region. Sediments derived from the Himalaya are continuously being supplied to the deep-sea fan through the Swatch of No Ground forming fan turbidites. The Swatch of No Ground canyon in the Bay of Bengal is a shelf-incising submarine canyon that is actively aggrading in its upper reaches despite regular gravity-driven transport and mass wasting. Although the canyon lies 150 km down drift of its main sediment source, the

Ganges–Brahmaputra–Meghna (GBM) river mouth, high sedimentation rates are sustained by both progradation of the subaqueous delta into the canyon head and the conveyance of shelf-generated hyperpycnal flows to the canyon floor. Hyperpycnal flow is produced when the density of the river water entering the ocean basin is greater than the density of the standing water in the ocean basin.

Georesource Potentials of the Bay of Bengal

Recovery of minerals from the sea bed and our knowledge of new sources of marine minerals like polymetallic nodules, cobalt-rich crust, polymetallic massive sulphides, have developed rapidly during recent decades. Commercial exploitation of solid marine minerals has so far been limited to the deposits originating from mechanical and chemical erosion of rocks in the continents and transported to the ocean primarily by the rivers. These resources are likely to be found in the relatively shallow offshore areas of the territorial sea and to the 200-nautical-mile exclusive economic zone. Minerals derived from mechanical erosion of the continental rocks are concentrated as placer deposits those are sorted by the flowing water according to the varying density of the constituent minerals. These minerals contain heavy metallic minerals such as barium, chromium, gold, iron, rare earth elements, tin, thorium, tungsten, zirconium, and non-metals like a diamond, lime, siliceous sand, gravel etc. Sands and gravel are being mined from the beaches and shallow offshore accumulations at many sites around the world for construction material and beach restoration. These are the marine materials with the highest annual production value. Of the non-solid minerals beneath the sea, fossil fuel, natural gas and petroleum are being exploited in shallow and deep water. Among the most promising of new fuel sources are methyl hydrates, a mixture of natural gas and water compressed into a solid by the cold and high pressures of the

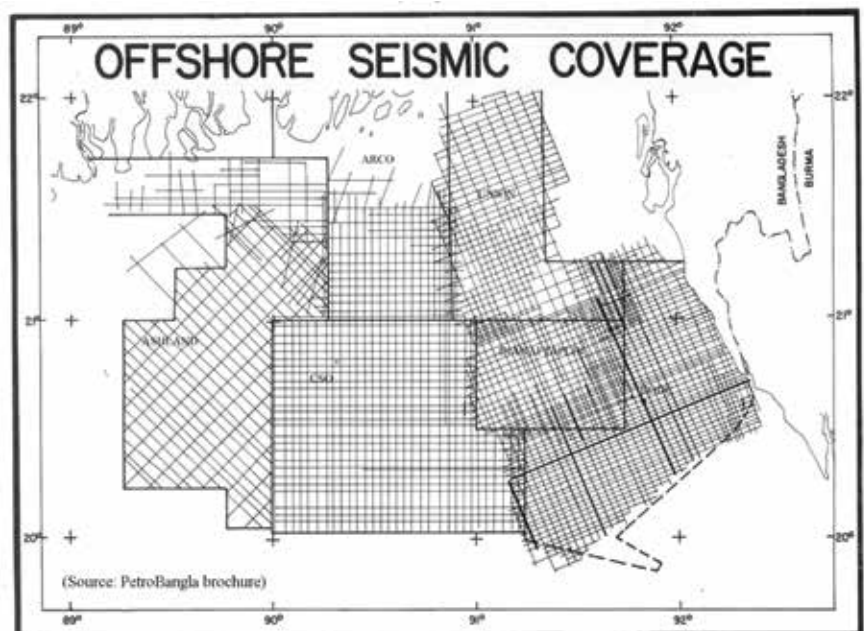
deep ocean floor in undersea basins of the continental margins. The continuous input of materials dissolved by chemical weathering from continental rocks and transported into the sea by rivers is considered adequate to meet future economic needs of several mineral types. One of these resources is phosphorite, which precipitates in the form of nodules and layers where seawater wells-up from the deep ocean at continental shelves within the belt of the trade winds between 30° latitudes in the north and south of the equator. Phosphorite is used as an agricultural fertiliser by adjacent coastal states. Land supply of phosphorite originally deposited beneath ancient seas fulfils present needs. Two metallic mineral resources of the deep seafloor incorporate dissolved metals from both continental and deep ocean sources. One of these consists of the golf-to-tennis ball-size polymetallic nodules of nickel, cobalt, iron and manganese in varying concentrations. These nodules precipitate from seawater over millions of years on sediment that forms the surface of the vast abyssal plains underlying the deep ocean of water depth 4 to 5 kilometres. Cobalt-rich ferromanganese crusts are the second of the two metallic mineral resources that incorporate metals from both land and sea sources. These precipitate from seawater as thin layers up to 25 centimetres thick on volcanic rocks of seamounts and submerged volcanic mountain ranges at water depths between 400 and 4,000 metres. The richest of these crusts lies within and beyond the exclusive economic zones of the island nations of the western Pacific. It is believed that one seabed mine site could provide up to 25 per cent of the annual global market for cobalt used to make corrosion-resistant, light, strong metal alloys, and paints. In recent time, another important resource has been discovered from the ocean bottom, known as 'oil shale'. Oil shale is a fine-grained sedimentary rock containing organic matter from which shale oil may be produced. The organic matter, derived mainly from aquatic organisms, is called kerogen. Oil shale and tar sands are strategically important domestic energy sources that should be developed to reduce the nation's growing dependence on oil.

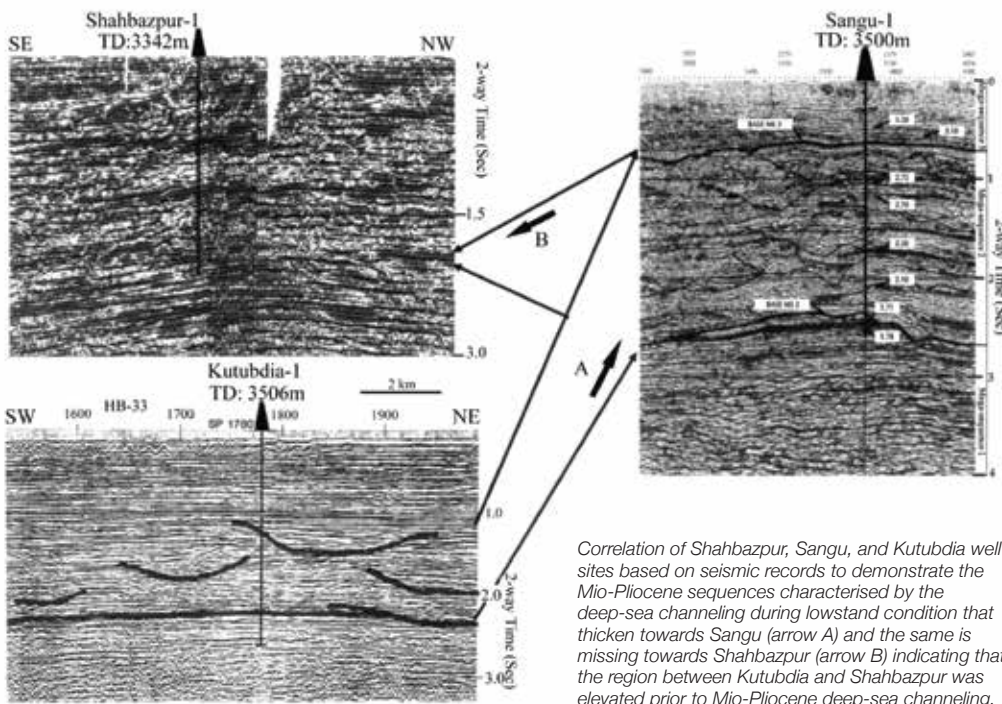
Continental shelf of Bangladesh is the southward extension of the Bengal Basin which covers a large area of the exclusive economic zone in the Bay of Bengal. Although the Bengal Basin has been proved to be a potential petroliferous basin, it is ironic that region within the maritime boundary of Bangladesh in the Bay of Bengal has remained as least studied and virgin area. Oil and gas exploration activities in the off-shore region of Bangladesh located between latitudes 20°N–22°N and longitudes 89°E – 92.5°E started in the year 1974 under Bangladesh Petroleum Act 1974 through the participation of six international oil companies such as Ashland, ARCO, CSO, Union, BODC and Ina Naftaplın. Total coverage of multiple fold 2D seismic data was little over 31000 line-km along with approximately 18000 line-km gravity data. Most of the 2D seismic data contain tremendous valuable geological information pertaining to the georesource potentials in the offshore area of Bangladesh. Discovery of gas in Kutubdia and Sangu in the offshore strongly indicate the occurrence of hydrocarbon source rock and suitable structural traps in the continental shelf of Bay of Bengal. Trapping of hydrocarbon in the structures developed at 4-6 km depths is proposed. In addition, mud and sand-filled channels, incised valleys of intense channelling,

and pro-delta clays pass up-dip to delta-front sand wedges are considered favourable for developing stratigraphic traps. Based on seismic and well data, the mid-Miocene gas-bearing horizon in Shahbazpur well is observed to occur at about 2600m depth while that in the Sangu well at around 3000m.

Crustal segmentation and deformation have resulted in the development of folds and inversion with a variable pattern wherein the young structures are formed on to the older structures. The sediments represent an overall basin-ward progradation from deep marine to coastal marine depositional settings overlain by continental-fluvial type wherein the lower part represents a slope-apron within a migrating accretionary prism complex. Thick mud rock sequence at around 5-6 km depth is considered as upper source rock undergone a high degree of maturation within the oil window. Based on seismic and well data, the mid-Miocene gas-bearing horizon in Shahbazpur well is observed to occur at about 2600m depth while that in Sangu well at around 3000m. The paleontological evidence, primarily the pollen distribution, suggests that the boundary between upper and middle Miocene in Cox's Bazar well occurs at around 3000m depth. Seismic sections of Shahbazpur, Sangu, and Kutubdia well sites have been correlated to demonstrate the sequences characterised by the deep-sea channelling during lowstand condition that thickens towards Sangu and the same is missing towards Shahbazpur indicating that the region between Kutubdia and Shahbazpur was elevated prior to Mio-Pliocene deep-sea channelling. Favourable trapping of hydrocarbon in the structures developed at 4-6 km depths is proposed. In addition, mud and sand-filled channels, incised valleys of intense channelling, and pro-delta clays pass up-dip to delta-front sand wedges are considered as favourable stratigraphic traps. Discoveries include a series of gas fields in the deep-water of Krishna-Godavari Basin of India, new oil and gas fields in the deep-water Krishna-Godavari Basin of India, discovery of gas fields offshore of the Mahanadi Basin of India, and discovery of large deposit of Shwe gas in the Rakhine Basin of Myanmar, all exhibit

Area in the Bay of Bengal covered by very high quality 2D seismic data surveyed by the six international oil companies in 1973-77. These largely uninterpreted data are in the custody of PetroBangla for interpretation, if needed, to unveil geological oceanographic information in the maritime boundary of Bangladesh to contribute to the 'Blue Economy' development.





Correlation of Shahbazpur, Sangu, and Kutubdia wells based on seismic records to demonstrate the Mio-Pliocene sequences characterised by the deep-sea channeling during lowstand condition that thicken towards Sangu (arrow A) and the same is missing towards Shahbazpur (arrow B) indicating that the region between Kutubdia and Shahbazpur was elevated prior to Mio-Pliocene deep-sea channeling.

marine geohazards should properly be addressed and further research is warranted.

Although earthquake record of the Bay of Bengal shows 'no to weak' seismicity associated with the region around the Ninety East Ridge and Eighty-Five East Ridge, it is customary to believe that the sources of earthquakes exist in the Bay of Bengal. Ongoing seismic activities is an indication of dynamic crust in the Bay of Bengal, especially in and around Andaman Trench and the Andaman Sea. Barren Island volcanic eruption of 18 April 2001 located south in the Andaman Sea. Eruptions of the Barren Volcano was recorded in 1787 and subsequent eruptions were recorded in 1789, 1795, 1803-04 and 1852. After nearly one and a half century of dormancy, the island had

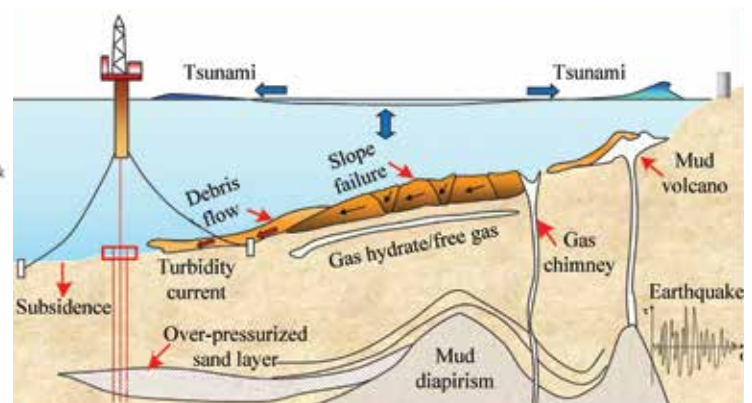
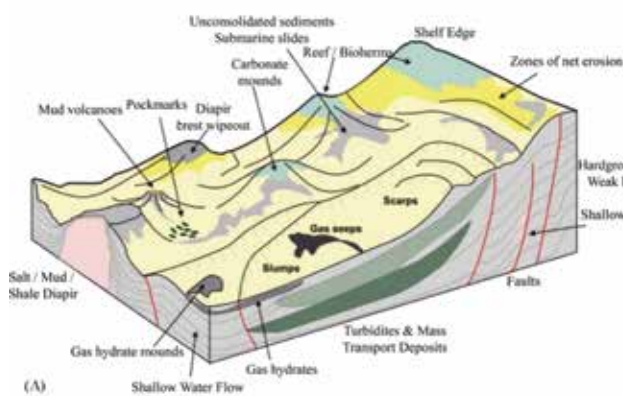
strong evidence in favour of new future discoveries in the deep-water basins of Bangladesh.

Geohazard vulnerability

Although Bangladesh coastal belt and the northern Bay of Bengal is highly vulnerable to frequent occurrences of atmospheric hazards like cyclone and storm surge, it is a fact that the vulnerability potentials of the geological hazards are low. Geohazard may be defined as a geological state of the art that may lead to widespread damage or risk. Geohazards are geological and environmental conditions and involve long-term or short-term geological processes. Important offshore geohazards include volcanic activities, mud diapirism and mud volcanism, slope instability, submarine landslide, turbidites, shallow gas, natural gas hydrates, shallow water flows, active fluid seepage, seafloor pockmark formation, seismicity and seismicity induced trans-oceanic tsunami, local tsunami and sea-level rise. The Bay of Bengal, by and large, is potential for the above-mentioned geohazards. However, the vulnerability of these

another eruption in 1991 that lasted six months and caused widespread damage. There were eruptions in 1994-1995 and 2005-07, the latter being considered to link to the 2004 Indian Ocean earthquake that generated a massive trans-oceanic tsunami. All these volcanic eruptions in the Andaman Sea are due to the subduction of the Indian plate in the Bay of Bengal beneath the Burmese plate. The most spectacular feature that has been formed due to the subduction along the Andaman Trench is the Andaman-Nicobar Volcanic Island Arc. Further, the eruptions of the subduction melts in the Andaman Sea can generate large earthquakes inducing back-arc extension in the Andaman Sea. In addition, the northern part of the Bay of Bengal especially the continental shelf shows induced seismicity effect from the continental source zone and tectonic trends. Seismicity induced hazards such as mud volcanism, slope instability, submarine landslides are likely to occur. Mud diaper, shallow gas, shallow water flows, high pressure and active fluid seepage are widespread and can pose threat. The Bay of Bengal, by and large, is free from occurrence of the tsunami

Sketch of important offshore geohazards those include volcanic activities, mud diapirism and mud volcanism, slope instability, submarine landslide, turbidites, shallow gas, natural gas hydrates, seafloor pockmark formation, seismicity and seismicity induced trans-oceanic hazards.



because of the two fundamental reasons viz., shallow water depth and sea-bed rupture pattern. For tsunami wave, it is essential that due to an earthquake the sea bed rupture must be vertical to near vertical in order to displace vertically the entire water column. However, focal mechanism study revealed that the sea bed rupture pattern is dominantly horizontal i.e., strike-slip. Bangladesh coast is characterised by an added advantage of having wide, approximately 200 km long continental shelf that can act as the barrier as well as plays a key role in flattening the waveform of the tsunami through defocusing process. Any trans-oceanic tsunami like December 2004 Indian Ocean tsunami due to Sumatra earthquake, will have an abrupt fall of velocity along the continental shelf break. Decay factor of the tsunami height in dispersive mode resulted from bed configuration and free air anomaly calculated for 2004 Indian Ocean tsunami is equal to 0.324 m/km. This resulted a total negative height drop of about 13m means a levelling with mean sea level at a distance about 43 km from the coast of Bangladesh. On reaching the coast, the estimated tsunami height would be -3m. Sea-level rise is the most legitimate concern that global warming is likely to induce. However, my recent publication has revealed that global warming and polar ice-melt will not contribute to sea level rise. Hence, the Bay of Bengal also will not be affected by any so-called predicted sea level rise. Sea level in the Bay of Bengal will rise and fall only due to the subsidence and uplift of the crust. In the present context of prograding Ganges-Brahmaputra delta and deposition of about 40 per cent yearly sediment influx on to the continental shelf of Bangladesh, relative sea-level is likely to drop. Hence, sea-level rise related hazards in the Bay of Bengal is unlikely to occur.

Development of 'Blue Economy'

'Blue Economy' is a term in economics relating to the exploitation and preservation of the marine environment. 'Blue Economy' refers to marine-based sustainable economic development which leads to improved human wellbeing and social equity through significantly reducing environmental risks and ecological scarcities. 'Blue Economy' aims for holistic and sustainable development along with enhancing human welfare. It is a broad concept as it is not only confined to minerals and marine products but also includes even maritime activities like shipping services, trade and business. This concept visualises oceans as the development spaces in which activities like conservation, sustainable energy production, mineral wealth extraction, bio-prospecting, marine transport etc. are integrated. The key elements thus can be summarised as,

- Optimum and efficient utilisation of resources
- Sustainable, inclusive, and harmonious and environment friendly development
- Exploitation of opportunities in emerging marine industries, and
- Creating and streamlining legal and regulatory institutions which govern the access, use and protection of maritime resources

'Blue Economy' concept is suitable for management and sustainable development of ocean resources. 'Blue Economy' also includes economic benefits that may not be marketed, such as carbon storage, coastal protection, cultural values and biodiversity by measuring variation at the genetic, species, and ecosystem level. A related term of the Blue Economy is ocean economy. However, these two terms represent different concepts. Ocean economy simply deals with the use of ocean resources and is strictly aimed at empowering the economic system of the ocean. 'Blue Economy' goes beyond viewing the ocean economy solely as a mechanism for economic growth. It focuses on the sustainability of the ocean for economic growth. Therefore, the Blue Economy encompasses

ecological aspects of the ocean along with economic aspects. The World Bank specifies three challenges that limit the potential to develop a 'Blue Economy':

- Current economic trends that have been rapidly degrading ocean resources
- Lack of investment in human capital for employment and development in innovative Blue Economy sectors
- Inadequate care for marine resources and ecosystem services of the oceans

The strategic and economic significance of the Indian Ocean and its implication for the Bay of Bengal is quite high. Sustainable 'Blue Economy' Conference held in Nairobi, Kenya in November 2018 to advance a sustainable 'Blue Economy' includes marine protection, plastics and waste management, maritime safety and security, fisheries development, financing, infrastructure, biodiversity and climate change, technical assistance and capacity building, private sector support, and partnerships.

Conclusion

The Bay of Bengal is intimately related to the early opening of the Indian Ocean resulting in the creation of new seafloor overlain by the modern Bengal deep-sea fan at the top 4 km and 12 km thick older sediments at the bottom. The Bay of Bengal has opened-up and enlarged along with the northward motion of the Indian plate between 120 Ma and 55 Ma at a rate of about 6 cm/yr. The Bay of Bengal is characterised by the geological features those formed principally by the tectonic activities including volcanic and sedimentological processes. Evolution history of the Bay of Bengal suggests the occurrence and enrichment of georesource and marine minerals like polymetallic nodules, cobalt-rich crust, polymetallic massive sulphides etc. Oil shale and tar sands are strategically important domestic energy sources that should be developed to reduce the nation's growing dependence on oil. The occurrence of hydrocarbon, gas hydrates and gas shale has been established but a lack of detailed studies and exploration, its reserve estimation has not yet been possible. Favourable trapping of hydrocarbon in the structures developed at 4-6 km depths has been inferred. In addition, mud and sand-filled channels, incised valleys of intense channelling, and pro-delta clays pass up-dip to delta-front sand wedges are considered as favourable stratigraphic traps. Although, Bay of Bengal of Bangladesh is rich in georesources, yet it is quite vulnerable to atmospheric hazards like cyclone and storm surge but geohazards pertaining to earthquake and tsunami are not high except along the north-south trending narrow strip of Andaman-Nicobar Islands. Earthquake-related marine hazards may occur in some tectonically weak zones in the submarine environment. Considering the georesource potential and low profile geohazards of the Bay of Bengal, Bangladesh shouldn't delay to advance her Blue Economy programmes by optimum and efficient utilisation of resources; by sustainable, inclusive, and harmonious and environment friendly development; by exploiting the opportunities in emerging marine industries; and, by creating and streamlining legal and regulatory institutions which govern the access, use and protection of maritime resources.

Aftab Alam Khan

Professor, Oceanography and Hydrography

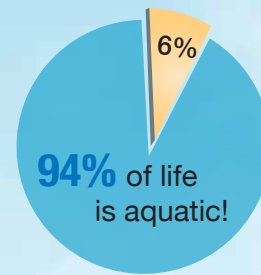
Faculty of Earth and Ocean Science, Bangabandhu Sheikh Mujibur Rahman Maritime University, Bangladesh

INFOBYTES

The largest known concentration of active volcanoes is in the South Pacific.

It's an area no bigger than the size of New York, but it contains a whopping

1,133 volcanoes.



according to the USA Science & Engineering Festival. That means those of us who live on land are part of a very, very small minority.



From the Titanic to Christopher Columbus's Santa Maria, the oceans are home to around

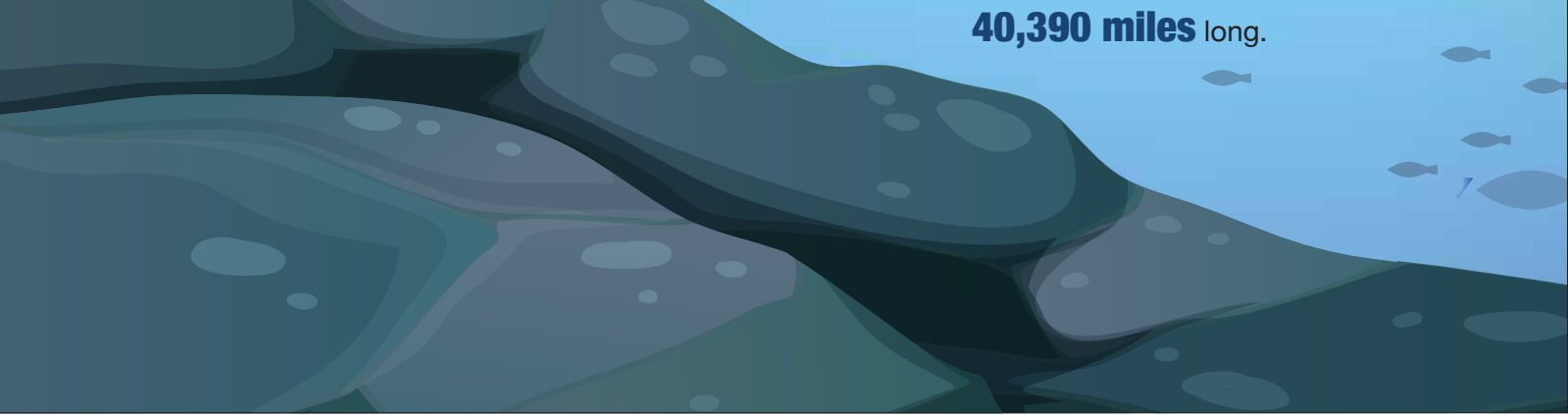
3 million shipwrecks,

according to the United Nations Educational, Scientific and Cultural Organization (UNESCO).

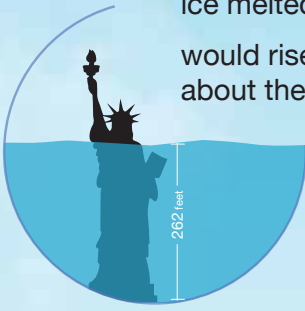


The actual longest mountain range on Earth is the Mid-Oceanic Ridge which snakes between all continents and clocks in at around

40,390 miles long.



If all of the glaciers and sheets of Arctic sea ice melted at the same time, the sea level would rise an estimated **262 feet**, which is about the height of a 26-story building.



The Pacific Ocean is wider than the moon. This expanse of ocean is **12,300 miles** across, which is more than **five times** the diameter of the moon!



In the Mariana Trench (35,802 feet below the surface), which includes the deepest point on the planet, the water pressure is

8 tons per square inch.



Oceans have an average depth of 12,100 feet and because light waves can only penetrate 330 feet of water, everything below that point is **dark.**



It is currently estimated that **91%** of the species that exist under the sea have yet to be discovered.



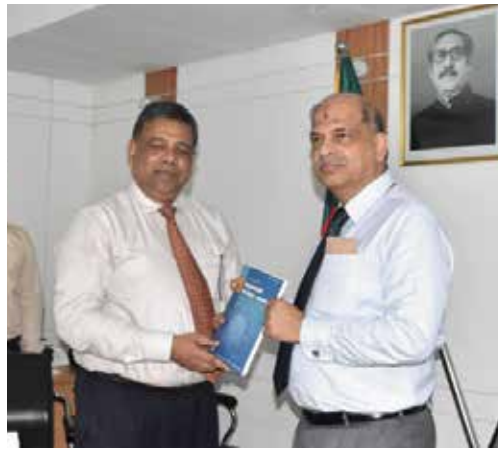
// Campus Canvas //

Hon'ble Chancellor approves statute for affiliation of colleges, academies and institutes



To spread the maritime education, the affiliation statute of colleges, academies and institutes of the BSMRMU has been approved by the Hon'ble Chancellor Abdul Hamid on 22 January 2019. The statute has been printed in booklets and copies have been sent to all departments /establishments and related maritime stakeholders. The soft copy of the statutes is also uploaded to the university website www.bsrmu.edu.bd.

BSMRMU conducts training workshops on 'Higher Education Scenario, Policy and Teaching and Learning'



On June 18, 2019, a workshop on 'Higher Education Scenario, Policy and Teaching and Learning' (Effective Strategies for Lecture, Feedback and Assessment) was held at the BSMRMU auditorium. The Vice-Chancellor of Daffodil International University, Professor Yusuf Mahbubul Islam (PhD) attended the workshop as resource person.

Another workshop on 'Higher Education Scenario, Policy and Teaching and Learning' (What is the best teachers do, they inspire, trust and love, critical thinking and creativity

in the classroom) was held in the BSMRMU auditorium on June 19, 2019. Professor Halimur Rashid Khan (PhD), former Professor of US Airforce Academy and Director, Professional Development Center Brac University attended the workshop as resource person.

On 23 June 2019, a lecture on 'Higher Education Scenario, Policy & Teaching and Learning' (Higher Education Scenario and Policy of Bangladesh) was held at the BSMRMU auditorium. A senior professor of the University of Dhaka and the higher education specialist of University Grants Commission Professor Syed Manzoorul Islam (PhD) was present as resource person in the workshop. BSMRMU teachers from different faculties were present and they learned practical experience regarding the Higher Education Scenario and Policy of Bangladesh.

BSMRMU students visit Bandarban

As a part of Bangladesh Studies course curriculum, the students of LLB and faculty members visited Bandarban on 24-25 April 2019. The team was led by Commodore M Ziauddin Alamgir, NGP, fdc, psc, BN. The team visited many historical places such as Nilgiri, Nilachal, Golden Temple etc. The students participated in Khudra Nri Gosthi Cultural Function at Zilla Parishad Auditorium under the arrangement of Bandarban Zilla Parishad.

The programme ends with traditional camp-firing at Nilgiri where Rear Admiral M Khaled Iqbal, BSP, ndc, psc, the Vice-Chancellor, BSMRMU and Mrs Ony Iqbal were present as chief and special guest respectively. The visit was helpful for the student to learn about the lifestyle, culture and socio-economical norms of hill-people.



BSMRMU approves Marine Fisheries Academy affiliation



Inspection for the purpose of affiliating the Marine Fisheries Academy was held on November 01, 2018 by the inspection team of BSMRMU. After inspection, a proposal for affiliation was forwarded to Academic Council and Syndicate for approval. After approval of the Syndicate, the courses of the Marine Fisheries Academy were upgraded from BSc pass to 04 (Four) years BSc Honours course. It is mentionable that the passing out parade of 37th batch cadets was held on 06 March 2019 in Marine Fisheries Academy, Chattogram.

FMGP organises workshop on “Research Methodology”



A workshop on “Research Methodology” was organised by the Faculty of Maritime Governance and Policy (FMGP) of BSMRMU on 29th May 2019. Professor Dr Altaf Hossain, Academic Adviser, BSMRMU graced the occasion as the chief guest. All faculty members and students of MPSM-4, LLM-4, MMB -2 and MMS -1 participated in the workshop.

Commodore M Ziauddin Alamgir, Dean, FSA & FMGP; Dr Abu Helal Mohammad Abdul Baquee, Professor, University of Dhaka and Dr Mamun Habib, Associate Professor, BRAC Business School, BRAC University conducted the workshop as resource persons.

VC congratulates newly appointed UGC Chairman



A delegation team headed by the Vice-Chancellor of the only maritime specialised public university of the country, BSMRMU, Bangladesh,

Rear Admiral M Khaled Iqbal paid a courtesy visit to the newly appointed Chairman of Bangladesh University Grants Commission (UGC) Dr Kazi Shahidullah on 15 June 2019. The Vice-Chancellor congratulated the UGC chairman and handed over a flower bouquet as a token of greet. Treasurer, Registrar, Academic Adviser, senior teachers and officers of the university were also present.

During the meet, BSMRMU Vice-Chancellor Rear Admiral M Khaled Iqbal informed the UGC chairman about the overall activities and condition of the university. UGC chairman assured all types of assistance to the university for the development of higher-education and for establishing the permanent campus. He also expressed his hope that BSMRMU will play an important role in implementing the Hon’ble Prime Minister’s “Vision-2041” considering the Blue Economy prospects.

Seminar held on “Exploring The Current Trends in Cell Science and Biotechnology”



On 26 June 2019, BSMRMU organised a seminar on “Exploring The Current Trends in Cell Science and Biotechnology” at the auditorium of its campus at Pallabi, Mirpur in the capital. Treasurer of BSMRMU Commodore A M Quamrul Huq graced the occasion as the chief guest. Academic Adviser of BSMRMU, Professor Altaf Hussain chaired the seminar.

Dr Kensuke Miki, Associate Professor of Department of Genome System Science of Yokohama City University, Swadhinata Padak-2019 awardee Dr Hasina Khan, Professor of Dhaka University and Dr Mamunur Rashid, former Professor of Department of Biochemistry and Molecular Biology of University of Dhaka presented their paper in the seminar. Dean of FEOS, Commodore M Ziauddin Alamgir supervised the whole programme. Students and faculty members attended the workshop with full enthusiasm.

BSMRMU participates in ICBM 2019

Faculties of Bangabandhu Sheikh Mujibur Rahaman Maritime University, Bangladesh participated in the 2nd International Conference on Business and Management (ICBM 2019) organised by BRAC Business School (BBS) on 25-27 April 2019 at Hotel Westin Dhaka. In the conference, faculties of BSMRMU presented ten research papers. Commodore M Ziauddin Alamgir, NGP, fdc, psc, BN, Dean, Faculty of Shipping Administration, BSMRMU also chaired the session of Maritime Business.



// Campus Canvas //

BSMRMU celebrates Pohela Boishakh-1426



By reflecting the spirit and enthusiasm of Pohela Boishakh at all levels of national life, the Vice-Chancellor of BSMRMU, Bangladesh Rear Admiral M Khaled Iqbal encouraged everyone to work in a harmony to achieve the developed country status by 2041 during the celebration of "Pohela Boishakh-1426" on 14 April 2019. The day was celebrated in a befitting manner at its campus located at Pallabi in the capital. On this occasion, a pleasant cultural programme was organised by the University's Cultural Club. The participants and guests were offered with different traditional Bengali dishes to mark the day.

The ceremony was inaugurated by the Chief Guest, Honourable Vice-Chancellor of the university Rear Admiral M Khaled Iqbal. The Treasurer, Registrar, Deans, teachers, officers and students of the university were also present and enjoyed the event.

Seminar held on "Prospects and Challenges of Eco-Tourism in Bangladesh"



On 25 June 2019, BSMRMU organised a seminar on "Prospects and Challenges of Eco-Tourism in Bangladesh" at the auditorium of its campus at Pallabi, Mirpur in the capital. Dean of FSA, Commodore M Ziauddin Alamgir graced the occasion as the chief guest. Mr Akhtaruz Zaman Khan Kabir, Chairman of Bangladesh Parjatan Corporation attended as the Keynote speaker. Professor Dr Sayed Rashidul Hasan, Dept of Tourism and Hospitality Management of University of Dhaka presented his paper as well.

BSMRMU signs joint research project with University of Hawaii and Connected Planet



With a view to developing the maritime tourism status of Bangladesh a joint research project entitled, "A Preliminary Study to Develop a Phased Approach for Maritime Tourism Development in Bangladesh" was signed among BSMRMU, University of Hawaii, USA and America's renowned tourism operator Connected Planet at the campus of BSMRMU located at Pallabi, Dhaka on 20 May 2019. In the presence of BSMRMU Vice-Chancellor Rear Admiral M Khaled Iqbal, Dean of FMBS Commodore M Ziauddin Alamgir on behalf of BSMRMU and M. Jan Rumi on behalf of University of Hawaii and Connected Planet signed the agreement. BSMRMU Treasurer, Registrar, Dean of FEOS and FGS, Academic Adviser, Controller of Exam, teachers and officers attended the ceremony as well.

This research will provide recommendations to government and non-government stakeholders in order to implement world-class services in potential maritime tourist locations. The researchers expressed their hope that the study will play an important role in achieving Honourable Prime Minister Sheikh Hasina's Vision-2041 by implementing useful maritime tourism plans for the country.

BSMRMU organises reception for Swadhinata Padak-2019 awardee Dr Hasina Khan



On 23 April, 2019, the sole maritime specialised public university of the country, Bangabandhu Sheikh Mujibur Rahman Maritime University, Bangladesh organised a reception programme for Swadhinata Padak-2019 awardee Dr Hasina Khan. Professor of Biochemistry and Microbiology of Dhaka University, Dr Hasina Khan was

awarded due to her outstanding contribution in research and training. The Vice-Chancellor of the university graced the programme held at university auditorium at Pallabi, Dhaka. Registrar, Deans of the Faculties, teachers, officers, staffs and students were present at the programme as well.

BSMRMU Vice-Chancellor inspects Bangladesh Marine Academy



An inspection team headed by the Vice-Chancellor Rear Admiral M Khaled Iqbal, BSP, ndc, psc visited Bangladesh Marine Academy on 14 April 2019. The following activities were conducted during the inspection:

a. Parade inspection: A parade was held with the participation of smartly turned out cadets of Bangladesh Marine Academy where they saluted the Vice-Chancellor. In his speech, the Vice-Chancellor gave important directions and guidelines to the cadets.

b. Discussion meeting: Faculty members and officers of Marine Academy participated in a discussion meeting with the Vice-Chancellor in the newly established seminar hall of the academy. Important issues were discussed during the discussion meeting.

c. Library and simulator inspection: Inspection team visited the library and simulator room of the academy and expressed satisfaction during the visit.

BSMRMU delegation visits India for academic cooperation



BSMRMU delegation headed by the Vice-Chancellor Rear Admiral M Khaled Iqbal, BSP, ndc, psc, visited National Institute of Oceanography (NIO), Dona Paula, Goa, India for mutual collaboration in maritime research and education on 29 April 2019. Prof. Sunil Kumar Singh, the Director of NIO, along with eight scientists were present at the occasion. The objective of the visit was to pursue the academic cooperation through possible collaboration in research, training and other related areas for the students and faculty members of BSMRMU. The delegation also visited the Goa University, Taleigao Plateau, Goa, India for mutual collaboration in maritime research and education on 30 April 2019. Professor Varun Sahni, Vice Chancellor, Goa University along with six faculty members were present in the discussion. On 1 May 2019, the delegation visited National Center for Polar and Ocean Research (NCPOR), Headland Sada, Vasco-da-Gama, Goa, India. Prof. Sunil Kumar Singh, the Director of NIO, along with eight scientists were present at the occasion.

Workshop held on 'Quality Assurance and Self-Assessment of Academic Programme'



A workshop on 'Quality Assurance and Self-Assessment of Academic Programme' was held on 5 May 2019 at BSMRMU auditorium. Dr Sanjay Kumar Adhikari, Professor of Agro Technology Discipline, Khulna University was present as the resource person of the workshop. The teachers and

officials from the university attended the workshops to have practical experience in the 'Quality Assurance and Self-Assessment of Academic'.

Annual Performance Agreement signed between UGC and BSMRMU



On 20 June 2019, the Annual Performance Agreement was signed between University Grants Commission (UGC) and BSMRMU. The Registrar of BSMRMU, Commodore A Z M Jalal Uddin, (C), PCGM, psc, BN and the Secretary of UGC, Dr Md. Khaled signed the agreement

on behalf of their respective organisations. During the signing ceremony, Professor Dr M. Shah Nowaz Ali, Member, UGC and the Vice-Chancellor of BSMRMU, Rear Admiral M Khaled Iqbal were also present among others.

Port managers for efficient commercial shipping

Maritime Campus desk

Under the department of logistics, the shipping and port management plays a crucial role in international trade and commerce. As almost 90% of world's overall trade is done through sea route, these ports need to be managed well. When trade across countries flourished, movement of freight by means of ships was considered to be the most cost effective means of transportation. This increased the demand for professionals in this area to manage port activities. Port Management includes handling shipment transportation and storage of goods and human resource management of different categories in a large scale.

Ports usually deal with a number of disparate activities like the movement, loading and unloading of ships, containers, and other cargo; customs activities as well as human resources. Port management is a necessary position required to keep ports organised, supervised, and functioning. Managing ports is a combination of material handling, road transport, storage, safe ship operations, health and safety. In other words, port management includes overseeing all commercial and technical components of the shipping industry. Duties in port management may also include cooperating with other ports, coordinating deliveries with ships, overseeing port development, advertising and promoting the port, and enforcing security and environmental protection initiatives.

With increasing importance of international trade, the need for skilled individuals to manage ports has increased. Services of shipping and port management professionals are required by both government agencies and private sectors.

One can find job in the shipping department as ship manager, port captain / manager, merchant officer etc. Port captain is responsible

for the tankers and cargo supervision. Ship management involves crew management, technical and commercial management. Technical department is responsible for the smooth, safe and economic operation of vessels. The job profile of a ship manager in the technical department involves preparation and overseeing of dry dock operation.

Some of the organisations which need port managers include shipping companies, clearing and forwarding companies, agency houses, export and import firms and major ports worldwide. There are also jobs for them in the railways and defence sector. The shipping and port managers also can work with international shipping majors and private port corporations. An aspirant can also find job with private packers and movers, transporters and organisations dealing with cargo handling.

To become a port manager or shipping manager, one should study BBA in Port Management and Logistics programme or Masters in Port and Shipping Management programme. These programmes are currently offered by Bangabandhu Sheikh Mujibur Rahman Maritime University, Bangladesh. The students who want to explore in the arena of shipping management, port economics, international trade and commerce, and economics of sea transport management, can admit themselves into this programme. The university admits into this programme once in a year and admission test is normally held in the month of July or August. Graduates will get a unique opportunity to develop their career in the different areas of job market like domestic and foreign port, terminals and ICDS, university teaching, shipping companies, commercial organisations, freight forwarding companies etc.





Basic familiarisation of LNG fuelled Dual Fuel Engine concept

S M Moshir Rahman

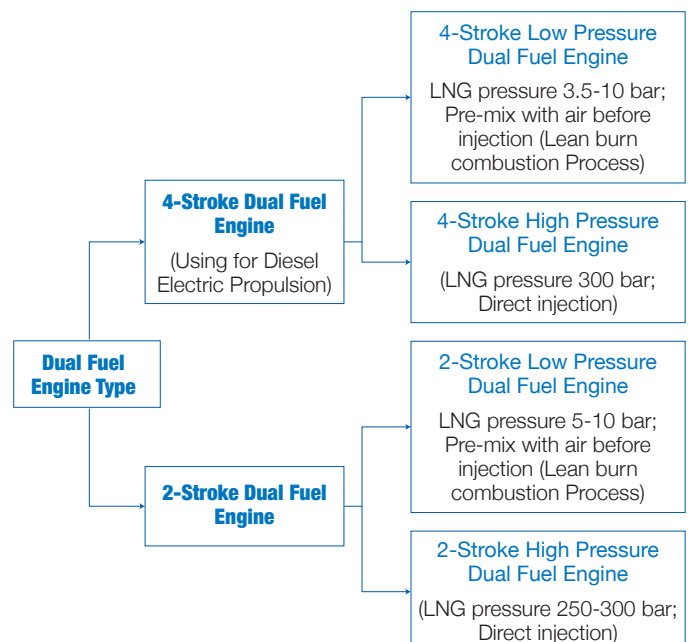
LNG (Liquefied Natural Gas) fuel is a great choice of current maritime industry to comply MARPOL ANNEX VI, Regulation 13, and IMO TIRE III NOx requirement. The demand of this technology is increasing day by day. Marine industry practitioners need to adopt with this technology for their sustainability in the future market. To understand this new technology, a basic familiarisation model of Dual Fuel Engine (DFE) concept has been developed in this article which may be helpful to our maritime industry practitioners and students.

Type of LNG powered dual fuel engine

Based on the LNG gas injection pressure, there are two types of LNG powered DFE using on board ship. These are:

- Low pressure LNG injection DFE
- High pressure LNG injection DFE

Both of this system can be used in 4 stroke and two stroke diesel engine. Briefly shown in figure below :



// Panorama //

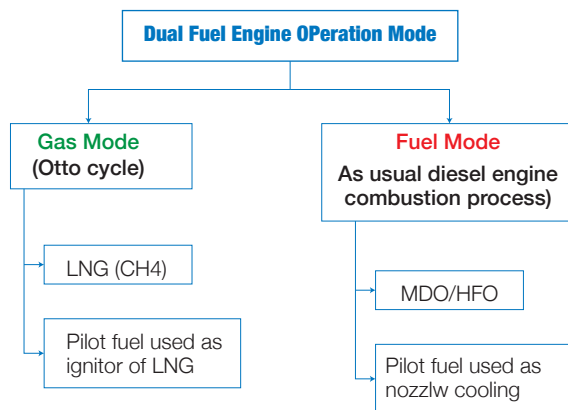
Advantage and disadvantage of low pressure and high pressure LNG injection system in DFE are:

- Low pressure LNG injection DFE comply IMO Tire -III NOx Requirement but it has high chances of methane slip and gas knocking.
- High pressure direct LNG injection DFE does not fully comply IMO Tire-III NOx requirement but it does not create methane slip and gas knocking. This engine needs additional NOx treatment system at the exhaust outlet to comply IMO-Tire-III NOx requirement.

Operation mode of LNG powered DFE

DFE is run any one of the two fuel modes which are:

- Marine Diesel Oil (MDO) or heavy fuel oil mode
- LNG & pilot fuel mode (small amount of fuel , approximate 1% of total fuel consumption, injected as pilot fuel to ignite LNG & air mixture)



Some important areas to know about the operational mode of this technology which are:

- During LNG operation mode, pilot fuel is always in operation to ignite the injected LNG in the combustion chamber because ignition point of LNG (CH₄) is low (Approx.600 Deg/C). So it can not burn alone. In this case, pilot fuel ignite first and burn the LNG and air mixture. This process reduces the combustion temperature approximately below 1200 centigrade and reduces the NOx.
- DFE is always started on MDO mode and change over to LNG mode at 20% to 60 % stable load condition of the engine.
- Fuel changeover from fuel mode to LNG mode or LNG mode to fuel mode is done by the automatic engine control system like WECS-8000 unit and AIS (Integrated automation System) in wartsila engine.

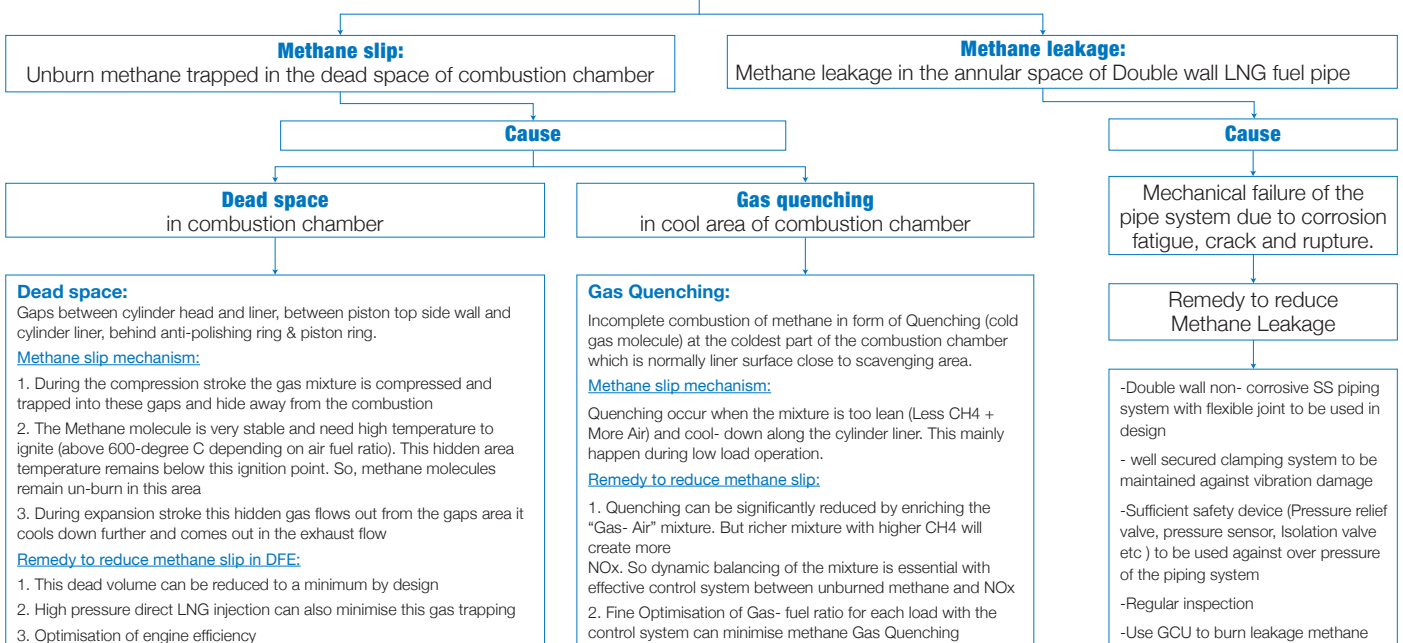
Methane emission in LNG powered DFE

There are two ways of methane emission can be occurred to the atmosphere from the LNG fuelled engine.

- Methane slip
- Methane leakage

Methane slip: Emission of unburnt methane with exhaust gas from the engine is known as the ‘methane slip’. Unburnt methane molecules are released to the atmosphere from the combustion space in DFE. It is a great source of air pollution. Methane molecule is trapped in the dead area of combustion space and goes to the atmosphere with exhaust gas. Methane slip is an important environmental and health concern for today’s modern LNG-dual fuel engine. It contains significant amount of hydro carbon in the atmosphere. Recent EEU research found that 7g unburnt methane release to the atmosphere in per kg use of LNG at high engine load

Two ways of methane emission from Dual Fuel LNG Engine: Impact on MARPOL ANNEX-VI Regulation:13-NOx Emission





and 23 g-36g at low engine load due to low combustion temperature. Together with exhaust, this may form polycyclic aromatic hydrocarbons, which have carcinogenic properties and can cause great harm to our human body. This causes great harm to our environment by affecting Ozone layer. It has also high global warming potential (GWP). This also impacts the MARPOL Annex-VI regulation 12 (Ozone depleting substance).

Methane leakage: Methane leakage occurred outside of the combustion space which is from the double wall gas pipe in to the annular space or valve and flange joint area. If gas leaks in to the annular space of the gas piping system, this will be purged out with nitrogen gas to the GCU from the system.

Many of our industry practitioners, Marine engineers and Marine Engineering students do not have the clear idea about this "methane slip". They are also not sure about how this methane slip occurs in the marine DFE. Many of them are confused between methane leakage and methane slip in the DFE. To provide a basic picture to them about this methane slip and methane leakage in a brief frame, "Graphical model of methane leakage" from the DFE has been developed here in figure below.

Major safety features of LNG powered DFE

Lots of safety features are included in the LNG powered Dual fuel engine in International Gas code and classification society rules. Few major and common safety features are listed here which are:

1. Double wall gas pipe
2. Gas pipe annular space ventilation
3. Gas leak sensor
4. Gas pipe annular space purging with nitrogen (N₂)
5. Gas valve shut down due to leakage
6. Auto change over to fuel mode

The annular space in double wall piping is ventilated by air supplied either from the engine room or via special pipeline outside the engine room. If gas leakage detected in the annular space, then gas detector sensor will shut down the main gas supply valve and engine will automatically switchover to MDO.

Numerous researches are still on going for the safe use of this technology in various leading universities and industries around the world. It is hoped that one day this LNG fuel technology will eliminate the existing conventional fuel technology in our shipping industry along with other renewable energy like wind power and hydro-electric power and make our health and environment safe from the various harmful emission.

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Participant of BoMS programme



Representation of females in maritime sector of Bangladesh

Sunanda Majumdar

'I am onboard with gender equality' - it was the 2019 campaign on the day of seafarers (25th June).

Throughout 2019, there is a strong emphasis in the maritime world and on value of women within the professional ranks.

The long interaction of men and the sea has created significant cultural barriers to the participation of women in seafaring. Women are not represented at the policy level in the maritime world till date. They represent only 2% of the world's 1.25 million seafarers. The need to advance women's role in maritime activities has become a subject of unprecedented awareness and interest. It is now time to change the statistic by enhancing opportunities for the women to be educated and gaining experience in Maritime activities. IMO plays an active role in integrating woman into the maritime field. The 2010 IMO STCW Manila diplomatic conference invited the governments to highlight the role of women in the seafaring profession and to promote their greater participation in maritime training at all levels in the maritime industry.

Bangladesh ranks in the top ten countries in terms of gender equality. Bangladeshi women are in all national mainstream activities like in the Police, Navy, Air Force, Army, etc. Bangladesh won the honour of becoming the first Muslim majority nation in the world to send an all-women's contingent on a UN peace mission to Haiti in 2010.

Female seafarers have been going to sea since the 19th century. Malaysia, India, Indonesia, Turkey, Brazil, Hong Kong, Japan, Korea, Philippines, UK, USA, Germany, Denmark, Sweden, Norway etc. has female seafarers. Not only that, our neighbouring country India,

which has similar culture as ours, already has female Captains and CEO/directors of shipping companies. Recently, the Singapore Shipping Association has elected first ever female president since its founding in 1985.

In Bangladesh it was not easy for a female to become a seafarer due to cultural barriers. Since 1996 the need to allow the participation of female in seafaring was in discussion on the policy making level of Bangladesh. Three broad areas of workplace for female seafarers are selected in our country: 1) Ocean going ships, 2) Shore based shipping offices, 3) Maritime education (Maritime university/academy).

Finally, the milestone decision of recruiting females for training to be a seafarer came into force in 2012. Sixteen physically, emotionally and spiritually motivated female cadets with strong determination stepped into the Bangladesh Marine Academy and who eventually became the pioneer of female seafarers in

Bangladesh. Since then female cadets are being recruited regularly, who, after completing their training in the academy has either joined the ship for onboard training or joined some shore-based shipping company office or contributing in maritime education, although facing some challenges.

The Marine Fisheries Academy also recruits female cadets who are also contributing in the maritime sector, in various fish processing plants, public institutes and also they have got CDC to join various ocean-going ships.

The horizon for the Bangladeshi female seafarers has widen when Bangladesh Shipping Corporation (BSC) has procured 6 brand new ships in the year 2018-2019. Each ship accommodates female cadets. Also, some of the females have already completed their onboard training, achieved their certificate of competency and working on BSC ships as an officer/engineer. One of the Bangladesh female cadets has joined a foreign company. It is expected that by 2025 we shall have female Captains and Chief Engineers.

The myths that females are unlucky or have safety risk or not capable to fight tough sea life has already been proven wrong by Bangladeshi young and vibrant female seafarers.

Bangladeshi females are 'Onboard with gender equality'.

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Circular economy and Port of Rotterdam

Mohammed Mojahid Hossain Chowdhury

To ensure sustainable growth, smarter and more sustainable use will need to be made of our resources. The current system, in which we collect raw materials, use them and then discard them, will need to be adjusted. As many resources are scarce, we need to find more environmentally and economically sustainable ways to use them. Businesses also have economic reasons to use their resources and raw materials in the best possible way. Research by research firm TNO estimated that the total market opportunities for the Netherlands under a more circular economy would be nearly €7.3 billion a year, approximately 1.4% of GDP.

The circular economy is important for ports because:

1. Ports function as 'matchmakers' that bring both the producing and recycling industries in contact with each other in order to re-use the energy in the chain.
2. Ports accommodate industries that are active in the treatment, collection and shipment of waste and stimulate the emergence of innovation circles.
3. Ports are important crossing-points for all kinds of waste and industrial flows and act as logistical hubs for the import/export of waste materials. Therefore, they are ideal locations to further develop the circular economy.
4. The presence of industrial clusters in ports help to facilitate the circular and more sustainable use of waste and resources because they offer the benefit of existing synergies between industries.

To further stimulate the circular economy, the Port of Rotterdam emphasises how crucial it is to recognise the value of waste and

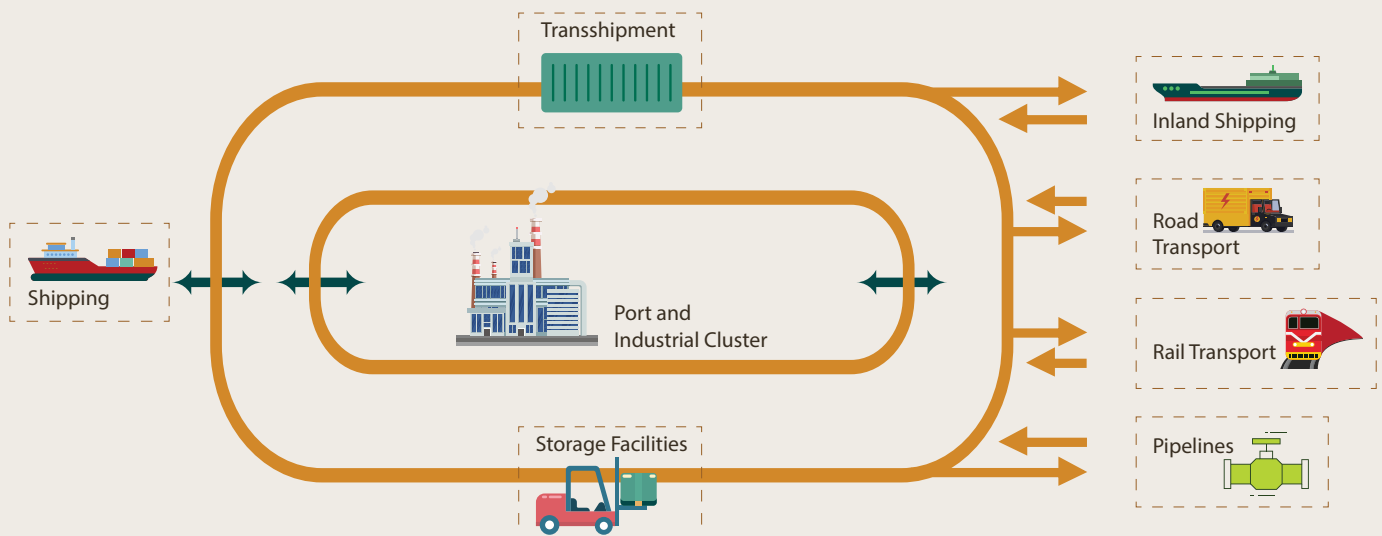
residual products. Of course, this should be done without harming public health and the environment. Furthermore, the European Commission should help to create a stable investment climate for businesses in the circular economy by harmonising waste legislation and reducing regulatory inconsistencies. The Port of Rotterdam Authority supports a European approach to waste legislation, for example through the cross-border implementation of the waste hierarchy. Finding a common definition of criteria for end-of-waste and residual products is necessary in order to enable efficient transport and safe use of these resources throughout the European Union. The circular economy will benefit from a decrease in the administrative burden for the transport of 'waste materials' within the EU and the reclassification of some substances originating from a production process and not intended for the production of something else by-products and not waste materials.

As Chattogram port is the gateway and logistics hub for Bangladesh, close attention can be given to the port so that a sustainable port development can be implemented. Research projects can be run based on Chattogram port and its circular economy.

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WMU to research gender equality in ocean science



A World Maritime University (WMU) team will undertake the research with a focus on gender equality and the empowerment of women in the conduct and delivery of ocean scientific research, in particular in relation to fisheries, oceanography, hydrography and climate change.

The announcement was made by Dr. Cleopatra Doumbia-Henry, President of WMU, and Dr. Genvieve Béchar, Hydrographer General of Canada on behalf of the Government of Canada, and relates to a major research project on the theme “Empowering Women for the United Nations Decade of Ocean Science for Sustainable Development.” This was made possible through Canada’s Department of Fisheries and Oceans.

In support of the project, the Government of Canada is also sponsoring a WMU Ph.D. scholarship and post-doctoral fellowship programme on gender empowerment in support of the Decade of Ocean Science for Sustainable Development. The programme aims to promote gender equality and empowerment of women in the conduct of ocean science as well as gender equality in the regulatory and ocean science governance systems that manage ocean science.

Against this background, WMU is launching a Ph.D. scholarship and Post-Doctoral fellowship programme with a focus on research proposals that canvass novel policy and scientific approaches on gender empowerment across the following thematic areas:

1. The role of gender equality and empowerment of women in the conduct of ocean scientific research;
2. Ocean science governance systems; and
3. Ocean science diplomacy.

The United Nations proclaimed a Decade of Ocean Science for Sustainable Development (2021-2030) with a view to reversing the cycle of decline in ocean health. It is recognised that the aims of the decade, including improved conditions for sustainable development of the ocean, can only be achieved with equal participation from both women and men.

In 2018, the WMU celebrated 35 years of excellence in education, research and capacity-building of future leaders in maritime and ocean-related studies and inaugurated the WMU-Sasakawa Global Ocean Institute. The Institute will contribute to the implementation of Goal 14 (Life Below Water) of the United Nations 2030 Sustainable Development Agenda, in particular with equal participation of both women and men in support of Goal 5 focused on gender equality. The government of Canada is actively committed to supporting this work.

Denmark launches digital certificates for seafarers

According to a notice released on May 29, the Danish Maritime Authority launched a pilot project on digital certificates for seafarers.

The project is being undertaken aboard the 2018-built containership Mumbai Maersk that is scheduled to sail from Denmark’s Port of Aarhus for destinations in Europe, Africa and Asia with crew certificates that are entirely digital instead of traditional paper certificates.

“This is simpler, faster and safer for seafarers, shipping companies and authorities,” Danish Maritime Authority said.

During the voyage, the 190,326 dwt ship will call ports in Germany, Morocco, Singapore, China and South Korea, where it will collect data and knowledge about the use of digital certificates for seafarers. In particular in connection with Port State Control.

“The pilot project aims to explore the advantages of digital certificates and hopefully pave the way for global acceptance and utilisation,” the authority concluded.

Simulation software will enhance Dutch seafarer training



STC Group has ordered simulation software from Wärtsilä for its training centres in Rotterdam, Stellendam, and Katwijk, the Netherlands. Wärtsilä said it would begin supplying software for these simulator classrooms immediately after site acceptance. It will supply Wärtsilä Navi-Trainer Professional (NTPRO) 5000 software for desktop simulators, which will be used to teach trainees the navigation skills required on modern ships. Equipment and software will all be installed by the end of August, in time for the start of the new academic year.

“The three new simulator classrooms to be installed will allow our vocational students to spend even more time on practical simulator training,” said STC Group senior project manager for simulators Joep Bonten.

“It will also ensure that maritime education at all STC Group locations in the Netherlands is identical and future-proof, while being made possible by our European regional development funding.”

Wärtsilä’s software can be customised for specific training requirements, said Wärtsilä voyage simulation and training sales expert Alex Ponomarev.

Rijeka Faculty of Maritime Studies celebrates 70th anniversary



On 4 April 2019, the Rijeka Faculty of Maritime Studies, the first and most important institution of higher education in the field of seafaring in Croatia celebrated its 70th anniversary, with President Kolinda Grabar-Kitarovic attending the event.

The Rijeka Faculty of Maritime Studies was established in 1949 as a two-year college and in 1992 it changed its name to the Faculty of Maritime Studies.

More than 13,550 students from Croatia and 30 other countries have graduated from the faculty, and it has awarded more than 127 master's degrees and more than 100 doctorates.

"The Adriatic Sea gives Croatia geo-strategic importance, and Rijeka and its port are the shortest bridge to Central European countries and all the way to the Baltic. That was so in the past, when Rijeka was the most important Mediterranean port for the entire Central Europe, a natural point of access to the sea and the main maritime point of economic development," said Grabar-Kitarovic, adding that this fact had not been valued sufficiently, which was why she participated in launching the Three Seas Initiative.

24% of West Antarctic ice is unstable



A new study has found that over the past 25 years, ice has thinned across West Antarctica so rapidly that a quarter of its glacier ice is now affected.

Scientists at the Centre for Polar Observation and Modelling (CPOM), based at the University of Leeds in the U.K., have combined 25 years of European Space Agency satellite altimeter measurements and a model of Antarctica's regional climate to track changes in snow and ice cover across the continent.

The study finds Antarctica's ice sheet has thinned by up to 122 meters in places, with the most rapid changes occurring in West.

The study suggests, altogether, ice losses from East and West Antarctica have contributed 4.6 millimetres to global sea level rise since 1992.

The study used over 800 million measurements of the Antarctic ice sheet height recorded by the ERS-1, ERS-2, Envisat, and CryoSat-2, satellite altimeter missions between 1992 and 2017 and simulations of snowfall over the same period produced by the RACMO regional, climate model. Together, these measurements allow changes in the ice sheet height to be separated into those due to weather patterns, such as less snowfall, and those due to longer term changes in climate, such as increasing ocean temperatures that eat away ice.

Artificial Intelligence will change the game of shipping industry



Artificial Intelligence (AI) is nothing less than a miracle of computer science. This extended branch of computer science focuses on building smart machines that are capable of performing human-like tasks like decision-making, speech recognition etc. The prominent feature of AI, which is making it the future of industries, is that through AI, machines can be trained to perform certain tasks by processing large amount of data and also draw patterns from the processed data.

Today AI is transforming almost every industry. Right from finance and banking sector to health care, retail/Etail, higher education, energy and utilities, AI is marking its prominent place in all the leading industries and now is all set to transfigure another major industry- Maritime.

The maritime sector is responsible for carrying out 90% of the world trade and is in dire requirement of technological elevation, which the AI is capable of providing. Hence, when it comes to technological innovations for the maritime sector, Artificial Intelligence is earning the reputation of being a prime technology.

Considered to be a slow-moving, traditional-in-approach and fragmented sector, the shipping industry is now eyeing at some major technological innovations based on AI. In fact, the coming era may witness the creation of an entirely transformed shipping industry that will offer greater economic, environmental and social advantage.

TERP makes 'a-Books' for maritime education



Maritime schools are becoming immersive to digital learning by bringing textbooks in smart phones to make learning more fun for students.

TERP, a technology company based in Norway and Hong Kong with operations in Europe and Asia, was pushing for digital transformation in education in the Philippines through publication of maritime textbooks.

Leiv Kare Johannessen Chief Executive Officer (CEO) and

co-founder of TERP said 10 maritime schools in the Philippines would start using TERP books called a-books this school year. TERP had pilot-tested this a-book at the University of Cebu last semester

"We developed a digital platform for publishing and distribution of books. We have teamed-up with authors from the Philippines and Norway to develop a-books for maritime education. We have pilot-tested it in maritime schools last November and now we have 10 schools using a-books starting June," Johannessen said.

He explained that the book is electronic, but it's not e-books. They are called a-books.

"The a-books can be downloaded in different levels using smart phones. There are animations and videos inside the a-Book and we integrated the assessment in their a-book," he said

The assessment provides feedback to student on what they can work on for their subjects. The a-books also provide feedback to teachers, so they can adjust to the needs of their class.

ILO, IMO agree on medical guide development for ships

This was agreed on the side-lines of the IMO's sub-committee on Human Element, Training and Watchkeeping (HTW 6) which met for its 6th session on 29 April-3 May, 2019.

The sub-committee invited the secretariat and other stakeholders involved to keep it informed of progress made with the development of the new medical guide.

Subject to approval by the corresponding bodies of ILO and IMO, it was agreed that the new medical guide should be referenced as one of the carriage requirement options in the 1978 STCW Convention (The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers), as amended, the STCW Convention and MLC (Maritime Labour Convention, 2006).



Beirut hosts EMMC 2019



The Lebanese capital Beirut hosted the East Med Maritime Conference EMMC on the 19th of June 2019, held under the patronage of Prime Minister Mr. Saad Hariri and the strategic partnership of the Lebanese Directorate General of Land and Maritime Transport, Ministry of Public Works and Transport.

The event gathered major experts widely known in the maritime and offshore sectors and the maritime academic sector, with over 32 specialised international speakers from different local and regional countries, and more than 30 sponsors, in participation of around 220 delegates.

The EMMC 2019 discussed the maritime industry's challenges and sustainability of the East Med ports, logistics' sector, current and future projects, in the presence of major shipping lines, ship owners, shipyards, shipping brokers and related industries, in addition to notable maritime academies.

WMU's International women's conference reflects World Maritime Day theme



WMU's (World Maritime University) 'International Women's Conference', 'Empowering Women in the Maritime Community' was held in Malmö, Sweden on 4-5 April 2019, reflecting this year's World Maritime Day theme.

Remove structural barriers, build good networks and support quality education to ensure no woman, no girl is left behind in the maritime sector - where women remain significantly under-represented. These were some of the themes reiterated by maritime leaders speaking in the event.

Opening the conference, WMU President Cleopatra Doumbia-Henry called on the whole maritime sector to "be bold for change" in order to achieve the UN Sustainable Development Goals (SDGs), in particular SDG 5 on gender equality. "We need to ensure a quality education is made available to everyone, including and empowering women and girls. No one should be left behind," she said.

"To make progress we need bold and innovative initiatives to ensure we progress gender diversity," said Helen Buni, focal point for International Maritime Organisation (IMO)'s Women in Maritime Programme, which supports women to access maritime training and other opportunities, including through gender-specific fellowships for high-level technical training.

Through this programme, IMO has facilitated the establishment of seven women in maritime associations across the globe to provide networking, mentorship and other opportunities.

Heike Deggim, Director of IMO's Maritime Safety Division said while there had been some progress in female representation at IMO meetings amongst national delegations, the maritime industry needed more women, particularly in leadership roles.

In a video message to the conference, IMO Secretary-General Kitack Lim said, "The maritime world needs all hands on deck, both male and female, to continue to carry the world's goods in a clean safe and efficient manner."



RMU appeals to IMO for training vessel

On 4 April 2019, the Management of the Regional Maritime University (RMU), Ghana appealed to the International Maritime Organisation (IMO) to assist the university to acquire a training vessel and a full-mission bridge simulator to expose the students to hands-on practical.

The training vessel will offer opportunities to acquire the requisite sea time after their undergraduate programmes to enable them pursue the certificate of competency courses.

Professor Elvis Nyarko, the Vice-Chancellor of the university, made the appeal to Mr Kitack Lim, the Secretary General of the International Maritime Organisation, during his visit to the university.

He said IMO in the late 1970s set up a system that continuously supply well-trained and qualified marine personnel to operate the regional merchant and fishing fleets of the region, in a quest to support the development of the maritime sector of the West and Central Africa.

Prof Nyarko said IMO provided assistance through the United Nations Development Programme to initiate the process of regionalisation of the maritime education and training institutions of West and Central Africa.

Mr Lim expressed IMO commitment to support and adapt global standards for safety and environmental protection, security, and efficiency for shipping and the maritime industry, and as well provide a level playing ground for all member states.

Maritime research can help keep up GDP growth



"Scientists and researchers have responsibilities to find out sustainable ways and means to maintain Bangladesh's current economic and GDP growth," Prime Minister Sheikh Hasina said on 10 April 2019.

"We have to sustain our economic growth and only research can give us that ability," she said this while addressing as Chief Guest in a distribution ceremony of

Bangabandhu Science and Technology Fellowship, National Science and Technology Fellowship and cheques of the grants for special research.

"We have formulated National Science and Technology Policy 2011 so that we can maintain sustainable economic and GDP growth," she said in the programme organised by Science and Technology Ministry at Bangabandhu International Conference Center.

Hon'ble Minister of the said ministry Mr Yafesh Osman was in the chair while Chairman of the Parliamentary Standing Committee on Science and Technology Affairs Mr Ruhul Haque MP was present as the special guest.

She said that Bangladesh gained a huge maritime area and research was essential to explore and exploit the potentials from its maritime boundary.

"We have already set up an institute in Cox's Bazar while studies are being conducted at Dhaka and Chattogram universities. We need a large-scale research in this sector," she said.

The Prime Minister further said that the country needed more scientists, technologists and researchers.

She mentioned that the government had awarded fellowships worth Tk 84.64 crore from 2009-10 to 2017-18 fiscal years to 13,713 persons.

"We are providing fellowships worth Tk 17.68 crore in the current fiscal year," she added.



New Netherlands Ambassador Verweij extols Bangladesh Delta Plan 2100

"I use a motto – 3 words: expand, brand, stand," the new ambassador said while explaining the future of bilateral relations to diplomatic correspondents in Dhaka on 5 May 2019.

He said there is room to expand the relations and for that expansion to happen, "We need to put the image of Bangladesh at the center of it all."

Verweij also said the Netherlands are transitioning policies towards Bangladesh as the country is graduating to a middle-income one.

The Diplomatic Correspondents Association, Bangladesh (DCAB) organised the 'DCAB Talk' with the ambassador at the Bangladesh Institute of International and Strategic Studies (BISS) auditorium.

Bangladesh and the Netherlands are both low-lying nations where big rivers end in the sea. Both are Delta nations.

Bangladesh is implementing the 'Bangladesh Delta Plan 2100' with the cooperation of the Netherlands.

The ambassador said this is the "most courageous" project Prime Minister Sheikh Hasina has taken. "It is not just potentiality for a distant future but a reality at this very moment. The Delta Plan will be launched this year," he said.

Drafts of two master plans finalised to save rivers: LGRD Minister



According to media reports citing LGRD minister Mr Tajul Islam MP, the government finalised drafts of two master plans to prevent pollution and occupation of rivers around the capital and the Karnafuli in Chattogram. He also said that another master plan will be drawn to save Padma, Meghna, Turag and Pungli rivers.

The LGRD minister also said that to prevent river pollution and increase

navigability around the capital, the master plan will be implemented in three (pollution, occupation and navigability) phases.

Under the master plan four steps - crash programme (1 year), short-term (3 years), mid-term (5 years) and long-term (10 years) - will be taken to save rivers.

The decision of making the master plan was taken on 14 June 2016, in a meeting of Executive Committee of the National Economic Council (ECNEC).

‘Summit LNG’ successfully completes its first ship-to-ship transfer



On 23 April 2019, ‘Summit LNG’ successfully completed its first Ship-to-Ship (STS) transfer of LNG at 6 km off Moheshkhali in the Bay of Bengal. Summit’s Floating Storage and Regasification Unit (FSRU) – ‘Summit LNG’ received 159,000 cubic meters of LNG from Oman Trading International. The transfer was done using flexible transfer hoses. The LNG tanker “Creole Spirit” carried LNG from Bethioua, Algeria. RPGCL (Rupantarita Prakritik Gas Co Ltd) on behalf of Petrobangla certified the completion of this transfer. The next STS transfer is due in early June 2019.

On reaching this milestone, the Founder Chairman of Summit Group Muhammed Aziz Khan said, “At Summit, we are grateful to receive the opportunity to prove the abilities of Bangladesh, on schedule implementation of power projects, LNG Projects and now terminalling. Each (project) proves the technological prowess and implementing ability of Bangladesh.”

Chairman of Petrobangla and RPGCL Md. Ruhul Amin commented, “We are very proud on successful completion of Summit’s Ship-to-Ship LNG transfer commissioned by RPGCL on behalf Petrobangla.”

Summit LNG Terminal Co Ltd (SLNG) is a subsidiary of Summit Power International (SPI) and is a company of Summit-Mitsubishi consortium. The ‘Summit LNG’ began commercial supply date (CSD) in Bangladesh on 29th April 2019. It had carried LNG from Qatar and later regasified liquefied natural gas (RLNG) before supplying it to the National Gas Grid.

Research on marine resources are necessary for sustainable development: Planning Minister



The Bay of Bengal has enormous resources, but there are no adequate ideas and information about these resources, Planning Minister M A Mannan said on 24 April 2019.

“Extensive survey and research is needed to ensure sustainable development through the proper utilisation of potentials of the sea and marine resources,” the minister said at the inaugural ceremony of an international conference titled “Sustainable Blue Economy for the Development of Bangladesh,” organised at the Nabab Nawab Ali Chowdhury Senate Building in the University of Dhaka.

The Department of Oceanography at the University of Dhaka, the Blue Economy Cell of the government, Bangladesh Institute of Maritime Research and Development (BIMRAD) and GreenTech jointly organised the conference.

Speaking at the event, the planning minister said: “Our ancestors always looked west for economic growth, but we have to look south as the sea is the new horizon of our economic development. We are graced with enormous potential of the Blue Economy, but we are not prepared to secure the resource.”

State Minister for Shipping Khalid Mahmud Chowdhury and State Minister to Fisheries and Livestock Md Asraf Ali Khan Khasru also attended two separate sessions, while hundreds of students, teachers, academicians, researchers and professionals from home and abroad took part in the conference.

Bangladesh and Bhutan sign five bilateral agreements

Bangladesh and Bhutan have signed five bilateral instruments to enhance cooperation on inland waterways, health, agriculture, tourism sectors and Public Administration training centres.

The instruments were signed after official talks between Bangladesh Prime Minister Sheikh Hasina and Bhutanese Prime Minister Lotay Tshering at the Prime Minister’s office (PMO) in Dhaka on 13 April 2019.

These instruments are expected to enhance cooperation on cargo transportation, cooperation in health, agriculture and tourism sectors and cooperation between the Public Administration training centres of the two countries for exchange of faculty members as well as training and capacity building.

Shipping Secretary of Bangladesh Md Abdus Samad and Bhutan’s Secretary of Ministry of Economic Affairs Dasho Yeshe Wangdi signed the Standard Operating Procedure (SOP) for the operationalisation of a memorandum of understanding (MoU) on the use of inland waterways for transportation of bilateral trade and transit cargos between the two countries.

Excelerate's FSRU "Summit LNG" flowing gas into Bangladesh



The floating storage and regasification unit (FSRU) Summit LNG has begun operations at Summit LNG Terminal located offshore Moheshkhali Island in the Bay of Bengal. On 29 April 2019, the FSRU successfully completed commissioning of the liquefied

natural gas (LNG) terminal, owned by Summit LNG Terminal Co Ltd (Summit). The terminal has a send-out capacity of 500 million standard cubic feet per day (mmscf/day) of natural gas.

In August 2017, Summit entered into a 15-year charter agreement with Excelerate for the FSRU Summit LNG. In addition to providing the FSRU, Excelerate acted as the Owner's Engineer for Summit in regards to the fixed infrastructure components of the terminal, which included a subsea plug, mooring system, and subsea pipeline.

"The successful completion of the Summit LNG Terminal represents a significant positive change to Bangladesh's energy supply – helping bolster local industry while benefitting the citizens of the country," stated Excelerate's Managing Director Steven Kobos. "We are pleased to have partnered with Summit on this very important project and are confident that our experience and expertise in FSRUs will ensure an efficient and reliable service for Bangladesh for the years to come."

In August 2018, Excelerate commissioned its Moheshkhali Floating LNG (MLNG) terminal – Bangladesh's first LNG import facility. Since beginning operations, MLNG has successfully imported 27 cargoes of LNG and delivered in excess of 70 million MMBtus of natural gas into the Bangladeshi market, which represents an increase in gas supply of over 10% during this period.

Bangladesh to dig wells near Myanmar border

For the first time, Bangladesh is going to dig two exploration wells at two prospects in shallow sea near the Myanmar maritime border. The two wells—Shimanto and Palongki—will be dug by the Australian company Santos in Block SS-11 in the Bay of Bengal within this year.

Earlier, Santos, under a joint venture (JV) with Singapore's KrisEnergy, carried out a 3D seismic survey in Block SS-11, covering some 305 square-kilometre area in shallow waters to explore the hydrocarbon potential.

In 2017, Santos and Kris had carried out a 2D seismic survey in 3,220 LKM (line kilometre) areas and identified seven prospects which backed the JV to carry out the 3D seismic survey later on.

The joint venture of Santos and Kris was committed to drilling an exploration well by conducting a 2D seismic survey in 3,220LKM area, a 3D survey in 300 sq km and offering a bank guarantee of USD 15 million for exploring SS-11 during the initial five years of the PSC starting from 2016.

Specialists believe that the maritime boundary area between Bangladesh and Myanmar held the most prospective oil and gas structures among all the offshore blocks of both countries. So, the next big discoveries in the Bay of Bengal are likely to take place there.

The PSC in Bangladesh allows the joint-venture firm the right to full repatriation of profits and not pay any signature bonus or royalty on equipment and machinery imported for exploration, development and production. Companies will also have 100 per cent cost recovery.

The contractor can also sell gas directly to third parties subject to Petrobangla's right of first refusal. But hydrocarbons produced from the shallow water blocks must be sold in the domestic market as exports are prohibited under PSCs.

Petrobangla's subsidiary, Bapex, will have 10 per cent carried interest in the shallow water block.

Currently, Bangladesh is entirely dependent on onshore fields for natural gas output, with current production hovering around 2,700 million cubic feet per day (mmcf) compared with the demand for more than 3,300 mmcf.

A Saudi firm keen to invest in Bangladesh ports

Red Sea Gateway Terminal (RSGT), Saudi port operator and investment group, has expressed its interest to invest in Bangladesh's port and terminal sectors.

The group has also wanted to invest in seaport's terminal sector too as the group has profound experience in construction of terminals in seaports.

The associate director of Red Sea Gateway Terminal (RSGT) under the Saudi Port Operator and Investment Group has placed its proposal before the State Minister for Shipping Khalid Mahmud Chowdhury during a meeting held at the secretariat in the capital on 8 May 2019.

"The Saudi business group has expressed to invest in Bangladesh's port and terminal sectors including Chattogram, Mongla and Payra seaports," Khalid Mahmud Chowdhury told reporters after the meeting.

Appreciating Saudi Arabia's investment proposal, the state minister for shipping said, "It will be a milestone for investment in Bangladesh's port and terminal sector. Saudi-Bangladesh economic relationship will be further strengthened under the dynamic leadership of Prime Minister Sheikh Hasina."

Shipping Secretary Abdus Samad, economic minister to Bangladesh embassy in Saudi Arabia Dr Mohammad Abul Hasan and other high officials attended the meeting.

BSMRMU cafeteria serves fresh and healthy food



The cafeteria and food services play a vital role in the retention of students. It does not exist solely to feed employees or students; rather it is an integral part of a retention strategy for university students. In American English, a university cafeteria is a cafeteria intended for university students and staff. In British English, it is often called the refectory. Every university should have a cafeteria. It is important for students to have freshly cooked food to maintain the strength they need at the university. A cafeteria is also an ideal place where students could relax, get a break, and enjoy hanging out with friends. The cafeteria is truly a lifesaver. You have a huge variety of foods from which to choose, so there is no excuse to eat poorly. You won't have to worry about missing out on your favourite entree since the cafeteria will usually repeat its menu several times throughout the year. A great university cafeteria shouldn't just give student's tasty and healthy food, but also fuel them with positive energy so they manage to focus through those long classes afterwards.

Bangabandhu Sheikh Mujibur Rahman Maritime University has a well decorated and well-maintained cafeteria on the third floor of the temporary campus. The cafeteria is being operated since September 2015. There are adequate seating arrangements for teachers as well as students. It provides the best quality foods and beverage at a

reasonable price. The cafeteria remains open from 8:30 am to 5 pm for teachers, students and staff. Besides, the cafeteria is equipped with an LED TV for entertainment and river osmosis water purifier for providing pure drinking water.



**Bangabandhu Sheikh Mujibur Rahman
Maritime University, Bangladesh**

