

**Proceedings of BSMRMU
International Seminar 2018**



**An Inclusive Maritime
Vision for Sustainable
Development of Bangladesh**





Seminar Proceedings
on
**An Inclusive Maritime Vision for
Sustainable Development of Bangladesh**

24-25 October 2018
BICC, Agargaon, Dhaka



Bangabandhu Sheikh Mujibur Rahman Maritime University, Bangladesh

December 2018

Seminar Proceedings on
An Inclusive Maritime Vision for Sustainable
Development of Bangladesh

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Editorial Note


The mariners of Bengal had proud legacies in marine history and heritage. The Bengal shipbuilding industries were of global reputation during the era of sail and wooden ships. Soon after the independence of Bangladesh, our great leader, Father of the Nation, Bangabandhu Sheikh Mujibur Rahman promulgated ‘Territorial Waters and Maritime Zones Act No. XXVI of 1974’. The government of Hon’ble Prime Minister Sheikh Hasina has successfully completed the delimitation of the maritime boundary with our neighbouring countries and now we have been endowed with a large sea area of 118,813 sq. km. We need to develop skilled manpower to explore and exploit our maritime resources.

Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU), Bangladesh was established on 26 October 2013 to provide the nation with knowledgeable and expert manpower in the maritime fields. BSMRMU has already started its journey toward its motto, “We Strive for Maritime Excellence”. Towards fulfilling its goals BSMRMU is conducting undergraduate and postgraduate programmes in various maritime fields and having collaboration with national and international educational and research organisations. BSMRMU also organises seminars on various maritime issues of national and international importance. For the first time, it has organised a two-day international seminar on ‘An Inclusive Maritime Vision for Sustainable Development of Bangladesh’ at Bangabandhu International Convention Centre (BICC), Agargaon on 24-25 October 2018. More than 500 participants from home and abroad attended the seminar. This two-day long international seminar had five session themes: i) port-led economic development, ii) blue economy- leading the way for sustainable development, iii) maritime education for a new generation, iv) maritime technological innovations, v) maritime governance and challenges. In the seminar, distinguished speakers from home and abroad presented 2 keynote papers and 15 invited papers on various maritime-related issues.

The proceeding sub-committee (editorial board) of the seminar has the task to publish the proceedings of the seminar. Members of the editorial board had to prepare proceedings from the audiovisual recordings and also using the presentation slides - the task was not easy. Few distinguished speakers handed over the soft copies of their papers which had to be edited a little bit to fit in the format of the proceedings. We tried our best to publish the proceedings as presented in the seminar however, there are minor changes made, keeping the theme of the paper intact.

We are grateful to the Hon’ble Vice-Chancellor of BSMRMU, Rear Admiral M Khaled Iqbal, for his support and constant guidance during the preparation of this seminar proceedings. An international seminar of this magnitude owes its success to all participants. We sincerely thank teachers, officers, students and staff members of BSMRMU for their support and cooperation.

It was possible to publish the seminar proceedings only because of very hard and dedicated teamwork. I thank all members of the Editorial Board.



Professor Dr Altaf Hussain
Academic Adviser, BSMRMU.

Bangabandhu Sheikh Mujibur Rahman Maritime University, Bangladesh (BSMRMU)

Bangabandhu Sheikh Mujibur Rahman Maritime University, Bangladesh (BSMRMU) was established with a vision to provide higher maritime education in order to make knowledgeable and expert manpower for achieving the goals of the blue economy. Since its inception on 26 October 2013, this specialised university started its journey towards maritime excellence. A number of MoU with different reputed maritime universities of the world have been signed for mutual support to maintain a high standard in the education system. The university is also planning to include an oceanographic research vessel for the training of students and research works at sea. With the successful delimitation of the maritime boundary with India and Myanmar, Bangladesh has been endowed with a large sea area of 1,18,813 square km. As the resources on land are depleting, it has become imperative for the nation to look towards the sea for its economic survival. Effective exploration and exploitation of maritime resources are therefore paramount for the economic emancipation of the country in the 21st century. In order to attain these goals, BSMRMU with its motto 'We Strive for Maritime Excellence' would provide necessary human resources for the nation, who are skilled, qualified and equipped with higher maritime knowledge in the respective field. Towards attaining its goals, the University is conducting both graduate and post-graduate courses on various maritime fields at its temporary location in Dhaka. But the establishment of its permanent campus in Chattogram on 106 acres of land by 2021 will open a new era of higher maritime education in Bangladesh. Our endeavour is to emerge as a regional centre of excellence in maritime higher education within the shortest possible time.

Vision

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

Mission

BSMRMU is committed to providing 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 a strong sense of ethical values and competence and ready to face the competitive world of maritime business, service and employment at the global level.

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Seminar Theme

An Inclusive Maritime Vision for Sustainable Development of Bangladesh

Bangladesh is fortunate to carry proud legacies in terms of both maritime history and heritage. From the early records, there are enough indications of our seafaring traditions and bonding with the oceans. The mariners from Bengal had profound knowledge in the area of seafaring, navigation, communication and shipbuilding. Chattogram was the major seaport of Bengal ever since the Arab and Yemenis used to come to India for trade in 2nd century BC. During the era of sail and wooden ships, Dhaka Shonargaon and Chattogram were the centres of great shipbuilding industries with a global reputation. But we could not keep pace in the maritime sector with the advent of the industrial and technological era. Rather we were suffering from ocean blindness. Soon after the independence of Bangladesh, our father of the nation Bangabandhu Sheikh Mujibur Rahman promulgated ‘Territorial waters and Maritime Zones Act No. XXVI of 1974’ well before the UNCLOS III came into being in 1982. In recent years, the present government of Hon’ble Prime Minister Sheikh Hasina has successfully completed the delimitation of a maritime boundary with our neighbouring countries through the verdict of ITLOS/PCA. It has given us the rights of exploration and exploitation of resources from a huge area of 118,813 sq. km. It has opened a wider horizon of ‘blue economy’ and scope for development of our coastal belt and maritime industries. This is high time that we seek for an inclusive maritime vision for sustainable development of Bangladesh.

The seminar will focus on the followings

Session 1

Port-led Economic Development

Session 2

Blue Economy – Leading the Way for Sustainable Development

Session 3

Maritime Education for the New Generation

Session 4

Maritime Technological Innovations

Session 5

Maritime Governance and Challenges

Inaugural Session

Welcome Address by Vice-Chancellor, BSMRMU

Rear Admiral M Khaled Iqbal, BSP, ndc, psc

Speech by Special Guest

Admiral Nizamuddin Ahmed, NBP, OSP, BCGM, ndc, psc

Chief of Naval Staff, Bangladesh Navy

Speech by Chief Guest

Major General Tarique Ahmed Siddique, rcds, psc (retd)

Security Adviser to the Hon'ble Prime Minister of Bangladesh.

Keynote Paper-1

*Harvesting Blue Economy – Need for Intertwined Economics
for Bay of Bengal Littorals*

Rear Admiral M Khurshed Alam (retd)

Secretary, Maritime Affairs Unit, Ministry of Foreign Affairs,
Bangladesh.



Welcome Address by Vice-Chancellor, BSMRMU

Rear Admiral M Khaled Iqbal, BSP, ndc, psc

Bismillahir Rahmanir Rahim.

The Hon'ble Chief Guest Maj. Gen. Tarique Ahmed Siddique (retd.), Security Adviser to the Honourable Prime Minister,

Special Guest Admiral Nizamuddin Ahmed, Chief of Naval Staff, Bangladesh Navy,

Former Services Chiefs, learned Session Chairs and Speakers, Senior Civil and Armed Forces Officers, Eminent Academicians, Marine Professionals, Representatives from Maritime Stakeholders, Faculty Members and Students of BSMRMU, Representatives from the Media, Ladies and Gentlemen, good afternoon. I would like to extend a hearty welcome to all participants to this important maritime seminar.

It is a matter of great pleasure and immense satisfaction for Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU) to host this seminar on "An Inclusive Maritime Vision for Sustainable Development of Bangladesh". I take special pride in the fact that we have been able to arrange five different sessions on various maritime dimensions with well-researched papers and comments from more than twenty eminent scholars and professionals from home and abroad.

We are especially honoured to have amongst us the Security Adviser to the Hon'ble Prime Minister as the Chief Guest, despite his busy schedule. Security and development go hand in hand and we believe that maritime security greatly compliments maritime development. As such, the presence of our Hon'ble Chief Guest clearly indicates the keen interest of the Hon'ble Prime Minister's office in giving the necessary momentum to the maritime sector.

We are also honoured to have the Special Guest, Admiral Nizamuddin Ahmed, Chief of Naval Staff Bangladesh Navy and we acknowledge the magnanimous support by Chief of Naval Staff, to this university at all times.

Ladies and gentlemen, though Bangladesh itself is comparatively a young nation, it has rich maritime history, heritage and seafaring traditions. We are aware of the wonderful craftsmanship of the master shipbuilders in Chattogram and Sandwip during the times of wooden ships, which were of high demand in many European countries and elsewhere. After the independence of Bangladesh, our father of the nation, Bangabandhu Sheikh Mujibur Rahman, with whose name this university has been proudly glorified, first gave this country a 'Maritime Vision' by promulgation of "Territorial waters and Maritime Zones Act 1974".

Thanks to the visionary leadership of Hon'ble Prime Minister Sheikh Hasina, today we have a huge maritime area of our own spanning 1,18,813 sq.km. This has opened a wider horizon of

‘blue economy’ and scope for development of our coastal belt and maritime industries. We are witnessing an unprecedented wave of economic development of our country in recent years with huge infrastructure development along the coastal belt. It’s high time that we seek an inclusive maritime vision for sustainable development of Bangladesh, and by organising this seminar, the university is endeavouring to create awareness and promote that vision.

The seminar will facilitate marine professionals, researchers, policymakers and stakeholders to promote ideas and thought process about our future maritime potential. But above all, it will be a great learning and enriching experience for our students which would be hard to grasp within the periphery of a classroom. Our vision should be inclusive of taking everyone onboard and that’s why the theme of this seminar has been set as ‘Prosperity through Maritime Vision’.

Ladies and gentlemen, this seminar will span over 2 days covering 5 sessions.

The first session is port-led economic development which is a model of economic development that comprises ports, Special Economic Zones (SEZs), rail, road, air and waterway connectivity with the hinterland.

The ‘blue economy’ is our area of focus in session 2, which could be seen as “living with the ocean and from the ocean in a sustainable way”.

The final session today will highlight the importance of Maritime Education and Training (MET) for the new generation in Bangladesh.

In fact, the establishing of BSMRMU in 2013 by the government has been a major step forward towards that direction.

The first session tomorrow will be on technological innovations which are moulding the future of the global maritime industry to its next stage of challenges.

Ladies and Gentlemen,

Better governance in the maritime sector cannot be ensured by one actor alone rather it requires a regional approach. As such the final session tomorrow will dwell on maritime governance, safety & security and foreign policy options.

Before I conclude, I must show my sincerest gratitude to the Hon’ble President of Bangladesh, Mr Abdul Hamid, who as the Hon’ble Chancellor of this university always gives us the inspiration and courage to take this university forward. I would also like to express my thanks to the Ministry of Education and University Grants Commission for their policy guidelines in line with maritime higher education. Once again, I would like to extend my heartfelt thanks to the Honourable Chief Guest Security Adviser to the Hon’ble Prime Minister, Special Guest Chief of Naval Staff, former Service Chiefs, Learned Speakers, Media and all the guests from home and abroad for participating in this seminar to enrich our maritime vision.

Thank you very much.



Speech by Special Guest

Admiral Nizamuddin Ahmed, NBP, OSP, BCGM, ndc, psc
Chief of Naval Staff of Bangladesh Navy

'Bismillahir Rahmanir Rahim'

The Honourable Chief Guest, Major General Tarique Ahmed Siddique, Security Adviser to the Honourable Prime Minister, Vice-Chancellor, Bangabandhu Sheikh Mujibur Rahman Maritime University, Learned Session Chair, Keynote Speaker, Distinguished Guests, Ladies and Gentlemen, Assalamu Alaikum and Good Afternoon.

First of all, I appreciate Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU) for arranging this international seminar on the topic “An Inclusive Maritime Vision for Sustainable Development of Bangladesh”. At the same time, it is also a great privilege for us to be in the company of our Honourable Chief Guest, the Security Adviser to the Honourable Prime Minister and take part in such an educative event.

Distinguished Audience,

As the seaborne trade and commerce flourished, maritime safety became an integral part of national economic activities. Therefore, safeguarding maritime interests and supporting national economies became an important role of navies across the globe. Since then, navies act as an enabler of maritime prosperity. Hence, all maritime nations invest appropriately in the development of their naval forces to ensure maritime security and promote prosperity. Bangladesh is not an exception to this.

Ladies and Gentlemen,

At this backdrop, it is important to note that the security dynamics in this huge maritime domain is also evolving and have a wider spectrum covering both traditional and non-traditional aspects. As you know, non-traditional and asymmetric maritime security threats range from maritime terrorism to IUU fishing.

Moreover, the evil nexus of radicalism, terrorism and insurgency aggravated by narcotics, piracy, smuggling, human trafficking and gun-running weakens government architecture and creates a perpetual state of anarchy which hinders the growth of the maritime sector to a large extent. Therefore, maintaining good order at sea to ensure a secured sea for safe passage of maritime trade and commerce is so vital.

Ladies and Gentlemen,

The recent emergence of the ‘blue economy’ concept has further revitalised the ventures of the littorals in the maritime domain manifolds. You have just heard the blue economic potentials and

related harvesting aspects for Bay of Bengal littorals from our keynote speaker. Navy is one of the important stakeholders in this complex gamut. Navies have a close relation with blue economic activities and the countries possessing balanced well-equipped navies, that can perform equally well covering the wide security spectrum, are expected to do better in supporting and promoting sustainable maritime activities.

We are fortunate that under the prudent leadership of our Honourable Prime Minister Sheikh Hasina, Bangladesh has peacefully settled the maritime boundary delimitation with our neighbours and we have achieved a vast maritime area of almost 1,18,813 square kilometres in the Bay of Bengal. It has opened a wider horizon of 'blue economy' and scope for development of our coastal belt and maritime industries. Being a maritime nation, we should consider the blue economy as one of the important tools available for achieving sustainable development. It should contribute to eradicating poverty as well as sustained economic growth, creating opportunities for employment, while maintaining the healthy functioning of the earth's ecosystem. In this regard, the phenomenal activities that are ongoing in the Bay of Bengal demand concerted efforts from all the stakeholders. Thus when we talk about the future, none of the stakeholders including the navy can be left aside.

In this connection, I would like to thank the Honourable Prime Minister Sheikh Hasina for providing all the necessary support to strengthen Bangladesh Navy and related other maritime agencies to undertake these vital and enormous tasks. Developing a balanced three-dimensional navy is a visionary step of our Honourable Prime Minister to secure the development of the maritime sector as a whole and protect and promote blue economy activities of the country in particular.

Ladies and Gentlemen,

The maritime domain awareness is another important issue for a maritime nation as Bangladesh. The nation needs to be well educated of maritime affairs to be able to reap the benefits of blue economy and ensure sustainable development of Maritime Sector. Bangladesh Navy as a pioneer institution in the maritime domain has been in the forefront to educate people since long. Meanwhile, we have established the Bangladesh Institute of Maritime Research and Development (BIMRAD) which will act as a 'centre of excellence' for the maritime research community.

Distinguished Audience,

Before I conclude, I would like to thank the session chair, distinguished guests and all the participants from home and abroad for their valuable contributions.

At the same time, I am confident that the eminent scholars those are going to speak in subsequent sessions will also contribute significantly for a positive outcome of this seminar. I thank all of them in advance.

I wish the seminar a grand success. Thank you all.



Speech by Chief Guest

Major General Tarique Ahmed Siddique, rcds, psc (retd)
Security Adviser to the Hon'ble Prime Minister of Bangladesh.

Bismillahir Rahmanir Rahim.

The Chief of Naval Staff, all the important personalities, Ex-Services Chiefs, Madam Ambassador, learned academicians, those who have been giving speeches and conducting sessions, the focus of today's seminar the students of Bangabandhu Sheikh Mujibur Rahman Maritime University, distinguished guests, ladies and gentlemen,

Assalamu Alaikum and good afternoon.

First of all, my sincere thanks to the Vice-Chancellor of Bangabandhu Sheikh Mujibur Rahman Maritime University Rear Admiral M Khaled Iqbal for inviting me and giving the opportunity to be in such an important international seminar. I really like these kinds of talks, I feel that if I had time I would have attended all these interesting talks, today and tomorrow also. Specially, I will be missing the vibrant question and answer session in the afternoon on the excellent keynote speech that Rear Admiral Khurshed Alam has delivered. I am sure that would be very interesting. Also, I have heard that you have been organising these kinds of seminars frequently, and that is encouraging.

Under the leadership of Hon'ble Prime Minister Sheikh Hasina, we have advanced tremendously. From 2009 to date, within these 9 years, we have moved from LDC to a lower middle income country. The Hon'ble Prime Minister Sheikh Hasina plans to achieve mid-income country status by 2021 and high-income country by 2041, which is a very affordable plan. In recent years, we are making huge developments though development always has a cost to be paid that's why this sort of seminar is required. I mean not to put a chain of rein on the development but to raise the awareness on how to develop keeping balance with sustainability.

What does the word sustainability mean? It means development that is economically viable but environment-friendly. That sort of development is most welcome in our country nowadays. Because we know, we should not misuse our mother planet. We call it a mother planet. We know that more than 70 per cent of our mother planet is covered by the sea. So, we should also call the sea Mother. It has got vast potentials which have already been covered by the keynote speaker; I will not repeat those. Because earlier it used to be viewed as for only military and security purposes and dominance; I mean the show of force and dominance but now it has risen above that. Now, in fact, it is dictating us and we will be dictating our future, our existence and our well-being through the ocean's vast potential.

I will say that our Bangladesh government is developing very fast. Insha'Allah, we shall be able

to be a developed country by the middle of this century. But side by side, keeping in view this aspect of sustainable development, we are also making huge progress in Sustainable Development Goals (SDGs). We are given a time limit up to 2030. We have named it SDG 2030; by then, all our development should be environment-friendly and at the same time viable, which gives a dividend to the mass population.

We have a vast sea area in the Bay of Bengal; that area, as already being said, we had not been using properly in the past. There are lots of untapped resources; I think this 'blue economy' concept is very important for achieving or boosting our economy. The 'blue economy', the very name reminds me that "Love is blue", so we all love the sea and we should love the sea, but we should not misuse it so that love is lost. It should not be like 'love becomes grey, once our loved one goes away', so we should not turn this blue sea into a grey one and later on suffer when it becomes an irreversible process.

Another major threat in the world is global warming and that causes lots of natural calamities. The threat of global warming is for Carbon dioxide and other similar gases. One aspect I must mention here about the role of the sea. It is the sea that can really save us from global warming because of algae. There are huge quantities of algae in the sea. More than 70 per cent of planet earth is covered by sea and the speciality of algae is that it can absorb Carbon dioxide more than the vegetation on land. On land, vegetation area, I think, is not even 10 per cent and rest is desert, mountains, glaciers and snow-covered regions. Another advantage of algae is that more oxygen they get more they will grow. But you have to make the ocean's water conducive for algae's to grow. If you pollute them with plastics, the horrific picture that has been shown by Rear Admiral Khurshed confirms that if we pollute ocean waters with plastics, oil spills and other things then algae will not grow. That's why; I always say that Mother Nature has a balancing factor like during those dinosaurs' period overcast sky, ashes etc. have made them extinct. We are also under the threat of extinction but if the sea is kept alive, they will balance it; the growth of Carbon dioxide will be balanced by sea. That's why the sea is very important and Blue Ocean should be kept blue.

Another aspect of our government is the Delta plan 2100, which is the product of the far-sighted vision of Hon'ble Prime Minister. It is one of her mammoth vision that has been recently passed in the Executive Committee of the National Economic Council (ECNEC). The Delta plan 2100 will be completed before the twenty second century. This mammoth plan includes 80 mega projects. It has been divided into three phases: short term, mid-term and long term. The short term is to be achieved by 2030, midterm by 2050 and the final one before the end of this century that is 2100. I will not go into details but if we can, with the help of Allah, achieve this plan; it will enable us to fight climate change and also ensure sustainable development especially at sea and coastal areas.

At this juncture, I must mention that I am very pleased to know the themes of various sessions of this two days long seminar, which is all very much essential for developing our 'blue economy'.

I find them to be very important and believe that the papers to be presented will give us good food for thought. Please listen to the keynote speakers (especially all the students and other participants) and ask them your queries and also interact with them during breaks. I would also like to thank all the foreign speakers; they have come with vast knowledge and experience. Please do disseminate some of your knowledge to our students so that they can carry it forward. The students, you have to go out to your work field but don't forget your mother sea, wherever you land. You have to raise the awareness to the entrepreneurs and other stakeholders those have been diagrammatically presented by the keynote speaker. The stakeholders should not only look for profits but be aware that they do not pollute the sea. I am sure that the outcome of the seminar will be disseminated accordingly and would be addressed by the appropriate authorities of Bangladesh for achieving our maritime vision.

I would like to conclude by again emphasising on the huge potential of the sea resources and we must keep that in mind. We need an ocean policy to really restrict the misuse or unscrupulous use of the sea. Once again, thank you very much for inviting me, I really enjoyed the sessions that I have attended and hope those other sessions will be of a very good standard because all the speakers are coming with vast experience. I thank everybody, who has organised this seminar. It has already given me a feeling that it is going to be a success story.

Thank you very much. Thank you all.



Keynote Paper - 1

Harvesting Blue Economy – Need for Intertwined Economics for the Bay of Bengal Littorals

Rear Admiral M. Khurshed Alam (retd)

Abstract

The blue economy is a developing world initiative but relevant to all coastal States and countries with an interest in waters beyond national jurisdiction. People have always been highly dependent upon the seas for their well-being but the blue economy, whilst encompassing the concept of ocean-based economies, goes far beyond that. Worldwide, the prosperity of a national economy is greatly influenced by the prosperity of regional economies. The strategic and economic significance of the Indian Ocean Region and its implication for the Bay of Bengal littorals is huge. The Bay of Bengal is inextricably linked to the Indian Ocean where Bangladesh is a key stakeholder. In the context of Bay of Bengal, we need to develop a cooperative mechanism among the littoral States, for instance among members of Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), in order to promote collaboration for reaping the maximum benefit of the blue economy. For Bangladesh, the establishment of intertwined economics among these littoral States could potentially be the most important step in achieving that goal.

Introduction

The blue economy conceptualises oceans and seas as “development spaces” where spatial planning integrates conservation, sustainable use of living resources, oil and mineral wealth extraction, bio-prospecting, sustainable energy production and marine transport. The blue economy approach is founded upon the assessment and incorporation of the real value of the natural (blue) capital into all aspects of economic activity (conceptualisation, planning, infrastructure development, trade, travel, renewable resource exploitation, energy production/consumption). Every country must take its share of the responsibility to protect the high seas, which cover 64 per cent of the surface of our oceans and constitute more than 90 per cent of their volume. There is a need to demonstrate measurable steps towards critical internationally agreed targets for fisheries, aquaculture, habitat protection and pollution reduction. It should also highlight the need to address the next frontiers of successful integrated approaches that include public-private partners, secure financing and catalyse good ocean governance while reconciling tensions and balancing priorities between (i) growth and conservation, (ii) private sector interests and equitable benefits for communities and (iii) Areas beyond national jurisdiction and Exclusive Economic Zones (EEZ) within the 200-mile limit from the coast.

The Blue Economy – Opportunities

The blue economy offers a suite of opportunities for sustainable, clean, equitable blue growth in both traditional and emerging sectors;

Shipping and Port Facilities- 80 per cent of global trade by volume and over 70 per cent by value is carried by sea and handled by ports worldwide. For developing countries, on a national basis, these percentages are typically higher. World seaborne trade grew by 4 per cent in 2011, to 8.7 billion tons despite the global economic crisis and container traffic is projected to triple by 2030.

Fisheries- Fish accounts for 15.7 per cent of the animal protein consumed globally. The value of fish traded by developing countries is estimated at USD 25 billion making it their largest single trade item. In 2009 marine capture production was 79 million tons.

Aquaculture- Aquaculture is the fastest growing global food sector now providing 47 per cent of the fish for human consumption. Fish used for human consumption grew by more than 90 million tons in the period 1960-2009 (from 27 to 118 million tons) and aquaculture is projected to soon surpass capture fisheries as the primary provider of such protein. Growth in the aquaculture sector in Asia, which accounts for more than 89 per cent of global production, is more than 5 per cent a year. Aquaculture offers huge potential for the provision of food and livelihoods. Aquaculture under the blue economy will incorporate the value of the natural capital in its development, respecting ecological parameters throughout the cycle of production, creating sustainable, decent employment and offering high-value commodities for export.

Tourism- Marine and coastal tourism is of key importance to many developing countries. Tourism is a major global industry; in 2012 international tourist arrivals increased by 4 per cent despite the global economic crisis and constituted 9 per cent of Global GDP (direct, indirect and induced impact). Trends in ageing populations, rising incomes and relatively low transport costs will make coastal and ocean locations ever more attractive. Cruise tourism is the fastest growing sector in the leisure travel industry; overall, average annual passenger growth rates are in the region of 7.5 per cent and passenger expenditures are estimated in the order of USD 18 billion per year. The tourism consumer, however, is driving the transformation of the sector with a 20 per cent annual growth rate in ecotourism; about 6 times the rate of growth of the overall industry.

Energy- In 2009 offshore fields accounted for 32 per cent of worldwide crude oil production and this is projected to rise to 34 per cent in 2025 and higher subsequently, as almost half the remaining recoverable conventional oil is estimated to be in offshore fields - a quarter of that in deep water. Ocean offers enormous potential for the generation of renewable energy – wind, wave, tidal, biomass, and thermal conversion and salinity gradients. Of these, the offshore wind energy industry is the most developed of the ocean-based energy sources. Global installed capacity was only a little over 6 GW in 2012 but relatively conservative estimates suggest this could grow to 175 GW by 2035.

Biotechnology- Marine biotech has the potential to address a suite of global challenges such as sustainable food supplies, human health, energy security and environmental remediation. Marine bacteria are a rich source of potential drugs. One area where marine biotech may make a critical contribution is the development of new antibiotics. The unexplored and understudied nature of much of the underwater world means that the capacity of marine organisms other than fish and shellfish to provide inputs to the ‘blue economy’ is only just beginning to be appreciated, partly through new gene sequencing technologies for living organisms. By 2020, it could grow as a medium-sized market, expanding towards the production of metabolites and primary compounds (lipids, sugars, polymers, proteins) as inputs for the food, feed and chemical industries.

The Submarine Mining- The world is gearing up for the exploration and exploitation of mineral deposits on and beneath the seafloor. Coastal countries need to prepare themselves to ensure they realise optimal benefits from resources in their own EEZs and likewise that their concerns are incorporated into the measures to manage the coming race for the riches of the seabed. The exploitation and mining of minerals, other than sand and gravel, from the sea, have just started.

By 2020, 5 per cent of the world's minerals, including cobalt, copper and zinc could come from the ocean floors. This could rise to 10 per cent by 2030. The global annual turnover of marine mineral mining can be expected to grow from virtually nothing to €5 billion in the next 10 years and up to €10 billion by 2030.

The Blue Economy for Bangladesh

The blue economy approach emphasised that ideas, principles, norms of the blue economy lend significant contribution towards eradication of poverty, contributing to food and nutrition security, mitigation and adaptation of climate change and generation of sustainable and inclusive livelihoods. Thus, the blue economy requires a balanced approach between conservation, development and utilisation of marine and coastal eco-systems, all oceanic resources and services with a view to enhancing their value and generates decent employment, secure productive marine economy and healthy marine ecosystems. Primarily, the 'blue economy' should have adequate focus on well-being and livelihood of people; and engagements between countries and stakeholders on the blue economy should be based on the principles inter alia of mutual trust and respect, equitable mutual benefit, and sharing of benefits to secure sustained and beneficial outcomes of all ocean-centric enterprise. It is needless to say that for most developing states particularly for Bangladesh, making a transition into the blue economy would entail fundamental and systemic changes in their policy regulatory–management–governance framework(s) and identification of various maritime economic functions.

Maritime functions in the context of the blue economy are not just economic sectors; they cover the relevant maritime value chains – including backward and forward linkages.

This is important since large parts of the economic activities take place not in core sectors themselves, but in adjacent economic activities. Twenty-six maritime economic functions can be identified from among the fishery, maritime trade and shipping, energy, tourism, coastal protection, maritime monitoring and surveillance. In each of these functions, full account is taken of the value chains that are developed across a range of sectors. The following summarises all maritime economic activities that have been identified and whose developments are now at various stages;

Maritime Trade and Shipping

Shipping- International shipping is the carrier of world trade, transporting around 90 per cent of global commerce. More than 90 per cent of Bangladesh's external freight trade is seaborne – and ongoing globalisation has made this flow ever more important. Presently Bangladesh's value of export and import stands at about USD 67 billion (2013-14) and are carried by 2500 foreign ships visiting our ports. Against our import and export value, during last ten years, importers, exporters and buyers have paid USD 95 billion as freight and related charges to shipping companies, airlines and freight operators to carry goods in and out of Bangladesh. There are only 74 registered (2014) Bangladeshi merchant ships which are not sufficient to carry even a fraction of our cargo. Considering the average import growth rate of 15.79 per cent (last 10 years) and export growth rate of 15.43 per cent (last 10 years), projected freight value for next ten years would be around USD 435 billion. In order to retain parts of the USD 400 billion in the country, over the ten years, Bangladesh must facilitate local shipping companies to add more ships to the existing fleet, freight operators to establish freight services including container liner services to carry goods to/from Bangladesh using our own as well as chartered ships and freighters.

Coastal Shipping/Feeder Services- Coastal shipping forms an important means of transport within most of the transport systems and this figure will be higher for Bangladesh having

extended coastlines along the rim of the Bay of Bengal. It caters to the transport needs of economies by providing maritime point-to-point transport of all kinds of commodities; provides the maritime link that connects the road network across the seas; serves as feeder transport distributing container flows from the major seaports hubs to smaller ports or other landlocked countries. For the long term annual growth expected in the range of 5-6 per cent for the coming decade, coastal shipping from India, Sri Lanka, Singapore, Malaysia, Thailand and Myanmar ports could play as a game changer in the feeder services. Such transshipment at Singapore, Kelang, Colombo and other ports of the region would be cost-effective, save time and increase employment opportunities.

Statistics reveal that the economy of Bangladesh is heavily dependent on international trade where maritime ports play the key role of transporting 94 per cent of our foreign trade. Bangladesh must enhance the existing handling capacities of ports and develop deep sea ports with more capabilities and modern handling equipment in Sonadia, Matarbari and Payra to cater for increased trade and commerce. Establishment of seaports can significantly reduce export lead times and earn a steady flow of revenue for the country.

Passenger Ferry Services- Transporting passengers on fixed sea routes, sometimes this is combined with Ro-Ro transport. Passenger ferries provide synergies as well while inland shipping is another essential component of the chain. During 2012 about 231.5 million passengers and 32.6 million Mt of cargoes were transported through inland/coastal networks leaving sufficient scope for further investment and expansion around the coastal belt.

Inland Waterway Transport- Bangladesh has one of the largest inland water transport network in the world covering 24,000 km long with 1000 landing points and 29 inland river ports. Pangoan Inland container terminal with 55,000 sqm of container yards, 2400 TEUS handling capacity and with two jetties have already been commissioned since Nov 2013. Chattogram Port handles about 1.5 million TEUs annually and 80 per cent of them is bound for Dhaka and only 10 per cent arrive Dhaka by rail. Now container can be carried by inland routes at a much cheaper cost. Bangladesh can raise its GDP by 1 per cent while foreign trade by 20 per cent if the IWT logistics system is made efficient and competitive according to Asian development bank report. There are more than 10,000 inland vessels, 75 coastal vessels and about 6500 inland ships registered with the department of shipping and almost all these vessels are built inside Bangladesh. So the maintenance of the navigability of the rivers of the country should take priority which will, in turn, generate jobs, and is less expensive than road links.

Shipbuilding- Finally, the shipbuilding industry contributes to this function by providing the necessary equipment. There are more than 300 shipyards and workshops in Bangladesh and almost 100 per cent requirement of inland vessels, fast patrol boats, dredging barges, passenger vessels, landing craft, tug, supply barges, deck loading barges, speed boat, cargo coasters, troop-carrying vessels, hydrographic survey vessels, survey boat, pilot boats, water taxi, pontoons and water taxi are being built by these yards. Shipbuilding yards are constructing 10,000 DWT Seagoing ships for export and are expected to upgrade their capacity to 25000 DWT. In the Drydocks of Bangladesh, about 15 ships are being repaired annually earning foreign exchange. Shipbuilding industry not only earns foreign exchange but also saves it whereas in road and rail transportation about 100 per cent transport vehicles/rolling stocks are imported from abroad. It should be promoted and nurtured in all possible ways.

Ship Recycling Industries- During 2013, about 300 ships were dismantled, which is the highest number in six years and Bangladesh ranked 2nd considering number of ships while ranked 3rd from the point of gross tonnage. It provides about 70-75 per cent scrap steel as raw material for steel and re-rolling mills, saving a lot of foreign currency. This industry not only met the growing

needs of furniture, household fittings of all classes, boilers, life-saving boats, generators etc. but also employment opportunities. There are about 125 ship breaking yards with an annual turnover of about USD 2.4 billion. Ship recycling must be turned into a modern industry with all eco-friendly infrastructure and compliance of international convention.

Food and Livelihood

Fishery- There are about 475 species of fish found in our EEZ compared to 250 species on land. Fish still provides the much-needed protein needs of our people. About 57,000 artisanal mechanised and non-mechanised wooden boats and 200 industrial steel body trawlers are engaged in fishing in the coastal waters up to 60 km (within 40m depth) from our coastline having very limited capability in catching pelagic fishing-shoals closer to the surface. A considerable amount of fish is salted and dried, mainly for human consumption. However, there are hardly any capabilities of catching demersal fishes below 50 m depth of water. Long lines fishing is totally absent in deep waters. In the benthic zone, the lowest level of the ocean-crustaceans-shrimp and lobster are caught in limited quantities but fishes close to sea bottom at about 150-550m depth cannot be caught along with cephalopod-octopus and squid industrial fishing. In the Bay of Bengal 8 million tons of fish are caught by other countries where Bangladesh's share is only 73,000 tons (2013). There is tremendous scope for increasing marine catch introducing technology and long line, incentives for the bigger ocean-going trawler, huge scope for a higher-end industry in venturing beyond 60 km coastline.

Future development prospects of aquaculture appear promising. Well-managed coastal aquaculture and mariculture offer significant scope for green growth and employment opportunities for coastal communities at low levels of CO₂ emissions when compared to other protein production systems.

Marine Aquatic Products- Marine aquatic products consist of the farming of marine aquatic organisms, mainly for human consumption and all the associated primary processing activities. While cultivation of aquatic plants and algae is still to be evolved, farming of aquatic animals composed of three major sub-sectors: marine shellfish farming (e.g. oysters and mussels), marine finfish farming and freshwater finfish farming (trout, carp, eel, etc.) could be considered for cultivation.

Marine Biotechnology- The unexplored and understudied nature of much of the underwater world means that the capacity of marine organisms other than fish and shellfish to provide inputs to the 'blue economy' is only just beginning to be appreciated, partly through new gene sequencing technologies for living organisms. Biostimulation can also be used to protect natural habitats by fostering bioremediation after important pollutions (as for the Exxon Valdez oil spill when bacteria were stimulated to degrade hydrocarbons). Another example is bioremediation in case of oil spills. A conclusion from this example is that the maritime sector as a whole has a strong interest in promoting new (bio-) technologies, cross-cutting services and suppliers that can benefit more than one sector.

Energy

Oil and Gas- Bangladesh is yet to assess the true potential of its offshore oil and gas prospects. Some 26 Tcf (trillion cubic feet) gas reserve has so far been discovered in Bangladesh, of which only about 1 Tcf is located in the offshore areas. The Sangu reserves of 0.8 Tcf have already depleted, whereas the Kutubdia reserves 0.04 Tcf are yet to be developed. Moreover, the drilling of the Magnama (3.5 Tcf) and Hatia (1.0 Tcf) yet to produce any commercial volumes of hydrocarbons. Due to close proximity to the discovered gas fields of Myanmar, some

Bangladeshi blocks are likely to have comparable geological structures and gas/oil prospects.

However, a logical plan is necessary to carry out a multiline survey (using state-of-the-art technology) in the bay in order to identify potential oil and gas fields, and their reserves. In fact, the country requires massive exploration and drilling activities to increase its overall gas output.

Ocean Renewable Energy- Marine-based renewable energy such as wind, wave and tidal range and currents offers a significant potential to contribute to low-carbon energy supplies for regions with appropriate coastal features. Off-shore wind covers all activities related to the development and construction of wind parks in marine waters and the exploitation of wind energy by generating electricity offshore. However, most suitable onshore locations for wind turbines need to be identified and the best (windiest) offshore sites have to be connected to the main transmission grid. A wind generator with a capacity of 2 MW has already been installed in the coastal area of Kutubdia, Bangladesh, but remains inactive.

Aggregates Mining (sand, gravel, etc.)- Sands containing valuable heavy minerals are found intermittently over the length of a 250 km coastal belt from Patenga to Teknaf of Bangladesh. The entire coastal belt has been explored with the discovery of 17 deposits of potentially valuable minerals such as zircon, rutile, ilmenite, leucoxene, kyanite, garnet, magnetite and monazite. Proper extraction and commercialisation of minerals from beach sand may enhance the growth of different industries and create huge employment opportunities for the local community.

Tourism

Coastal Tourism- Globally, coastal tourism is the largest market segment and represents 5 per cent of world GDP and contributes to 6-7 per cent of total employment. Sustainable tourism can create new jobs and reduce poverty. Tourism is human-resource intensive. One job in the core industry creates one and a half additional jobs in the tourism-related economy.

Recreational Water Sports, Yachting and Marinas- Introduction of various water sports for recreational activities, construction and servicing of seaworthy pleasure boats and the required supporting infrastructure including marina ports could encourage the growth of coastal tourism.

Cruise Tourism- Tourism based on people travelling by small size cruise ship in and around the coastal islands and tourist areas. Much of this growth is dependent upon the sector's ability to develop sustainable business models, to invest in port infrastructure and to address a variety of security concerns.

Artificial Islands- To reduce the demographic pressure on land, Bangladesh should adopt an appropriate strategy to construct new artificial islands in our Territorial sea and EEZ allowed by the UNCLOS 1982. Sustainability of existing 75 marine islands or newly built islands must be ensured through planting salt tolerant/mangrove plants.

Greening Coastal Belt/Delta Planning- This will help reduce wind pressure of cyclones and also solidification of new lands. Bangladesh is already working for delta planning and in the long run, it will help sustain agriculture, river course and intrusion saline waters etc.

Human Resource, Maritime Surveillance and Spatial Planning

Human Resource- A thrust in blue economic growth may come from a large army of skilled coastal and offshore engineers, navigators, merchant mariners, fisheries technologists, biotechnologists, etc. and in a variety of other professions. There is reportedly a shortage of marine officers and rating worldwide and shortage escalating about 20 per cent every year. The Philippines, China and India are supplying providing most of the officers to all the merchant ships

around the globes. Bangladesh has enormous potential for seafaring job opportunities from its 18 private and public marine academies provided it can arrange onboard practical training facilities for its would-be seafarers.

Maritime Surveillance- It aims to improve the situational awareness of all activities at sea impacting on maritime safety and security, the marine environment, fisheries control, trade and economic interests as well as general law enforcement and defence. There is a growing demand for all of these functions due to the increasing number of (legal and illegal) activities at sea.

Maritime Spatial Planning (MSP)- is a mechanism for the integrated management of maritime areas in which a central vision for the future of the area, in conjunction with knowledge of activity interactions and impacts, guides the location, timing, intensity and future development of all activities in the maritime space. It recognises that seas and oceans are drivers for the economy with great potential for innovation and growth. A comprehensive understanding of the maritime environment is crucial for successful MSP, as is a thorough understanding of how maritime activities impact each other and the environment.

Conclusion

In conclusion, it can be said that the future development potential of a blue economy strategy for Bangladesh strongly depends on the ability of the economic actors to find a business model which fits the developmental stage and the national and global developments. However, once confidence of the future potential is established, new players can easily enter the business, invest, upscale and grow the business. Once risks subside, large industrial players (e.g. from pharmaceutical, chemical and cosmetics, but also energy, utility and mining companies) are expected to become interested in the opportunities of the blue economy. Access to finance is therefore amongst the most important barriers for the maritime economic activities in the not so developed maritime economic functions. Clearly, investment risks are substantial in this phase, but so can be the rewards. Apart from the funding of activities in the development phase, access to finance can block the realisation of investment plans and new business initiatives.

In light of this, it is essential that Bangladesh recognises the true potential of its marine resources and develops an integrated maritime policy that acknowledges the interlinkages that exist between the different domains and functions of its seas, oceans and coastal areas.

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Session 1

Port-led Economic Development

Paper-1

**Port-led Economic Development – Success
Story of China**

Paper-2

**Contribution of Private Sector in Indian
Port Development and Project Sagarmala**

Paper-3

**Strategies to Enhance Port Competitiveness
and Support Economic Development – The
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Session Theme

Port-led Economic Development

Port-led economic development means a port-led model of economic development that comprises ports, special economic zones (SEZs), rail, road, air and waterway connectivity with the hinterland. It leads to unlocking the economic value by adopting logistics intensive industries, efficient ports, seamless connectivity and requisite skill base community. The vision is to reduce logistics cost for both domestic and export-import cargo. It is a strategic and customer-oriented initiative to modernise ports so that port-led development can be augmented and coastlines can be developed to contribute to national economic growth. For initiating such a model, a national port development strategy covering the entire coastline should be prepared to identify potential geographical regions for industrialisation ensuring synergy and integration with planned transport corridor and industrial cluster.

Port-led Economic Development - Success Story of China

Prof. Chen Jihong

Abstract

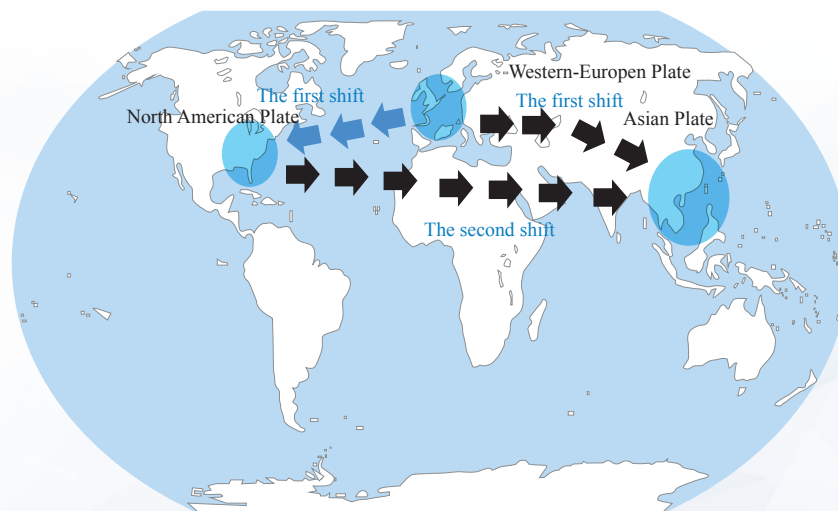
The port industry plays an irreplaceable role in China's social and economic development and international trade. Thanks to the changes in the world economy and shipping landscape and China's reform and opening up from 1978, the Chinese port industry has gained a leading position in the world in terms of port production. The Shenzhen special economic zone was formally established in August 1980. Under the special policy framework, Shengzheng, one of the largest port and shipping city in China, has achieved rapid development. Shenzhen port is one of the swiftly developing ports in China and its shipping logistics industry has the advantage of its own.

The successful development of Shenzhen and Shenzhen port industry has brought good experience to the development of Bangladesh's cities and ports. Centring on this, we will analyse the following issues.

- Changing landscape of world shipping industry and development of Chinese port and shipping industry
- Historical evolution and basic situation of Shenzhen port's development.
- As a key shipping centre in China, what are the successful and replicable experiences of the development of Shenzhen port?
- How should the government govern and promote the sustainable development of the port logistics industry of Shengzheng in the future?

Introduction

The global shipping landscape keeps evolving. Geographically-speaking, international shipping centres emerged, in chronological order, in Western Europe (London, Rotterdam, etc.), North



America (New York), and Eastern Asia (Hong Kong, Singapore, etc.). The expansion marks the shifts of growth points in the global economy and trade. Along with the shifting economic development focus in the world, international shipping centres experienced two rounds of relocation, from initially the “Western European Plate”, to the "North American Plate", and then to the "Eastern Asian Plate" (see details in Table 1).

China's Port Development Achievements

As the global shipping centre transits eastward, China plays a vital role in this process. It has also outperformed the peers in terms of the development of ports. China now has 6 out of the 10 largest ports by throughput capacity (see Fig 1) as well as 7 out of the 10 largest container ports. In terms of the size of maritime shipping fleets, China tops the world by the number of fleets owned (5,206), with the world's third-largest deadweight (165 million tons) (see Fig 2).

History of Shenzhen Port

Shenzhen is located in the South China coastal area and at the eastern bank of the Pearl River mouth. The city has Dapeng Bay and Daya Bay, and neighbours the Pearl river mouth to the west. Given these natural advantages, it is positioned for a good start in shipping. In 1979, China Merchants Shekou Industrial Zone was inaugurated for construction, marking the grand opening of the development of Shenzhen Special Economic Zone and Shenzhen Port. Shenzhen port soon emerged as the world's third largest container port as China rolled out the reform and opening up. A miracle in the history of city and port development has been created where Shenzhen Port and the city have supported and fuelled each other's growth.

Table 1 Geographic relocation of global shipping centres

Economic plate	A shift of economic and trade focus	The emergence of global shipping centres
Western European plate	After the discovery of the New Continent by Columbus, the global economic and trade centre was relocated from the Mediterranean to the Atlantic.	In the 19th century, the "World Factory" London, an important production base following the industrial revolution in the UK, took it over as the new global shipping centre. After World War I, Rotterdam became the new centre by virtue of its advantageous location and hinterland economy.
North American plate	In the 19th century, especially after World War I, the world economic growth driver shifted toward the Atlantic.	The rise of New York has contributed to the formation of the North American plate and a new global shipping centre in this continent.
Eastern Asian plate	After World War II, the centre of world economic growth again shifted from North America towards Asia. Since the 1980s, China has been the new "World Factory" thanks to the reform and opening up.	Ports enjoying good locations in the coastal area of Asia have become important ports, such as ports of Tokyo, Kobe, Yokohama, Singapore, Hong Kong, Busan, Kaohsiung, Shanghai, and Tianjin, forming the "Eastern Asian Plate".

Starting Phase

At the beginning of China's reform and opening-up, Shenzhen witnessed the first round of port construction upsurge in response to fast-growing transportation and urban construction needs in its hinterlands. By 1991, the overall throughput of the port was 10.44 million tons, covering over 60 per cent of construction materials shipped into the region for urban construction. It soon became one of the top 10 coastal ports in China.

Restructuring & Planning Phase

Since the 1990s, thanks to the accelerating economic globalisation, Shenzhen and the Pearl River Delta Region embraced the second round of high-rate growth of the economy and foreign trade. By 2001, the port throughput hit 66.43 million tons, including 5.08 million TEUs of container throughput. It was the second largest container port nationwide.

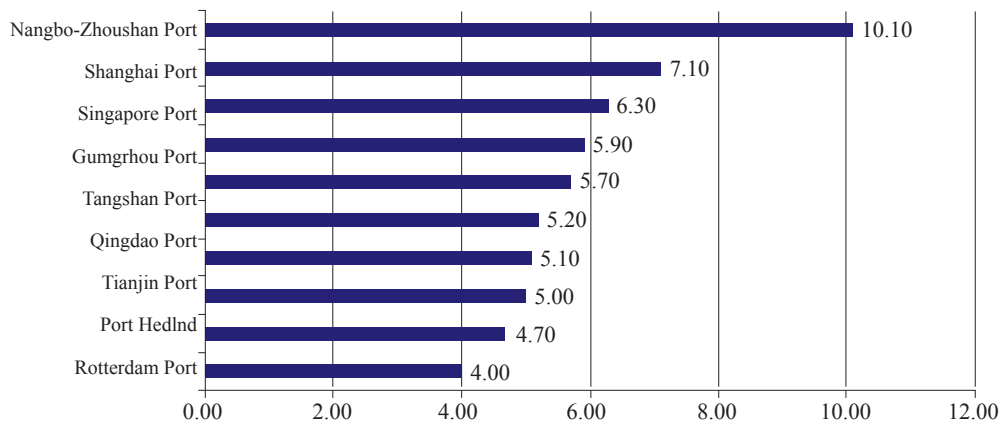


Fig 1: World top 10 ports by cargo throughput in 2017 (100 million tons)

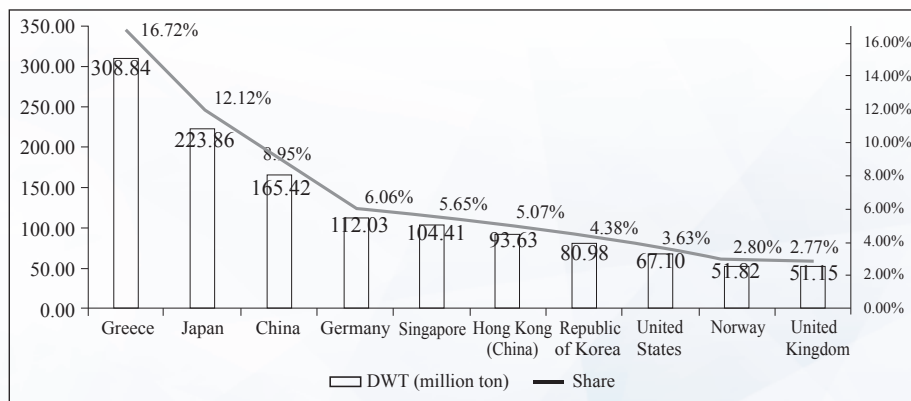
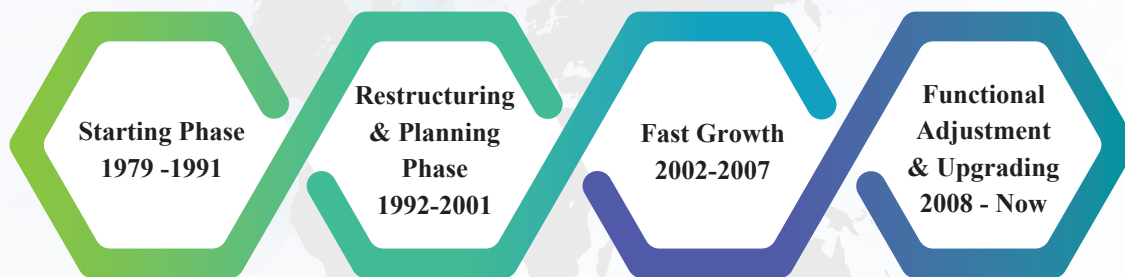


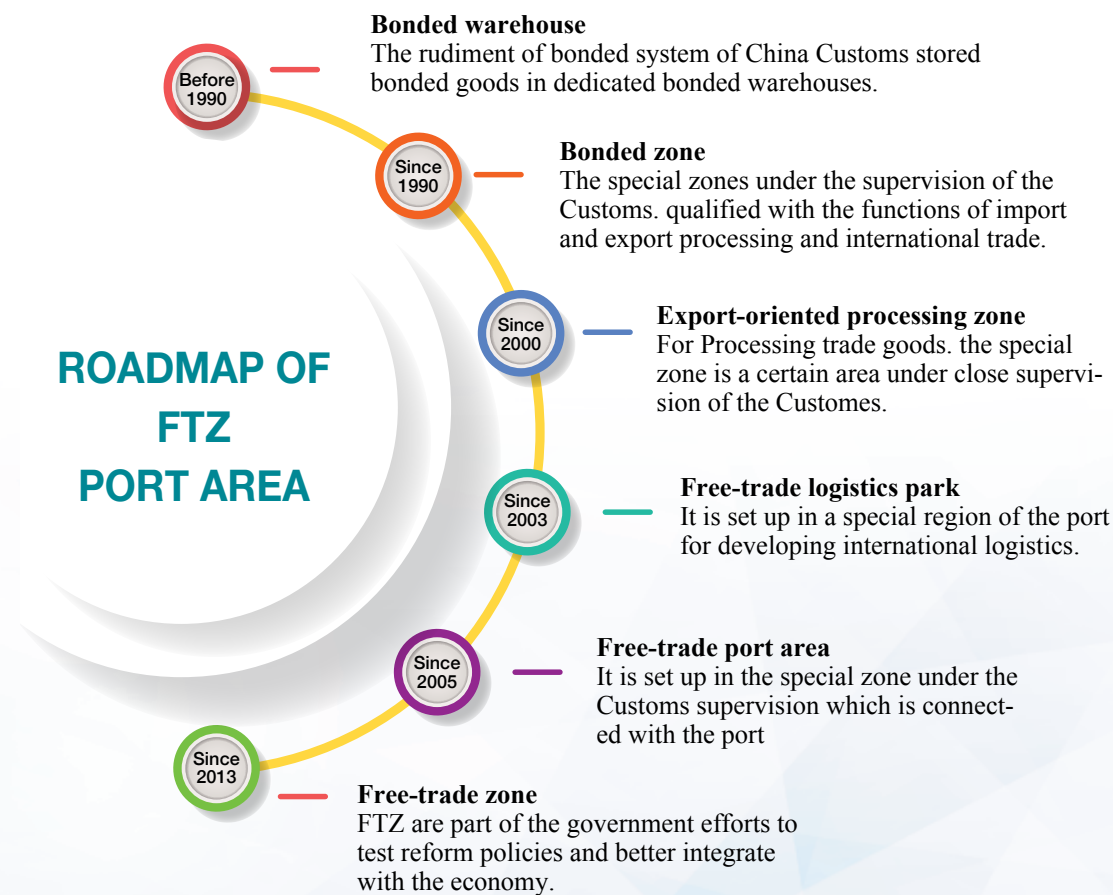
Fig 2: World top 10 shipping nations/regions by fleet size



Fast Growth

As China's WTO membership took effect, the hinterland economy has maintained sustained and fast growth. Container shipment and multi-purpose berths featured the port construction in this period. Shenzhen Port was the world's fourth-largest container port for consecutive years, with its container throughput increased from 7.62 million TEUs in 2002 to 21.1 million TEUs in 2007.

Development of Free-Trade Zone Port Area



Functional Adjustment & Upgrading

Subject to the headwind of the global financial crisis in 2008, Shenzhen port had a sudden slowdown of container throughput, ushering the port into a phase of slowed growth on a high base. In this period, Shenzhen port overtook Hong Kong as the world's third largest container handling port in 2013, and it has held on to the spot to this day. Around 85 per cent of containers handled in Shenzhen port was processed for international lines.

Overview of Shenzhen Port

Shenzhen port is supported by hinterlands covering provinces including Guangdong, Fujian, Guangxi, Jiangxi, Hunan, Hubei, Sichuan, Yunnan, and Guizhou. Among these areas, Shenzhen city provides the port with direct support. The direct economic hinterland is the Pearl River Delta area with radiance over the whole province, while the indirect hinterland covers the pan-Pearl river delta area, including South China, Central China and Southwest China.

Shenzhen port, divided by the Kowloon Peninsula, has two port clusters in the east and west. Now it has completed construction of nine port areas, including Yantian, Xiadong, Sha Yu Chung port areas in the east, and Shekou, Chiwan, Mawan, Dachan Bay, Dong Jiao Tou and Airport port areas in the west, as well as the Dapeng LNG special-purpose terminal.

In 2017, Shenzhen port completed a container throughput of 25,208,700 TEUs, hitting a record high with an increase of 5.13 per cent year on year, marking the highest growth rate in the past 10 years. It was ranked, for the fifth year in a row, the world's third largest container port thanks to this achievement. Container handling accounts for over 80 per cent of the cargoes processed by the port, making it the port with the highest share of container handling in coastal China.

Increasing Openness



Functional Positioning and Development Experience of Shenzhen Port

Shenzhen port focuses on foreign trade container shipment, supplemented by some energy and general cargo traffic. It is positioned to attract and develop modernised service industries such as logistics, information, agency, insurance and finance. The port welcomes reasonable development of port industries with local characteristics and targets to expand passenger transport and coastal tourism. Shenzhen Port sets out to be a modern port featuring "competitiveness, impetus, environmental-friendliness, security, and sustainability".

Participation in Globalised Trade and Economy

Shenzhen is now a critical gateway of the two main logistics networks connecting the hinterlands with domestic China and the hinterlands with overseas markets. Currently, 36 per cent of import and export via maritime shipping and 73 per cent of export containers are processed by the Shenzhen port. The port's active participation in globalised trade has played an important role in promoting its own development.

Conclusion

We need to promote the development of industries such as shipping finance, global vessel transport, global vessel management, global shipping brokerage, global vessel leasing, crew nationality management, launch research on policies and set up long-term mechanisms in this regard. We also need to focus on promoting clustering of vessel elements for enhanced growth of shipping services in shipping information, shipping finance, shipping insurance, maritime arbitration and enhance the comprehensiveness of service capacities of Shenzhen shipping markets. Set up market-oriented and government-led shipping development equity fund and allow fund sponsors to establish equity fund companies. Support combined use of shipping development equity funds with policies such as shipbreaking capital and shipping franchising to focus on shipping capacity structural changes, ownership and management right separation as well as scaled and professional development of shipping enterprises. Improve capacity and influence of Shenzhen Global Shipping Center in the rule- and standard-setting, market regulation, and research and consultancy in the global shipping arena Encourage domestic and global shipping organisations, associations, service agencies and platforms to set up a physical presence in Shenzhen.



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Contribution of Private Sector in Indian Port Development and Project Sagarmala

Rabindra Kumar Agarwal

Abstract

It is universally recognised that transport is crucial for sustained growth and modernisation. Adequacy of this vital infrastructure is an important determinant of the success of a nation's effort in diversifying its production base, expanding trade and linking together resources and markets into an integrated economy. It is also necessary for connecting remote and developing regions closer to one another. Transport, therefore, forms a key input for production processes and adequate provision of transport infrastructure and services helps in increasing productivity and lowering production costs. Ports are the gateways for India's international trade by sea and handle about 90 per cent of foreign trade. There are 12 major ports and 200 operable minor and intermediate ports along the long coastline of the country. Post liberalisation in the 1990s, the number of projects under public-private partnerships (PPP) in India have increased exponentially, with a view to redefine performance through capacity augmentation, efficiency and productivity enhancement as well as increased competition. Subsequently, the port privatisation programme was flagged off in India in 1997, which, apart from the aforementioned dynamics, also saw the infusion of fresh funding - including foreign investments - in the ports sector. Nhava Sheva International Container Terminal (NSICT) at JNP, Maharashtra, was the first terminal that was developed on a PPP basis. The Government of India recognises the importance of the private sector in bridging the resource gap in investment and improving the operational and managerial efficiency in the ports sector in order to address capacity constraints and deficiencies in the existing transport infrastructure and meet rapidly growing demand. Given the present government's emphasis on port-led development, and ensuing plans for commissioning ambitious projects such as Sagarmala, inland waterways and smart port cities, attracting private investments becomes imperative. The Government is actively pursuing policies to promote private sector involvement in the development of ports infrastructure and services. The experience in involving the private sector in port development in India is the focus of the paper. It provides a broad overview of government policies and various initiatives that have been undertaken to promote private participation following various models. It also discusses achievements made and draws some conclusions on major policies and initiatives of the Government.

Introduction

The Indian economy is rushing ahead now which is pushing the transport industry to be in its full capacity. In India, there is a number of ministries and agencies working separately for the development of individual sector for example Ministry of Shipping for ports and waterways whereas Ministry of Railways for the railways, Ministry of Road Transport for Road and there are activities for the development of coastal communities. But the whole transport industry needs to develop an integrated way so that the whole logistic system could create an inclusive effort. A port without better hinterland connectivity will become a chunk. So, India needs to come out of this and think on a way of multimodal transportation. And we need to think about the port proximity industrialisation. Six port out of the ten largest port of the world are Chinese and all they are

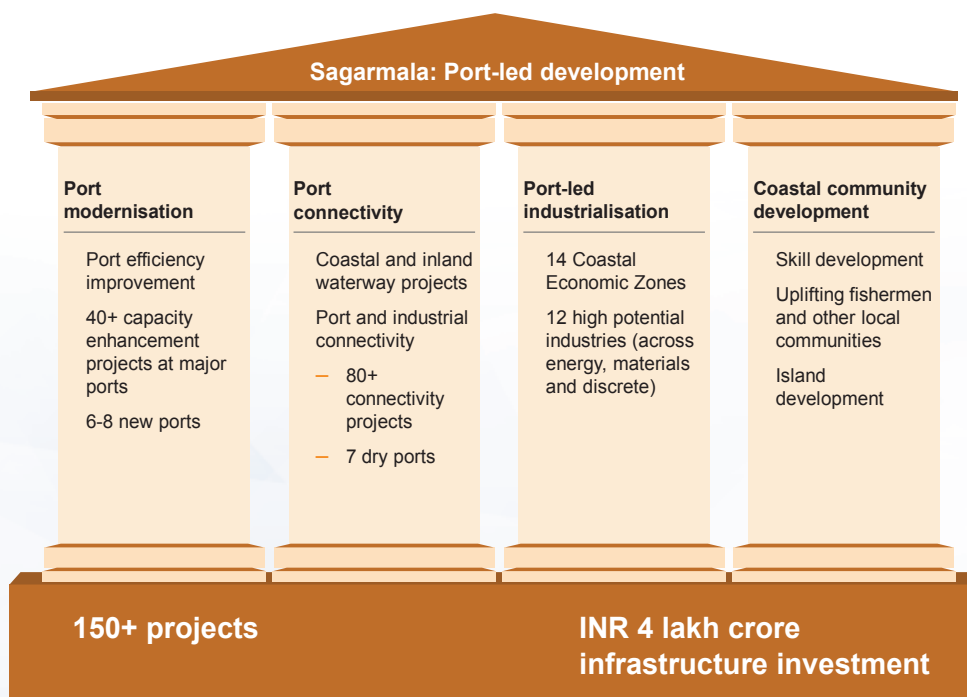
connected with industrial hubs. So we decided that a comprehensive development of the maritime industry is a must. That is how the Sagarmala project come into the discussion. Port modernisation and capacity augmentation, port connectivity, port-led industrialisation and development of coastal communities are four main components of the Sagarmala adopted on 25 March 2015 with a vision of reducing the total logistics cost. Here I will discuss the components of Sagarmala, the operationalisation of it, some area of India-Bangladesh cooperation in the maritime sector and finally the port-led economic development model.

The Components of Sagarmala

The Sagarmala project stands on the four pillars which include the port development, port connectivity, port-led development and coastal community development. The port development includes modernisation and capacity enhancement of the existing ports and development of new ports. Port connectivity covers the inter-port connectivity through the coastal and inland waterways projects and connects the industrial zone through road and railways and others. Having the port and developed connectivity would obviously boost the industrialisation, therefore facilitation of the industrialisation, utilisation of land resources through development of economic zone well connected through the other pillars. The final pillar that is the coastal community development by incorporating them to the development process so that the sustainability of the entire scheme is achieved.

Incorporating in the National Plan

The process started with a detailed Origin-Destination (O-D) survey to dig out the Indian logistics pattern. It was identified that there are five key commodities that cover an aggregated trade amount of 80 per cent of the total freight. Then an analysis of that five commodities movement individually brings with an assessment of the extent of capacity increase required at



ports for the efficient movement of commodities as well as infrastructure requirements beyond port as well. And the project finally comes with a National Perspective Plan which includes more than 600 projects right from the identification to implementation and operation. One of the main areas of the implementation and operation of the project is the involvement of the private sector. To involve the private sector, one needs to understand how the ports have been developed in India. In India, there are ports which are developed by the national government and ports developed by the provincial government as well. So we have two varieties of ports, named as major ports and non-major ports. The whole port has been developed by the private sector like Kishnapuram. There is port completely developed by government agencies. But now we are thinking of landlord model where the main infrastructure is done by the government agencies but the operational structure by the private sector. So to build the confidence of the private sector we have reformed all our concession agreements, the arbitration process, revenue collection mechanism, all the standard documents so that the development could be facilitated. So now we have largest FDI in the port sector with the PSA 4.8 million TEUs capacity INR 8000 crore came out in 2013. PPP is immensely a success area in India as we have reduced the risk from their shoulder.

India-Bangladesh Maritime Cooperation

The geographical condition of India and Bangladesh implies that both countries can be benefited from mutual connectivity. The beginning is just after the independence in 1971 with the signing of Protocol on Inland Water Trade and Transit (PIWTT), through which we could easily access the North-Eastern part of India. Both the countries have signed the coastal shipping agreement also due to the geographical condition of both the countries, a vessel of lower standard that is lower cost could navigate to other country using the coast of another. Another attempt is there to facilitate the Indian cargo to use the Mongal and Chattogram port in Bangladesh for the North-Eastern region of India. We are implementing a project with the help of World Bank national waterways development project. So there will be a fairway of connecting both countries. A vessel from the Ganges in India through the Ganges in Bangladesh can navigate to the Brahmaputra in India gain. In India, there is 7500 km coastal waterways and 15000 km navigable waterways and that is the reason the coastal areas are densely populated and their contribution to the national GDP is more than the hinterlands. That is why we are significantly trying to utilise the coastline to enhance the economy of the country.

Port-led Economic Development

India identified the ports with adjacent lands like in Kandla and Paradip so that the industrialisation could be facilities. The business community wants good connectivity so that their export and imports could be done seamlessly. Therefore, the port proximity industrialisation is a very important way of economic development. China is the best example to explain port-led development. India is also trying to work in the same way. The demand for such port adjacent land is huge. The example of the Jawaharlal Nehru Port Trust's Special Zone is the best to explain the demand, the expected estimation for the price quotation was INR 180 which goes to INR 600 when it came into the auction. This is also good for the port as well. Ports need cargo, therefore, port adjacent industrialisation would attract more cargo for the port. It is a symbiotic relationship between the port and the industries. For facilitating the hinterland connectivity so that the progress of all pillars of Sagarmala integrated, India has developed allied agencies like Indian port rail corporation ltd. They have identified 45 small projects so that the connectivity remains seamless. Sagarmala development company ltd. another example to facilitate funding for the project Special Purpose Vehicle (SPV) set up by port and the private parties. India is looking at the other allied industries as well, for example, the shipyards. Steps have been taken to modernise

the old shipyard by forming the joint venture with the private parties so that the ship repairs facilities at the port area are ensured. India is thinking about the other components of the port-led development like cruise shipping. Ports in the large cities are becoming obsolete, they need to shift to the deep waters. So, the old ports need to do something with. Mumbai port is redesigning it as a cruise port and the entire policy of immigration has been modified and modernising.

Conclusion

In conclusion, to gain the larger connectivity by reducing the overall logistics cost of Indian freight movement Sagarmala has been designed with four pillars covering the port development, its connectivity to the main hinterland, port-led industrialisation and the coastal community development. It has taken into consideration the other allied facilities as well so that an integrated maritime industry can act, which is being considered the fuel of economic development through trade facilitation. Not only the development projects under the Sagarmala, but it has also been incorporated in the national plan and developed the implementation mechanism for it as well. Along with the modification of all the standard document for facilitating the private investment, the creation of Sagarmala development company ltd. and the port rail corporation ltd. are the best examples of it. Overall, India is on the highway of a comprehensive approach for the development of the maritime sector of the country.



Mr Shri Rabindra Agarwal

Joint Secretary (Ports)
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Strategies to Enhance Port Competitiveness: The European Experience

Thanos Pallis

Abstract

As the world merchandise trade volume is expected to grow 4.4 per cent in 2018 accompanied by GDP growth of 3.2 per cent at market exchange rates the maritime industry needs to cope with the strategies to gain more of these market shares. Port is tempting to follow the traditional targets by maximising throughput to gain market share. To access maximum market share they will look at the asset harmonisation and high performance. By increasing the infrastructure that is water depths, nautical facilities, bigger terminals, high-performance cranes and other allied facilities, port authorities would try to attract the users. However, it is associated with various risk as well, which could cover the risk of pursuing a relentless growth in productivity, investment, size and equipment, the risk of imitative behaviour and overcapacity, the risk of destructive local overcapacity and risk to play the competitive game on a battlefield where there is no chance to win. To grow in such a competitive and uncertain market, ports need alternative strategies for growth. Some ingredients of such alternative strategies could be choosing the right battlefield of four potential domains which includes port operation, creating value in the supply chain, port networks and business ecosystem. In addition to this, reducing the distance by organising landside operations and exploring Value-Added Logistics (VAL) and Value-Added Services (VAS) are also important factors. This paper will discuss all of these options more elaborately and conclude with the identification of some additional areas of emphasis.

Introduction

The maritime industry is going to have some good news, as the world merchandise trade volume is expected to grow 4.4 per cent in 2018 accompanied by GDP growth of 3.2 per cent at market exchange rates. The container trade on the major east-west routes for the last 4 years also shows a positive trend. The industry is obviously going to react to penetrate the additional share and for this, it is going to enhance its competitiveness which is also associated with the economic development of the port countries. Port is tempting to follow the traditional targets by maximising throughput in order to maximise market share. To access maximum market share they will look at the asset comparison and high performance. Port authorities would try to attract the users by increasing the infrastructure that is; water depths, nautical facilities, bigger terminals, high-performance cranes and other allied facilities. However, it is associated with various risks as well, which would include the risk of pursuing a relentless growth in productivity, investment, size and equipment. There are also risks of imitative behaviour and overcapacity, destructive local overcapacity and risk to play the competitive game on a battlefield where there is no chance to win.

In order to grow in such a competitive and uncertain market, ports need alternative strategies for growth. Some ingredients of such alternative strategies could be choosing the right battlefield of four potential domains, which includes port operation, creating value in the supply chain, port networks and business ecosystem. In addition to this, reducing the distance by organising landside operations and exploring Value-Added Logistics (VAL) and Value-Added Services (VAS). This paper will discuss all of these options with reference to European ports and conclude with the identification of some additional areas of emphasis.

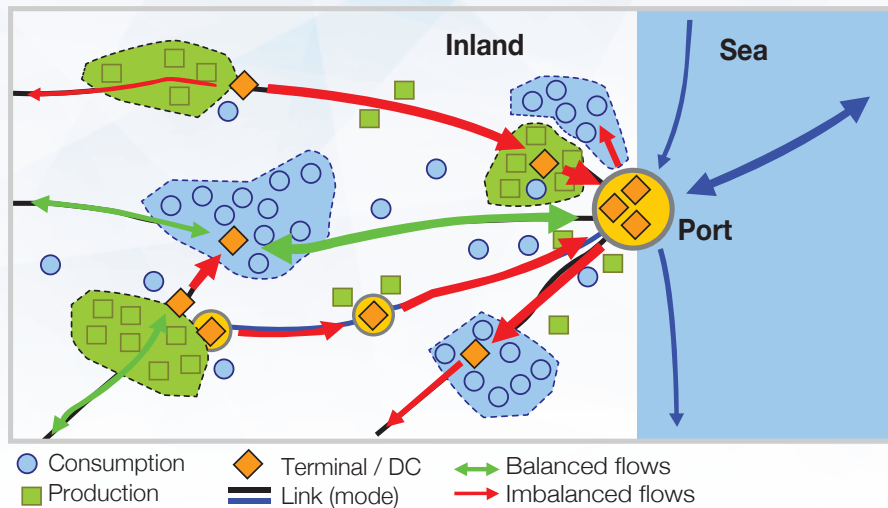


Figure -1

Source: Rodrigue & Noteboom, 2005

Port Regionalisation

The concept of port regionalisation could be a better strategy for an upcoming port. It can be done by serving a greater hinterland beyond the traditional hinterland, which would place the port into a more competitive position. Ports are not only a business house but it is a system that is embedded in the supply chains of a country or a region. Thus the competitiveness of a port will depend largely on factors external to the port itself. One has to keep in mind that higher margin could be gained from the noncore port activities. Additionally, connectivity of the port to the hinterland is really important and this is where a port can create value in the supply chain. Competitive advantage is also about creating a network. However, there are challenges as the bargaining power of the market player is decreased due to horizontal and vertical integration as well as the strong influence of public policy on the overall port operation. Moreover, society does no longer value the significance of ports in some cases.

The figure -1 shows the importance of regionalisation of port with balanced flows linking both consumption and production nodes in the supply chain.

The Extended Gate Concept

This concept could also place the port as a regional consolidation centre by establishing network and connectivity to different hinterland through the inland port or dry port. The inland ports are connected to the main maritime port with

The Extended Gate Concept

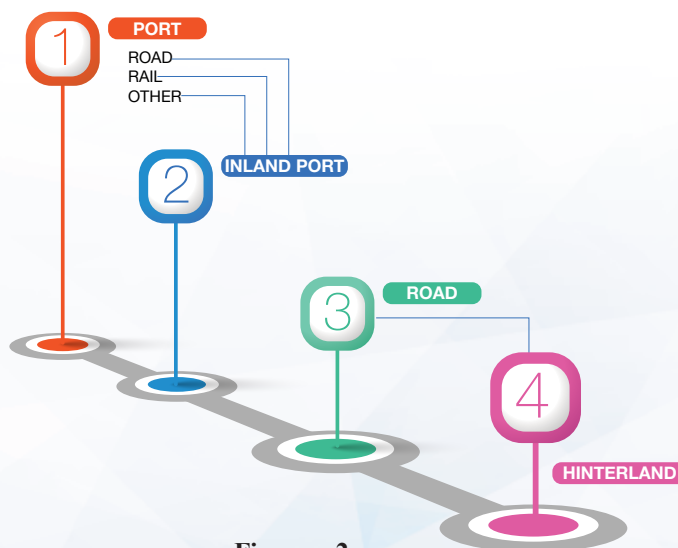


Figure – 2

different modes like road, rail or other, whereas the hinterlands are mostly connected by road. Moreover, the operation of the inland ports is also nowadays incorporated within the management structure of the main port. The following diagram provides the gradual development of the utilisation of dry port for accessing more market share.

Traditionally, the inland port and the hinterland connection were isolated operations for any port, whereas now all of them are working together. Even sometimes as the same organisation. However, there are a number of issues associated with the extended gate concept as different containers arrive and are requested by their customers at different times. These issues are:

- a. Terminal location.
- b. Coordination of cargo movement.
- c. The connectivity of rail or barge transport.
- d. Information exchanges and network design.
- e. Customs/Administrative procedures

Hinterland Distribution of Cargo

In distributing the goods to the hinterland, the road is the dominant modes conventionally. Modal shift is not an easy mechanism to deploy. However, efforts are there but still, the last/first mile age options are always dependent on the road. Hinterland distributions of cargo are done using three modes namely: trucking, rail and inland water transport as discussed in the succeeding paragraphs.

Trucking, to enhance the utility of trucking a mechanism called adjusted terminal gates are there in practice. Customarily, in a port, trucks are used to pick the containers whenever it is available. But under this mechanism, there is an appointment system and window system that enables the truckers to have an appointment and a certain period of time to collect and deliver the goods.

Figure – 3 Hinterland Connectivity of Hamburg port



This mechanism obviously requires some consideration of IT infrastructure, labour issue and the practice of the trucking industry and security and customs is the major player to facilitate the implementation of it.

Rail, the competitive advantage of rail in the reduction of carbon footprint along with the capacity to carry large volume, environmental friendliness, low cost as well as reliability is always proposing rail connectivity as a good strategic option for port hinterland connectivity. But, here again, the huge capital-intensive nature of it is hindering the larger connectivity of using rail network. There are ports in northern Europe, where competitiveness is largely associated with the rail network. The example of this is the Betuwe route freight rail connection, which enables the Port of Rotterdam to get access to the German market. The network is of a length of 160 km with the capacity to operate 10 trains per hour facilitate with dedicated freight trains with double tracks. Hamburg port is another success story for rail transportation. More than 230 freight trains a day connect the different parts of Europe from this port as shown in figure 3. These rail transports are opening the market in Europe by brokering between interested parties. There are increased intend from both 'seaside' and 'landside' market players in developing and operating land, rail and barge connections.

Inland Water Transport

Another competitive advantage of the Port of Rotterdam is their connectivity through inland waterways to other parts of Europe, which provide the most competitive cost and environmental benefit. The capacity of carrying larger volume is facilitating the exploration of economic density. It is reducing road congestion around the port and increasing the use of barge transport.

Strategies to Enhance Port Competitiveness

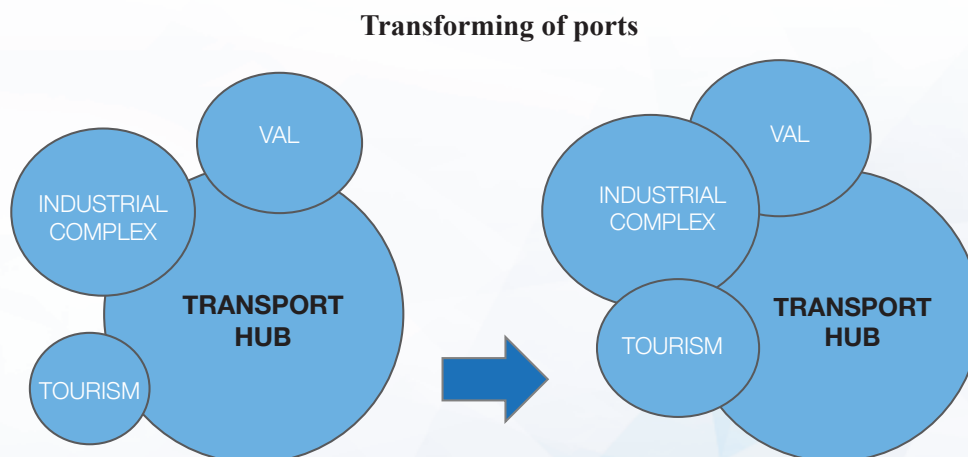
Strategies to enhance port competitiveness of a port are discussed in the following paragraphs:

a. Attract investment.

Capital intensive port infrastructure and the facility for hinterland connectivity through rail and inland waterways require better policy planning and financing to attract both the public and private funds. Therefore, this is another strategic area for the port competitiveness obviously.

b. Adjacent logistic zones and sites

One of the significant competitiveness of the Port of Rotterdam, Antwerp and Hamburg is the



large associated logistics parks where thousands of global manufacturers are operating their facilities. Logistics connectivity of these ports is among the main determinants of their success. In the logistic parks, the operators are facilitated with different Value-Added Services (VAS). The Value-Added Services could be classified into two broader categories these are Value-Added Logistics (VAL) and Value-Added Facilities (VAF). Value-added logistics have two general categories like general logistic services and logistics chain integration services. General logistics services include loading/unloading, stripping/stuffing, bulk storage, tank storage, general warehousing and distribution centres. Logistics chain integration services include quality control, repacking, customisation, assembly, testing, repair and re-use. Value-added facilities cover packing facilities, weighbridges, customs facilities, truck maintenance and repair facilities, container repair and maintenance, cleaning, facilities, tanking facilities, trailer renting and easing, information and communication, safety and security services, offices/WTC, hotels, restaurants, shops etc.

c. Transforming port business ecosystem

Port ecosystem evolves away from main transport hubs towards integrated industrial/ logistics/ leisure complex. Traditionally the mechanism was to work in an isolated away. Integration has created the value of the industry by creating a greater advantage in the area of cost and time savings as well as a service enhancement. The following diagram shows how the isolated activities are transforming into an integrated operation.

Other Ingredients to Gain Competitive Advantages

Along with the above-mentioned areas, there are some other ingredients that could enhance the competitiveness of a port that includes technological advancement, cooperation and collaboration with stakeholders and a more active port authority. Port authorities have to develop a multimodal port governance vision. Ports have to have a greater look beyond the landside

Figure -4

Source: J. Garcia de la Guia (2010)



access and supplies including the local community even the world beyond. There is a need to establish a coordination mechanism that could minimise the risk of bottlenecks. The coordination is a big challenge of which most significant is the insufficient information flow of container data causing inadequate planning. Investment in hinterland terminals does not come spontaneously. Moreover, introduction to new service also suffers from adequate cargo. On the other hand, limited customs declaration facilities, as well as administrative inspection facilities, cause delay, which is also due to insufficient information on containers, those are provided. Hundreds of actors including container shipping lines, terminal operators, forwarder, trucker, rail operator, inland port operator, customs, inspection services and other organs are related with coordination, which is a great challenge at the same time. In Europe, there are initiatives to simplify port procedure, improving the digital information flow, establishment of EU maritime single window (it will provide technical and legal frameworks for the submission and re-use of regulatory reposting information), e-Manifest for Customs, research and innovation as well as promotion and support on EU social dialogue between port workers and employees. It also includes the necessary training and development of an effective port community system, which is obviously the prime concern to establish coordination among the stakeholders. The different stakeholders of the port community system are shown in figure 4.

In addition to the above, the environmental concern is a great challenge to set up the strategic options to gain competitive advantages of a port. In Europe, there is an example of European Sea Port Organisation (ESPO), which has developed the environmental code of practice on the social integration of Ports in 2010. It has also developed ESPO code of practice on the birds and habitats directives in 2006. Additionally, a port should develop international ties through port collaboration within and beyond the region.

Conclusion

It is imperative to understand that to gain greater completeness, the ports have to look at the four-potential sectors for improvement these are the port operation, creating value chains, port networks and business ecosystem. In addition to these four area ports have to reduce the distance by organising landside operation, explore VAL and VAS opportunities. Moreover, they need to look at the technological advancement, coordination and collaboration with stakeholders as well as establish a more active port authority.

The port authority should work to achieve balance societal and environmental goals of the community at large. At the same time, it should collaborate with international authorities and advance cluster organisation to influence cargo routers by taking measures that will increase both efficiency and effectivities of cargo handling. Additionally, an active port authority would need to address public domain interest by creating social value next to private value for example; taking a more cooperative approach to change land use to urban functions.



Professor Dr Thanos Pallis
University of the Aegean, Greece

President
International Association of Maritime Economists

Comments of Session Chair

Mr Abul Kashem Khan

First of all, the session chair thanked everyone along with the expert panel. He said that he dealt with DCCI on different port issues. It was his opportunity to learn about what is happening in China, India and Greece regarding the port operation. Then he invited the first speaker to deliver his presentation.

After the presentation of Prof. Chen Jihong, Mr Khan mentioned that it was interesting to know the story behind the success of Shenzhen port. Especially, the information was about 4 elements of port,

- a. Territorial zones
- b. Participation in global trade and economy
- c. Economic ties with Hong Kong
- d. High-speed development process

According to him, first two is quite good in Bangladesh. The country is close to Hong Kong and Bangladesh should give more emphasis on high-speed development process.

After the presentation of Mr Shri Rabindra Agarwal, he noted that port-led economic development required a master plan. He emphasised on the four points of Sagarmala program.

- Basic Report Capacity
- Port Connectivity
- Port-led growth
- Community development

He said, India has proved that they have done quite well in this sector. In the case of Bangladesh, the suggestion is that the private investors should come into port. The connectivity of the ports and the logistics support service needs to come within the proximity of the ports.

He also mentioned, Bangladesh is growing at 7% + GDP and the country requires about 300 billion dollars of infrastructural investment until 2030. Which means from now, Bangladesh requires 20 billion dollars investment in maritime infrastructures annually.

Therefore, Dhaka Chamber in the last couple of months has been advocating the creation of National Maritime Port Authority because the port-led growth has to come from the private sector as well. The private sector must be in a partnership with government to develop this huge infrastructure.

As we know the Hon'ble Prime Minister Sheikh Hasina has taken strategy to create 100 special economic zones. Now if you think on Chattogram and Mongla, they need to facilitate these exports. The road connectivity needs to be created to address that kind of demands. So inland water and inland ports have to be connected well to take us through the middle-income journey to a developed country.

Mr Khan proposed two proposals to the govt.

- (i) "National Maritime Authority" can be formed hundreds of private-public platforms
- (ii) Logistic support in the proximity of the port needs to be created.

Chattogram port though is quite efficient, it has few weaknesses. Now the Bay Terminals and others, if they start operation, the country will see the real port-led development.



Mr Abul Kasem Khan

President
Dhaka Chamber of Commerce and Industry

Session 2

Blue Economy - Leading the Way for Sustainable Development

Paper-1

Changing Trends in Shipping and Maritime Business

Paper-2

Maritime Tourism – Changing Trends and Future Prospects

Session Theme

Blue Economy - Leading the Way for Sustainable Development

The blue economy conceptualises oceans and seas as ‘Development Spaces’ where spatial planning integrates conservation, sustainable use of living resources, oil and mineral wealth extraction, bio-prospecting, sustainable energy production and marine transport. The blue economy is basically a transition from a traditional economic path to a human-ocean centric development which could be seen as ‘living with the ocean and from the ocean in a sustainable way’. Now in layman’s term, it comprises of all the activities of an economy which take place directly or indirectly in seas and the oceans as well as the coastal waters; and the economic activities include exploration and exploitation of the ocean resources and appropriate use of them. But above all, the blue economy concept is based on the principles of equity, well-being, low carbon development, resources efficiency and social inclusion.

Changing Trends in Shipping and Maritime Business

Mr Clive Van Onselen

Abstract

The maritime sector, the most dynamic sector in the world, continues to evolve in response to economic, political, demographic, and technological trends in every area from shipbuilding to shipping operation, from port operation to hinterland connection, financing shipping to the future of seafaring. Understanding these trends is critical to improving the performance of the industry in every aspect of planning, operation, development, regulating as well as formulating successful long-term business strategy. Here some of such trends that will shape the industry in the coming decade would be discussed and particular focus would be given to the areas where the developing parts of the world can emphasise more to penetrate more market share.

Introduction

Current trends to discuss. I will speak on the small part of it, focus more on practical sides what we are dealing at the moment. To make sense of what is happening right now in terms of sustainability for the shipping and maritime business, we need to consider what ‘sustainability’ means to the industry. Since I work for a Maersk company I will take the liberty of using Maersk’s definition: “We define corporate sustainability as working systematically to reduce negative and enhance positive societal and environmental impacts in our operations and related to products and services sold to our customers, seeking to leverage these efforts for risk mitigation, competitive advantage and business growth.”

Green Shipping

Elements of this vision can be seen in the joint commitment made by the leaders of most of the world’s largest shipping lines and related organisations at the recent Global Maritime Forum in Hong Kong at the beginning of this month. These leaders of the shipping industry challenged themselves and the industry through “Call to action to reduce Global Greenhouse Gas emissions from international shipping by at least 50 per cent by 2050 compared to 2008.” Their roadmap to this objective stressed the need to be: “Ambitious Predictable Market-Oriented Technology-enabling Urgent Coherent Enforceable”.

Reduction of Carbon Emission

Recent years reduction of Carbon dioxide output has been a focus of the world and the shipping industry has embraced this agenda with open arms. In 2008 Maersk Line’s set itself an ambitious target to produce 60 per cent less Carbon dioxide per container moved by 2020 (using 2007 as a baseline). By the end of 2016 Maersk Line had already reduced emissions by 42 per cent per container. So they have continued to set even higher targets for reduction.

Whilst Maersk (we) are very proud of this achievement I need you to consider the drivers here. In the years leading up to 2016 Maersk Line removed more than a billion dollars from their costs annually. This was primarily done by reducing their fuel bill or should I say reducing Carbon

dioxide emissions? Whilst this may sound very cynical. I think this is the key to driving sustainability (good business sense). The reduction of Carbon dioxide per container moved was achieved by operating supersized container vessels carrying 20,000 TEUs at a time, and implementing strict slow steaming operations that operated all vessels at the best efficiency possible. This saved a lot of money and therefore the industry has adopted these measures with open arms.

Reduction of Sulphur Emission

The current hot topic is the reduction of sulphur emissions from shipping. By 2020 the industry has agreed to reduce the maximum allowed sulphur content of the fuel used from 3 per cent to 0.5 per cent. This will be achieved by burning lower sulphur fuels, or by cleaning the sulphur out of emissions through the use of ‘Scrubbers’. What happens to the effluent from the “Scrubbers” is a big debate environmentally, but to me, the biggest concern is that this effort will cost money, a lot of money. Seaintel has calculated that the IMO 2020 regulations on reduced sulphur will add USD 11.2 billion to the fuel bills of shipping lines. Maersk estimates this will cost them alone USD 2 billion, wiping out much of the savings generated in reducing Carbon dioxide. These costs will have to be passed on to the shippers and ultimately to us the consumer, but along the way we will see resistance to the process because of this huge cost, and my concern is to find the way that this improvement can be incentivised or else it will be very tough to reach this ambitious target.

Societal Impact

Safety at Work: Shipping lines and related terminals, yards etc. are increasingly prepared to spend money on improving safety as a safe operation is a cheap and efficient operation. Obviously, as compassionate humans, we do not want to see people are suffering in the workplace whilst doing their normal duty and this unsafe practice should be considered as bad business to businessmen. We lose valuable resources when people are injured in the workplace. Improving safety has a good economic driver and therefore we are rapidly seeing the adoption of every improving safety practices, from the use of appropriate personal protection clothing to improved training in the handling of equipment such as ship cranes.

Safety in Ship Recycling: Recycling of ships is a hot topic in this region as the ship-breaking industry can be very good business, unfortunately, due to environmental and safety concerns many owners will not recycle their ships in Chattogram or Alang and instead do it with a greater cost in Chinese yards. Maersk is working with a number of operators in order to improve safety and environmental impact of shipbreaking operations in that area. This brings more business to the region and reduces the costs for Maersk while money will well be spent by both parties. Hopefully, we will see similar initiatives in Chattogram soon to help realise the potential of this business here in Bangladesh.

Anti-corruption

Maritime Anti-Corruption Network (MACN) was formed in 2011 under the auspices of BSR (Business for Social Responsibility). MACN is a network of over 100 shipping lines focused on reducing corruption in shipping. They have jointly tackled issues in hot spots such as Nigeria, Argentina, the Suez Canal and Indonesia. It has substantially reduced the practice of paying facilitation fees or gifts to local authorities. Those of you who have been to sea and seen the harassment faced by ships officers in many ports of the world will realise what a huge task this is to change this destructive practice. But we cannot be successful purely by refusing to give the pilot in the Suez a box of cigarettes or the Nigerian customs official a case of Whiskey. We need

to ensure that the remuneration these people receive is fair to maintain a suitable standard of living and then work from the top down to eradicate this practice. Maersk has been successful in most countries reducing the facilitation payments paid by ships by 96 per cent but we have faced continual resistance from pilots threatening to run ships aground to quarantine officials magically finding a stray cockroach in the galley requiring full ship fumigation.

Conclusion

Maersk believes that “We have a responsibility to counter and not contribute to corrupt practices, and as leaders in our industry to take affront runner role in eliminating facilitation payments thereby reducing the cost of international trade.” In summary, I want to reiterate that sustainability is an essential part of any businesses strategy if they want to be successful and continue to do business in the future.



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Maritime Tourism – Changing Trends and Future Prospects

Mr Frank Haas, Mr M Jan Rumi

Abstract

Tourism is one of the – if not the – largest global industries, with 1.3 billion international arrivals in 2017, accounting for USD 1.3 trillion in receipts with arrivals growing at 7 per cent per annum. Tourism accounts for approximately 10 per cent of both global employment and GDP. For developing economies such as Bangladesh, tourism is a particularly attractive development target because it is both clean and labour intensive, providing employment growth and poverty relief and, managed properly, without undue negative impacts on the environment. Maritime and coastal tourism is particularly well-positioned for development, given Bangladesh's long coastline and access to growing regional markets. The development of Bangladeshi maritime tourism can benefit by learning from well-developed maritime tourism destinations as well as best practices in sustainability, which together can support the orderly and strategic development of a viable maritime tourism product. While Bangladesh currently receives about USD 337 million annually in tourism receipts, the economic success of other countries in the region such as Sri Lanka (USD 3.9 billion receipts) and the Maldives (USD 2.7 billion) point to the opportunities for substantial growth. In this presentation the successful development of Bangladesh's maritime tourism will be discussed, citing foundational planning, incorporating best practices, sustainability initiatives, and partnership development.

Introduction

Bangladesh has enjoyed strong economic growth over the past few years, but the future will be even brighter with the development of a “blue economy” built around its maritime resources. Maritime and Coastal Tourism can be part of that bright future since tourism an industry that has strong growth potential, generates substantial employment and is a clean alternative to other economic sectors. Tourism is the world's leading industry and it continues to grow in size and importance and eighty per cent of tourism is coastal tourism.

Compared to some of its South Asia neighbours, Bangladesh tourism is relatively small, but favourable conditions in Bangladesh and the region provide indications that it can become a major contributor to economic growth. Neighbours like the Maldives, with a USD 2.7 billion tourism industry and Sri Lanka, with USD 3.9 billion in tourism receipts, point to the potential for Bangladesh, which currently generates only USD 227 million in tourism receipts.

Global Outlook for Tourism

Looking into the future, the UNWTO forecasts tourism's growth to continue at an annual 3.3 per cent rate through 2030. By 2030, that would mean 1.8 billion arrivals (up from the current 1.2 billion arrivals). The good news for Bangladesh is that UNWTO forecasts that emerging destination will grow at double the rate of developed economies with forecasted increases of 4.4 per cent annually. That means that emerging economies will account for about 57 per cent of trips or about 1 billion arrivals by 2030.

Regional Outlook for Tourism

Contributing to this rosy forecast are very favourable conditions in the South Asia and Southeast Asia Region. First of all, the world in general – and Asia in particular – is shifting from a mostly poor to a mostly middle-class world. By 2030, nearly 5 billion people in the world could be considered middle class, nearly two-thirds of the world’s population.

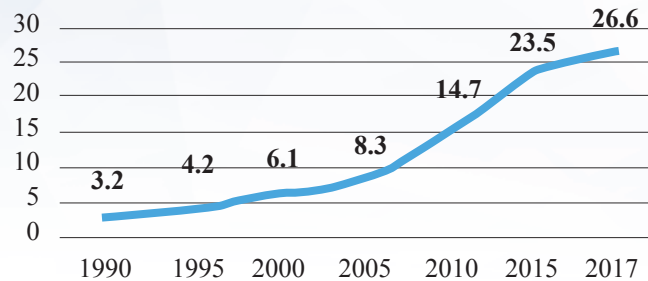


Figure 1: South Asia International Arrivals (millions)

Changing circumstances within Asia also support the robust development of regional tourism. More and more of the population is living in urban centres where they have access to transportation hubs. Within the region, there is strong growth in the acquisition of aircraft and, with currently stable fuel prices, we have seen the development of low-cost regional air carriers.

Looking within the region at tourism spending, India dominates with USD 27.4 billion. The Maldives and Sri Lanka are multi-billion dollar destinations in terms of visitors receipts and their success points to the potential of Bangladesh which, in 2016, only posted USD 337 million, just 0.1 per cent of global tourism receipts.

Bangladesh Tourism

The conditions for growth are in place for both the development of domestic and international tourism for Bangladesh. The economy has been growing rapidly both in Bangladesh and the South Asia region providing an economic foundation for growth. Within the domestic and regional economies, there is a growing middle class with the means to travel for recreation and leisure. Structurally, conditions favour the development of tourism since air routes are expanding within the region and more and more of the population lives in urban regions with access to air service. Finally, the growing availability of long-haul aircraft and low-cost air carriers can open up Bangladesh tourism to distant markets.

Apart from just visitor receipts as reported by the UN World Tourism Organisation, we see that tourism is a small but potentially significant contributor to the Bangladesh economy. The current direct contribution to GDP is USD 5.3 billion 2.2 per cent of the total. The good news is that tourism’s contribution is forecast to grow 6.2 per cent annually through 2021. One of the good things about tourism for a country like Bangladesh is that, as a service industry, it is labour intensive (accounting for about 10 per cent of all global jobs). In Bangladesh, that figure is 3.8 per cent and again, indicating the potential for growth.

Of course, today we are here to discuss the potential of coastal and maritime tourism. It is estimated that 80 per cent of all global tourism is coastal tourism and Bangladesh is blessed with a long coastline on the Bay of Bengal.

Bangladesh's Maritime Tourism Potential

Proof of tourism's potential for Bangladesh is also found in the current growth rates for global tourism. The United Nations World Tourism Organisation estimates that the global tourism industry grew by 6.8 per cent in 2017 and has projected continued growth at a 3.3 per cent annual rate through 2030. The picture is even more positive for South Asia, which posted an average annual growth rate of more than 10 per cent since 2005 and now brings USD 39.5 billion annually into the region.

Bangladesh has much to offer prospective visitors. The country has one of the world's longest sandy beaches at Cox's Bazar, the Sundarbans mangrove forest (a UNESCO World Heritage Site), St. Martin's Island, cultural and religious sites and the potential to create water-based recreational activities on its extensive Bay of Bengal coastline.

The Bangladesh government has already developed policies that recognise tourism's potential to attract foreign exchange, preserve and maintain cultural and natural resources, alleviate poverty and create a favourable national image for the country. What is needed now is a plan to put these policies into action and coordinate the industry, government and non-governmental agencies that can contribute to tourism's successful development. The policies and assets are in place, ready to be developed.

As a developing coastal and maritime tourism destination, Bangladesh would benefit by focusing on three fundamental precepts to realise its potential. First, it needs to preserve and protect its coastal and aquatic assets, primarily the Bay of Bengal, its beaches and tributaries. The Bay of Bengal has an extended coastline with a variety of beaches and aquatic resources that can be the basis for coastal tourism. The development of these assets, however, requires that the conditions in the bay remain safe and attractive for recreation. Since the bay touches several nations within the region, the critical steps to maintain its health will require the continuation of multi-national efforts.

Secondly, as a relatively underdeveloped maritime destination, Bangladesh has the opportunity to strategically develop its maritime tourism by tapping into best practices of other, more highly developed destinations. In one sense, tourism in Bangladesh is underdeveloped; however, another way to look at this is to consider tourism to be a "blank page" ready for a comprehensive development plan. Master-planning will ensure that development in Bangladesh is strategic and coordinated.

Finally, to create a comprehensive development plan, Bangladesh should coordinate developments through regional and international partnerships. Other countries and regions with highly developed tourism industries can provide Bangladesh with a blueprint for development and allow the country to take advantage of learning from other successful tourism destinations.

Protecting the Bay of Bengal

With a growing emphasis on Bangladesh's "blue economy" and a wealth of maritime attractions and resources, the time is right for the development of Maritime and Coastal Tourism as a significant contributor to Bangladesh's economic vitality and growth. It's a simple fact that the development of maritime tourism is dependent on an attractive product, primarily the Bay of Bengal. The bay has already come under pressure for environmental sustainability and those pressures are likely to continue with continued development of maritime tourism. A study in Hawai'i showed that tourism and tourists disproportionately contribute to increased use of and degradation of resources unless they are managed. Because the bay touches multiple jurisdictions, its preservation will require cooperative efforts and expansion of existing initiatives like the GEF and BIMSTEC projects.

Developing maritime tourism in Bangladesh can also benefit from lessons learned in other more mature maritime tourism destinations as well as academic studies in sustainable and

environmental tourism and from other governmental jurisdictions like the EU, which has developed a strategy for “Growth and Jobs in Coastal and Maritime Tourism.” The United Nations strategic development goals adopted in 2015 serve as a guide for the responsible development of coastal and maritime tourism in Bangladesh.

Partnerships with Established Players

Partnerships will be key to the strategic development of maritime tourism in Bangladesh and should cover a range of potential partners including tourism-based companies both within the region and internationally. Knowledge-based partners such as universities and other training institutions along with the government to government relationships and partnerships will be key to tourism development. Bangladesh can benefit from the expertise and lessons learned in other successful maritime tourism destinations.

As the authors of this article are from the State of Hawaii, USA, a dream maritime tourism destination, it is suggested that a partnership such as establishing a Sister-State relationship with the State of Hawai‘i could be a game changer for the development of maritime tourism of Bangladesh. We are from Hawai‘i and that state in the United States is an example of a “dream destination” for maritime tourism. Tourism receipts in Hawai‘i total almost USD 17 billion and looking at the profile of visitor activities in Hawai‘i, we see that water-based activities make up a significant part of this destination’s appeal. The importance of the tourism industry in Hawai‘i was not always so robust. Tourism in Hawai‘i has grown rapidly since the advent of jet travel in the 1960s and Hawai‘i has posted six consecutive years of arrivals growth and will probably exceed 10 million visitors in 2018, most of whom are coming for a world-class maritime tourism experience.

Hawaii Beach Experiences

The heritage of maritime tourism in Hawai‘i goes back to the 1930s when “beach boys” taught the well-to-do visitors of the time how to surf and paddle an outrigger canoe, so maritime tourism is embedded in Hawaii’s tourism culture. The beach boys are still part of Hawai‘i tourism, but the industry has grown and expanded to include many exciting, contemporary water-based activities for visitors.

As an example, Waikīkī Beach Activities is a company affiliated with the Hilton Hawaiian Village Hotel. The company offers a wide variety of “soft adventure” products for visitors including sunset sails, snorkels, canoe paddling ... and even trendy and noble activities like Stand Up Paddle Yoga.





There are many, many companies in the private sector of Hawai‘i Tourism that can provide companies in Bangladesh with best practices on product development. But, Hawai‘i also has been developing programmes to sustainably manage its popular sites to ensure their sustainable future. One of the most popular sites in Hawai‘i is Hanauma Bay – a beautiful, protected bay with incredible snorkelling. Its popularity, however, was creating unsustainable pressures on the bay as thousands of daily visitors took their toll on its coral reefs and fish populations. The city & county of Honolulu created a site management plan which has controlled overuse through education and restricted access. Other sensitive sites across Hawaii are now being managed as the tourism industry recognises the need for sustainable practices.

Atlantis submarines is a company with state of the art submarine technology operation in eight different tourism markets.

Partnerships will be key to the strategic development of maritime tourism in Bangladesh and should cover a range of potential partners including tourism-based companies in the region and internationally, knowledge-based partners universities and other training institutions and government to government relationships and partnerships so that Bangladesh can benefit from lessons learned in other successful maritime tourism destinations. It would be beneficial, for example, to create a Sister-State relationship with Hawai‘i to more closely tap into the expertise that Hawai‘i has in maritime tourism product and sustainable development.

Coordinate between Industry, Government and NGOs

Within Bangladesh, there already existing companies, industry organisations, NGOs and government agencies to develop tourism. The lesson learned in other jurisdictions is the importance of coordinating their efforts so that development is synchronised and strategic rather

than haphazard. Even in a mature destination like Hawai‘i, we find it challenging to coordinate the activities of the many organisations with different objectives that are important players and stakeholders in the industry.

Government Tourism Policy

Government policy in Bangladesh has recognised the important contribution of tourism going back at least to the 1990s. While the fundamental benefits and policy issues remain in place, the dynamic nature of tourism requires constant review of how these policies are implemented and what specific plans need to be put into place to be competitive in a competitive industry. Certainly, incorporating the realities of climate change into tourism plans is a fact of life in the 21st century.

Visitor safety is clearly a growing issue in the world. Not only should we protect the security of our guests because it is the ethically correct thing to do, but destinations which have a reputation for safety and security also have a competitive marketing advantage over destinations that don’t. With the growth of global tourism, visitors are becoming more sophisticated and practices which were acceptable in the past are no longer competitive in today’s tourism marketplace. Certainly, new imperatives in tourism management including risk management, revenue management, predictive analytics, big data, the dominance of social media and other trends have made hospitality education ever more critical for success.

Developing a complex industry such as maritime tourism will necessarily require the government to put a priority on handling key determinants of success such as strategic planning the development of critical infrastructure the establishment and maintenance of standards workforce training research to lay the foundation for strategic development and many more activities that only the government is best suited to deliver.

Conclusion

Beyond “numbers” tourism is becoming more significant as an engine of economic development and as a vehicle for sharing cultures, creating peace and building mutual understanding. There is a higher purpose which was nicely stated by the World Travel and Tourism Council. We hope to see the exciting development of Bangladesh’s maritime tourism as a model industry in the coming years. Trends are very favourable and the outlook is positive for Bangladesh’s maritime tourism development is bright. The path forward will be facilitated with appropriate planning and partnerships that will allow Bangladesh to benefit from the success of others in the growing global tourism industry.



Mr M Jan Rumi
Dean,
Consular Corps of Hawai‘i



Mr Frank Haas
Former Dean,
University of Hawai‘i

Comments of Session Chair

Mr Farook Sobhan

In this session, there were three distinguished speakers. The 1st speaker was Rear Admiral M Khurshed Alam (retd). Mr Farook Sobhan mentioned that the speaker had shown a dream in his full presentation with very rich information. He proposed that Bangladesh should look forward towards developing the country in capacity, participation and involvement in the Blue Economy in the Indo-Pacific region.

In a closing remark, the session chair focused on capacity building on education, developing well-articulated maritime policy and their implementation efficiently and effectively. He also shared that he had come back from the 12th South Asian Security Conference, where he has been attending in the last 12 years. Interestingly one of the keynote speeches given in that conference by Mr Ram Madhab, the head of the think tank and also the general secretary of BJP also has expressed special responsibility for relations with India's neighbours.

He emphasised on Maritime Tourism and Hospitality. Learning from the experience of others as the Hawaii representative mentioned, Bangladesh needs to remember that in this age of the internet that the country is living in a very competitive environment. Bangladesh itself is generating a huge number of tourists domestically and also who are travelling abroad.

Mr Sobhan said that Bangladesh has greater potential in terms of tourism compared to Thailand and Egypt. But the country is lagging behind in tourism infrastructure and facilities. The environment has such an important role for Bangladesh. He also said that the country had a long way to go in terms of eco-tourism.

There are many advantages such as the shipbuilding or shipping in general. Bangladesh needs to focus on these issues as the country moves forward on the larger issue of reaping the benefit of the Blue Economy.



Mr Farooq Sobhan

President and Chief Executive Officer
Bangladesh Enterprise Institute

Session 3

Maritime Education for the New Generation

Paper-1

Transfer of Knowledge for Maritime Excellence Through Global Alliance

Paper-2

Consolidation of Maritime Training for Better Employment

Paper-3

Need for Maritime Higher Education in Bangladesh

Session Theme

Maritime Education for the New Generation

With respect to the rapidly changing technological landscape and the globalisation in technology use, the maritime education and training should endeavour to impart knowledge and the right attitudes to develop global maritime citizens to advance global goals. Preparing for the new generation demands that we can stand together, to increase the attractiveness of Maritime Professionals as both a career path for young people and for lifelong learners. For Bangladesh, maritime education is increasingly vital in the context of the blue economy. However, Bangladesh is yet to have any formal education in this sector. To fill this gap we need to provide specialised knowledge apposite to these industries. Ensuring maritime education for the new generation will help the nation to meet the manpower needs of the maritime and offshore industries. But how to ensure it is a big question that needs to be answered.

Transfer of Knowledge for Maritime Excellence Through Alliance

Rear Admiral A S M Abdul Baten, BSP, ndc, psc

Abstract

The paper is based on the principles of knowledge and technology transfer through a strategic alliance between universities and other institutions and organisations. There is no hard and fast rule for knowledge transfer though, but the study reveals that through effective and objective collaboration between universities and between universities and industries, transfer of knowledge is pragmatic, easier and it helps the institutions for higher education sectors to develop and attain excellence. Opening a university is difficult, but running the same smoothly is even more challenging particularly if it is a specialised institution. Along with strong support from highly educated experts, there is a strong need for a significant financial backup to support its academics, research and logistics. In this paper, the endeavour has been made to study a few of the existing global alliances between reputed universities and institutions of different continents to find how the stakeholders have been benefitted. As a follow up of this, an effort has been made to recommend a few practices for the newly established maritime institutions in Bangladesh for achieving maritime excellence, which definitely would contribute to the national vision 2041.

Keywords: Knowledge Transfer, Alliance, Strategic, Sustainable, 'Blue Economy', Maritime, Marine.

Introduction

Knowledge Transfer (KT) is a term used to encompass a very broad range of activities to support mutually beneficial collaborations between universities, businesses and the public sector. It's all about the transfer of tangible and intellectual property, expertise, learning and skills between academia and the non-academic community. It's very well recognised by many governments and funders as an important return on their respective investments in academic research. The end results obviously provide a significant driving force for enhancing economic growth and societal wellbeing. For academics, KT or Technology Transfer (TT) can be a way of gaining new perspectives on possible directions and approaches for research. This two-way exchange element of KT is at the heart of successful and sustainable collaboration. Three main factors seem to be the driving force for successful KT. First, it's not a 'zero cost' activity; it takes effort and time to make it work. Second, it works best when people meet to exchange ideas, sometimes by chance, and spot new opportunities. Third, it needs practical, timely and active support at an institutional level – within companies and universities – encouraging a culture of open access and open innovation. An alliance is known as a partnership which is a collaborative arrangement between two or more organisations. When it is with some kind of strategy build up to have a competitive advantage over other in a common ground it is a strategic alliance. A strategic alliance is formed to help each other in organisational/business functions for mutual benefits. It does not entail forming a new organisational entity. The partners in alliances have no formal ownership ties like a joint venture. The parties rather work cooperatively under an agreement. None of the parties loses, rather all gain. Strategic alliance creates a good ground for allies to perform joint research, share technology and improve products.

Universities are widely known as suitable platforms for the creation of knowledge for humanity. Depending on the type, size, scope and role the universities, the output knowledge also varies from institution to institution. World reputed universities have grown over centuries with cooperation from other institutions or organisations/industries. The contribution of the oldest universities has been recognised by the world for their successful dissemination of knowledge through different methods and alliance is one of those.

In the maritime arena, China claims to have raised their first maritime university in the Asia Pacific region, which was founded in 1909. The World Maritime University (WMU) in Malmö, Sweden, is a postgraduate maritime university founded by the International Maritime Organisation (IMO) by an IMO Assembly Resolution in 1983. But, research and development in the field of maritime higher education is relatively less in IMO sponsored universities compared to other international universities. The primary reasons may be many, but most important are: lack of appropriately qualified personnel, lack of funding and lack of cooperation between the institutions. With the development of modern science and technology, the operation of maritime platforms and conducting different economic activities at sea have become more technology dependent, complex and challenging and it would be difficult to do research singlehandedly by any institution on such arena. Some sort of partnership would always be the best option for effective knowledge share and benefit on a win-win basis. Sharing Knowledge and building partnership between technologically advanced institutions and newly formed institutions is not an easy-going affair, as it takes a lot of effort and initiative for such engagement. This is a debatable matter though but the newly formed institutions will never rise unless new strategies are formulated on how to get closer to matured institutions and get the mutual benefits for respective future developments. This study shows some ideas which might benefit those who would work for the development of maritime higher institutions of excellence in the shortest possible time.

Methodology

The methodology of this research has been an empirical study of secondary sources, focused group discussion through the visit of international universities and research facilities, author's own views and case studies. There has been a limitation of time in carrying out research, but there is plenty of scopes to conduct research on the subject. It is difficult to get validated available information on unsuccessful partnerships. This is because the organisations have their own confidentiality and it is not always possible to bring those in public.

Transnational Partnerships in Global Higher Education

The partnership between universities worldwide is a fundamental element of twenty-first-century internationalisation. The growth in transnational partnerships between groups of higher education institutions across the globe represents fundamental changes in the ways that universities are working together and constructing themselves. Partnerships, networks, and global alliances have become strategically important and 'universities can realise significant value from engaging in alliances. (Gunn and Mintrom, 2013: 180). The lessons learnt from Chinese Maritime Universities are that they are very aggressive and trying to achieve excellence within the shortest possible time by large scale collaboration with international partners. Their government is also very proactive and firm to develop the institutions for higher. They constantly keep tracking western universities and either try to imitate or make a strategic partnership to strengthen their own institutions. The strategic steps taken recently to build their maritime universities have been quite significant and can be good lessons for the new institutes in the region.

Influence of University Ranking for Partnership Development

Globally the demand for tertiary education is gradually increasing as the middle-class population is also increasing. The global tertiary-enrolment ratio—the share of the student-age population at university—went up from 14 per cent to 32 per cent in the last three decades. (The Economist 15 Mar 2015). Between 2000 and 2014, the number of students in higher education institutions more than doubled, rising from 100 million to 207 million. Most of the employers look for graduates passed out from smartest universities. Apart from job opportunities, industries also look for clever students who can really mean the business of research and create new ideas. As a result, the best universities are responsible for many of the discoveries that have made the world a safer, richer and more interesting place. Again, top universities in the world are always in a race to build a competitive advantage to achieve a higher ranking. The amount of knowledge transfer by any university is counted while assessing the world ranking of the universities which also allures students.

Maritime Arena for Higher Education

Nations are now becoming more and more dependent on sea and resources in and around. The issues which we generally face and would likely to face in future in maritime education, training and research sectors of maritime arena need to be addressed with special care as they demand specialised skills. For making the best uses of the resources and to build a sustainable ‘blue economy’, the need for a comprehensive policy to create competent human resources is imperative. With the rapid rise in the development of new technology, and increasing competition in extracting benefits from the sea there is also an urge to create new knowledge on the field and it demands efficient human capital to operate modern platforms with state-of-the-art gadgets for commerce and conduct scientific exploration and exploitation of oceans. Research on maritime affair subjects is an expensive task. Most of the times it becomes gradually burdensome for any single institution to conduct higher education and research on such a complex environment. Transfer of knowledge and technology matters may be better handled through collaboration or in alliance with different research institutions, universities and organisations within the same country or in different countries. The process of building a strategic alliance is a complex and difficult issue but not impossible to perform. Some of the institutions in smaller states in the African continent, e.g., Ghana have become successful in building partnerships with world reputed universities and performing excellent work. The people who would be in the helm of affairs in raising the institutions have to know the art of negotiation and patience to engage with world-class institutions as well as fund supporting bodies. The methodologies of building alliances must be well understood by all concerned.

The Modality of Alliance Build Up

Organisations enter into strategic alliances or develop partnerships for numerous reasons. In the field of education, people have been doing it by communities in different forms since long. Jewish community have an education alliance programme in New York since 1889 for Eastern European Jewish immigrants. Organisations have been benefited through better cooperation both from within and outside the national boundary.

Within the national boundary, benefits are:

- a. It gives access to new opportunities.
- b. Improve competitiveness.
- c. Collaborate on technology and development.

- d. Acquire new competencies.
- e. Open up expanded opportunities.

Outside the national boundary, opportunities are:

- a. To build a presence in a foreign country.
- b. Capitalise on technological resources and information age revolution through collaborative partnerships with other sound organisations.
- c. Assemble more diverse skills, resources, technological capabilities and competitive capabilities than an organisation can assemble alone.
- d. Gain access to technology and expertise in a cost-effective way.
- e. Gain 'inside knowledge' about unfamiliar areas.

Alliances are not always very successful if they are not meant to follow the mutually agreed terms and conditions. A study in the USA revealed that about two-thirds of alliances in the USA were not successful. Major reasons for weak alliances are, a. The inability of the partners to work together. b. Failure or delay in responding and adapting to changes in the internal and external environment. c. Lack of willingness on the part of partners to negotiate the terms and conditions of alliances. d. Failure of the partners to value the skills and resources each partner brings to the alliance. e. The rivalry between the partners, and f). The inability of the partners to ensure win-win outcomes from the agreement.

The strategic alliance becomes successful and would sustain if the partners become serious in ongoing commitment, mutual learning, and close collaboration on a continuing basis. But each organisation must develop its expertise for attaining leadership in the respective areas.

In order to create a good partnership, the OECD (2006) offers succinct insights into the nature and function of partnerships in the knowledge economy, viz:

A partnership brings synergy within parties. Successful partnership enhances the impact and effectiveness of action through combined and more efficient use of resources; promotes innovation; and is distinguished by a strong commitment from each partner. Co-operation within a partnership is collaborative; it will be effective if the partners share a strategic vision, pursue compatible targets. The key to success for the partners is the co-creation of an intellectual asset under the partners' control and this requires a deliberate series of actions to embed the knowledge as a changed capability.

Spence (2006) developed clear rules for the development of good partnerships, which are summarised here:

- Look for common ground; find shared values, personal experiences. Pay attention to and give feedback; accept differences.
- Learn about others; consider their perspectives and needs, appeal to highest motives, let others express freely.
- Critique results, not people; make others feel good, avoid criticism and put-downs.
- Give and get respect, considerate and friendly, put yourself in other person's shoes; be responsive to emotions; speak with confidence but remain tactful.
- Proceed slowly – one idea at a time; check for understanding and acceptance before the next. Speak in an organised and logical sequence.
- Be explicit and clear; share ideas and feelings; pay attention to non-verbal communication;

eye-contact. Select words that have meaning for listeners.

- Communicate clearly and concisely.

Principles that Complement Good Partnerships

Placing less emphasis on:

- a. Defining the right business arrangement
- b. Creating end metrics
- c. Eliminating differences
- d. Establishing formal alliance management systems and structures
- e. Managing the external relationship with partners

Placing more emphasis on:

- a. Developing the right working relationship
- b. Creating means metrics
- c. Embracing the difference
- d. Enabling collaborative behaviour.
- e. Managing your own internal stakeholders

(Harvard Business Review-Jonathan Hughes and Jeff Weiss, November 2007).

It has been found that strategic alliances may fail due to many reasons, such as lack of shared vision, over-or under-investing, poor governance and lack of trust, and lack of adaptability of the partners in the alliance.

Existing Alliances of Universities

Alliances are established regularly between two or many universities. University partnerships provide a huge amount of opportunities for students and staff alike. Along with research opportunities and cultural awareness, institutions can offer international experiences including study abroad programmes and staff exchanges. In terms of teaching, benefits include curriculum development and degrees formed in collaboration with partner institutions. Forming international university partnerships helps students in two main ways: For domestic students, it offers the opportunity to travel internationally via any programmes which may have been set up – and vice-versa for students at partnered universities.

Strategic Alliances in Institutions of Higher Education: A Case Study of Bandung and Bali Institutes of Tourism in Indonesia.

Results of research on strategic alliances in higher education in Indonesian tourism sector can be used as a reference for higher education providers in tourism at regional and international levels.

Findings: Sekolah Tinggi Pariwisata (STP) Bandung and Bali have carried out various strategic measures through the improvement of both their internal and external environments. Strategic alliances with other institutions are oriented toward the improvement of the quality of education. This is in accordance with the vision and mission of the institution where priorities were put on joint programmes, organisation of students' internship programmes, support for the development of educational institutions, and optimising the implementation of the three responsibilities of higher education in Indonesia, both in terms of quantity and quality, along with building a culture of research for lecturers.

Practical Implications: This study confirms the importance of strategic alliances between institutions of tourism education, at the national, regional, and international levels, that are producers of human resources for tourism for the government. Being graduates, they serve as competent members of a government agency responsible for managing a destination or other tourism sectors, at local, provincial, national, regional, and international levels.

Social Implications: This study also implies that the Ministry of Tourism should implement the model of strategic education management through strategic alliances, so as to increase the capacity of the human resources for tourism, thus directly or indirectly contributing to the quality of area: city/regional or tourism destination.

Alliances in the African Continent

In 2015, fifteen universities from eight African countries had launched an alliance of research universities, at the African Higher Education Summit in Senegal's capital Dakar. The focus of the group had been to build African research excellence as a "vital precondition" for the continent to develop and exert control over its future. Leading institutions with strong research and postgraduate training joined the African Research Universities Alliance, or ARUA, with its first chair being Dr Max Price of the University of Cape Town. The alliance follows in the footsteps and shares the aims of other research university consortiums around the world – such as the League of European Research Universities and the Group of Eight in Australia – that advocate for strengthening research and postgraduate training in higher education. "The primary focus of ARUA is to build indigenous research excellence with the intention of asserting Africa as a powerful global force." There will be three main thrusts to the work of ARUA – improving training and support for PhD students, capacity building to enhance research management, and collaborative research. Cooperation, said Price, could lead to joint PhD programmes, better support for young researchers and the ability to keep them within Africa, and research initiatives that spanned several universities – such activities could be a game-changer for African research.

Indian Global Higher Education Alliance

The College Board formed the India Global Higher Education Alliance ("India Global Alliance") to provide a platform for innovative Indian universities to engage with the world's most prominent universities to drive access and excellence in undergraduate preparation, recruitment, admission, and enrolment practices. The India Global Alliance convenes universities in India with prominent universities globally to foster collaboration and sharing of best practices to advance access and excellence in higher education. The alliance aims to ease the transition through a community of innovative leaders from the education sector.

The International Alliance of Research Universities (IARU)

IARU was established in 2006, which is a network of eleven international research-intensive universities from nine countries across the globe. The eleven members share similar values, a global vision and a commitment to educating future world leaders. Central to these values is the importance of academic diversity and international collaboration as reflected in IARU's principles. The IARU Secretariat is also located at the University of California, Berkeley. IARU's vision is "To address the major challenges of our time". IARU members have agreed that the alliance should operate in accord with a set of principles, some of those are:

a. The alliance would be strategic, drawing together a select group of research-intensive universities that share similar values, a global vision and a commitment to educating future world leaders.

- b. The alliance aims to add value by providing opportunities to students and staff that would not arise otherwise, allowing members to achieve things they would be unable to achieve on their own.
- c. The alliance would offer the opportunity for substantially deeper and more wide-ranging associations than usual international university consortia or groupings.
- d. The alliance would bring a new dimension to members' international activities, including new opportunities for international research, teaching and learning.

The New Alliance of Asian Universities

Top leading Asian institutions formed new universities alliance in 2017. The new group will promote student mobility among member institutions and countries and is expected to be a catalyst for expanded research activity and scholarly exchange. The Asian Universities Alliance (AUA) was launched in Beijing on 29 April 2017 with an initial membership of 15 universities from across the region and seed funding of USD 1.5 million from initiating member Tsinghua University. The new association aims to promote student and faculty mobility within Asia and to promote collaborative research among member institutions. “Asian universities should improve their global reputation and impact through co-operation and exchanges with international counterparts,” added Tsinghua University President Qiu Yong. A prominent consortium of Asian institutions could have a broad influence on international mobility, tilting the balance further in favour of students staying within the region as opposed to heading out to leading destinations to the west.

The Alliance of Technology Transfer Professionals (ATTP)

The Alliance of Technology Transfer Professionals (ATTP) is an alliance of eleven knowledge and technology transfer associations. ATTP was formed in March 2010 and is registered as a not-for-profit company limited by guarantee in Scotland. ATTP’s mission is to promote and maintain global standards in knowledge and technology transfer.

Maritime Higher Education: Issues and Remedies

With ships becoming more automated and digital every year, young students should be given exposure or at least a glimpse of what they can expect while working on future ships. The global maritime education system is in a way very rigid and slow to adopt changes and to keep with the pace of the ever-evolving world. This may eventually lead to disturbances in the growth of the maritime sector as a whole when young trained students from maritime institutes join the industry. The maritime education sector thus needs to be more flexible and should adapt to the changes that are going on and are necessary for the maritime sector as soon as possible. Maritime universities in the world are not many. But there are maritime institutions in all of the maritime countries of the world. Formal alliances are there with many public and private institutions. The practice of signing MoU is on and many of these are frozen as filed documents. We need to be proactive to make working relations in fulfilling the mutual objectives. Maritime cooperation efforts are complicated by a number of issues.

Efforts to cooperate in maritime education and training are often faced with a range of barriers, of a structural and/or practical nature: a. Variation in the national characteristics of maritime education and training, including its public or private nature. b. Mutual recognition of qualifications is at times very complicated. Maritime education system responds to a national system of academic job titles and academic reconnaissance. For example, a person that studies in

the UK will be granted with a British academic title that will not be recognised in France, whereas in France, North African titles are more recognised as they are more or less similar to the French system; IMO should monitor these activities and coordinate to resolve. c. Insufficient capitalisation on past experiences. For example, the choice of a wrong cooperation framework and underestimation of the sustainability issue; d. Lack of understanding and interest in the maritime sector among mainstream institutions and education organisations; Building proper partnerships on pragmatic framework may resolve the issues. e. Financial barriers which do not allow the continuation of cooperation unless new funding schemes are made available; difficulties in ensuring the continuation of project-based networks of collaboration in the long-term.

Bangladesh National Education Policy

The national education policy 2010 of Bangladesh is considered as one of the best and most practical education policies ever formulated in Bangladesh. The Bangladesh government passed the “National Education Policy 2010” under the Ministry of Education. This Policy had 28 chapters and 3 Annexure. In chapter 8 of this policy “higher education”, the aims and objectives of higher education are alright with the provisions of growing up free-thinking, creative, humane citizens. One of the aims of higher education is the innovation of new areas of knowledge through research and creativity. Allocation of funding is very limited for research and this does not create an initiative to do class research work. This policy also suggested strategies to attain these goals stated in it. The strategies suggested updating the curricula and syllabus of higher education to meet international standards. Building alliance would enable the local institutions to set a new benchmark and improve the standard.

Issues of Maritime Education in Bangladesh

Bangladesh government took the historic decision to open the first specialised maritime university in Bangladesh under the name of the father of the nation Bangabandhu Sheikh Mujibur Rahman. A few departments in three of our public universities had been conducting courses on marine science. BSMRMU has now the major challenge to work as a central university for the maritime environment. Major current challenges are inadequate infrastructure, research facilities, and over and above skilled and qualified resource persons. Collaboration with reputed maritime universities would definitely strengthen her capabilities in order to achieve excellence and world ranking. A regional network within the Bay of Bengal area may be formed to build confidence and share resources where possible.

Under the fourth Sustainable Development Goal (SDG) on inclusive and equitable quality education and lifelong learning opportunities for all, Target 4.3 states that, by 2030, countries should provide equal access for all women and men to affordable and quality technical, vocational and higher education, including university. Achieving this target will facilitate the achievement not only of SDG4 but also of all other SDGs.

Conclusions

Building a strategic partnership or alliance between maritime institutions nationally, regionally and internationally is important to make the best use of resources. Bangladesh is a developing maritime nation and is on the right path now to build her sustainable ‘blue economy’. Bangabandhu Sheikh Mujibur Rahman Maritime University, Bangladesh has a greater role to play as a central platform to strengthen its ties with global partners. More emphasis is to be given to training the researchers and experts who would work both in the industry and academic arena.

A strategic alliance between the institutions would be effective if the stakeholders follow the common guiding principles.

The following recommendations are made for maritime professionals: a. Align quality standards across the coastal partners; as there is a need to earn credits in education. b. Target the real needs – that are future-oriented and that respond to real challenges and problems; carefully establish the right framework conditions – take the time to build up the trust step-by-step. c. There has to be a pool of resources to make joint use of expensive equipment, such as maritime simulators or training ships. d. Build on experiences gained – take into account lessons learnt from previous initiatives and avoid re-inventing wheels. e. The private sector may be engaged more and more – as they know best what the labour market requires, and which may help to create job opportunities. f. Develop blue career initiatives – that promote overall awareness and attractiveness of maritime professions to youngsters. g. Create joint programmes and open maritime seasonal schools/ institutions. h. Explore e-learning opportunities – especially as the costs for covering travel distances across the sea-basin are high, and as e-learning offers opportunities to take part in training outside the seas; j. ‘Marinate’ existing Vocational Training Curricula – make use of existing and established training offers, but ensure that it is adapted to the specificities of the marine environment. k. Create and promote maritime sectoral clusters; l. Maintain an open dialogue between private and public stakeholders; m. Strengthen the competitiveness and support of the clusters; n. Lead the sectors towards innovation-based economies; f. Propose to Government maritime policy and infrastructural improvements; g. Lead towards the creation of increased added value and future proof job h. Encourage transfer of knowledge between academy and business; i. Promote maritime cultural awareness and education opportunities locally; j. Maintain inventory, statistics and progress of sectoral clusters; and k. Promote and participate at national fora and internationally.



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Consolidation of Maritime Training for Better Employment

Capt John Lloyd

Abstract

With changing technologies, workplace practices and constantly evolving demands in the maritime sector, the role of the mariner has always required training beyond that mandated by the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers or STCW. At the same time, sector-specific operations are being developed that have a growing need for specialist skills in the areas such as the renewable energy sector, passenger vessel command and control and a general increase in highly sophisticated support technologies both on board ship and ashore. The maritime industry is faced with the conundrum that, as systems and operations develop in both sophistication and reliability, how do we ensure that the mariner remains properly trained and qualified in meeting the rigorous demands and is ready to respond to emergencies or system failures? This paper explores the key roles of training and continuing professional development which can counter skill fade as well as enhance the mariner's overall capability and efficiency in a profession that is key to world trade and environmental protection. It identifies how training draws upon the experience of lessons learned through previous incidents and how mariners can benefit from case-study analyses to understand their own capabilities and limitations. The paper also identifies how leading institutions and vessel operators are utilising advanced simulation capabilities to improve operational effectiveness and safety.

Keywords: *Training, Technology, Conundrum, Professional Development, Capabilities.*

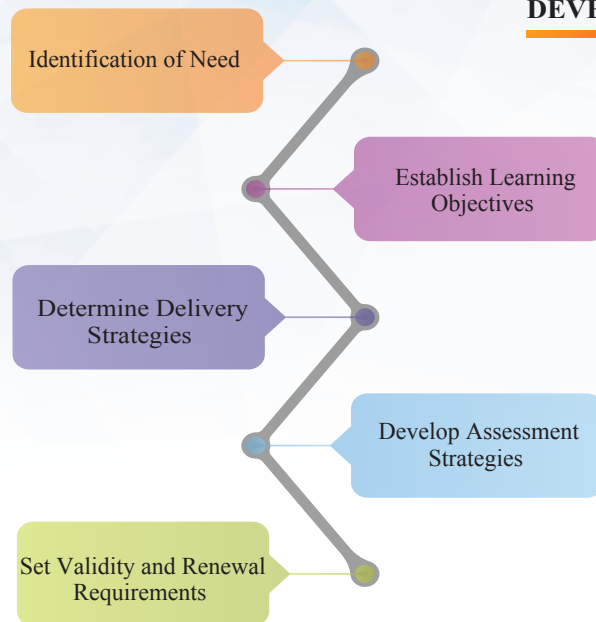
Introduction

The marine industry operates in an ever-changing environment so it is imperative that our mariners are updated with changes affecting their work including new regulations and developments of the latest technology. Fulfilling the STCW qualification is only the basic, minimum, requirement in respect of competency. To be suitably qualified for a type-specific ship, the mariner must also have the requisite experience and have to pursue additional qualifications and training. 90 per cent of our goods are transported by sea and to do that safely and efficiently and effectively is the key responsibility for a successful nation. There is a great change in autonomy and automation. Training is changing as well and the ability to use the modern simulator to draw upon the internet for knowledge and information transfer is really quite useful. Perhaps that is not moving with high-speed ferry but with slim sophisticated passenger vessel. Finally, there is a framework of regulations and they are moving with the speed of arbiter.

Identifying the Need for Professional Development

Historically the maritime sector has relied upon 'case history' in the development of regulations and requirements for ships and personnel. Examples include the introduction of SOLAS in response to the TITANIC disaster and the advent of MARPOL following the TORREY CANYON grounding. New Safety of Life at Sea (SOLAS) Regulation many years later in the 1960s there was huge oil pollution south-west coast of England. The ship called the TORREY CANYON had spilled oil all over the ocean, all over the coast of France and the southwest coast of England and following on from those tighter regulations for marine pollution were introduced.

DEVELOPING A CPD COURSE



The standard of training of watchkeepers began in 1978 with the introduction of competence of seafarers' amendments in 1995 and further amendments in 2010. So, the regulatory framework is responsive but not proactive. Introducing changes is a difficult task as it has to be done by the consensus of the signatory members of IMO. So inevitably it drives towards lowest denominator, the lowest acceptable standard internationally and because of that, it discourages innovation.

Today onboard inspections, requirements of charterers, guidance on best practice and interviews with professionals go some way to identify areas in which the seafarer can benefit from additional training. One example that has proved to be increasingly popular is the demand for explicit training in areas such as bridge resource management and type-specific training for specialist equipment. Of course, these professionals already hold the requisite license for service on board the ship. What is missing is specific contextual professional development that addresses the application of that knowledge in the context of the vessel type and the vessel's operation.

The skills needed for the future are hard skills (computer and analytical skills) and soft skills (critical thinking, creativity, problem-solving). The present seafarers actually have technical competence. Seafarers are prepared for today and yesterday but not for tomorrow. Because of the checklists, a whole compliance culture and deeper profound understanding are needed because it is a human ability which can use this information properly. When the expert bodies like seminars, trade unions, professional bodies are brought together, the skill requirements for the future can easily be defined.

Developing a CPD Course

By their very nature, Continuing Professional Development or CPD courses are usually discretionary either on the part of the DPO or the company considering their need. There is no fixed regulation that says the specific course must be done. It follows that any such course must be very focused on a definable need and must have a specification and integrity that is internationally consistent, meets the industry need and enhances safety if it is to be widely adopted. Developing such a programme requires extensive customer consultation and development in order to consider the needs and expectations of the sector.

There are a number of key phases to be addressed in the development of a CPD course. These include:

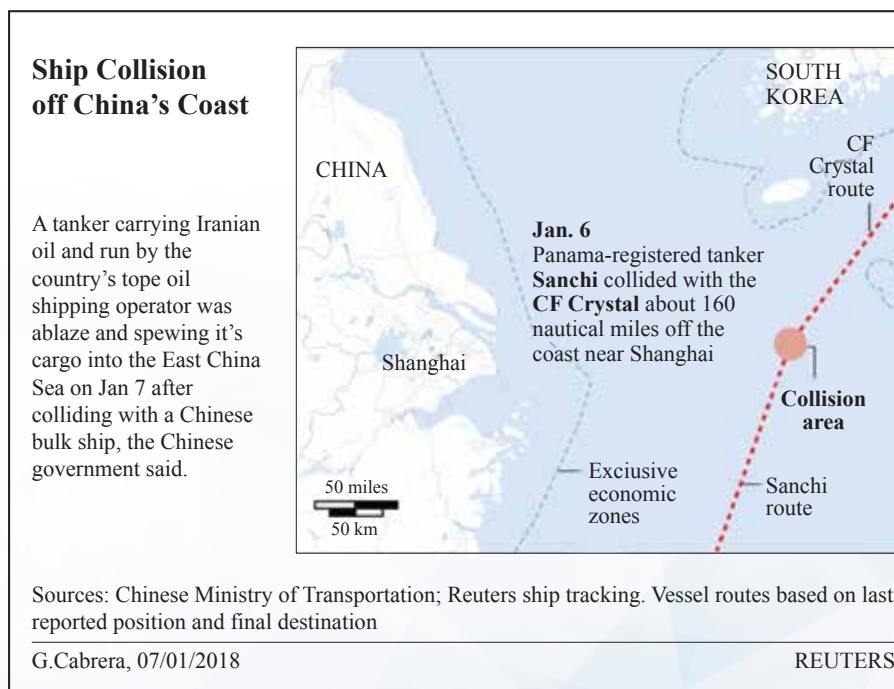
- Identification of the need
- Establishing learning outcomes
- Determining delivery strategies
- Developing assessment Strategies
- Setting validity and renewal requirements

The process of identifying the need has been identified earlier in this paper and the other steps are explained in further detail below:

Establishing the Learning Outcomes

This body of work determines the learning syllabus required to be covered by the student and which must be delivered by the learning resources. Typically training centres, operators and employers will be engaged with during this phase of development. Once the scope and a scale have been established the training centres are then usually best placed to advise on the delivery strategies. The learning outcomes may be knowledge-based but in key operational areas are likely to include an important component of practical competency-based outcomes.

The Mariners have to be trained to use the equipment. The new innovations can provide new opportunities. For example, using the Google map is like the job of a navigator. Instead of using a paper map which gives a single layer of information, the multiple sources of updated information in real time can be obtained and that requires more skills and all these have to be reflected in the curriculum. For that, the national initiatives are good opportunities but mostly rejected by the most maritime nations including the UK. In this regard, the industry can help by delivering effective partnership between the ship operators and the equipment because it is the only way to introduce new equipment to a human, who can reintroduce them and think about the new information, evaluate it, process it and reach a uniform decision by truly delivering on proper value.



Delivery Strategies

These are typically developed utilising the experience of the training centres and maybe classroom-based activities, Computer-based learning, simulation activities or a combination of these and other learning methodologies. This phase is critical in establishing the resources required for delivery and also inform discussion about the assessment strategies. Delivery and ‘student experience’ should be established in the context of the Quality Management System with provision for learner feedback and opportunities for improvement noted and implemented through course management procedures.

Assessment Strategies

Assessment strategies complement the learning and ensure that ‘learning has taken place’. Training centres will often be best placed to offer advice on effective techniques for assessment. Often an independent test such as a remotely-managed on-line assessment can form a component of the assessment regime. In the case of the Nautical Institute, candidates log-in using their unique identifiers and their assessment results form part of their personal DP training records. Statistical analysis of the results provides feedback on student performance, centre delivery and curriculum focus.

Learning from Others – Case Studies

When the ships are taken to the sea, previously unexplored regions are explored including the polar ice caps and so new challenges may arise. That’s the new frontier of the polar code introduced to help is to address those areas. So the question comes how can technology be introduced to support the Mariners effectively? That’s the responsibility of maritime training institutions, ship manufacturers to support and enhance navigation and the effectiveness of the safety of the sea transport. Already there is automation in many areas such as the automatic pilot coast checking, the electronic charts, engine monitoring, fire protection etc. So, the question is what we have at the moment is working for us or not. It is not working as well as it should have. The collision between CF Crystal and a vessel called the Sanchi occurred in clear visibility. Both vessels were fully manned, had in-depth flag registrations, in-depth inspection with no materials defects and yet still they managed to collide in good weather conditions. It’s an abomination that the Mariners have not been trained to use to that equipment and this incident caused the loss of thirty-two seafarers, twenty-nine Iranians and three Bangladeshis.

So it becomes important for educating the mariners to use the equipment effectively. The accident occurred due to over-reliance on a single source of information and a failure to use the resources available to them properly. It is true that automation helps relieve stress, repetitive tasks, boredom, and fatigue but at the same time it degrades manual skills and leads to over-reliance on it as noticed in the Sanchi incident. The information given by the machines is taken for granted. So, the Mariners are required to be given the skills to reject the narrow view and take into account as much information as possible.

The maritime community puts a great deal of effort into noting accidents and incidents with a view to developing safer operations. There are numerous excellent resources available in this regard including the Mariners’ Alerting and Reporting Scheme (MARS) run by the Nautical

Institute, the CHIRP (Aviation and Maritime Confidential Incident Reporting programme) as well as safety bulletins issued by IMCA. MTS issues guidance in a number of formats often based on best practice learned from incidents and accidents. The importance of case studies should not be underestimated. Indeed, at IMO’s HTW 5/7 this was raised by China who proposed that:

“following consideration by the HTW and III Sub-Committees, HTW might consider a number of relevant elements and develop guidance on the application of marine casualty cases and lessons learned to seafarers’ training and education such as:

- a. Select suitable casualty cases and lessons learned for maritime academies
- b. Use human factors of any casualties in different teaching sessions of the training courses
- c. Identify the happening process and root causes of applicable casualties
- d. Train seafarers at management level, operational level or support level in different ways and using different key points accordingly”

Conclusion

Continuing professional development is the marquee of the professional mariner. A focus on constant improvement, engagement with peers and sharing of best practice helps elevate safety and understanding in a complex environment. As technology continues to move at a greater pace than regulations can match, the responsibility of industry to train its practitioners reaches a higher level of importance. For CPD to be effective it must meet the needs and expectations of both the individual and the employer or sponsor and at the same time become accessible and affordable to the individual. Courses and programmes monitored on an international scale by an independent organisation of high standing, experience and professionalism help to ensure consistency of expectation and delivery. The industry believes in remote and autonomous ships particularly in more sophisticated machinery which are more efficient and cheaper to build but they must be supported by sophisticated shore structure that supports the people who remain onboard. The large scale unmanned ships will not be seen across our oceans in the foreseeable future. And it is leadership, creativity, and exploitation of those skills that will enable the organisations to strike the right balance for the future. The best of technology needs to be received that will elevate not eliminate the people from their workplace and that goes into the learning environment as well. It has to be ensured that the learning environment is modern. All these things will come ahead with remote sensing and increased monitoring and a lot of teamwork, modern supervision from the shore is necessary. With that innovative learning, flexible and innovative legislation coupled with responsible employers, more benign and effective environment has to be created for mariners of the future. If that can be done instead of striving competence, critical thinkers will strive towards their way to be expert practitioners and that’s how Bangladesh can stand up to that place. Looking at the curriculum, seeing what are the challenges are, skills for the future are all that is needed for getting ahead of the competitions on the basis of quality but not quantity.



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Need for Maritime Higher Education in Bangladesh

Prof. Ainun Nishat

Abstract

Bangladesh has geographical advantages in the Bay of Bengal and may take the opportunity of having world-class maritime education to get a share of the global job market in this area. But Bangladesh is lagging behind in the process of providing maritime education to create qualified seafarers for occupying global seafarers' job market and also to create necessary workforces for extracting ocean resources. Existing institutions of the country are unable to attract the students to choose their career in the maritime sector due to lack of awareness and absence of a proper structure for maritime education. Presently lots of development/mega projects are in progress along with coastal belt regarding port development, shipping and shipbuilding industries, energy hubs, offshore engineering, alternative energy, SEZ's and other coastal industries. But we are still heavily dependent on foreign expertise for planning, developing and managing these organisations. This is mainly because in Bangladesh the young generation is not yet very keen to undertake maritime profession as their career choice. Hence, a modest beginning has started with the inception of BSMRMU and other oceanography/fisheries related faculty in new universities. This is now high time that our education system should include adequate space for maritime education (both secondary and higher) whereas all public and private maritime enterprises should demand homegrown maritime professionals in the job sector.

Keywords: Maritime Education, Qualified Seafarers, Career, Foreign Expertise, Job Market.

Introduction

The need for higher maritime education is well established and it does not need to be reestablished. The economy of Bangladesh is growing very fast. Bangladesh has sustained more than 7 per cent GDP growth for the last seven years and it will go into double-digit very soon. Therefore, there would be a need for trained professionals in various fields. Opportunities for employment abroad must also be availed. The opportunities should be grabbed from anywhere like the Philippines who provide half of the mariners globally. These opportunities can be availed from two sides; one is from growing demand inside the country and the other from the growing demand outside of the country.

Because of automation, some types of jobs would be reduced. Then, equally a number of people will be required to run the equipment. We need to find out the right discipline or right area to train our people. Maritime Education and Training (MET) programmes are age-old subjects. From seafarers of ancient times, various domains of the professions have evolved through ages with improvement in instrumentation, science and technological innovations.

In Bangladesh, merchant mariners have been professionally active from early days of known history. In Noakhali there is a place known as “chagol-naiyya” which is possibly “sagar-naiyya”. Maybe two thousand years ago seafarers would visit most of the parts of the world. The Chinese used to call Chattogram port as ‘Che-ta-gong’ meaning ‘the great western port’ which was the exit for Kunming, the western side of China. The Portuguese called this great western port as “La- Porto-Grande”. Sandwip was known for the construction of sea-going vessels. It was a naval port for the merchant mariners.

Initially, Maritime Education and Training (MET) was focused on shipping, seafaring or the mariners but now it has a broad coverage. Naval architecture, marine engineering, maritime law, oceanography, marine biology etc. are well-placed areas of specialisation. In developed countries, new subjects such as ‘Marine Archeology’ have emerged. A new boat has just been discovered in the Black Sea which is about 2500 years old and it is maintained with intact manner.

There are internal standards and rules which have to be followed. The 1978 International Convention on Standards of Training, Certification and Watch-keeping for Seafarers has set the international benchmark for seafarer training and education. Significant amendments to the convention were adopted in 2010 in Manila.

Higher Education

Higher education stands for the tertiary level of education. There are four layers in it as follows:

- Bachelor’s level
- Master’s level
- Doctoral level
- Short course

Each would have a different approach. The short courses can also be added to the university’s programmes. In the undergraduate level, many subjects are being included in undergraduate programmes which are not correct. In the USA, the students can graduate with 120 credit hours in a two-semester system. Conversely, in Bangladesh, 160/180 credit courses are being offered and unnecessarily the students are getting overloads.

METs are professional programmes; therefore, it must be job/employment oriented. The parents who send their children would expect to get a job based on the training or education their sons/daughters have got. It’s not like Denmark where someone with a degree in maritime archaeology becomes an income tax officer. So, while designing the curriculum, the employment issues have to be thought about. Such jobs may be available within the country, or, at the global level. Therefore, the university should maintain the global standard.

At the undergraduate level, the curricula should not be narrowly focused on hard-core technical/professional topics. The command over basic sciences, as appropriate, must be aimed at. For example, if students are studying oceanography, they should have a strong base in mathematics. Language and communication skills must be developed; and, a socially responsible citizen must emerge. For example, in the United States, all undergraduate courses require a course on history and sociology. At the postgraduate level in which the specialisation comes in and the students have choices. The curricula should be aimed at specialisation in chosen subjects. At the PhD level, the aim should be producing confident researchers with appropriate skills for undertaking research independently. The output of the research is not significant. The important thing is that the students must master the techniques of conducting research. The university has a big job for professional development, continuing education by running short courses. Short courses may be organised as refresher’s course or capacity enhancement efforts.

The Scenario of BSMRMU

BSMRMU offers four undergraduate programmes on the fields of:

- Oceanography;
- Naval architecture and Offshore Engineering;
- Maritime law;
- Port management and Logistics.

In BSMRMU post-graduate programmes are offered in the fields of:

- Maritime Law;
- Maritime Business;
- Marine biotechnology;
- Maritime science

All programmes are relevant and they are based on professional subjects. However, the undergraduates will be groomed first as citizens and develop their capacity to understand any new thing put to them when they are going to specialise either through the employers or the postgraduate levels. Attention must be given to acceptance by Professional Accreditation Committees. For instance, maritime law programme should be recognised by Bar Council so that the graduates can practice general law.

SDG 14: Conserve and Sustainably Use the Oceans, Seas and Marine Resources for Sustainable Development

The graduates of BSMRMU will play an important role in achieving the targets of SDG 14. The types of fish which migrate or come in the Bay of Bengal are not clearly known. There is a dolphin called 'Irabati' of which global population would be 6500. Six thousand is between swatch of no ground and Hatia island. That could be a very good tourist attraction because few hundreds of dolphins jumping up but it has to be done in the winter months. There is a lack of knowledge about marine biodiversity about the whales and sharks that come into the coastline. So, Bangladesh needs to work on marine pollution control, healthy and productive oceans. St. Martin island is not a coral island; it has some coral colony and some marine weeds. Possibly it is the only island in the world in which the coral and the weeds go together. Better understanding needs to be developed on sustainable management and protection of marine and coastal ecosystems, sustainable management of fisheries, aquaculture and tourism, regulation of harvesting. The overfishing, illegal, unreported and unregulated fishing and destructive fishing practices have to be stopped. The marine and coastal areas need to be conserved in consistent with national and international laws and based on the best available scientific information. There are many international laws related to fishing and harvesting resources. Scientific knowledge has to be developed and research capacity and transfer marine technology have to be increased.

Conclusion

Maritime education and training at BSMRMU must be of high and consistent quality, as demand at the global level. The graduates should no longer confine themselves within the territory of Bangladesh; they have to reach up to the world. The people of our country expect to earn their livelihood from wherever they can avail the opportunities. The graduates must be skills based; competences based and require being able to utilise the latest technological innovation.



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Comments of Session Chair

Prof. Dr Rashed-Uz-Zaman

Bangladesh is on the right path to build her sustainable 'Blue Economy'. Bangabandhu Sheikh Mujibur Rahman Maritime University, Bangladesh has a greater role to play as a central platform to strengthen its ties with global partners. More emphasis is to be given to training the researchers and experts who would work both in the industry and academic arena. A strategic alliance between the institutions would be effective if the stakeholders follow the common guiding principles.

In achieving the sustainable 'Blue Economy' major challenges are inadequate infrastructure, research facilities and qualified resource persons. A regional network within the Bay of Bengal area may be formed to build confidence and share resources where possible.

The Mariners have to be trained to use the equipment. The new innovations can provide new opportunities. For example, using the Google map is like the job of a navigator. Instead of using a paper map which gives a single layer of information, the multiple sources of updated information in real time can be obtained and that requires more skills and all these have to be reflected in the curriculum.

Global alliances with the internationally renowned university and institution were one of the main discussions in this session. Collaboration with reputed maritime universities would definitely strengthen our capabilities. It was further been raised that the university should have its own strategies and most importantly a research policy to address these challenges.

It was highly pointed that BSMRMU just started its journey and they are optimistic and ambitious with set goals and objectives to become a centre of excellence in 'Maritime Education'. In summing up the session it was mentioned highlighting a Chinese proverb that "The Longest Journey Start with the Small Step". Therefore, the university would obviously reach to its set goal with this small step what it has started already.



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Session 4

Maritime Technological Innovations

Paper-1

**Energy Efficient Shipping and Smart Port -
a Vision for the Future**

Paper-2

**Alternative Marine Propulsion and
Sustainable Shipping Technology for
Developing Countries**

Paper-3

**Sustainable Dredging Technology for
Bangladesh Waters**

Session Theme

Maritime Technological Innovations

Technological innovations are moulding the future of the global maritime industry to its next stage of challenges. For instance, energy efficient smart ports, green shipping technology, sustainable ship recycling, offshore engineering, marine biotechnology etc. are few to mention among various maritime technological developments. These advancements, together with the integration of existing IT assets with systems onboard vessels and ashore, have driven efficiencies, improved operations and created savings across all organisations and businesses in the maritime sector. Advances in technological innovations have also resulted in safer, greener and more sustainable maritime industries across the globe. Due to global connectivity, it is imperative that the technological innovations, which take place in the technologically developed countries, are transferred to all other countries in order to stay abreast of the technological developments in the maritime sectors worldwide.

Energy Efficient Shipping and Smart Port - a Vision for the Future

Prof. Dr M. Rafiqul Islam

Abstract

The world population is now 7.7 billion and it is estimated that it will grow up to 8.6 billion in 2030, 9.8 billion in 2050. The urban population will grow faster than rural and world population. This fact will have a positive impact on seaborne trade. Currently, 90 per cent of the global trade is transported by ships. The environmental impact of shipping operations whether at sea or in ports have been known for decades, however, it is only recent years that the regulatory measures have been taken. The International Maritime Organisation (IMO) has announced that it would reduce greenhouse gas emissions from global shipping in half by the year 2050, and to make ships entirely Carbon dioxide-neutral before 2100. But long before that, the so-called sulphur cap will take effect from 2020 and all oceangoing ships must run on fuel that contains no more than 0.5 per cent of sulphur that leads to the green shipping concept. Green Shipping refers to the use of resources and energy to transport people and goods by ships and specifically concerns the reduction in such resources and energy in order to preserve the global environment from GHGs and environmental pollutants generated by ships. Smart Port is the new way of thinking and conception to maximise the existing capacities of the port and integrating different activities of a port in order to achieve maximum profit with the least available resources. Key regulations related to green shipping includes IMO regulation of MARPOL 73/78 convention of Annex VI which deals with pollution measurement. The IMO also has announced three ways to reduce GHG emissions which are: (i) Energy Efficiency Design Index (EEDI), (ii) Energy Efficiency Operational Indicator (EEOI) and the Ship Energy Efficiency Management Plan (SEEMP) and (iii) Market-Based Measures (MBMs). Currently, the world shipping industries are building eco-friendly vessels in their shipyards. They have started doing research and development of energy saving and carbon emissions reduction for ships, Air Lubrication System & eco-friendly ship technology which reduces GHG emissions. Major shipping companies like the Maersk Group, the COSCO Group, the NYK Line are now started ordering eco-friendly vessels. Even our neighbour country India is going to introduce a discount for all 'green' ships docking at the country's ports. Ships need a minimum score based on fuel consumption and emissions including sulphur dioxide and carbon-di-oxide. The ports in different countries are also offering incentives on fees for having green shipping technology of the vessel. For example, Port of Amsterdam 6 per cent reduction in port fees for tankers and cargo ships; Port of Rotterdam Port fee discount of 6 per cent -for tankers. India is also planning to run all government ports on green energy. Bangladesh is far away to ratify the IMO initiatives for GHES by reduction of SOx, Carbon dioxide and NOx whereas many of the countries in the world are taking initiatives for implementing green shipping and smart green port concept. To achieve Sustainable Development Goal (SDG) 13 of the seventh five-year plan, the country must take essential steps for green shipping and smart port concept through which IMO amendments and regulations could be responded and thus preserve the regional and global environment. This initiative will help us to become a developed country by 2041. This seminar paper will provide the overall picture on green shipping and smart port in the global and regional context and a number of recommendations will be made related to preparation of energy efficient green shipping and smart ports in Bangladesh based on the current scenario and international practices.

The Environmental Impact of Shipping

The environmental impact of shipping in operations whether at sea or in ports have been known for decades. Ships emit almost 8 per cent of global SO_x emissions and 15 per cent global NO_x emissions annually. Carbon dioxide emissions from the global shipping industry amount to approximately 1 billion tons per year, accounting for 3 per cent of the world's total GHG emissions. According to NASA's Goddard Institute for Space Studies (GISS), the average global temperature on Earth has increased by about 0.8° Celsius (1.4° Fahrenheit) since 1880. Two-thirds of the warming has occurred since 1975, at a rate of roughly 0.15-0.20°C per decade. One-degree global change is significant because Physical climate changes that can be identified or quantified per degree of warming include: precipitation increases or decreases by 5-10 per cent per degree of warming across many regions, the average September extent of Arctic sea ice is reduced by about 25 per cent per degree of warming, oceans continue to become more acidic (the average pH value of seawater continues to decrease), risk of very hot summers increases and amount of rain falling during the heaviest precipitation events increases by 3-10 per cent per degree.

IMO Initiatives

International Maritime Organisation (IMO) has announced its targets of cutting greenhouse gas emissions from global shipping in half by the year 2050, and to make ships entirely Carbon dioxide-neutral before 2100. Sulphur oxides (SO_x) will take effect from 2020 and all oceangoing ships must run on fuel that contains no more than 0.5 per cent of sulphur that leads to the green shipping concept. In this regard, some regulatory measures have been taken by IMO. The key regulations relating to green shipping includes IMO regulation of MARPOL 73/78 convention of Annex VI: (Prevention of Pollution by Air Pollutants)

Step 1: New building regulations concerning NO_x were applied to vessels equipped with diesel engines of 130 KW or more from July 1, 2010.

Step 2: Secondary regulations which started in 2011, aimed to cut NO_x emissions by a further 15 per cent to 20 per cent.

Step 3: Tertiary regulations, which began in 2016, are designed to cut 80 per cent of the current emissions in the ECA region.

IMO has announced three ways to reduce GHG emissions which are: (i) Energy Efficiency Design Index (EEDI), (ii) Energy Efficiency Operational Indicator (EEOI) and the Ship Energy Efficiency Management Plan (SEEMP) and (iii) Market-Based Measures (MBMs).

Global Initiatives

Europe, officially launched a joint research project called "LeanShips" (low energy and near to zero emissions ships), is an energy-saving and eco-friendly technological collaboration that is working toward effectiveness and reliability with an aim is to reduce ships' fuel consumption by up to 25 per cent; Carbon dioxide emissions by at least 25 per cent. In the U. S. one of the representative examples of eco-friendly ships is the Navy's Ship Service Fuel Cell (SSFC) project which develops eco-friendly power generation systems. Mitsubishi Heavy Industries (MHI), Japan has developed its air lubrication system which reduces friction by injecting air into the bottom of a ship and it can reduce the GHG emission up to 25 per cent. The Chinese government submitted a national plan for responding to climate change through which China is promoting the development of 'resource saving, environment-friendly' transport industry.

COSCO Shipyard Group, China has been developed the design of a "Clean Sky" LNG-driven

Kamsarmax bulk carrier since 2011 which is expected to reduce GHG emissions by a large amount because it can choose to use a dual fuel or medium fuel system from diesel, heavy oil and LNG fuels.

Incentive Policies for Green Shipping

Some incentive policies have also been taken to ensure green shipping. Singapore-flagged ships registered on or after 1 July 2011, which go beyond the requirements of the IMO's EEDI, will enjoy a 50 per cent reduction in fees. On the other, the existing ships which utilise energy efficient ship designs that meet the requirements for the Green Ship Programme will enjoy the 20 per cent rebate on ATT (Annual Tonnage Tax). The port of Amsterdam declared 6 per cent reduction in port fees for tankers and cargo ships and Port of Rotterdam Port fee discount of 6 per cent for tankers. India has started the process of setting up renewable energy projects at its twelve major ports by investing INR 7.04 billion (USD 104.5 million) as part of the country's Green Port Initiative.

Bangladesh is far away to ratify the IMO initiatives for GHEs by reduction of SOx, Carbon dioxide and NOx. In order to sustain and compete with the world maritime shipping industry as well as to achieve to SDGs, there is no alternative to take essential steps for green shipping.

Impact of Ports on the Economy

Well-functioning ports are important for a country's economic growth. Our ports are handling 90 per cent of the total export and import of goods. Bangladesh economy is the 43rd largest in the world in nominal terms and 31st largest by Purchasing Power Parity. It is classified among to the 'next eleven' emerging market economies. Bangladesh's economy is the second fastest growing major economy of 2018, with a rate of 7.3 per cent. Export of goods and services contribute 15.04 per cent of GDP.

Facts on Seaborne Trade

International seaborne trade growth is 4 per cent, the fastest growth in the last five year (UNCTAD 2018) and forecasted to grow 3.8 per cent during 2018-2023 which reflecting the world economic recovery and improved global merchandise trade. The containerised cargo growth rate is 6 per cent in 2017, 1.1 per cent and 3.1 per cent in 2015 and 2016 respectively. Asia accounted for 64 per cent of the total container throughput and containerised cargo growth rate is 1.8 per cent (China) and 6.2 per cent (Excl. China). Bangladesh (CTG) container handling growth is 9.6 per cent (2016-2017) and it is projected to increase. Chattogram port is the 70th busiest container port in the world (2018) as per Lloyds list based on container handling (2.5 Million TEU) compare to 71st in 2017, 76th in 2016 and 87th in 2015. Various metrics have been used for container port performance. These include utilisation rate, the productivity of crane, berth productivity, yard productivity etc.

Smart Port Concept

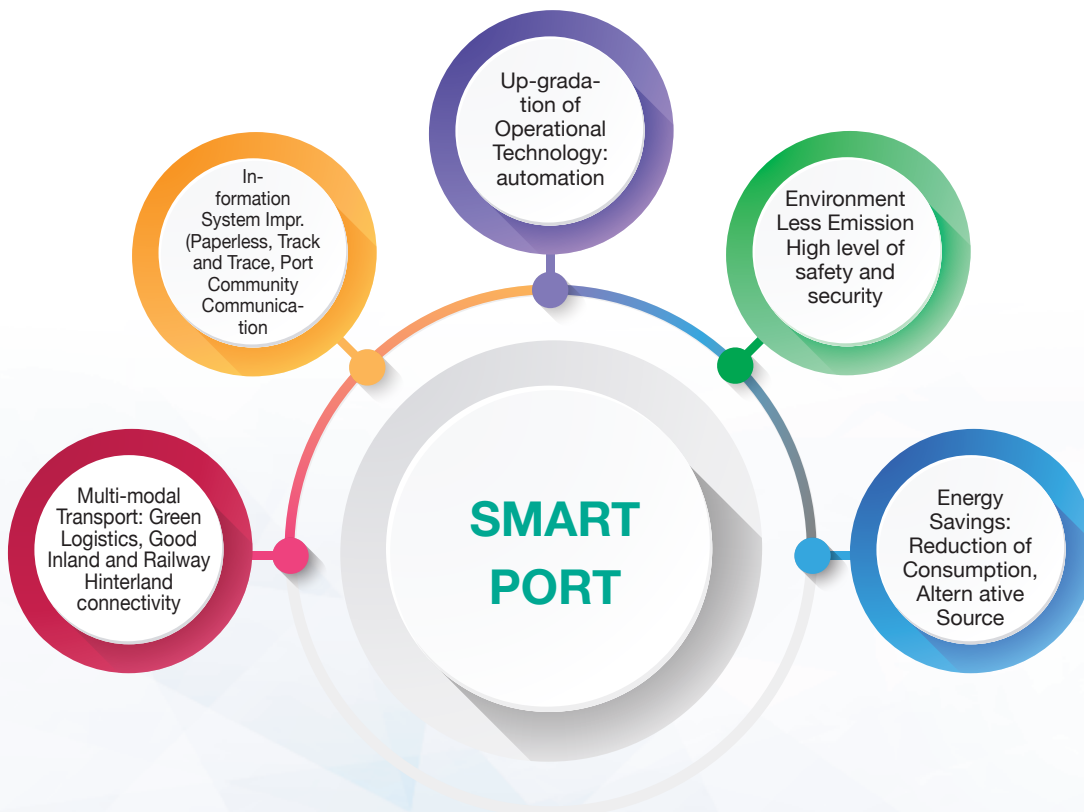
So, it is clearly understood that there is no alternative to technological integration in port. A smart port is one solution to improve port performance. A smart port is the new way of thinking and conception to maximise the existing capacities of the port by integrating different activities of a port to achieve maximum efficiency with the least available resources. It is mainly focused on three key areas of port competitiveness: operations, environment and energy consumption. There is no internationally accepted definition. However, IMO and EU are working to define Smart Port by 2020.

EU Initiatives

Europe, as per 2020 strategy, commits to the consolidation of a smart, sustainable and inclusive Europe. To align with these priorities, the smart port project was taken. The proposed work is first to define a smart port concept and then study the current situation of Mediterranean ports. Based on a study, a 17-member advisory board has been determined key factors of port competitiveness which include operational, energy and environmental aspects. Most importantly Port of Rotterdam Authority and IBM announced that they will collaborate on a multi-year digitisation initiative to transform the port's operational environment using Internet of Things (IoT) technologies in the cloud to be the smartest port in the world. Hamburg Port Authority, smart PORT project aims to build on the green energy strategy of the port, as well as focusing on intelligent traffic and trade flows. Overall, the project was established to provide quality information, both strategically and operatively, through measures concerned with traffic management. Port of Antwerp started the smart port project with T-Mining using blockchain Technology.

Initiatives by Asian Ports

The Maritime Port Authority (MPA), Singapore unveiled its smart port initiatives in early 2015. The new initiatives look at using mobile technology coupled with wireless connectivity to enhance the overall communications, productivity and maritime crew welfare in the Port of Singapore. Port Klang, Malaysia has taken initiative to become Smart port through Port Klang Net (Electronic Port Community System: Through accessibility-24X7+Anywhere + Anytime +



Any Smart devices). Under the Sagarmala Programme in India, various projects have been taken to increase the operational efficiency, capacity expansion and new port development by adopting Global Benchmark (Under Project Unnati).

Conclusion

Technology, in the form of physical and IT infrastructure, could be the best way to see benefits in a smart port environment. However which technologies and infrastructure are required to build a smart port? That should be decided based on current facilities. The study found that some IMO amendments have been taken so it is vital now to make necessary policy for the ratification of the IMO amendments. The research finds that for ensuring energy efficient shipping the following steps need to be taken by the world community:

1. Allocation of adequate funds for R & D relating to energy efficient vessel, renewable energy to enable 'blue economy' and reduction of GHE.
2. Making collaboration between industry and the academia.
3. Collaboration with technologically advanced countries for designing and building dual fuel, LNG fuel vessel and eco-friendly vessels.
4. Develop a ship to ship LNG bunkering system.
5. Appropriate training on energy efficient and eco-friendly vessels that address the inspection and certification.



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Alternative Marine Propulsion and Sustainable Shipping Technology for Developing Countries

Gavin Allwright

Abstract

We have seen a wind change in the industry over the last four to five years where it comes to shipping efficiency and this has gone hand-in-hand with steady growth in alternative marine propulsion systems and sustainable shipping technology, however, the uptake of these systems has been piecemeal at best. In contrast, the last 12 months has been a significant uptick in interest and installations of low emissions, ship efficiency and alternative fuel solutions in the market and since April 2018 and the IMO initial strategy for Carbon dioxide, calling for 'at least' 50 per cent cuts by 2050 from a 2008 baseline, that interest has grown dramatically. Therefore, with significant and ongoing price rises for fuel, the international sulphur cap expected to raise that further, what does all of this mean for developing countries and in particular Bangladesh? Firstly, this article will place those changes into perspective, focusing on the change drivers, the barriers & solutions to that and some examples of new build and retrofit projects to watch. For blue ocean vessels, I will highlight the growth of wind propulsion and wind hybrid solutions that are coming through the pipeline and into the market, presenting an interesting new market area. We will use a couple of examples of those projects to also explore a number of solutions that incorporate wind-assist systems along with optimisation, alternative fuels and how these are shaping a potential low carbon future. We will then focus on the developing world, the need to create a sustainable fleet for the regions that will see the majority of population rise and other pressures in the coming 50 years and the demands that will put on the maritime fleet. How will shipping integrate with the fuel developments on land? what solutions will be viable in which segments? and how will that transition to an alternative, fully sustainable system play out in the market?. Finally, we will explore a number of case studies that touch on three main areas of shipping, the international fleet, the domestic maritime fleet and inland vessels which are so key to Bangladeshi life.

These projects at an advanced stage of development or in the market and will provide the audience with a clearer understanding of the potential for change, rating performance and outlining the expected costs, returns and other commercial considerations along with the potential social and environmental impacts.

Introduction

The ships that are being designed and built today will be operating in a net zero Green House Gas (GHG) emissions world at the end of their commercial lifetime (20-30 years), meaning that every additional ton of carbon that is released into the atmosphere from these vessels will have to be compensated by a ton of carbon removed somewhere else in the world economy. The shipping industry is still very far away from a shipping fleet that delivers that and one must be reminded about the challenge ahead. The remaining carbon budget that is available to achieve the goal of restricting global temperature rises to 1.5° C, as specified by the Paris agreement, is very limited, with 5 years of current emissions or slightly longer, depending on whether the industry adopt a hard

stop or soft stop/overshoot and remediation approach outlined by the recent IPCC 1.5° C report (IPCC 2018). That report calls for 45 per cent reductions in global carbon emissions by 2030 if attempts are to get anywhere near meeting that target. In the face of this challenge, the shipping industry, with up to 3 per cent of global GHG emissions, is certainly not standing still, the International Maritime Organisation (IMO) interim strategy that was adopted in April 2018 calls for at least 50 per cent reduction in GHG emissions across the fleet by 2050, from a 2008 baseline, although that aims at a 2°C of global warming trajectory, not a 1.5° C one, it is still a significant move. The inclusion of the ‘at least’ clause is being very important. The industry is belatedly waking up to the need to fully decarbonise and in recent days, MAERSK, the largest container shipping company in the world has declared that it will be carbon neutral by 2050, a big step and clear message to the market.

The IMO projects a doubling of the world fleet by 2050, and world trade growth leading to 50-250 per cent growth in emissions if no mitigation steps are taken by then. With land-based emissions set to decline dramatically in the coming decade, a ‘business as usual’ approach in shipping would see its share of global emissions grow up to 17 per cent of global Carbon dioxide emissions in 2050, if left unregulated.

The shipping in changing climates project work has shown, the 1.5°C scenario will require ultra-low carbon and zero emissions technology uptake and operations to start aggressively in 2030 and grow to full fleet penetration by 2040 and this will mean large scale scrapping and bankruptcy through forced obsolescence and while a 2°C scenario pushes that timeline out further, this will still require drastic and far-reaching changes throughout the industry.

This article will try to put these challenges in perspective, taking a brief look at the developments in ‘Sustainable Shipping’ and the technologies coming through. It will explore some of the underlying themes, drivers and barriers the industry faces in delivering decarbonisation and using wind-assist technologies as an example will also highlight some of the opportunities in the market that may be applicable to Bangladesh and the wider regional fleet as it transitions to low and ultimately carbon neutral operations.

IMO GHG Reduction Submissions

International Maritime Organisation is responsible for the global regulation of all aspects of international shipping and has a key role in ensuring that lives at sea are not put at risk, including security of shipping, and that the environment is not polluted by ships’ operations – as summed up in IMO’s mission statement, safe, secure and efficient shipping on clean oceans. With these objectives, IMO is working across the globe. IMO has conducted some IMO GHG study and depending on the study it has submitted the IMO GHG reduction strategy as shown in figure 1.

Therefore, now the policymakers and some shipping companies are making bold statements of intent. There are the increasing realisation and pressure around the building climate crisis based on solid analysis on what the impacts of swift and deep decarbonisation strategies will likely be. However, the industry is faced with how to implement this huge transition, what technologies are available and which ones will deliver both the level of decarbonisation required and in an operational sense also live up to their marketing. However, the IPCC 1.5° C report submitted in October 2018 was a wake-up call to all concerned with the shipping industries, indicating that there are only 12 years until shipping industry reach to seriously challenging and potentially catastrophic benchmark and the report states a minimum of 45 per cent Carbon dioxide reduction will be required by 2030 prompting all to take deeper and faster action.

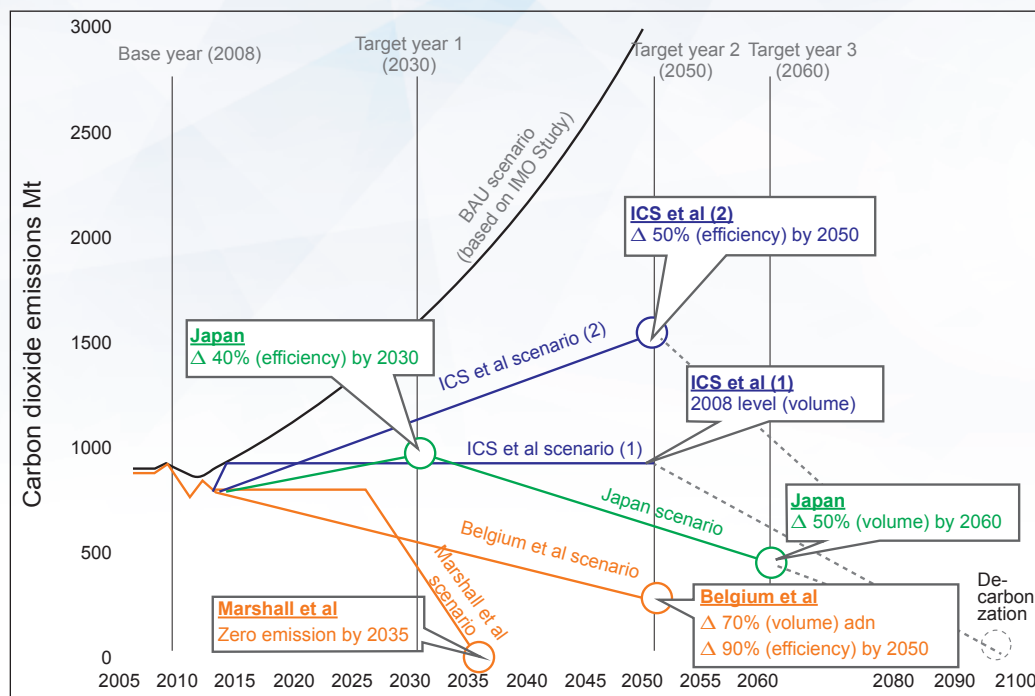


Figure -1: IMO GHG reduction submission

Current Situation of Sustainable Shipping

The three keywords to describe the current situation are, uncertainty, transition and volatility. Uncertainty, as mentioned above, derives from assessing which direction to take, which fuels will be available, does LNG provide a transitional answer, what IMO measures will be brought in and when etc. Most shipping companies have been focused upon ballast water compliance and more recently the worldwide low sulphur directive coming into force on 01 Jan 2020, but unfortunately, the scrubber/distillate options don't deliver much to the GHG challenge.

The transition is occurring throughout the industry, with digitalisation, alternative fuels, new designs, SO_x, NO_x, PM, VOC, GHG, hydro-phonic noise reduction, operational profiles, efficiency technology and so on. The industry is used to managing change, however, the speed and breadth of change have been accelerating and there is no sign of that abating. Finally, volatility, something that market dislike but is inherent in an industry so tightly tied to fuel costs. Predicting the future price of fuel is a very dicey activity, and the steep declines in bunkering costs in 2014-15 proved all of the predictions wrong, however with the pressures on prices on the increase, there are likely to be a period of increasing prices and regulatory restriction along with increased pressure from the customers to further green operations.

Policy Drivers and Market Projections

There are a number of key drivers in the market at present and these have been touched upon in the opening statement and could be classed as follows: Policy, Providers, Perception, People and Price. The policy has been clearly outlined and will likely strengthen in the coming years, especially from 2023 when the IMO GHG measures will be introduced (IMO 2018). Providers of technologies, alternative fuels and services are also an important driver, over the last few years an

array of companies are starting to deliver viable and credible solutions, the key will be to scale those quickly and efficiently. Perception is around the scale and intensity of the challenge and the understanding of the need to change have moved significantly but has not permeated all strata of the industry yet, but that is developing quickly as the impact on the bottom line is grasped. This change also links to People, where we are seeing a generational change from the boardroom, to the wheelhouse to the design team. A generation of mid-career professionals is coming into decision making positions that understand clearly the GHG challenge and can identify and act on the exciting opportunities that this challenge represents. All of these drivers are individually significant but it is collectively that is driving this paradigm shift. Due to the broad transition the industry is undergoing, if any one of these drivers softens, the others will be able to maintain the momentum, however it is in the economic area that the drivers are most significant and will drive all actors, not just those with the resources to be first movers or early adopters, so we come to price.

Fuel prices, as mentioned earlier have been moving upwards, with the usual corrections and fluctuations, HFO was averaging in October/November 2018 around USD 500/tn at Rotterdam prices, but significantly higher in peripheral markets (as is usually the case, and vitally important for small regional operators), ULSFO (USD 650/tn) and MGO (USD 700/tn). The prices on submission in early December 2018 have dipped by 20 per cent; however the price in for example Colombo, Sri Lanka is still around these levels or higher (<http://www.petrolbunkering.com/price>). Most observers expect the cost of distillate fuel to rise as the low sulphur regulations come in and the supply of low sulphur fuel will also be challenging outside of the main bunkering sites, at least in the short to medium term.

Another key medium to long term issue is the price of carbon and while shipping is currently excluded from carbon trading systems, the adoption of carbon pricing and the effects on customers, the supply chain and ultimately through levies or taxation on shipping, is predicted to rise dramatically. As an example; the EU Emissions Trading System (ETS) has seen a significant upward tick, over the last 12 months the price for a ton of carbon has increased from €7 to €20 and according to the Bloomberg.

It is seen by many traders as; “the best performing commodity on the market this year”. On future carbon pricing, the EU Carbon Tracker estimates €35-40/tn average through 2019-23 and Germany’s Berenberg Bank estimates that could rise to €100/tn by the end of 2020. That translates to at least USD 63/tn of fuel now (based on a ton of fuel producing approximately 3.1 tons of Carbon dioxide) and then up to a possible USD 330/tn of fuel in 2020. Currently, this does not directly affect shipping; however, the IMO measures under consideration include some form of carbon tax or bunker levy for adoption after 2023, however, the question remains, by that time what will the price of carbon be in the market? And perhaps more importantly will the EU and other regional actors wait another 5 years for IMO action or will they include shipping into their regional emission trading systems?

There are clear signals in the market, and obviously opportunities to invest and develop new technologies to help the industry decarbonise. It can be expected that the development and uptake of these technology and fuel solutions to mirror the development of renewable energy on land and offshore, with sharp growth in scale and efficiency over the coming decade. An example market projection for wind propulsion technology uptake made in an EU report in November 2016; "In 2030, the market potential could amount to 3,700–10,700 installed systems on bulkers & tankers, associated with approx. 3.5–7.5 Mt Carbon dioxide savings & 6,500–8,000 direct + 8,500–10,000 indirect jobs". This forecast was predicated on technologies reaching a level of maturity and starting to enter the market by 2020, however, these projections were also made

prior to the adoption of the worldwide sulphur cap and the game-changing initial GHG strategy declaration at the IMO this year.

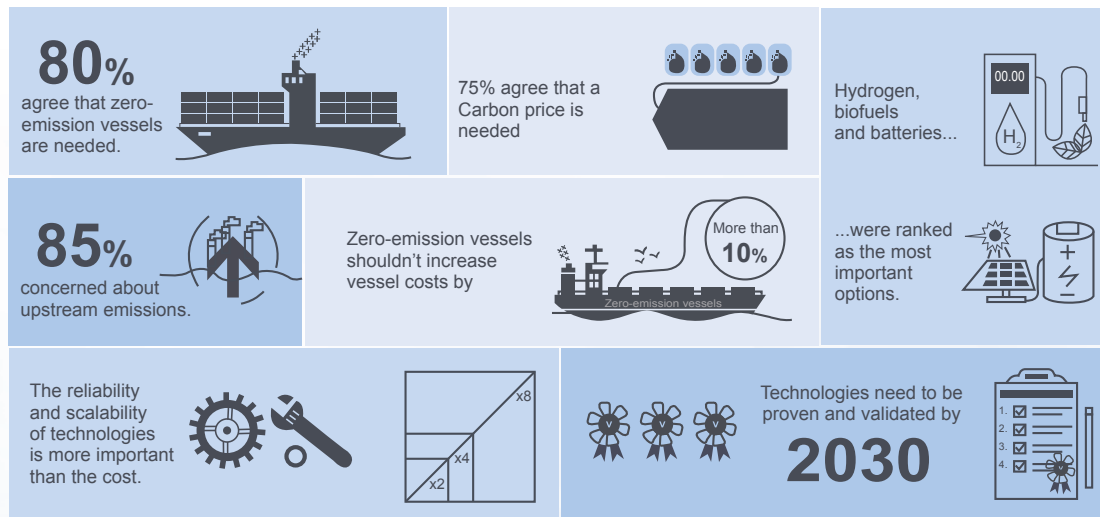
Lloyd’s Register (LR) and University Maritime Advisory Services (UMAS) conducted a study aiming to demonstrate the viability of zero-emission vessels (ZEVs) – identifying what needs to be in place to make them a competitive solution for decarbonisation. The technology options for ZEVs applied to five different ship types. These options consist of various combinations of battery, synthetic fuels and biofuel for the onboard storage of energy, coupled with either a fuel cell and motor, internal combustion engine; or a motor for the conversion of that energy store into the mechanical and electrical energy required for propulsion and auxiliary services. The costs of some of the components considered: fuel cells, batteries and hydrogen storage could all reduce significantly, especially if they become important components of another sector’s decarbonisation, or if the action taken during shipping’s transition assists with the technology’s development. By assessing different decarbonisation options for different ship types, the study tried to identify the drivers that need to be in place to make them a competitive solution, which has been aimed to show the opportunity for a successful and low-cost decarbonisation pathway for shipping. However, LR survey of shipping operators clearly indicates that the key considerations would be around a moderate carbon price (e.g. USD 50/tonne Carbon dioxide) and without too great an increase to the capital cost of the ship.

All of the above issues are coming together into a perfect storm, driving the technology, alternative fuel development and providing incentives for ship owners and operators to make the necessary changes; however, are we seeing significant, widespread deployment of those technologies yet? The answer to that question is a simple ‘no’ or more accurately, outside of a few notable first movers, ‘not yet’ and there are clear reasons for that, some of which have been touched on already.

Barriers and Challenges in the Alternative Propulsion

The barriers to change listed below remain, although many are being challenged and gradually overcome. Again the hard economic truth is that until the fuel price component is high enough for

LR Survey of Shipping Operators



long enough, then the operators and owners that are struggling to stay in business in the short term will not make significant investments in retrofitting or ordering new vessels until they are forced to do so or a system is devised where it is immediately beneficial to their operations and bottom line.

On a broader industry base, there are key barriers that are still retarding the adoption of new fuels and technologies. The structure of the industry itself generates a number of serious barriers to new technology uptake. The split incentive, where the owner doesn't pay for the fuel but must invest in the new technology to save fuel for their customers to benefit, while currently not receiving any premium in the charter market and thus providing little incentive to invest. The reliance on time charters is another barrier, rather than fuel or carbon being the main contractual driver. As mentioned earlier there are new mechanisms being tried out with lease or rental options for equipment, ship performance and green rating indexes along with 'pay as you save' models, where the cost of the equipment is covered by the savings made, thus transferring the majority of the cost from CAPEX to OPEX.

As noted, perception is an important barrier, especially for high profile ones, such as installing a wind-assist rig, less established technologies and fuels for large vessels such as hydrogen or ammonia. This perception is changing with technologies being proven by technology companies and demonstrator vessels in operation. Also, the increase in quality information on options, their verified fuel saving delivery and the development of fleet assessment tools available to fleet managers to compare technologies and other options are all underway and vital to changing that perspective, as is the generational change in the industry.

The capital intensity for working demonstrator vessels and the high cost of bringing the technologies to market is also being tackled in a more concerted fashion, with increasing attention from financial institutions, technology support clusters and other such mechanisms. There are also seen outreach and technology transfer movement into developing regions. The IMO & EU established the Maritime Technology Cooperation Centres (MTCCs) in five developing regions to help develop that further and the International Windship Association is liaising with those centres and also establishing wind propulsion hubs or centres of excellence around the world, at first in EU and US, but also now in the South Pacific and Asia. Intellectual property is always a challenge in this development; however, the pooling of IP, collaboration on the development of new solutions and low-cost licencing agreements could all mean with which to tackle this. Finally, there are the operational and technical challenges of new technologies and fuels. During the Ambition 1.5°C: Global Shipping's Action Plan conference at the United Nations Framework Convention on Climate Change (UNFCCC) COP23 proceedings in Bonn in 2017, the 100+ leading shipping and supply chain experts concluded that the challenge was not a technology one, there are basket full of technologies and fuel options to radically and swiftly decarbonise the industry, it is a facilitation issue. They felt that the investment funding is available but the challenge is more the way of providing the returns and security for those investments allowing the industry to step out in front of regulation, with first movers and early adopters being rewarded by strong business returns, a stable beyond compliancy operational model and locking in the savings and profits made, once regulation finally catches up.

The drivers are in place, the barriers are coming down and the business opportunities are out there, so what are the options available to make a vessel or a fleet 'sustainable', meaning environmentally sound, increasingly low carbon, resilient to changes in future fuel price volatility and regulatory framework, economically viable and profitable and generating employment, supporting trade and delivering on social indicators too?

Alternative Propulsion & Sustainable Shipping Technology

The main focus of this section of the article is to highlight the opportunities and developments around renewable energy uptake for primary propulsion or auxiliary provision, thus reducing fossil fuel or alternative fuel use. There are three main areas that need to be considered, primary renewables, secondary renewables and other operational or vessel optimisation and efficiency measures. Primary renewables are designated as non-fossil fuel energy delivered at the point of use, abundant, free, very low carbon and truly sustainable. These include wind propulsion, which is the most developed for all types and can easily provide, 5-20 per cent and potentially up to 30 per cent fuel and emissions savings as a retrofit solution and 30 per cent upwards for more optimised new build vessels running in existing operational patterns (higher if operational profile adjustments are made). Solar, which is readily available in panels but limited by available deck space on vessels, can deliver ancillary power and auxiliary power for smaller vessels (as would small wind turbines). Further development is underway on maritime solar coatings for decks and other structures, flexible solar arrays that could be combined with soft sail etc. Wave energy also has a large untapped potential and while it is difficult to harness, there is ongoing R&D for generators in water tanks on board and other direct propulsion concepts.

The leading technology segment in the primary renewable field is wind propulsion. Wind propulsion technologies are developing quickly and the perception and acceptance of this technology solution are gaining ground in the industry. With fuel and emissions savings of 5-20 per cent and up to 30 per cent for retrofit installations to new builds that can deliver 30 per cent savings and with the potential to deliver much higher savings, dependent on design, rig sizes and operational considerations (speed, port access etc.). The basket of technology solutions can be split into seven main categories, with all technologies being fully automated in operation for ease of use, safety and efficiency. These include;

- **Soft Sail** – both traditional sail and new designs of Dynarig etc.
- **Hard Sail** – wingsails, foils and JAMDA style rigs. Some rigs have solar panels for added ancillary power generation.
- **Flettner Rotor or Rotor Sails** – rotating cylinders operated by low power motors that use the Magnus effect (difference in air pressure on different sides of a spinning object) to generate thrust.
- **Suction Wings (Ventifoil, Turbosail)** – non-rotating wing with vents and internal fan (or other devices) that use boundary layer suction for maximum effect.
- **Kites** – the deployment of dynamic or passive kites off the bow of the vessel to assist propulsion or to generate a mixture of thrust and electrical energy.
- **Turbines** – using marine adapted wind turbines to either generate electrical energy or a combination of electrical energy and thrust.
- **Hull Form** – the redesign of ship's hulls to capture the power of the wind to generate thrust.

Each technology will adapt to certain vessel types better than others, with larger, heavier rigs providing substantial propulsive force but restricted to vessels with enough deck space and size to accommodate those, while containerised versions or off deck technologies such as kites may be the preferred solutions for container vessels with limited deck space.

Currently, the market is seeing the uptake of Flettner Rotor technology, with rotors installed on six vessels currently in operation, with four of those added in the last 12 months. These have 14

rotors in operation between them and cover the tanker, bulker, ferry/cruise, RoRo and general cargo segments. Two of the most recent installations include two 30m rotors installed on the 109,000 dwt Maersk Pelican LR2 product tanker and the large Viking Lines ferry/cruise vessel Viking Grace.

Other technologies are at various stages development with a number of land and sea trial installations completed recently. There are a number of leading companies involved in these projects involving MOL & Class NK (Hard Sail Bulker), Renault (cargo partner for Soft Sail Ro-Ro new builds), Airbus (cargo partner for Kite technology), Ultrabulk, Drax, Rolls Royce & Tata Steel (Dynarig derived Fastrig Bulker) and so on (IWSA 2018).

Both the earlier mentioned EU report and key findings of the Shipping in Changing Climates (SCC) research programme found that Carbon dioxide Emissions from International Shipping reduction targets and their associated pathways requirement for wind-assist technologies is clearly the mix of propulsion, although the reports also highlighted the lack of maturity at that time (UMAS 2016).

Secondary renewables, or energy stored from renewable energy sources on land (and offshore), commodified and then sold as power/fuel for shipping is the area understandably drawing most attention and resources at present and if these energy storage systems are linked together with primary renewable technologies and possibly on board generation of energy, then it becomes commercially viable earlier and can provide significant decarbonisation, even with existing technology. These include:

a. **Batteries** – ideal for ferries, short sea applications, tugs – drawdown and recharge rates are improving and prices are dropping. The technology is readily available and well understood. These only become a renewable option when charged with the wind, solar, wave, tidal or geothermal renewables. For example; there are an increasing number of electric and hybrid

Stages of Development

Technology	Ship Size	2008	2014	2016	2018-2020
Rotors	<10,000t	Concept	R & D	Test & Trial	Commercial
	>10,000t	R & D	Test & Trial	Commercial	Commercial
Hard Sail	<10,000t	R & D	Test & Trial	Commercial	Commercial
	>10,000t	Concept	R & D	Test & Trial	Commercial
Soft Sail	<10,000t	R & D	Test & Trial	Commercial	Commercial
	>10,000t	Concept	R & D	Test & Trial	Commercial
Kite	<10,000t	R & D	Test & Trial	Commercial	Commercial
	>10,000t	R & D	Test & Trial	Commercial	Commercial
Suction Wing	<10,000t	R & D	Test & Trial	Commercial	Commercial
	>10,000t	Concept	R & D	Test & Trial	Commercial
Turbine		Concept	R & D	Test & Trial	Commercial
Hull Form		Concept	R & D	Test & Trial	Commercial

Concept

R & D

Test & Trial

Commercial

ferries in Europe and smaller vessel examples around the world. The impact of production and disposal of the batteries is an important consideration when adopting these systems.

b. **Biofuel** – biogas/biodiesel etc. are a relatively easy solution when blended or used as an SVO with existing vessel engines, though conversion and certain operational considerations need to be followed. This is an important option for developing countries, however not if this replaces food production, which much of the first generation biofuel production has done in the past. The second generation of waste derived biofuel will be the key and while the feedstock scalability is a challenge, it will be a growing segment, recently projected in the OECD International Transport Forum (ITF) report on decarbonising shipping as potentially contributing up to 22 per cent of fuel by 2035. There are already a number of small companies delivering waste derived biofuel to shipping, mainly derived from wood waste. Third generation fuel derived from algae or other

biological processes is under development and if scalable will also be an important process in delivering the fuel to the market but little is yet available commercially. (ITF OECD 2018)

c. **Methanol** – Stena Lines developed the first methanol ferry and that is operated in Europe and is fairly compatible with existing systems.

d. **Hydrogen** – this is an abundant source of storing energy, though currently most of the supply is cracked from natural gas, however renewably generated electricity used to make H₂ will lead to very low emissions across the entire supply chain. It is a low-density fuel, so there are storage challenges and work is being done to mitigate embrittlement caused by small molecule size, so there is increased interest in this as a marine fuel, especially for smaller and short distance vessels at present.

e. **Ammonia** – we have seen an uptick in interest in this widely produced and traded chemical as a fuel in the last 12 months. Proponents point to its stability, density and availability as all important drivers for its adoption. Detractors point to the fuel toxicity and some regulatory and technical issues with its adoption but there is significant interest.

f. **Power to Gas, Power to Liquid** – currently strong interest in Germany, using renewable energy to generate these synthetic fuels, currently still under development and a large amount of energy required to create a transportable fuel but that ratio is improving.

Conclusions

Vessel optimisation and energy efficiency measures are pretty well understood and are being implemented across the industry, good energy management is the name of the game and many of the low hanging fruit savings can be realised before more expensive new technology options are deployed, including; improvements in voyage preparation, auxiliary engine management, energy management assessments, trim optimisation, engine maintenance etc. are all key to developing sustainable shipping and are enhanced with new data systems.

Operational changes and investments in crew training, shared ownership and incentive models all lead to greater efficiencies. A happy, well-trained and compensated team makes the vessel more efficient and a safer environment for all. The operational changes include just-in-time management, virtual arrivals and slow steaming etc. can add substantially to fuel savings and efficient utilisation of the assets, both crew and vessel. In combination, these can potentially deliver a further 20-30 per cent saving to fuel and emissions, with other new technologies such as air lubrication, improved hull coatings, heat recovery, exhaust gas recycling etc. which are either on the market or under development offering 5-20 per cent savings, though the combined total savings from all of these measures will also depend upon how they are calculated when taken together.

Thus in combination, the use of primary (wind-assist and primary wind) and secondary renewable energy (produced from wind, solar, geothermal or biomass sources) coupled to vessel and operational optimisation measures, the decarbonisation and sustainable operation of the existing fleet is far less of a challenge than has previously been assessed, at least from a solutions point of view. The technology and fuel selection, financing, effective operational profiles, profitable business models and other facilitation issues continue to be significant challenges facing the industry, but these are not insurmountable issues and the barriers to implementation are coming down. With a strengthening toolbox of solutions, regulatory drivers in place and finance available for decarbonising operations, the future looks bright for a resilient, flexible and fully decarbonised, clean & green fleet by 2050, but there are still have a lot of work to do.

***NOTE:** LNG is not a renewable source of energy but is seen by many in the industry as a transition fuel, however others are wary of the high costs of installation and the full carbon footprint of the fuel, with bunker to funnel estimates of 20-25 per cent reduction in Carbon dioxide, but other studies estimating slightly worse equivalent Carbon dioxide emissions than standard fuels. Methane slip in engines is being dealt with but the methane slip in the supply chain is also significant, with methane 20+ times the impact of Carbon dioxide as a GHG gas. Nonetheless, the infrastructure could be used for other fuels in the future (biomethane, Hydrogen etc.) and while the market has reacted in the past by opting for dual fuel engines or building LNG-ready vessels rather than adopting the fuel directly. It is now seen increasing numbers with approximately 500 vessels in operation (up from 400 in 2014) and with another 100 on order - these numbers also include a large number of LNG carriers.*



Mr Gavin Allwright

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Sustainable Dredging Technology for Bangladesh Waters

Mr Bernard Malherbe

Abstract

A prerequisite for sustainable regional economic development is reliable nautical accessibility to an efficient marine port-infrastructure, with sound hinterland connection. More than 85 per cent of all trade happens via maritime ways. Because of the economy of scale, maritime trade operates merchant vessels, with ever-increasing dimensions: carrying capacities, lengths, beams and static drafts tend to grow as years goes by. Capital dredging of nautical fairways and channels and the maintenance thereof are hence crucial for sustainable economic development. Bangladesh is in this respect no exception. And the physical and hydro-meteorological context of the Ganges-Brahmaputra-Meghna estuary is posing even larger challenges to ensure the nautical accessibility. Sustainable design of capital (and maintenance) dredging of nautical access-channels shall rely on the hydro-sedimentological and morphological processes at work in the specific project environment: coastal seas, estuaries or rivers. Use the forces of nature instead of going against them is the key principle of sustainability. The presentation will illustrate several examples of achievements worldwide (Mekong Delta, Rio de la Plata, Red River Delta etc.) and then focus on the situation in Bangladesh. The alignment of the channel shall be compliant to the autonomous morphological trend, in conjunction with the modified current flow and wave propagation field. The dimensions of the channel shall be in accordance with the expected traffic of merchant vessels and optimisation of the keel- and bank-clearances may be beneficial regarding the overall feasibility. Wherever loose mud deposits occur – such as in marine or estuarine turbidity maximum areas – the adoption of nautical bottom concepts can optimise nautical accessibility. Sustainable open-water disposal of dredged materials shall take into account the dispersion patterns in order to minimise recirculation. Even fine-grained sediments can be beneficially re-used to create wetlands or substrates for mangrove forests. Buffer-pits or sediment-traps can be envisaged to concentrate the maintenance dredging in some specific areas. These are some of the practical examples that will be highlighted in the presentation. Specific engineering and hydro-sedimentological survey tools to assist sustainable dredging design will be presented in the above-mentioned examples.

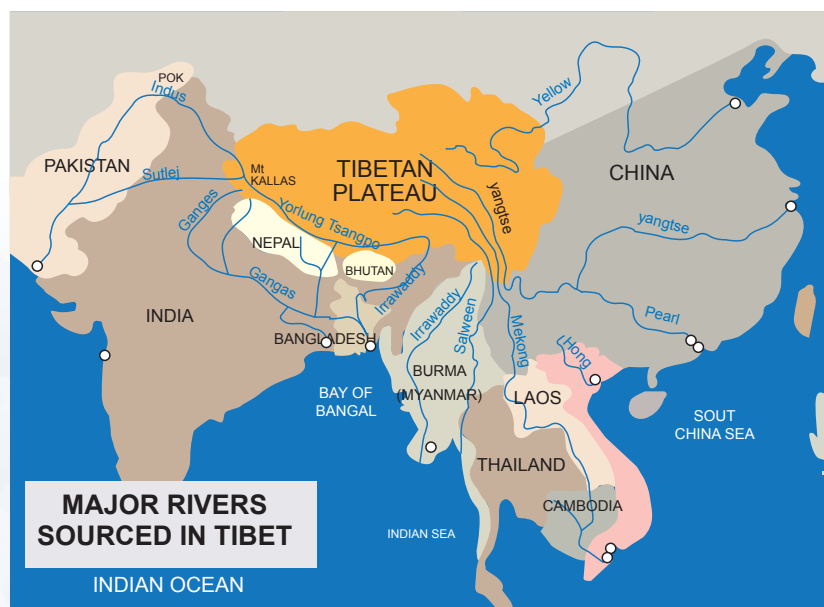
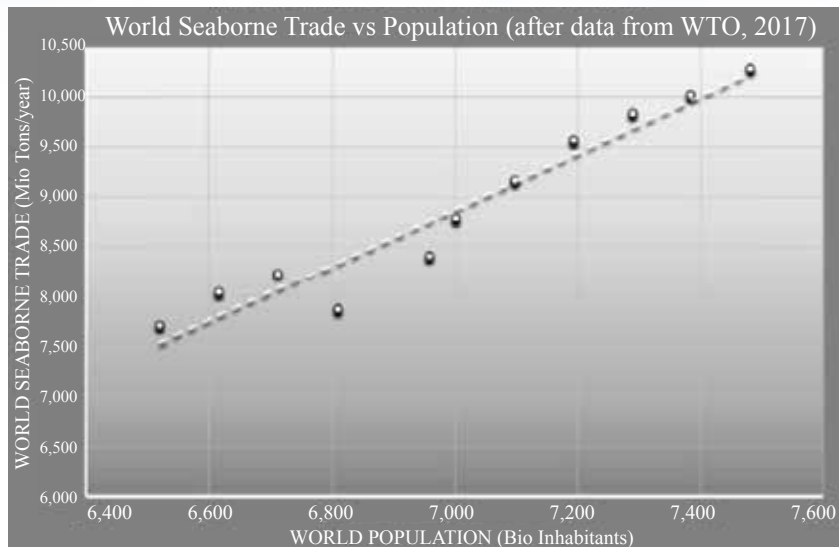
Introduction

Secured and safe nautical accessibility is essential for sustainable economic development. Harvesting natural resources to the benefit for sustainable dredging is a challenging task. Field level experiences gathered from different continents and different projects show how contractors are trying to optimise and improve the feasibility of capital dredging and maintenance dredging. Access channels are essential for the economic development of a region or any country is the gateway for prosperity. At least seven of these SDGs set by UN are concerned with safe, sustainable and reliable access channels. Because any shipping will need these safe, reliable access channels.

Major River Basins and Main Ports in Himalaya Range & South-East Asia

There is a direct relationship between earth population and maritime trade. Any port that lets the ships wait to enter, definitely play with a future. That is why dredging is so important for the overall sustainability of a port.

More than 60 per cent of all ports, big, hard ports, are located close to river systems. And, Southeast Asia is no exception. On this visible map on the screen, the indicated little dots, indicate major hubs, located along the major river systems, or industries, and unfortunately, these streams and river systems carry not only water but also sediments.



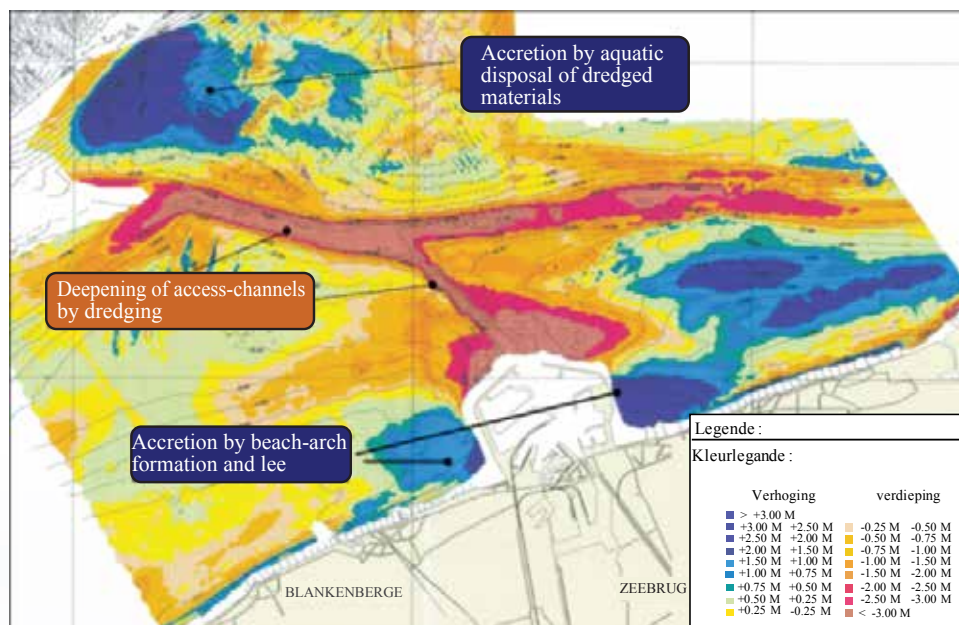
Capital and Maintenance Dredging Operations Different Concepts and Contract modes

The primary fate with the sediments is to settle down in the stream. There are different ways to consider a dredging contract. Traditionally it was either a capital dredging contract or a maintenance contact over some years. In maintenance contact, maintaining a fixed channel, which has been fixed or freeze between boundaries, between buoy lines or in some cases, a dynamic channel, where a channel has given its liberty to move and the dredging is adapted to maintain that dynamic channel.

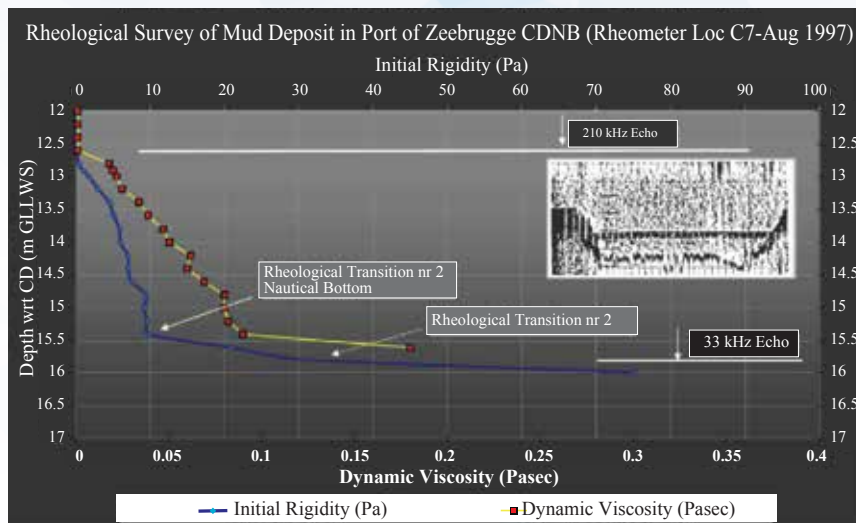
Built, Operate and Transfer (Build, Operate, Finance & Transfer Concession) Contract (BOT)

Nowadays, there is some new tendency to grow some sense of private-public partnerships or even BOT concession contracts. In Belgium, we have the bait of the North Sea, about 150 kilometres of maritime fairways designed to absorb about 50 to 60 thousand ship movements per year. More than 300 million tons of cargo transiting to the ports of Zeebrugge each year.

In this long term differential mapping, Belgian Continental Shelf around Zeebrugge (1976-1994) is shown. It is observed that the channel is sneaking in between sandbanks, title flats and that has been a challenge not only for the shipping but also for the dredging. The graph indicates the areas



where currently dredging is ongoing. This maintenance dredging in this area, which has been evolving ever since WW2, to deepen the western scale and maritime fairways to accommodate the ever increasing ship sizes has been done in 2-3 times deepen programme and associated maintenance dredging which of course increases in the same proportions. The way that maintenance dredging is managed in this astray is by putting the dredge material back into the system. Not to actually impact negatively the hydraulic equilibrium, the fragile equilibrium between sediments, tidal current, river discharge and wave action. Hence almost every cubic meter which is dredged for maintenance dredging is put back into the astray. Of course, people



say “well, that induces recirculation, so that means that the dredge material will come back to the areas to be dredged.” And that’s true but at a slower pace. And that is the price they were ready to pay to maintain the equilibrium in this astray.

Maritime Access-Channels in the Belgian North Sea: Monitoring and Dredging-Management System

On the maritime side, the maritime fairways in the southern part of the North Sea, that dredge material is disposed into allocated dumping grounds. And there, the mixture of fine sand and muddy sediments, muddy particles are studied in detail to see to what extent the choice of the dumping ground is appropriate. Studies showed that by differential mapping, seen in this image, hydrographic maps were digitised and digital terrain models were produced. There were colours on visible maps: the brown colours and the red colours indicated the deepening so that the effect of the dredging of the deepening of the access channels. The blue parts indicated the natural accretion. And for instance, in this image, there was a disposal area where the dredge materials were disposed. And the other patches, close to the ports, are the effect of the building of the extension of the port. So, these tools allow them to evaluate what the impact is of mankind on the natural systems. Satellite images also prove to be a very valuable tool to indicate or to investigate the impacts that they have but also to understand better the mechanism of natural forces applied. This satellite image reveals what they call to be the maximum area. This is a very complex mechanism where fine grains of sediments are kept in a closed box. This is to be associated with a fine grain to lose and mobile made deposits, which eventually will accumulate into access channels and impeach vertical accessibility.

Radio-Active Recirculation Study

We have also used radioactive traces, these are isotopes which are injected into the sediments and dumped onto the different disposal areas to see what the fate is of these fine grain materials. They recirculate back to the coastal areas or eventually to the areas to be dredged again. With these blue patches: the dispersion of these traces back to the maximum area. We have developed special investigation tools to analyse the sheer strength properties of the sediments in order to define the nautical bottom.

For instance, in this graph, there seen a classic eco sounder which would detect the nautical badge and

the access channel to the port of Zeebrugge at 12.5m. But in reality, when introducing that concept of the nautical bottom by sheer strength properties, the nautical accessibility would either be 15.5m. So, we need to gain in nautical accessibility result in need of dredging. These digital train models are powerful tools to actually help in the management of maintenance dredging operations that are seen, areas where the dredging need is crucial and where no maintenance dredging is needed.

Fixed Channel Dredging

Rotterdam

Port of Rotterdam also transits 300 million tons of cargo each year. This port has been actually frozen with rigid banks. So the river has no room for movement anymore thus maintenance dredging is done there on a regular basis at between 15 and 20 million cubic meters each year disposed out at sea. This is done with a scheme of appropriate disposal management that can keep the management dredging at a constant level.

The Congo River

Dredging needs different docks and different aspects and different access channels in the estuary. Using the knowledge of the sediment dynamics, The Congo river with average 40000 cubic meter a second, going sometimes up to 80000 cubic meters a second. The natural movements of the sandbanks account for about hundred millions of cubic meters a year. By dredging, about 3 to 4 million cubic meters a year in a dynamic mode. So, keeping an actually dynamic channel and adapting the maintenance dredging channel to the natural movements they can ascertain nautical accessibility of 8 to 9 meters below chart data.

Ecuador

Ecuador has developed the access channel to Port of Cutuco (San Salvador). It is on the Pacific coast. The ocean swells of the Pacific penetrate at bay. Whenever the channel is dredged, the simulation showed that there would be a tremendous modification of the wave field. So, the eastern bank would have an increased wave activity while the western bank would have come down of the wave activity. Immediately this has a reflection on the sedimentation of the channel. Thus the eastern bank is suffering actually tremendous erosion. All these material is dropping in the channel. And on the western bank, where we have this wave calm area, sediments tend to accumulate. But, actually, this is a tragedy because this port has a very poor nautical accessibility and is not called by the regular container lines anymore.

Vietnam

In the red river delta, it is flowing down to the Gulf of Tonkin. The Port of Hai Phong transits 33 million tons each year which is a gateway for the economic development of northern Vietnam. The question was what is the best access channel to be designed in order to keep maintenance dredging under control? The port of Hai Phong is located here and the existing channel here had mere nautical accessibility of minus 3 meters below chart data. This was extreme difficulties to keep it open. This was chosen based on analysing the seabed composition the sediment deposits the residual transports. We have also used the satellite images to identify the potential existence of turbidity maximum areas and loose mud deposits. We have analysed the way the existing channel was sedimented after each typhoon, for instance, the channel was almost totally lost.

Mekong River Delta (MRD)

The port of Can Tho in Mekong River Delta (MRD) is the gateway for the export of rice of the Mekong delta. Port of Can Tho is very difficult to access. The Mekong has a hydrological regime based on what happens in the Himalaya. During the monsoon in June-July, the melting of the ice

in the Himalayas giving a peak in discharge but also a peak in sediment supply. And shortly after that, August-October, there is this monsoon giving a second peak. So any channel there has to cope with especially the only nautical access channel to the Mekong Delta which is the Bassac River. The river has to cope with the transit of more than half a billion tons of dry solids of sediments each year. We have studied the river by the Bathymetric surveys, by analysing the tidal window. There is a long section over the access channel need to be dredged.

Ganges-Brahmaputra-Meghna River System

This is a huge delta with a lot of sediment supply, more than a billion tons of dry solids each year which has evolved over time. There is a very complex hydrological regime, which starts actually in May and June and ends in the year. It is a challenge because of the natural supply mechanisms of fine sands and mud deposits. Now we investigated that together with the Institute of water management from Bangladesh, how sediment concentration is varying as a function of a monthly tidal cycle with spring tides and neap tides. We have observed that the backgrounds of a substantial concentration of about half a kilo of dry solids per cubic meter in the astray indicate that you are facing here a major turbidity maximum area probably the existence of huge quantities of loose and mobile mud sediments.

In a couple of months, we will start at Kutubdia Island, at the energy hub by dredging some of the tidal pits in the plant's access channel. To investigate the natural sedimentation and try to develop an economical and feasible access channel for this energy hub port. We are moving to classic approach for contracts for dredging: capital or maintenance contract. We now also develop concession contracts. Concession contracts where we do the capital dredging, the maintenance dredging, the buoys and all the aids to navigation and the toll recovery.

Conclusion

Design of these discussed access channels is extremely important. We have to work with nature. To understand natural forces and design it according to these natural processes. Another point of attention is the port design of disposal areas, of the dredge material. Not only from the environmental point of view but also from the point of view of recirculation back to the areas prone to sedimentation. The optimisation of the nautical accessibility using a tidal window or introducing the concept of nautical bottom whenever we have loose mud deposits is required. And then optimise the management of this dredging works. For instance, installing buffer pits or adapts this management by pre hydrographic surveys and adapting the way of maintenance dredging and then, last but not least, the BOT contracts. These concession contracts prove to be a very successful way of doing dredging, makes everybody happy. The channel users are happy because they are secured to have nautical accessibility, contractors are happy because we have work and the authorities are happy because they recover the concession fees.



Mr Bernard Malherbe
Director, Project Development
Jan De Nul Group

Comments of Session Chair

Mr Syed Farhad Ahmed

The two words innovation and invention tend to be confusing to many people. The invention is something created from scratch to resolve a certain situation or a problem to address any other kind of solution. But innovation is not necessarily a creation; it is actually improvisation of the existing processes of an existing scenario.

When we talk about technological innovation, we are actually using technology as an enabler to improve certain processes, situations, to improvise quality, delivery and so forth. I am happy that in maritime space, the technology is being embraced. With institutions like Bangabandhu Sheikh Mujibur Rahman Maritime University, technology will enable Bangladesh to reach new heights, the depth and the amount that can be contributed from the maritime sector towards the development of Bangladesh.

I feel proud that technology is being embraced in the right fashion. The sessions on technological innovation can mould the future maritime industry towards the next stage of challenges. For instance, energy efficient smart port, green shipping technology, sustainable ship recycling, offshore engineering, marine biotechnology, etc. are a few to mention among the various technological developments. These advancements together with the existing assets with systems on board vessel and onshore have driven efficiency to improve operations and created savings across organisations and businesses all throughout the maritime sector.

Advances in technological innovations also have resulted in safer, greener and more sustainable maritime industries across the globe. Due to global connectivity, it is imperative that the technological innovations have taken place in developed countries and now it can also be transferred to other countries in order to stay abreast from the technological developments in these sectors worldwide.

Being in the technology space for so many years, there is no right technology. Technology is a solution to infinity. Technology changes like the weather. The technology that is the best and updated today can be outdated and replaced by something new tomorrow. One of the key factors to consider is flexibility or adaptability to change. The more rigid we become, the more difficult it becomes to change. When technology is deployed in whichever industry across the globe, there should be an element of adaption and flexibility.



Mr Syed Farhad Ahmed

Managing Director,
aamra Companies

Session 5

Maritime Governance and Challenges

Paper-1

**Maritime Safety and Security for Blue
Economy – Bangladesh Perspective**

Paper-2

**Contemporary Issues in Sustainable Ocean
Governance and Policy**

Session Theme

Maritime Governance and Challenges

The ocean is regarded as the last major frontier on earth for the exploration and development of resources to sustain mankind in the future. Sea Lines of Communication comprises the umbilical cord of the state's economy and the arteries of a region's economic health. The world is in many ways at a turning point in setting its economic priorities in the ocean. Sustainably managing and developing coastal and ocean spaces are critical to a nation's economic development. In the United Nations' Sustainable Development Goals, it is very clearly mentioned in Goal 14 to 'Conserve and sustainably use the oceans, seas and marine resources for sustainable development'. Oceans have a major role to play in humanity's future and the 'blue economy' offers an approach to sustainable development better suited to the circumstances, constraints and challenges.

But maritime issues such as piracy; smuggling; illicit wildlife trade; illegal, unreported and unregulated fishing; maritime pollution; and trafficking in humans, arms and drugs can have a destabilising effect and act as deterrents to sustainable development. Increasing maritime insecurity, not least terrorism, piracy and illegal migration has highlighted the need to establish a framework for ocean management and ocean policy. Currently, there is a duplication of efforts overlapping one another and lack of coordination. Under this framework, information can be shared more effectively and collective responses to security challenges can be coordinated.

Maritime Safety and Security for Blue Economy: Bangladesh Perspective

Rear Admiral M Makbul Hossain, OSP, BCGMS, ndu, psc

Abstract

The 'blue economy', maritime safety and security are very much integrated nowadays. Sustainable uses of the ocean resources to promote blue growth, preserving the biodiversity and ecosystem is actually not possible without implementing proper safety and security measure in the maritime sector. Both concepts aim to re-thinking the objectives of ocean governance. If maritime safety and security points to the risks and perils of the sea, the 'blue economy' captures its prospects and promises. Maritime safety and security emphasise the importance of protecting maritime space from diverse threats, such as inter-state disputes, piracy or other forms of transnational crime like IUU fishing, marine pollution but also the necessity to ensure good order at sea. The 'blue economy', in turn, emphasises the economic potential of ocean resources, ranging from fishing, resource extraction, to tourism. The 'blue economy' is not only about economic growth, but also about the importance of striking a balance between blue growth, ocean health, and sustainability. Settlement of maritime boundary disputes is leading towards the potentials of 'blue economy' prospects for economic growth of Bangladesh. However, like other ocean regions, the Bay of Bengal is also rigged with the problems of IUU fishing, marine pollution, ineffective marine regulation and the non-traditional security menace. Therefore, it is high time for us to emphasise the maritime safety and security issues in the Bay of Bengal for achieving 'blue economy' vision.

Introduction

The planet, the earth is regarded as a blue planet as two-thirds of it is covered with blue water of oceans. The idea of using these oceans as the economic field is hardly new. Mankind has been benefited by the ocean resources for centuries. Marine resources have contributed immensely to the economic development of the world. Coastal and marine ecosystems play a complex and vital role in supporting economic

prosperity and social welfare in developing countries. They sustain the livelihoods of millions of poor households; provide multiple ecosystem services that are essential for life, yield vast amounts of food, and play a critical role in driving weather and climate. As we progress further into the 21st century, the importance of these coastal and marine resources is certain to increase. Both in absolute terms and as a proportion of the whole, more of the country's population will live along or near coastal areas. If we are to make further inroads in reducing poverty and further economic prosperity around the country, it will be vitally important to manage coastal and marine resources more sustainably.

The Blue Economy

The 'blue economy' is a concept of sustainable development framework which looks at the oceans as 'development spaces'. The concept addresses to the frame of spatial planning that integrates conservation, sustainable use of living resources, oil and mineral resources, energy production and development of the marine transport sector. At the core of the blue economy, the concept is the de-coupling of socio-economic development from environmental degradation, as opposed to the usual 'brown' scenario of high energy, low employment and industrialised development models. Bangladesh has long been neglecting the marine resources that remain hidden beneath the sea. The Bay of Bengal remains one of the least explored marine areas of the world. With the rapidly increasing population of 167 million in a tiny land area of 1, 47,570 square kilometres the demands

for food, energy, and other resources have been putting much strain on the limited land-based resources. Proper and optimum utilisation of marine resources can be an alternative solution to these escalating demands. To add to our happiness, after the two verdicts of International Tribunal for the Law of the Sea (ITLOS) regarding the settlement of maritime dispute initially with Myanmar in March 2012 and then with India in July 2014, Bangladesh obtained its absolute maritime territory of 1, 18,813 square kilometres, 200 nautical mile Exclusive Economic Zone (EEZ) and an additional area of continental shelf (sea bed) from the coast. The total area falling under the sovereign rights of Bangladesh makes up 81 per cent of the mainland of Bangladesh. It is like that we have got another Bangladesh in the Bay of Bengal as the whole area has nearly doubled through it. The delimitation of sea boundary with Myanmar and India has indeed opened up a new window of opportunities in terms of harnessing resources and enhancing existing external trade. With these increasing maritime activities, security challenges have also increased in a manifold and are likely to aggravate if a holistic maritime security policy is not formulated and put into place at the earliest.

Though there are several studies on the prospects of the ‘blue economy’, there has hardly been any elaborate study on associated ‘blue economy’ security challenges in Bangladesh. As a result, fight against the security threats of the national ‘blue economy’ has never been brought into the limelight. In Bangladesh, Bangladesh Navy (BN) has the solemn responsibility of ensuring safety and security of all stakeholders in the sea. Recognising the importance of the matter, the government of Bangladesh in February 2018 has nominated BN as the “lead organisation” for all ‘blue economy’ security issues.

This paper will focus on the issues like the ‘blue economy’ and maritime security, ‘blue economy’ activities of Bangladesh, BN and security of ‘blue economy’, and BN’s plan to address security challenges related to the ‘blue economy’.

Blue Economy and Maritime Security

The concept of ‘blue economy’ is still in evolution. The idea of the ‘blue economy’ was first publicly announced by professor Gunter Pauli in 1994 through his zero-emission research at United Nations University. During the UN conference on sustainable development in Rio de Janeiro in 2012, coastal countries questioned the applicability of traditional green economy and campaigned for Pauli’s ‘blue economy’ approach. The outcome of the discussion in the UN conference was defining the concept, development, prospect and challenges of the blue economy.

Security has been defined and redefined to match the context in which states operate. Security measures do not have any meaning without identifying any threats. Security comprises every action to protect and promote national core values. The term ‘maritime security’ has generated different meanings depending upon organisational interests, political, and ideological bias. Acknowledging the need, professor Geoffrey Till identified four basic principles that govern the use of the oceans. The principles are the source of wealth, as a life support system, a medium for trade and communications and a tradition those who use the oceans, should do so in peace and security.

Both ‘blue economy’ and maritime security are conceptual innovations related to seas. While the ‘blue economy’ deals with prospects and promises of the ocean, maritime security points to the risks and perils of the seas. They are two sides of the same coin. Exploration and exploitation of ocean resources cannot take place smoothly in presence of maritime security threats. In fact, maritime security and security of the ‘blue economy’ are intertwined. So, it is important to identify how maritime professionals, researchers, and security professionals can work hand in hand for the betterment of the seas and coastal population.

Blue Economy Activities of Bangladesh

The preamble of Bangladesh’s Constitution sets the national goal as ‘prosper in freedom’ and ‘security of vital national interests. The vital national interest is manifested in peace, stability, prosperity, economic emancipation and well-being of the people.

‘Prosper in freedom’ and ‘security of vital national interests’ have direct connections. These reflect Bangladesh’s endeavour to maritime prosperity. In fact, Bangladesh has achieved immense prosperity and progress in the last decade. And all the socio-economic factors of the country bear the testimony of its graduation from the low-income country to middle-income country. However, to become a developed country by 2041 Bangladesh needs to accelerate her economic progress without any detrimental effect on her environment. Being a densely populated country with a booming economy and an acute shortage of land-based resources, the ‘blue economy’ can be an effective tool to become a developed country by 2041.

On-going Blue Economy Projects

In order to reap the benefits of the ‘blue economy’, Bangladesh government has already taken several projects. Among them, the establishment of LNG (Liquefied Natural Gas) can be mentioned first. Moheshkhali floating LNG terminal started operation from August 2018. Two floating and one land-based LNG terminals will be built at Kutubdia and Moheshkhali and will be subsequently connected to national gas line. The project utilises state-of-the-art technology to access natural gas from global markets. With up to 500 million standard cubic feet of gas per day of re-gasification capacity, this terminal provides energy to promote power reliability and industrial development.

Another project is Matarbari power plant. 1200 MW coal-based power plant at Matarbari is expected to be in service by 2024. Dredging for an artificial channel (2.5km x 100m x 8m) is on-going. The channel will be expanded to 8km x 250m x 18m and the jetty facilities will be upgraded. Yet another one is single point mooring with a double pipeline. In the west of Maheshkhali, two separate pipes for crude oil and diesel will be placed at 27m depth. Ships will come at single point mooring and both crude oil and diesel will be stored in tanks and thereafter transferred to the eastern refinery through offshore (70 Km) and onshore (34 Km) pipelines. On the other hand, a 2D/3D seismic survey is on board. BAPEX will carry out a survey in maximum blocks at sea for gas and oil. Contracts have been signed with some foreign companies to explore remaining sea blocks by a 2D and 3D seismic survey. Other near-future ‘blue economy’ projects include Tuna and Pelagic fishing, coastal shipping, cruise tourism etc. Steps have been taken to generate skilled manpower for longline fishing in a joint venture with Sri Lanka. Such fishing is expected to start by 2020. Coastal container shipping agreements have been signed with India and Myanmar. Consequently, goods will be carried directly to and from Pangaon container terminal. As a result, cost, congestion and pollution will be reduced. Moreover, international luxury cruise line Silversea has inaugurated maiden cruise liner tour to Bangladesh this year. 162 onboard tourists have visited Sunderbans and Maheshkhali. Following the example, Bangladesh will start cruise among Bangladesh, India, Srilanka and Maldives very soon.

Bangladesh Navy and Security of the Blue Economy

Many national and international companies are operating in our coastal areas. The platform and personnel working to boost our national economy need 24/7 hour protection. To ensure security, BN is offering several services to them. For example, BN escorts ships, crafts and vessels on requirement basis, 24/7 security within 1,000 meters of the pipelines called ‘temporary impact area’, regular patrol on the working site, protection from theft and robbery, clearing fishing boats and nets and other emergency support as and when required.

BN is performing her task to support maritime trade, protection of marine reserve etc. After the maritime boundary demarcation, BN revised her peacetime role in line with national ‘blue economy’ activities and BN has started ‘Operation Blue Guard’.

Blue Economy Security Challenges Faced by BN

There are certain 'blue economy' security challenges that are being handled by BN. Firstly, the densely populated coastal cities and areas of the country are hideouts, sanctuaries and sources of material supply chain for terrorism. The networking between organised criminals and terrorists with trans-national capabilities poses maritime security threats. Secondly, the Bay of Bengal remains very rough almost nine months in a year, especially in summer. The south-west side of Pekua pontoon, located in the south of Kutubdia island, is open sea and safety of ships berthed alongside is difficult to ensure especially in bad weather. Ships deployed for the 'blue economy' remain in that pontoon and they pass a hard time in the monsoon. Even then ships are continuing the protection service. Another challenge is lack of accommodation of contingents. They hardly have any other facilities at their work area.

BN's Plan to Address the Blue Economy Security

With the support of the government of Bangladesh, BN has already taken a massive initiative to address security issues related to the 'blue economy'. Under the auspices of Forces Goal 2030, BN has been blessed with 18 new ships, 2 MPAs, 2 helicopters and 2 submarines. The government has planned to develop BN as a 3Dimensional force. As such, BN procurements are centred on the surface, subsurface and aerial platforms.

An ad-hoc 'blue economy' cell has been formed at Naval Headquarter and it is working in full swing. A regional cell in Chattogram and a local cell at Matarbari for coordination on-ground have also been installed. On the other hand, dedicated BN ships under Operation Blue Guard are assigned round the clock for continuous coordination and monitoring for the security of vessels/personnel engaged in 'blue economy' activities. Though it's several offshore and coastal platforms, BN is patrolling our Exclusive Economic Zone (EEZ) and providing security to the 'blue economy' operators successfully. BN is also working hard in order to address the accommodation problem of contingents.

So BN has started doing everything to address any issues that may hinder maritime security and it is strongly believed that everything will be established at the earliest.

Conclusion

To conclude, maritime security is an integral part of the 'blue economy'. The number of 'blue economy' activities is increasing day by day. Ensuring maritime security is a prerequisite for the successful outcome of national 'blue economy'. BN is ensuring maritime safety and security with existing platforms. But it is essential to have support and coordination from others offices of the government to ensure a sustainable and seamless maritime security of the country which will lead to achieving the target of harvesting the benefits of the 'blue economy'.



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Contemporary issues in Sustainable Ocean Governance and Policy

Prof. Dr Pierre Failler

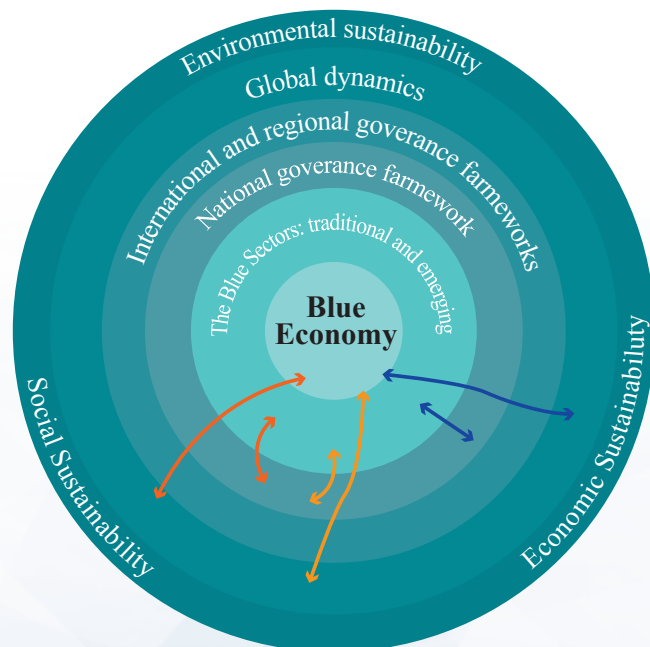
Abstract

The presentation will highlight the governance issues linked to the development of the 'Blue Economy' (BE) in Bangladesh. It will present the BE coordination and planning challenges in the country. From an entrepreneurial point of view, future needs to be secured in order to invest on a long term basis. Marine Spatial Planning is, therefore, a prerequisite for any BE development as well as the implementation of a strong inter-governmental coordinating unit (with independence, a real lever for actions and technical capacities). This should go along with the enhancement of the regional coordination mechanism as the Bay of Bengal is shared between 3 countries. Research and education capabilities should, therefore, be reinforced relying on regional and international cooperation. Investigations are undergoing to develop research and education linkages with EU institutions.

Introduction

The following article is based on the work that we've carried on virtually in Bangladesh. This work has been financially supported and also technically supported by the EU especially the EU delegation in Dhaka. It is a joint initiative made with the EU on one side and on the other side the ministry of foreign affairs that represents Bangladesh. It is very well established that the 'blue economy' is the cornerstone of the economics. So, we will discuss wealth, economics, environmental things and social issues.

The Desirable Blue Economy Framework

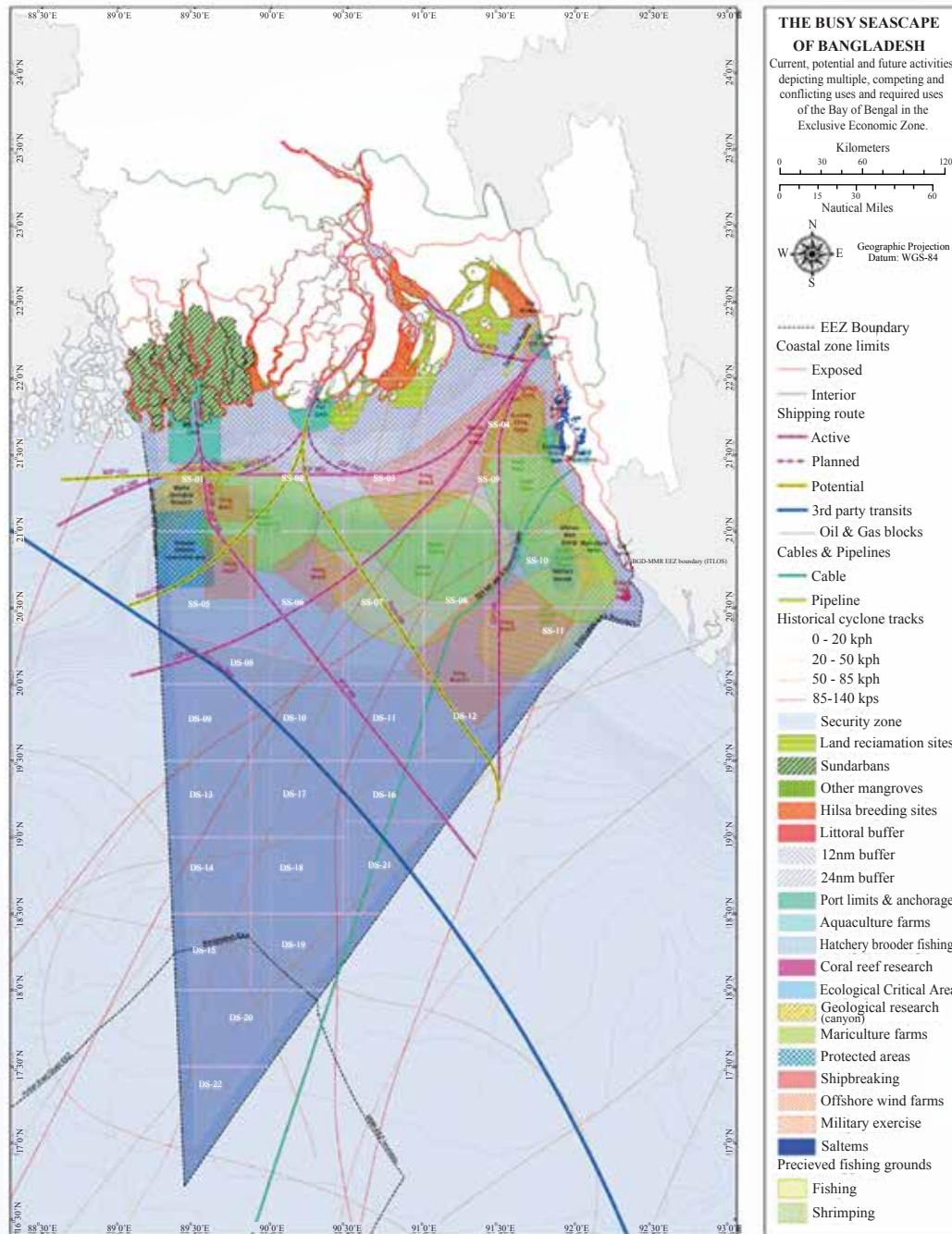


Blue Economy is an Ocean Economy

It aims at the improvement of human well-being & social equity, which reduces environmental risks & ecological disasters. It defined as all economic activities of the oceans, seas and coasts

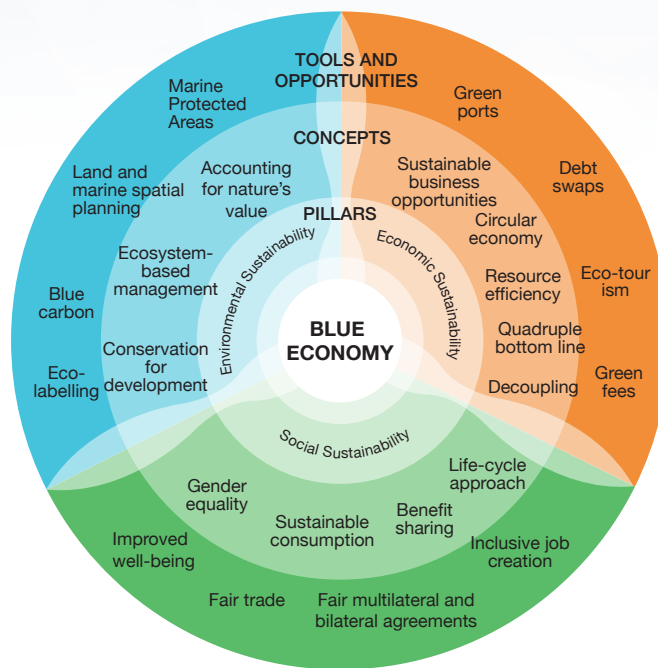
Blue Growth is the New Ocean Economy

It is about unlocking the potential of seas and ocean: novel technologies for sustainable high growth and job potentials in aquaculture, ocean energy, marine biotechnology, seabed mining etc.



Blue Governance

This issue concentrates on the development. We need to develop an offshore economy, we need to develop the port and we need to develop shipping. Everybody will be able to develop this as long as the environment and nature are preserved. That's the key sense. And as long as the people you know will benefit from the development. That's the key issues. So, this is why we have in this diagram, we see the 3 pillars, but what is also important is to see that there are different levels that we need to take into account.



So, more or less, if we talk about Bangladesh, we need to take into account what the others, the neighbours are doing, mainly India and Myanmar. Governance is a process and it takes a lot of time. We need to be patient. But we need to continue to work on.

Blue Economy Challenges in Bangladesh

We have been discussing a lot about green shipping, green ports. And I would like to emphasise one or two concepts here. If we take seashell, for instance, the seashell is using this to remove or release the debt labour. So more or less they are making a change. We protect the blue nature. In Africa, Gabon is one of the key counties in this area. They are using the ecosystem services. They allow the trees to grow than cutting down the trees and selling the wood. We need to keep in mind that nature has value.

We can develop the gas exploration, we can develop shipping and we can develop tuna fishing. But at the end what will happen is that what we see every day in Dhaka, big traffic jam, or even in Chattogram. Even if they try to improve the traffic in Chattogram especially the access to the port. They just have a big traffic jam.

Marine Ecosystem Protection

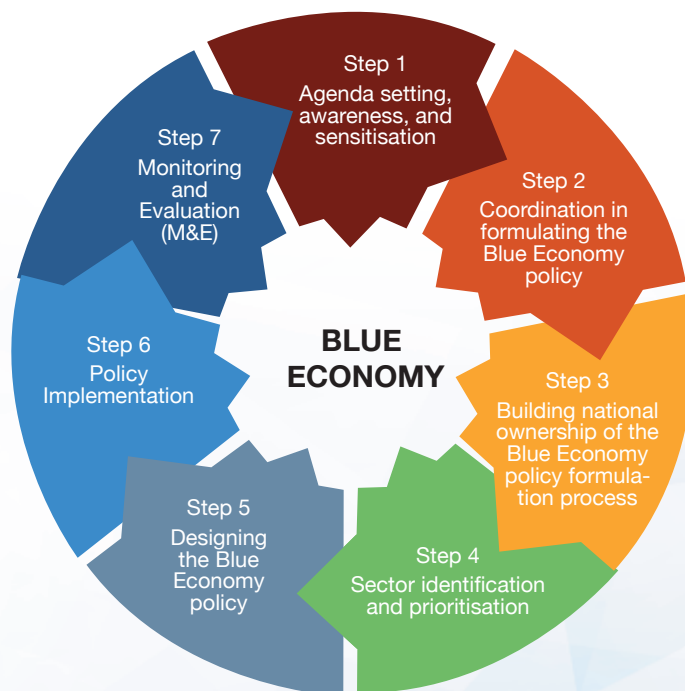
This needed to be done as soon as possible. Not only by putting marine protected area. This should also include what happens in the land, what happened in the sea. The pollution is coming from the river mainly. Not from the sea. So, this has to be addressed quite urgently.

Monitoring and Research

When you visit Chattogram, you can see that shipbreaking is making a lot of improvement to decrease pollution. But there's still a lot to do. The challenge is mainly about developing research. We have made some partnership. For example, Khulna University is working with the Dutch people for Shrimp cultivation and mangrove. Developing partnership with enterprises and foreign institutes but also at the national level will promote research to develop marine aquaculture project. People are making bottles from seaweeds. This can be done like in Indonesia. There is no pollution. In Madagascar, in Tanzania, in Zanzibar, they got massive pollution for one or two years and the seaweeds are gone. So it is a big issue. You can develop some aquacultural sense, as long as there are no pollutions. So this needs to be coordinated. One can change the term of a framework. It is not a simple one. We have to remember planning and cooperation. Planning is the first one because if people want to invest in Bangladesh they need to have their future secure. So securing investments is a key change. If we develop a seaweed farm, we need to know what will be the environmental conditions, natural conditions and also economics in the near future and the long term as well.

Blue Economy Cell

We need to maintain the coordination between the sea people and the land people. Over the two years, we have visited all of the ministries involved in the 'blue economy'. Everybody is doing their own agenda. There is no communication. They set up the 'blue economy' cell. The



co-operation between ministries at the regional level is very important because if Bangladesh does something and India does the opposite, it will not work. It is also important to be able to monitor the progress. We need to be able to adapt and to mitigate this process. Possible working formulae can be as follows.

Conclusion

Instead of getting negative externalities we should really create synergies and develop some positive externalities. This needs to be done at the regional level. There are a lot of universities and institutions already involved in the 'blue economy'. We have some research proposals in the pipeline. Universities of Bangladesh need to collaborate not only with the universities but also the new national oceanographic centre. The 'blue economy' cell is directly linked to the presidency. They do not belong to any ministries thus it makes a change. There are about 2-3 thousands of institutions that are working on the 'blue economy'. I think from what I have seen in the world, Bangladesh can be the leader in 'blue economy' implementation. I did not say development, I said implementation. Bangladesh has all the tools, the people, all the capacities in term of research, especially with maritime university now.



Prof. Dr Pierre Failler

Department of Economics and Finance,
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Comments of Session Chair

Dr Daud Hasan

The oceans are important for water, minerals, fisheries, recreation, shipping and transportation. The world oceans produce 70 per cent of oxygen. 95 per cent global water supply comes from the oceans. 80 per cent founder life remains in the oceans. We need to save and protect the oceans for the sake of humankind. There was a time when the oceans were used for negative aspects. Oceans were considered as the waste sink to dump anything. According to the global aspect of scientific marine pollution, it's identified that the oceans' sink capacity is also limited.

The world oceans are important but they are being affected by a number of unsustainable activities. For example, over-exploitation of resources, land-based and oil-based marine pollution, dumping. The oceans have been used and now that usage has to be given back through sustainable ocean governance regiment. The term 'maritime governance' usually refers to shipping and port sectors. Effective and responsible maritime governance has significant implications in terms of the marine environment, maritime safety and security, economic development linked with the 'blue economy'. Maritime safety, marine environment and economic development are an integral part to each other. In addition to law and order, secured marine environment has to be ensured; otherwise, international trade and investment will be affected. That is why, maritime security is linked with economic development in a 'blue economy'.

In order to achieve 'blue economy', maritime safety is important. Regarding the piracy issues, it is difficult to catch the pirates under the conventions of the law of the sea because it has a number of limitation in respect of definitional and operational point of view.

In 1988 suppression of unlawful acts were enacted because under the law of the seas no one could be considered as a pirate in high seas. Moreover, it is difficult to distinguish between piracy and maritime terrorism. A uniform law does not exist and so the pirates cannot be treated with an international law although they are universal criminals. For example, the Chinese government deals with the pirates according to their acts.

In Bangladesh, there is no specific provision with criminal law that can be dealt with many other countries. The pirates of Southeast Asia, the Gulf of Singapore state and Malacca state are different from the pirates of Somalia, Gulf of Eden and Gulf of Guinea. For instance, Somalia considers their pirates as 'national freedom fighters', not as pirates. It is very important for maritime safety and security to come together on these issues. When RECAP was adapted, it was ineffective because Australia and New Zealand were not the parties; later on, they became the party and increased the surveillance capacity.

The Bay of Bengal like other oceans is still an unexplored area in terms of the ocean environment. But due to the current settlement of maritime disputes under the leadership of the current Prime Minister, the ocean use in the Bay of Bengal will significantly increase. When the significance of ocean increases, stronger protection is needed. For that, a more functional and sustainable management system is required to be put in place. The more rational management system can be achieved if the important measures and initiatives are taken into account in terms of ‘blue economy’, ecosystem management and marine spatial planning implementation.

Before the ‘blue economy’, the ecosystem management was a global agenda for sustainable ocean governance and ecosystem management needs to be incorporated within the national regional scheme. In order to implement ecosystem management, it is very important to introduce and implement marine spatial planning which is happening in other parts of the world.

Out of the five continents, the four continents are covered by marine spatial planning. More coherent and comprehensive legislation is needed to deal with these matters. The way forward how some initiatives can be taken, how the management system can be improved, how all the important management principles and majors within a national scheme can be incorporated should be sought out.

At this stage, the country needs a comprehensive ocean policy. For example, the Australian ocean policy was adopted in 1998. Long before, the great barrier reef which an example of marine spatial planning initially started with a marine protected area (MPA). In 1974 it was commonwealth legislation. It has been amended a number of times. How the scheme and legislative assembly arrangement can be improved has to be thought out and for that, a common platform is also required.



Dr Daud Hassan

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Closing Session

Keynote Paper-2

Foreign Policy Options for Blue Economy

Ambassador Munshi Faiz Ahmad

Chairman, Board of Governors

Bangladesh Institute of International and Strategic Studies
(BISS)

Speech by Chief Guest

Dr Dipu Moni, MP

Chairperson, Parliamentary Standing Committee on
Foreign Affairs

Closing Remarks by Vice-Chancellor, BSMRMU

Rear Admiral M Khaled Iqbal, BSP, ndc, psc



Keynote Paper - 2

Foreign Policy Options for Blue Economy

Ambassador Munshi Faiz Ahmad

Abstract

Blue economy's actual potential is dependent on the foreign policy options of a nation. The 'blue economy' encompasses sea trade, commerce, export and import growth; and depends on establishing new ties as well as nurturing existing ones with the rest of the world. Development in energy, port and shipping sectors is reliant on regional cooperation. Regional cooperation is also of paramount importance for tackling piracy, maritime insecurity and illegal migration. Due to global connectivity, it is imperative that the technological innovations in the maritime sectors of the developed world are transferred to all other countries. This would also allow Bangladesh to stay abreast of the technological developments in those sectors. The objective of the 'blue economy' initiative is to promote smart, sustainable and inclusive growth and employment opportunities. The universality of ocean necessitates international connotations for any sort of development. In order to achieve vision 2041 and the objectives of 'blue economy', it is high time Bangladesh evaluates its foreign policy options and enhances regional and global cooperation in order to reap the benefits of any components of the 'blue economy'. The foreign policy options need to be designed in such a way so that Bangladesh can actively participate in regional and global forums or associations and can align itself with various groupings in order to fulfil its vision of the 'blue economy'.

Introduction

A country's foreign policy, as also foreign relations or foreign affairs, consists of self-interest strategies chosen by the state to safeguard its national interests and achieve predetermined goals and objectives through its international relations. These approaches are employed in interactions with other countries as well as other foreign entities. Domestic strength and capacity of a country will positively impact its ability in pursuing its foreign policy. In short, foreign policy, is an extension of domestic policy, a projection of national interests abroad. The World Bank defines it as "sustainable use of ocean resources for economic growth, improved livelihoods and jobs while preserving the health of the ocean ecosystem." In addition to the actual waters, we will use the word to cover relevant infrastructures, livelihoods and activities onshore related to the maritime domain.

Blue economy's actual potential is dependent on the foreign policy options of a nation. The 'blue economy' encompasses sea trade, commerce, export and import growth; and depends on establishing new ties as well as nurturing existing ones with the rest of the world. Development in energy, port and shipping sectors is reliant on regional cooperation. Regional cooperation is also of paramount importance for tackling piracy, maritime insecurity and illegal migration. Due to global connectivity, it is imperative that the technological innovations in the maritime sectors of the developed world are transferred to all other countries. This would also allow Bangladesh to stay abreast of the technological developments in those sectors. The objective of the 'blue economy' initiative is to promote smart, sustainable and inclusive growth and employment opportunities.

Background of Bangladesh Foreign Policy in the Maritime Sector

Maritime Domain Awareness (MDA) is the effective understanding of all areas and things of, on, under, relating to, adjacent to, or bordering on a sea, ocean, or other navigable waterways,

including all maritime-related activities, infrastructure, people, cargo, and vessels and other conveyances. The genesis of Bangladesh's foreign policy can be traced back to before independence, in our efforts to garner support for the struggle for independence and the War of Liberation from friends abroad. The Father of the Nation, Bangabandhu Sheikh Mujibur Rahman famously narrated the fundamental principle of our foreign policy as: "Friendship to all, malice to none". We continue to be guided by that principle, to date.

Basics of Bangladesh's foreign policy originate from Article-25 of our constitution that aims at promoting global peace, security and solidarity. It says the State shall base its international relations on principles of respect for national sovereignty, equality, non-interference in internal affairs of other countries, peaceful settlement of international disputes, respect for international law and principles enunciated in the UN Charter. As a visionary leader, the Father of the Nation understood the critical significance of the maritime domain for our economic development as well as security. In 1974, he enacted the Territorial Waters and Maritime Zones Act (Act No. XXVI of 1974) to establish Bangladesh's sovereign rights over the sea and its resources. It includes territorial waters, contiguous zone, economic zone, conservation zone, continental shelf, control of pollution etc.

Prime Minister Sheikh Hasina, the worthy daughter of the Father of the Nation, decided to take the disputes to the appropriate international courts for arbitration. Once India and Myanmar agreed to the arbitration, the case with Myanmar was referred to the ITLOS and the case with India was referred to the arbitral tribunal at the PCA in the Hague in 2009, to secure full and satisfactory delimitation of Bangladesh's maritime boundaries with the two countries, the territorial sea, exclusive economic zone and continental shelf in accordance with international law.

After several years of long legal battles, the verdicts were issued, which proved largely favourable to Bangladesh; the disputes were amicably resolved with the two neighbours. The then Foreign Minister, Dr Dipu Moni was instrumental in securing the historic victory for Bangladesh. She along with the Secretary of Maritime Affairs, Rear Admiral Khurshid Alam, and a team of local and foreign legal experts represented Bangladesh at the ITLOS. Under the wise direction and guidance of Honourable Prime Minister Sheikh Hasina, they worked tirelessly on the cases and ultimately obtained favourable judgments for the country, resolving longstanding disputes with Myanmar and India. These verdicts opened up about 1,18,813 square km of resource-rich waters for Bangladesh to develop its 'blue economy'.

Prospect of Bangladesh in the Maritime Sector for Foreign Policy

As a maritime nation, Bangladesh now has a substantial size of sea area which can play a vital role in the national economy and well-being of its future generations. Resources on land are depleting rapidly and it is believed resources in and around the sea will become an increasingly important destination for livelihood in future. The government of Bangladesh has started working with diverse stakeholders at home and abroad to embark upon expansion of the 'blue economy' by formulating relevant policies and plans. The objective is to sustainably exploit untapped potentials of the marine environment using helpful solutions and innovations for increasing food security, alleviating poverty, improving nutrition and health, creating jobs, lifting trade and industrial profiles while protecting ecosystem health and biodiversity, also improving regional security and peace.

The government has taken up development of the 'blue economy' as a top priority. This will involve greater maritime domain awareness, development of necessary infrastructures both on and offshore, exploration and sustainable exploitation of resources above, in and below the waters, conservation and protection of the resources as well as ensuring overall security of the waters, the resources therein, economic activities in these waters, trade and commerce and navigation. A more immediate priority is preparing an appropriate submission regarding Bangladesh's continental shelf entitlements and pursuing it with vigour to achieve a satisfactory outcome.

For harnessing the full utility of ocean-based resources, Bangladesh should emphasise and consider a range of productive economic sectors, e.g., marine fisheries and aquaculture; minerals and mining; oceanic sources of renewable energy; increasing maritime trade, shipping and transport; tourism; education and research on maritime affairs; marine spatial planning etc. The Bay of Bengal holds vast prospects for wind, solar and wave energy. Heavy minerals (radioactive) like Ilmenite, Zircon, Rutile, and magnetite have been discovered in sands of the Cox's Bazar beach. Bangladesh has favourable conditions for wave energy especially during the period starting from late March-early October.

Challenges in the Maritime Sector of Bangladesh for Foreign Policy

Despite vast resources and prospects, development of the 'blue economy' faces many challenges including lack of awareness, knowledge and information about the domain, pollution, overfishing, illegal fishing, uncontrolled and unplanned exploitation of resources, violation of territorial waters, piracy and robbery, human, weapons and drugs trafficking, irregular migration, terrorism, manmade and natural disasters, climate change, inadequate governance mechanisms, lack of appropriate and coordinated security architecture etc. In addition, surveillance, safeguarding and protection against misuse of these resources in peacetime, will, therefore, be of very high importance to the country's security and economic growth. Bangladesh Navy and Coast Guard in coordination with all related government bodies, maritime agencies and organisations need to enhance their capacity and ability to address these issues.

All these are further compounded by big power rivalry and various exclusivist security arrangements being touted by some littoral and external players from time to time. Within Bangladesh, there remains a need for creating greater awareness about maritime affairs including the 'blue economy'. So far, these issues have been confined largely to intellectuals and those interested. There is only one dedicated institution, the Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU) for developing expertise and skilled human resources on maritime issues. More such institutions, relevant literature, developing indigenous experts, media coverage are essential to transforming our people into a more maritime-oriented nation.

The new opportunities and challenges will have to be addressed at two levels: domestic and foreign. However, since Bangladesh is relatively new in the business of developing a 'blue economy', almost everything that needs to be done to avail of the opportunities and address the challenges has a foreign policy aspect in terms of the significant amount of cooperation envisaged to achieve the appropriate goals. For example, we will require substantial cooperation in terms of technical and financial assistance with suitable partners for: extensive and targeted surveys of our waters and resources therein, human resource development and capacity building, expansion of education and knowledge in the relevant fields, exploration and exploitation of oil, gas and other minerals, sustainable fishing, conservation of biodiversity, development of infrastructures and new livelihood opportunities both on and offshore.

Substantive cooperation will also be required with relevant partners for boosting our national capacity in countering maritime crimes including piracy, robbery, trafficking, poaching and intrusion. There is also a need for enhanced cooperation in developing regional mechanisms to fight these scourges. International and regional cooperation needs to be enhanced considerably to ensure safety and security for trade and commerce and seafarers by establishing appropriate networks of relevant information sharing and joint and or coordinated response mechanisms. Effective cooperation mechanism is also required for disaster warning, preparedness and response. Putting in place suitable structures/architecture for ensuring seamless cooperation among the navies, coast guards, and other relevant law enforcement agencies to avoid unwanted confrontations and duplications in routine patrolling or while responding to specific events at sea. Beside routine diplomatic and professional engagements, this will also involve 24/7 communication, connectivity and joint exercises.

Maritime nations are prioritising the issues of establishing mechanisms for rules-based governance and inclusive security architectures covering, territorial waters, the EEZs and international waters based on principles of sovereign equality, equitable sharing of the waters and resources therein, and freedom of navigation. Developing such mechanisms will require serious and protracted negotiations. Bangladesh will need to enhance its skills and expertise to engage in the relevant negotiations proactively and effectively.

Talking of various structures/mechanisms/forums— there are already a few regional, sub-regional and international forums in place, serving littorals of the Bay of Bengal and the Indian Ocean as well as external stakeholders in the region. Some of them are Indian Ocean Rim Association (IORA), Bay of Bengal Large Marine Ecosystem Project (BOBLME), Indian Ocean Naval Symposium (IONS), Global Tsunami Warning and Mitigation System etc. Moreover, the UNCLOS and other related international legal frameworks and institutions serve significantly in matters of rules-based governance and security in the maritime domain. Bangladesh as a beneficiary and stakeholder must engage with all these institutions to further strengthen them and to continue to derive benefit from them.

While trying to maximise her benefits from cooperation and collaboration in all matters related to the ‘blue economy’, she needs to remain constantly engaged with relevant littorals, countries with knowledge, expertise and relevant technologies, major players in global trade, shipping and security. To mention a few relevant littorals and non-littorals: India, Sri Lanka, Myanmar, China, Japan, USA, Russia, UK, France, Germany, Australia, Indonesia, Malaysia, Singapore, Thailand, Canada, South Africa and many others. We need to remain constantly engaged with them in search of an increasingly congenial atmosphere in our maritime domain, development partnership, sharing best practices and joint efforts towards setting norms and rules for win-win use of the maritime domain.

We should get involved in, as many as possible, regional, sub-regional and international initiatives for connectivity and development cooperation, such as China’s BRI, Japan’s BIG-B, India’s SAGAR, and others. However, we should be wary of various exclusivist initiatives and vigorously encourage inclusivity all around. We will also need to work with technical and legal experts of international repute as well as relevant friendly countries to appropriately prepare and present our submission on continental shelf entitlements, well before the deadline. We must remain engaged with countries with conflicting claims to ensure maintenance of a mutually friendly and accommodative attitude on the issue.

Conclusion

The universality of ocean necessitates international connotations for any sort of development. In order to achieve vision 2041 and the objectives of ‘blue economy’, it is high time Bangladesh evaluates its foreign policy options and enhances regional and global cooperation in order to reap the benefits of any components of the ‘blue economy’. The foreign policy options need to be designed in such a way so that Bangladesh can actively participate in regional and global forums or associations and can align itself with various groupings in order to fulfil its vision of the ‘blue economy’. Finally, the boundaries in the water are blurred and invisible. The domain awareness is extremely difficult for most countries. Economic activities in and around the sea are difficult, complicated and subject to fast-changing technologies. The environmental and security issues connected with the maritime domain impact profoundly on all countries, littoral and non-littoral. No one country or a small group of countries, however powerful or technologically advanced, can satisfactorily address all the related challenges alone. Therefore, cooperation, collaboration and coordination with three big Cs are critically important. That too must be fully inclusive.

Ambassador Munshi Faiz Ahmad

Chairman, Board of Governors,
Bangladesh Institute of International and Strategic Studies (BISS)



Speech by the Chief Guest

Dr Dipu Moni, MP

Chairperson

Parliamentary Standing Committee on Foreign Affairs

Bismillahir Rahmanir Rahim.

Vice-Chancellor of Bangabandhu Sheikh Mujibur Rahman Maritime University, Rear Admiral M Khaled Iqbal, Eminent academicians, marine professionals, researchers, faculty members and students of Bangabandhu Sheikh Mujibur Rahman Maritime University,

Representatives from the media, distinguished guests, ladies and gentlemen, Assalamu Alaikum and good afternoon.

I am delighted to be here though much later than expected and very happy to see that Maritime University has organised an international maritime seminar, which is likely to generate huge interest and ignites our thought process for sustainable use of ocean resources.

The ocean covers 71 per cent of the earth surface. It is the basic component of the global bio support system as well as a treasure house of resources and an important regulator of the environment.

The rapid growth of world population and the development of science and technology and a gradual shortage of land resources have made us switch our focus to the ocean resources.

After the War of Liberation in 1971, our Father of the Nation, Bangabandhu Sheikh Mujibur Rahman envisioned the need of marine resources for the overall development of our country. Under his visionary leadership, the Territorial Water and Maritime Zones Act 1974 was enacted well before the UNCLOS III came into being in 1982. Thereafter, our Hon'ble Prime Minister Sheikh Hasina carried forward the vision of Bangabandhu Sheikh Mujibur Rahman and decided to ratify the UNCLOS on 25 July 2001, which also entitled us to claim our continental shelf or to make our claim on the continental shelf within the stipulated 10 years of time.

Subsequently, under the prudent leadership of the Hon'ble Prime Minister and the daughter of Bangabandhu, Sheikh Hasina, we have settled our maritime boundary delimitation with Myanmar in 2012 in the International Tribunal for the Law of the Sea and with India at the Permanent Court of Arbitration in 2014 resulting in the gain of huge maritime area of 118,813 sq km. I had the opportunity or rather I am privileged to be the agent of Bangladesh in both of these successfully concluded cases.

Throughout the ages, our oceans, seas and waterways have made economic, social and human development possible serving as conduits for trade and commerce, adventure and discovery and

the human stories involving oceans and waterways and seas also enriched our literature. Indeed, life itself rose from the oceans. Life on earth still very much relies on the ocean – from being a prime source of nourishment for billions of people to impact our climate and the weather, even the air that we breathe, thanks to the delicate interplay between the oceans and the atmosphere.

The oceans are the global common and resource for the world to meet the sustainable development goals. The present government has identified the maritime sector as an important sector to contribute in increasing our food security, elevating poverty, creating jobs and lifting trade and industrial profiles of the country in terms of ‘blue economy’.

But, when we talk about the ‘blue economy’, we must remind ourselves; when we took the initiative to resolve our maritime boundary dispute through international law, we did not only think of economic prospects, which we call ‘blue economy’ today. In fact having our sovereign rights established in maritime areas that were rightfully ours was the prime motivating factor and obviously, security, economic development, scientific research was also important to us. Our Bay of Bengal not only carries, in its name, our heritage of thousands of years but also connects us to the world. And because of Bay of Bengal, we are not only a riverine nation but also we are a maritime nation.

At present, our interests are manifested in a variety of blue economic activities around our coastal belt and maritime space. Development of new ports, the extension of Chattogram port and other related activities have led the economic development along the coastal belt. Besides enhancing the potential of coastal aquaculture, operating surveys in a number of sea blocks for exploiting oil and gas, developing sea salt extraction, promoting marine and coastal eco-tourism, marine biotechnology, diversification of resource utilisation, harvesting fisheries resources, etc. have increased activity within our coastal waters.

The maritime sector is a major economic player. We need a sea change approach for national as well as global developments. We need strategies for our ocean industries, with a view to paving the way for sustainable growth for years to come. We are committed to the sustainable use of resources and concrete measures to combat the threats facing our oceans. Along with Bangladesh, the regional countries have also big roles to play. The threats to our climate and the health of our oceans can only be addressed through innovation and global cooperation. We all have to coordinate for a better world.

Therefore, ocean governance is crucial. Issues of rule-based governance structure and initiatives and security structures have already been discussed by our very distinguished keynote speaker. So I will not go into those again. After the fulfilment of Millennium Development Goals, the United Nations has targeted Sustainable Development Goals. These Sustainable Development Goals are the blueprint to achieve a better and more sustainable future for all. They address the global challenges we face, including those related to poverty, inequality, climate, environmental degradation, prosperity, and peace and justice. It is important that we achieve each goal and target

by 2030. Moreover, we can explore the potential contribution of shipping to the Sustainable Development Goals because shipping is an integral part of the global economy.

We are aware that the SDG 14, which is 'Life below water' can be the standard of accountability for Bangladesh's own quest towards marine conservation and 'blue economy'. We need to increase scientific knowledge, develop research capacity and transfer marine technology. Besides, SDG 14 tells us to enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS III, which provides the legal framework for the same. The 2030 Agenda of SDGs comes at a time when Bangladesh has already started its journey towards an upper middle-income country by 2021 and a developed country by 2041. In order to give more importance to the maritime sectors, we have established the Maritime Affairs Unit at MOFA, for exploring the international cooperation for the maritime development of Bangladesh. At the helm of this unit is our Rear Admiral (retd) Khurshed Alam, who I had the honour and privilege to have as my co-agent. Moreover, we have established the 'blue economy' cell to coordinate and to have a focused approach on the 'blue economy'. The establishment of Bangabandhu Sheikh Mujibur Rahman Maritime University in 2013 was a visionary step by Sheikh Hasina's government towards the maritime higher education and research. We must remember, when we took that initiative to resolve the maritime boundary issue through international law with our two immediate neighbours; at the same time, we have started developing institution to train personnel to develop this sector that is when Marine Academies were also established, Maritime University was established, Oceanography was started and it is being taught at two to three public universities. Dhaka, Chattogram and Noakhali universities, I think, teach oceanography now. Marine Technology Institute and Bangladesh Oceanographic Research Institute were also established and at the same time, we have enhanced greatly the capacity of our Navy and Coast Guard during this period. Bangladesh Navy, because of all these reasons, has now become three dimensional Navy.

I would like to conclude by saying that sustainable development is the ultimate goal of coastal and ocean management. We have huge potentials in the maritime sector. In fact, the time has come to think about a Maritime Policy for Bangladesh which would guide all maritime stakeholders to use the sea in a sustainable and orderly manner. Then only, the actual theme of today's seminar will be attained. I wish to give my sincere thanks once again to the Vice-Chancellor of Bangabandhu Sheikh Mujibur Rahman Maritime University for inviting me to this important seminar.

I hope that the sessions of these two days of seminar have been worthwhile in encouraging the participants to think about the various ways and means to utilise our marine resources in a sustainable manner; to come out with solutions to stop the pollution to preserve the oceans; the global commons, which connects peoples, societies, civilisations, and is an integral and important part of life on this planet earth that we call our home.

Thank you all.



Closing Remarks by Vice-Chancellor, BSMRMU

Rear Admiral M Khaled Iqbal, BSP, ndc, psc

Bismillahir Rahmanir Rahim.

The Honourable Chief Guest the Chairperson of the Parliamentary Standing Committee on Foreign Affairs, Dr Dipu Moni, MP.

Learned Speakers and Session Chairs, eminent scholars, academicians, students, distinguished guests, Assala-mu-Alaikum and a very good afternoon.

It has been indeed a matter of great pleasure and immense satisfaction for Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU) to have successfully hosted this two days seminar on "An Inclusive Maritime Vision for Sustainable Development of Bangladesh". It is now my turn to wrap up the seminar and draw the curtain on this extensive intellectual pursuit.

In this concluding session, we are especially honoured to have amongst us Hon'ble Member of Parliament Dr Dipu Moni despite her very busy schedule.

Bangladesh is truly a maritime nation with centuries of seafaring traditions whereas we still boast of our shipbuilding heritage of the good old sailing days. It was our father of the nation, Bangabandhu Sheikh Mujibur Rahman who first gave this nation the maritime vision promulgating Maritime Zones and Territorial Waters Act 1974.

In the last several years, the Hon'ble Prime Minister Sheikh Hasina has given an unprecedented momentum to the entire gamut of the maritime sector. Today we can witness a lot of development projects in port and shipping, coastal industries, coastal energy hubs, offshore structures, and in every other sector of the 'blue economy'.

Thanks to the prudent leadership of the Hon'ble Prime Minister Sheikh Hasina, today we are in possession of a huge maritime area of our own. In this respect, the immense contribution of our today's Chief Guest Dr Dipu Moni, MP, as the immediate past Foreign Minister is acknowledged with gratitude.

This two days seminar has rightly emphasised on the need for inclusive maritime vision sharing the ideas and thought process of all stakeholders and the seminar theme, 'Prosperity through Maritime Vision' has been reaffirmed by the session speakers.

The papers presented by the eminent scholars at different sessions were well orchestrated and highlighted on the ways and mean to develop our blue economic activities.

Yesterday, in the session 'port-led Economic Development', the speakers stressed how to achieve port competitiveness and gave an account of success stories in China, India and Europe.

The keynote speaker yesterday Rear Admiral M Khurshed Alam (retd) has highlighted the need for intertwined economics among the Bay of Bengal littorals whereas other speakers of the ‘blue economy’ session stressed on adapting to changing shipping and maritime tourism trends for attaining a sustainable ‘blue economy’.

The need for developing skilled manpower equipped with higher maritime education is a prerequisite to harness the potential of maritime resources, which were broadly discussed in the third session under the theme ‘Maritime Education for the New Generation’.

Today, the speakers of the session ‘Maritime Technological Innovations’ showed us the future prospects of energy efficient ports and shipping and emphasised sustainable dredging technology, which is very relevant to the context of Bangladesh.

In the fifth session, we were enriched with deliberations on the need for maritime safety and security and maritime governance. In today’s keynote paper, Ambassador Munshi Faiz Ahmad has shed light on the success of our foreign policy in recent years for pursuing international and regional cooperation to achieve the objectives of the ‘blue economy’. He also indicated few foreign policy options for days to come.

Before I conclude, I would like to extend my heartfelt thanks to the Hon’ble Chief Guest Dr Dipu Moni, MP for her kind presence and giving us some valuable words of advice for the cause of maritime development.

I would profusely thank eminent speakers, session chairs, learned academicians and distinguished guests from home and abroad for their enthusiastic participation in the seminar.

I would like to especially thank the organisers of this seminar, notably our officers, faculty members and staffs from BSMRMU, who have worked round the clock over past six months to organise this successful seminar.

I would also like to thank our friends from the media, for being present at this seminar and covering the two days’ programme.

Thank you very much.

**Glimpses of
BSMRMU
International
Seminar**

INAUGURAL SESSION



INAUGURAL SESSION



INAUGURAL SESSION



INAUGURAL SESSION



SESSION 01



SESSION 02



SESSION 03



SESSION 04



SESSION 05



CLOSING SESSION



CLOSING SESSION





Bangabandhu Sheikh Mujibur Rahman Maritime University, Bangladesh

